2.0 Introduction

The New Hampshire electric and natural gas utilities are pleased to submit our 2018-2020 New Hampshire Statewide Energy Efficiency Plan (the "Plan") for approval by the New Hampshire Public Utilities Commission (the "Commission"). This Plan is being filed jointly by Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty Utilities, New Hampshire Electric Cooperative, Inc. ("NHEC"), Public Service Company of New Hampshire d/b/a Eversource Energy, and Unitil Energy Systems, Inc.("UES") (referred to throughout the remainder of this document as the "NH Electric Utilities") and EnergyNorth Natural Gas, Inc. d/b/a Liberty Utilities and Northern Utilities, Inc. ("Northern") (referred to as the "NH Natural Gas Utilities") or collectively as the "NH Utilities". The NH Utilities appreciate the opportunity to build upon our long history of providing energy efficiency programs in New Hampshire. We look forward to working with our customers and all of the energy efficiency stakeholders to increase energy savings and achieve the significant economic and environmental benefits that energy efficiency brings to New Hampshire.

This Plan is the result of a coordinated and integrated planning effort among the six NH Electric and Natural Gas Utilities, including input from a wide variety of energy efficiency stakeholders, contractors and customers. The NH Utilities are focused on providing high quality, innovative and comprehensive energy efficiency products and services to meet our customers' ever evolving energy needs. Since 2002, we have worked together to seamlessly deliver energy solutions and services. One of our goals is to help ensure that all of New Hampshire's residents, businesses, and municipalities have access to high quality energy efficiency offerings that take into account the unique customer characteristics and demographics of each Utility's service area.

The NH Utilities have helped our customers achieve substantial energy savings over the past 15 years[4] through the coordinated NHSaves electric and natural gas energy efficiency programs (formerly known as the CORE Programs). Since program inception, customers have leveraged our programs to save over 13 billion electric kilowatt-hours and 27.7million natural gas MMBtu over the life of the measures installed. The energy savings alone have resulted in customer cost savings of $2.2 billion.

The NHSaves program accomplishments reflect the solid working relationships developed among the energy efficiency teams from each utility and our focus on customer and stakeholder partnerships. These partnerships have proven to be critically important for the

[4] The NH utilities provided energy efficiency programs individually prior to 2002

successful delivery of energy efficiency programs and services to-date and will remain so in the future.

2.1 Energy Efficiency Vision

The NH Utilities view the pursuit of energy efficiency as a key strategy for building a modern and sustainable energy future. Three main elements of progress include: market transformation, capturing all cost-effective energy efficiency, and delivering the value of energy efficiency to the NH economy. The first element of our vision is to transform the way our customers think about and use energy by giving them access to a variety of innovative energy efficiency services and energy information that will help them to better manage their energy use and costs and move them toward adoption of efficiency measures as a standard practice. The second element is to help our customers recognize energy efficiency as an important energy resource and motivate them to actively pursue all cost-effective energy efficiency in their homes, businesses and municipalities. The third element is to deliver cost effective energy savings that provide significant benefits to the NH economy by lowering energy bills, generating local jobs, reducing the energy dollars that go to pay for out-of-state fuels, and increasing the quality of our building stock. Working together with our customers, energy efficiency service providers, and stakeholders, we can achieve this vision for New Hampshire. The 2018-2020 Energy Efficiency Plan is an exciting next step in our progress toward these goals.

2.2 Energy Efficiency Resource Standard

On August 2, 2016[5] the Commission issued Order 25,932 to adopt an Energy Efficiency Resource Standard ("EERS"), which establishes energy savings goals as a percentage of the NH Utilities' retail sales. This order by the Commission set increasing energy efficiency goals and provided a mechanism for funding to reach these new goals. The approved EERS framework consists of 3-year planning periods with associated savings goals as well as a long-term goal to pursue all cost-effective energy efficiency opportunities and measures. The framework ensures Commission oversight of the EERS programs and reaffirms a process for stakeholder involvement as well as robust evaluation, measurement and verification ("EM&V") to validate energy savings and improve program delivery.

The cumulative energy savings goal over the 3-year planning period equates to 3.10 percent of retail electric sales and 2.25 percent of retail natural gas sales, relative to a 2014 baseline.

[5] New Hampshire Public Utilities Commission (2016, August 8), Order No. 25,932, "Energy Efficiency Resource Standard – Order Approving Settlement Agreement". Retrieved from http://www.puc.state.nh.us/Regulatory/Orders/2016orders/25932e.pdf

When compared to the previous three years of 2015, 2016, and 2017, the statewide NHSaves programs goals for the NH Utilities for 2018, 2019, and 2020 will increase by approximately 160,000 Annual MWhs and 78,000 Annual MMBtus.

Table 2.1: Comparison to Previous 3-year Period

ELECTRIC PROGRAMS	2015-2017	2018-2020
Cumulative Lifetime MWh Savings	2,271,515	4,038,590
Cumulative Annual MWh Savings	175,168	334,273
Cumulative Annual Savings as a % of 2014 Delivery Sales	1.62	3.1%
Cumulative Program Funding	$83,357,515	$154,142,047
Program Cost per Lifetime kWh Savings	$0.037	$0.038
NATURAL GAS PROGRAMS	**2015-2017**	**2018-2020**
Cumulative Lifetime MMBtu Savings	6,908,142	7,509,343
Cumulative Annual MMBtu Savings	447,585	525,575
Cumulative Annual Savings as a % of 2014 Delivery Sales	1.92	2.3%
Cumulative Program Funding	$22,464,480	$31,396,650
Program Cost per Lifetime MMBTU Savings	$3.25	$4.18

The EERS will allow the NH Utilities to reach more New Hampshire customers and also drive expanded partnerships to achieve more comprehensive energy efficiency. New initiatives to achieve these goals include a new residential energy audit option, a financing option for moderate income residents, new measure offerings in both residential and commercial programs, and multi-year energy planning to encourage long-term energy savings projects among large commercial customers.

This expansion of energy efficiency services will provide significant benefits to the residents, businesses, and communities of New Hampshire, even for non-participants. Increased efficiency lowers energy use overall and can lead to peak load reductions. Saving energy and reducing demand contributes to lower customer energy bills. Significantly, the energy efficiency industry also supports a growing local and state labor force to identify, design, install, inspect, evaluate, and continuously improve and expand energy efficiency products and programs. The industry also supports the development, manufacture, and sale of energy efficiency products and systems in New Hampshire and beyond.

2.3 EERS Background

In early 2015, the New Hampshire Public Utilities Commission opened docket DE 15-137[6] to invite stakeholders to engage in a dialogue that ultimately led to the establishment of an Energy Efficiency Resource Standard (EERS) in New Hampshire. In the months following the commencement of this docket, many parties met regularly in well-attended stakeholder technical sessions to discuss the issues surrounding the creation of an EERS. Out of those sessions came a Settlement Agreement[7] between stakeholders which embodied the creation of an EERS with the long-term goal of achieving all cost-effective energy efficiency in NH.

The EERS Settlement Agreement provided that the NH Utilities would continue to administer the energy efficiency programs throughout 2017 and create a 3-year energy efficiency plan for program years 2018-2020. As part of the transition from the CORE programs to an EERS, specific annual savings goals were established, starting with 2017 electric and natural gas statewide goals of 0.60 percent and 0.66 percent (of 2014 delivered sales), respectively. In the subsequent years, those goals increase as following:

Year	Electric	Gas
2018	0.80%	0.70%
2019	1.00%	0.75%
2020	1.30%	0.80%

The Settlement Agreement also addressed performance incentives and lost revenues. To balance the interests of customers and stakeholders, the target performance incentives for electric and natural gas were lowered from 7.5 to 5.5 percent, starting in 2017, with the regulated NH Utilities recovering lost revenues associated with energy efficiency measures installed on or after January 1, 2017, and the expectation that the lost revenue mechanism will be removed once a utility moves to a decoupling mechanism.

The Settlement Agreement provides a mechanism to adjust funding levels in order to meet the increased energy savings goals. The NH Utilities will request any necessary changes to the System Benefits Charge (SBC) annually for the electric utilities, as well as the Local Delivery Adjustment Clause (LDAC), for the natural gas utilities. As a protection for income-eligible

[6] New Hampshire Public Utilities Commission (2015, May 5). "Gas and Electric Utilities: Energy Efficiency Resource Standard". Retrieved from, http://www.puc.state.nh.us/Regulatory/Docketbk/2015/15-137.html

[7] New Hampshire Public Utilities Commission Staff & Settling Parties (2016, April 27). "State of New Hampshire, before the Public Utilities Commission. Energy Efficiency Resource Standard – Settlement Agreement." Retrieved from, http://www.puc.state.nh.us/Regulatory/Docketbk/2015/15-137/LETTERS-MEMOS-TARIFFS/15-137_2016-04-27_STAFF_PARTIES_SETTLEMENT_AGREEMENT.PDF

customers, the overall energy efficiency budget dedicated to the Home Energy Assistance program increased from 15.5 percent to 17 percent starting in 2017.

The Settlement Agreement also provided for more detailed evaluation, monitoring, and verification activities and funding for an independent expert to be hired and supervised by the Commission. This expert will assist Staff and stakeholders by providing advice on issues related to EM&V including scope, methods, scheduling, and process improvements. As one of the major deliverables, the independent expert will assist the parties to the Settlement in developing a NH-specific technical resource manual by the end of 2020.

To facilitate an enhanced stakeholder review process, the Commission hired an additional Consultant to assist in gathering stakeholder input, to provide information and recommendations to stakeholders during their review of program plans, and to provide other support as needed.

In the preparation of this 3-Year Plan, the NH Utilities have worked closely with stakeholders. Stakeholder discussions regarding establishing the EERS and 3-year plan began in February 2015, when the Straw Proposal[8] was published. (The Commission opened the investigative docket IR 15-072 in March 2015 and followed with Docket 15-137, opened May 8, 2015.) In early 2016, nineteen Parties came to agreement and filed a Settlement on April 26, 2016. The Commission then approved the EERS in Order No 25,932 on August 2, 2016. Since then, the EESE Board and other stakeholders have worked collaboratively with the NH Utilities to provide input into this 2018-2020 Energy Efficiency Plan.

2.4 EERS Enhanced Stakeholder Review

Since the August 2, 2016 Commission Order, the NH Utilities have elicited and received significant stakeholder feedback to inform the preparation of the 3-Year Plan. The main bodies for stakeholder discussion and input are NH's Energy Efficiency and Sustainable Energy (EESE) Board and a committee of the Board, the EERS Committee.[9] In early 2017, the NH Utilities and the EESE Board, with the advice and assistance of the stakeholder consultant, jointly hosted a series of stakeholder workshops[10] designed to allow deeper discussion and input on the key topic areas for the 3-Year Plan. The workshops were well attended and generated a great deal of information and discussion to inform the planning process. The topics covered in workshop

[8]New Hampshire Public Utilities Commission (2015, February 3). "Energy Efficiency Resource Standard – A Straw Proposal". Retrieved from, http://www.puc.state.nh.us/Electric/EERS%20Straw%20Proposal.pdf

[9]Energy Efficiency and Sustainable Energy Board (2017, May 30). "Membership". Retrieved from, https://www.puc.nh.gov/EESE%20Board/EESE%20Board%20Member%20List%2005-30-17.pdf

[10]EESE Board, EERS Committee (2017). "EERS Committee Workshops". Retrieved from, http://puc.nh.gov/EESE%20Board/EERS_Committe_Workshops.html

discussions included:

- Residential Programs
- Commercial, Industrial and Municipal Programs
- Program Cost-Effectiveness Test & Approach for Assessing Non-Energy Impacts
- Energy Efficiency Financing
- Program Marketing
- Evaluation, Measurement & Verification

The EERS Committee discussed all of the workshop topics and the overall planning process during its meetings. The Committee developed policy statements on several of the topics as a formal way to share high level stakeholder input with the NH Utilities. All of these statements were subsequently discussed at the EESE Board and adopted at the Board's[11] March 2017 and April 2017 meetings.

The NH Utilities provided a full draft of the Plan to the EESE Board on May 31, 2017[12]. The EERS Committee then undertook a substantive review process, meeting weekly for seven weeks in June and July to discuss the Draft, receive input and advice from the stakeholder consultant and provide feedback to the NH Utilities. The Committee made a series of recommendations, which were then adopted by the EESE Board at its July, 2017 meeting[13].

The NH Utilities wish to extend their sincere appreciation for the candid and beneficial feedback received from stakeholders during this process.

This 2018-2020 Statewide Energy Efficiency Plan is the culmination of the collective work toward establishing an EERS in New Hampshire and provides the elements needed to achieve New Hampshire's energy savings goals over the next three years.

[11]Energy Efficiency and Sustainable Energy Board (2017, March 17). "EESE Board Meeting Minutes, March." Retrieved from http://puc.nh.gov/EESE%20Board/Meetings/2017/031717Mtg/EESE%20Board%20Minutes%20-%20March%2017%202017%20FINAL.pdf

[12]NH Utilities (2017, May 31). "NHSaves 2018-2020 Statewide Energy Efficiency Plan – Draft". Retrieved from, http://puc.nh.gov/EESE%20Board/NHSaves%202018-2020%20Draft%20EE%20Plan.pdf

[13]Energy Efficiency and Sustainable Energy Board (2017, July 21). "EERS Committee Report to EESE Board." Retrieved from http://puc.nh.gov/EESE%20Board/Meetings/2017/072117Mtg/EERS%20Committee%20Report%20to%20EESE%20Board%207-21-17%20Final.pdf

3.0 2018-2020 Plan - Vision and Benefits

3.1 2018-2020 Plan Vision

Our collective vision for the future under an EERS includes expanding the reach of our existing award-winning programs by serving more customers, implementing new and innovative initiatives and deepening our relationships with skilled tradespeople and other key energy efficiency stakeholders. Our knowledge, infrastructure, and relationships will allow us to scale up our NHSaves Programs to deliver increased energy savings in the state. We have built long-term positive relationships with our customers and vendors and understand their energy needs at home and at work; we are their trusted advisors on matters related to energy efficiency.

The 2018-2020 Plan Vision includes several main elements that carry through the whole Plan and each of the individual programs.

Provide a portfolio of cost-effective and comprehensive electric and natural gas programs available to all customers with a secondary focus on fuel-neutral savings. Our energy efficiency solutions serve and benefit all of our customers: residential, business, and municipal, regardless of the customer's financial or market situation. Portfolio offerings range from low-cost individual measures to significant building upgrades. As an overall approach, we believe it is important to encourage comprehensive projects that bundle low-cost, high savings items with longer term measures in order to create a 'one-touch' package for the customer that maximizes savings while providing attractive payback periods. In addition to achieving electric and natural gas savings, the NH Utilities also provide fuel-neutral solutions to ensure we can help customers reduce their overall energy usage.

Each program contributes to the overall portfolio in a different way. Programs such as Home Energy Assistance and ENERGY STAR Products ensure that offerings are available to customers regardless of income level and to those who may want to start with modest individual improvements, like light bulb replacement. The residential weatherization and municipal programs make up the majority of the portfolio fuel neutral savings, while still contributing to electric and natural gas goals. Large and Small Business programs, along with Home Energy Reports and Products, ensure significant cost-effective electric and natural gas savings to meet the portfolio goals. Combined, the portfolio of programs offer a variety of options that make energy efficiency available to all customers, while meeting both the primary electric and natural gas savings goals and also providing important fuel neutral savings.

Scale up to deliver increased energy savings while stimulating market transformation. The 2018-2020 Plan is designed to deliver increased energy savings while stimulating market transformation. Five main elements of this effort include:

Expand the reach of existing programs by serving more customers. The 2018-2020 Plan presents the opportunity to bring energy efficiency measures to more of our customers. Long-term, consistent and clear messaging regarding the benefits of energy efficiency will help strengthen the support of New Hampshire's energy reduction goals and increase adoption among all customers. The more the NH Utilities are able to make energy consumption awareness messages directly relevant to residents, building owners and occupants, the more likely our customers will be to seek out and implement energy efficiency projects.

Enhance customer experience. Delivering a positive customer experience is an integral part of the NH Utilities' approach over the next three years. Our customers are proactive partners who contribute to statewide energy savings objectives through their own decision making and investment of time and resources. Raising awareness of energy efficiency opportunities and ensuring customers realize the benefits of lower bills and higher quality of life as a result of their energy efficiency investments is a key component of the NH Utilities' efforts. The NH Utilities are interested in delivering customer-focused strategies that will improve the customer experience and engage and empower them as energy partners and advocates.

Engage stakeholders to increase customer participation and energy savings. The NH Utilities work with a substantial range of stakeholders and partners to design and deliver effective efficiency programs and services. They include manufacturers, equipment distributors, builders, contractors, trade associations, nonprofit organizations, policy makers, and customers. Their support and feedback is crucial to the success of the NHSaves Programs and helps us deliver energy savings.

Expand product and service provider infrastructure. A body of knowledgeable and capable service providers is critical to our ability to scale up the energy efficiency programs and is also a critical resource for market transformation. The NH Utilities are engaged with multiple service providers through each of our programs. Quality standards ensure that participating

service providers are experts in their fields and able to capably and safely install energy efficiency measures. Trainings and seminars provide opportunities to increase knowledge and stay abreast of new technologies. Customer demand for program offerings and measures provides a growing marketplace of consumers, creating opportunity for growth in the service provider sector.

Stimulate customer and other private investment. Incentives cover only a portion of the cost of an energy efficiency project. Each program has an incentive design that provides a stimulus to move forward with projects but also helps customers recognize the value of their own investments in energy efficiency. Partnerships with lenders and financing institutions helps to make private capital available so that customers can invest in comprehensive projects.

3.2 Program Benefits

The NHSaves programs provide value to all customers: participants and nonparticipants. The benefits associated with improving the energy performance of commercial and residential buildings are numerous. Increased energy efficiency yields direct energy and cost savings, environmental benefits from reducing pollution from power plants, economic benefits including job creation, lower municipal spending, and a variety of other non-energy benefits.

Direct Energy Savings and Demand Reduction

Since 2002, New Hampshire natural gas and electric customers have installed energy efficiency measures that have saved more than 13 billion electric kilowatt-hours and 27.7 million natural gas MMBtus, resulting in cumulative customer savings in excess of $2.2 billion. Furthermore, the 2016 ISO-NE Energy Efficiency Forecast Report[14] found that energy efficiency programs in New England saved over 2,000 MW of peak demand from energy saving projects installed between 2010 and 2017.

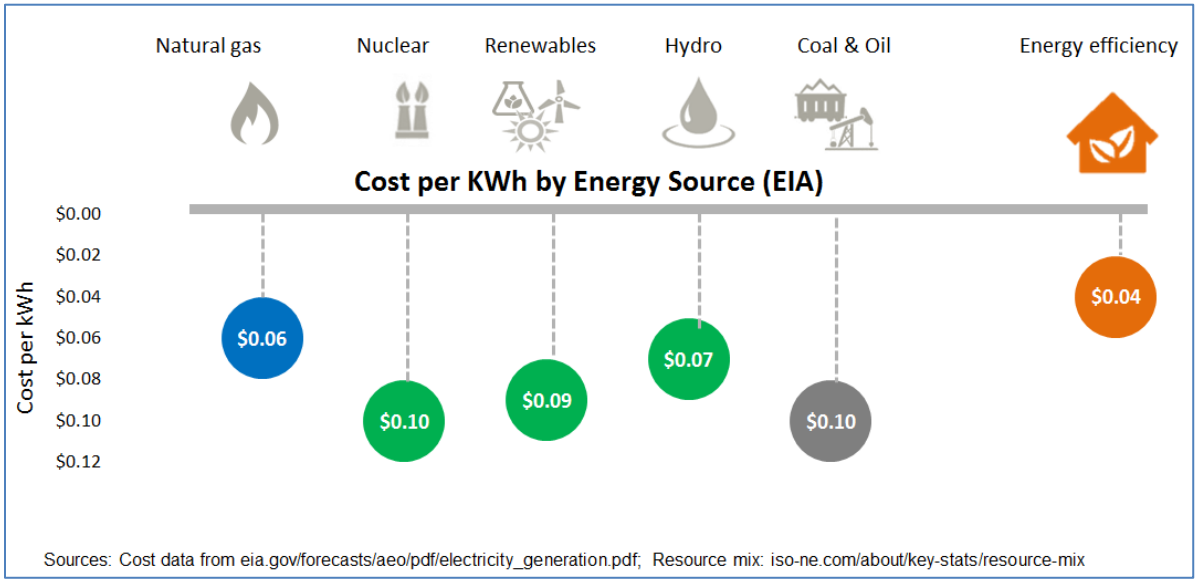
The 2018-2020 Program will save more than 4 billion electric kilowatt-hours and 7.5 million natural gas MMBtus. In addition, the program will save 5.4 million MMBtus from other fuels. These energy savings will result in customer energy cost savings of more than $867 million over the lifetime of the measures.

[14] Independent System Operator – New England (2016, May 1). "2016 Energy-Efficiency, Forecast 2020-2025." Retrieved from https://www.iso-ne.com/static-assets/documents/2016/04/ISO_NE_2016_EE_Forecast_2020_2025_Final.pdf

Cost Savings

Although energy efficiency program participants receive the greatest direct benefits from energy-efficiency programs, all customers benefit by offsetting consumption through efficiency and conservation. Energy efficiency and conservation can defer costs of building new power plants and are less expensive than new energy generation. Data from the Energy Information Administration (2017)[15]demonstrates that energy efficiency is at least half the cost of coal & oil and natural gas. (**Figure 3.1**).

Figure 3.1: Cost per kWh by Energy Source



Environmental Benefits

Energy efficiency efforts help offset energy consumption, which in turn helps mitigate greenhouse gas emissions as power plants burn fewer fossil fuels to meet the lower demand. Since inception, the NHSaves programs have led to a reduction of more than 10.7 million tons of greenhouse gas emissions, the equivalent of taking 2.2 million passenger vehicles off the road for one year.

The 2018-2020 Program will lead to a reduction of more than 2.8 million tons of greenhouse gas emissions, the equivalent of taking 606,000 passenger vehicles off the road for one year.

[15] U.S. Energy Information Administration (2017, January 5). "Annual Energy Outlook 2017". Retrieved from https://www.eia.gov/outlooks/aeo/; Independent System Operator – New England (2017). "Resource Mix". Retrieved from https://www.iso-ne.com/about/key-stats/resource-mix

Economic Benefits

Spending on energy-efficient technologies and services supports the local workforce. According to a study from the Political Economy Research Institute (PERI) of the University of Massachusetts at Amherst (2012)[16], every million dollars spent on energy-efficient measures, such as building retrofits, supports 7 direct jobs and 4.9 indirect jobs. Using this calculation, the 2018-2020 Plan will support 2,096 full time equivalents (FTEs) or 4.4 million work hours (using 2,080 hours for each FTE).

Table 3.2: Jobs supported by 2018-2020 NHSaves Programs

Total Budget	Direct Jobs supported	Indirect Jobs supported
$ 176.2 million	1,233	863

Direct jobs include those performed by home energy auditors or installation contractors, or those undertaken to implement lighting and equipment upgrades in a commercial building. Indirect jobs represent jobs in industries that supply goods for the building retrofits, such as insulation, efficient lighting equipment, air compressors, and heating and cooling equipment.

Direct jobs in energy efficiency tend to be located close to where the retrofits and new construction take place, thereby stimulating the local economy. Across the state, the NHSaves programs work with approximately 1,200 retailers, electricians, energy auditors, energy service companies, engineers, builders and other clean technology professionals. Many jobs in energy efficiency require knowledge and training— fortunately, many workers can transfer skills from the fields in which they have experience, such as construction and heating, ventilation and air-conditioning (HVAC) for retrofitting projects.

Efficiency investments help local economies in other ways. When energy bills are lowered, residents and businesses have more money to spend on operations, materials, labor and other productive investments. The lower energy costs that result from efficiency projects in municipal buildings save money for all taxpayers in the community.

Additional Benefits

Those who participate in the NHSaves programs also realize benefits such as improved air quality, increased comfort, improved performance and productivity, reduced maintenance costs, improved building value, and healthier and more comfortable buildings in which to live

[16]Burr, A., Majerski, C., Stellberg, S., Garrett-Peltier, H. (2012, March). "Analysis of Job Creation and Energy Cost Savings". Retrieved from http://www.peri.umass.edu/fileadmin/pdf/other_publication_types/PERI-IMT-2012-Analysis_Job_Creation.pdf

and work (Figure 3.3). These benefits are particularly important to income-eligible and moderate income customers, who spend higher portions of their household budgets on energy and housing costs.

Figure 3.3: Additional Benefits from Energy Efficiency

3.3 NHSaves Program Achievements

The NH Utilities have established a strong foundation of energy efficiency programs and intend to initiate new implementation methods that incorporate lessons learned, respond to market changes, and both seek out and share best practices. Our efforts, as well as those of some of our partners, have been nationally recognized for performance and partnership. We are proud of these awards, but realize that we cannot build upon this success without engaged energy efficiency contractors and a supportive stakeholder and regulatory network. The awards we have earned represent the significant collaboration and dedication to energy efficiency shown by all stakeholders in New Hampshire.

ENERGY STAR Awards

In 2017, the U.S. Environmental Protection Agency (EPA) recognized the NH Utilities with its highest ENERGY STAR award, the Partner of the Year – Sustained Excellence Award[17],

[17]ENERGY STAR® (2017). "NH CORE Utilities: Partner of the Year – Sustained Excellence – Energy Efficiency Program

demonstrating a strong commitment to energy efficiency through superior energy efficiency achievements and continued leadership in protecting the environment. Specifically, the NH Utilities were honored for excellence in implementation of the ENERGY STAR Certified Homes program, including certifying and providing incentives for nearly 700 homes in 2015 and 2016, conducting builder and consumer energy efficiency training, and participating in 15 home and energy-related events attended by a total of over 15,000 people. This recognition represents a significant collaborative effort between the NH Utilities and the building trades in New Hampshire that assist with the delivery of this program.

The NH Utilities have also been recognized by ENERGY STAR in previous years.

- 2016 - ENERGY STAR Partner of the Year—Sustained Excellence recognition for its successful implementation of the ENERGY STAR Certified Homes program[18]
- 2015 - ENERGY STAR Partner of the Year—Sustained Excellence recognition for its successful implementation of the ENERGY STAR Certified Homes program[19].
- 2014 – Partner of the year – Program Delivery for its successful implementation of the ENERGY STAR Certified Homes program[20].
- 2013 – Partner of the year – Program delivery recognition for its successful implementation of the ENERGY STAR Certified Homes and Home Performance with ENERGY STAR (HPwES) programs[21] .

Program Partner Awards

The NHSaves programs are supported by top-tier partners. GDS Associates and Chinburg Builders were recognized by the EPA for their outstanding achievements in the ENERGY STAR Homes program. Chinburg Properties won the 2017 ENERGY STAR Partner of the Year award[22] in the New Home Builder and Affordable Housing categories, while GDS Associates won the 2017 ENERGY STAR Partner of the Year award as a Home Energy Rater[23].

Delivery". Retrieved from https://www.energystar.gov/about/content/nh_core_utilities

[18]ENERGY STAR® (2016). "NH CORE Utilities: Partner of the Year – Sustained Excellence – Energy Efficiency Program Delivery". Retrieved fromhttps://www.energystar.gov/about/content/nh_energy_efficiency_team

[19]ENERGY STAR (2015). "NH CORE Utilities: Partner of the Year – Sustained Excellence – Energy Efficiency Program Delivery". Retrieved fromhttps://www.energystar.gov/about/awards/2015_energy_star_award_winners

[20]ENERGY STAR (2014). "NH CORE Utilities: Partner of the Year – Energy Efficiency Program Delivery". Retrieved fromhttps://www.energystar.gov/sites/default/uploads/about/old/files/POY_2014_Profiles_508.pdf

[21]ENERGY STAR (2013). "NH CORE Utilities: Partner of the Year – Energy Efficiency Program Delivery". Retrieved fromhttps://www.energystar.gov/ia/partners/publications/pubdocs/POY%202013%20Profiles%20508%20compliant.pdf?4b83-5829

[22]ENERGY STAR (2017). "Chinburg Properties – Partner of the Year – New Home Builder and Affordable Housing". Retrieved from https://www.energystar.gov/about/content/chinburg_properties_0

[23]ENERGY STAR (2017). "GDS Associates – Partner of the Year – Home Energy Rater". Retrieved fromhttps://www.energystar.gov/about/content/gds_associates_0

New Hampshire's First ENERGY STAR Multifamily High-Rise

The Cotton Mill Square Apartments, developed in a historic 1905 warehouse in downtown Nashua by The Stabile Companies, earned an ENERGY STAR label in December 2014[24].This is New Hampshire's first ENERGY STAR multifamily high-rise, and was only the second multifamily high-rise in New England to earn this rating at the time. The residents of the 108 apartment units, 51 percent of which are reserved for low to moderate income families, now enjoy comfortable homes with lower energy bills. This project was eight years in the making and involved meticulous planning and construction for the total rehabilitation of the building. Efficiency highlights included:

- ENERGY STAR certified refrigerators, dishwashers, light fixtures and windows;
- Highly efficient, electric air source heat pump units for heating, cooling and hot water;
- Highly efficient plumbing fixtures using less water than required by state code; and
- Exterior walls lined with R21 spray foam insulation.

Northeast Energy Efficiency Partnership (NEEP) Awards

The NH Utilities regularly recognize the significant energy efficiency achievements of their customers. The following business customers are the most recent of those nominated by their respective NH utility and recognized by NEEP for their outstanding efforts to advance energy efficiency:

- The Holderness School (2016 Northeast Business Leader for Energy Efficiency and Business Leader State Champion[25]): The Holderness School, a private, co-educational school for grades 9-12, has participated in the NH programs and puts energy efficiency at the heart of its new construction and renovation projects. Holderness has achieved an annual savings of over 191,000 kWhs and an annual cost savings of nearly $370,000.
- Concord Hospital (2015 Northeast Business Leader for Energy Efficiency[26]): Since 2006, Concord Hospital has completed a variety of natural gas and electric energy efficiency projects, resulting in natural gas annual savings of 179,000 therms and electric annual savings of approximately 3.7 million kWhs. The combined energy savings corresponds to an annual cost savings of approximately $720,000.
- Dartmouth College (2015 Northeast Business Leader for Energy Efficiency[27]): Dartmouth College's far-reaching commitment to energy efficiency has resulted in annual savings of

[24]ENERGY STAR (2014). "ENERGY STAR Multifamily High Rise Building Profile – Cotton Mill Square". Retrieved from https://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/mfhr/bldg_profiles/Cotton_Mill_-_MFHR_Building_Profile_Kit.pdf?fd51-9671

[25]Northeast Energy Efficiency Partnerships (2015). "The Holderness School – State Champion: Case Study". Retrieved from http://www.neep.org/case-study/holderness-school

[26]Northeast Energy Efficiency Partnerships (2015). "Concord Hospital: Case Study". Retrieved from http://www.neep.org/case-study/concord-hospital

[27]Northeast Energy Efficiency Partnerships (2015). "Dartmouth College: Case Study". Retrieved from http://www.neep.org/case-study/dartmouth-college

nearly 2.9 million kWhs and about $300,000 in annual electricity costs.

- DevTech Labs, Inc. (2015 Northeast Business Leader for Energy Efficiency[28]): DevTech Labs has taken part in the NH programs since 2002 and has completed 15 energy efficiency projects to date, yielding annual savings of approximately 2.9 million kWhs, or about $351,000 annual savings in electricity costs.

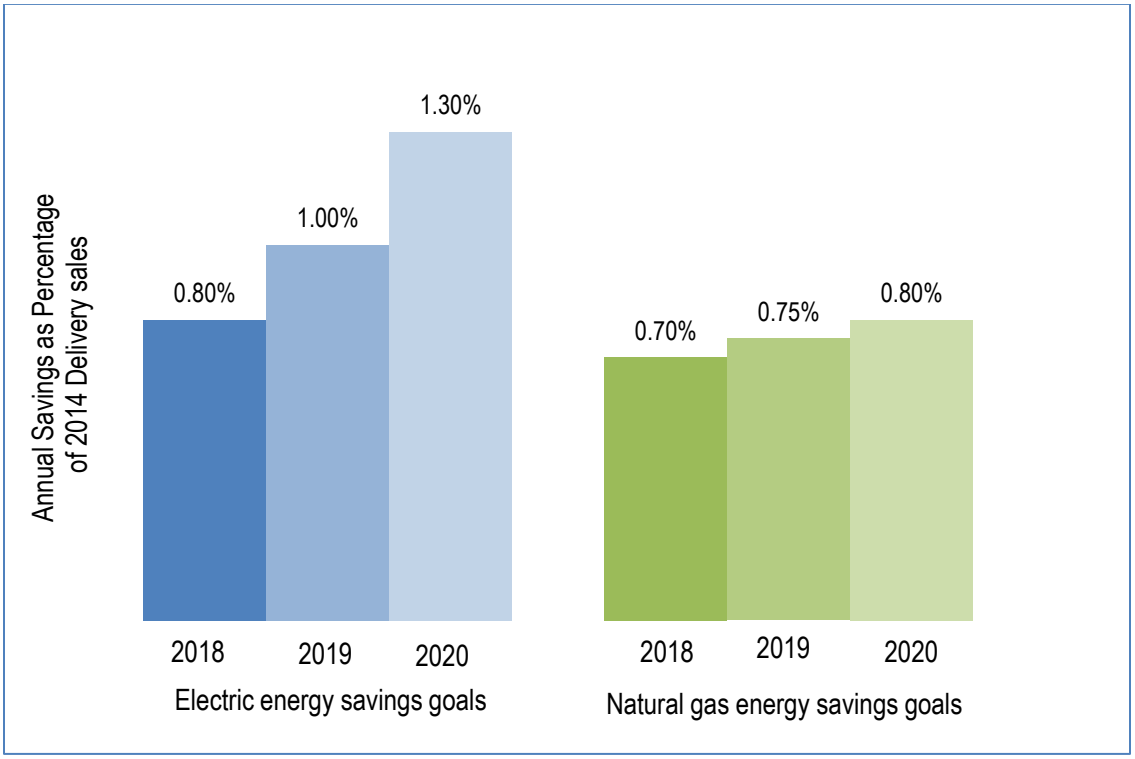
[28]Northeast Energy Efficiency Partnerships (2015). "DevTech Holdings: Case Study". Retrieved fromhttp://www.neep.org/case-study/devtech-holdings

4.0 The 2018-2020 Program Goals

Commission Order No. 25,932[29] set statewide energy savings goals for the 2018-2020 NHSaves Programs based on a percentage of the NH Utilities 2014 delivery sales. In this Plan, the NH Utilities propose energy efficiency measures, tools, and programs designed to achieve cumulative energy savings of 3.10 percent of retail electric sales and 2.25 percent of retail natural gas sales, relative to a 2014 baseline. The annual electric savings goals [**Figure 3.1**] are 0.80 percent of retail sales in 2018, 1.00 percent in 2019, and 1.30 percent in 2020. The annual natural gas savings goals are 0.70 percent of retail delivery in 2018, 0.75 percent in 2019, and 0.80 percent in 2020.

FIGURE 4.1: Energy savings goals as a percentage of 2014 retail sales

The annual energy savings goals increase incrementally between 2018 and 2020.



[29] New Hampshire Public Utilities Commission (2016, August 8), Order No. 25,932, "Energy Efficiency Resource Standard – Order Approving Settlement Agreement". Retrieved from http://www.puc.state.nh.us/Regulatory/Orders/2016orders/25932e.pdf

Tables 4.2 and 4.3 summarize the specific statewide energy savings goals for the NHSaves Electric and Natural Gas Programs.

Table 4.2: Electric Program Annual Statewide Savings Goals

	Electric Annual Statewide Goals (MWH)			
2014 Delivery Sales (MWH)	2018 0.8%	2019 1.0%	2020 1.3%	2018-2020
10,782,973	86,264	107,830	140,179	334,273

Table 4.3: Natural Gas Program Annual Statewide Savings Goals

	Natural Gas Annual Statewide Goals (MMBtu)			
2014 Delivery Sales (MMBtu)	2018 0.70%	2019 0.75%	2020 0.80%	2018-2020
23,352,672	163,616	174,787	187,172	525,575

4.1 Annual Energy Savings Targets

The 2018-2020 Plan includes 3-year cumulative electric energy savings of approximately 334,000 MWhs and natural gas energy savings of 525,600 MMBtus. Tables 4.4 and 4.5, summarize the energy savings targets for the NHSaves electric program. Tables 4.6 and 4.7 summarize the energy savings targets for the NHSaves natural gas programs.

Table 4.4: Electric Program Annual Savings, by Utility

Company	Electric Annual Savings (MWH)				Percentage of 3-year Statewide Savings
	2018	2019	2020	2018-2020	
Eversource	66,225	83,483	108,285	257,993	77%
Liberty Utilities	7,359	9,083	11,671	28,114	8%
NHEC	3,974	5,177	6,964	16,115	5%
UES	8,706	10,087	13,259	32,052	10%
Total	**86,264**	**107,830**	**140,179**	**334,273**	**100%**

Table 4.5: Electric Program Annual Savings, by Sector

Sector	Electric Annual Savings (MWH)				Percentage of 3-year Statewide Savings
	2018	2019	2020	2018-2020	
C&I and Municipal	67,362	84,693	110,320	262,375	78%
Residential	18,084	22,100	28,475	68,659	21%
Income Eligible	818	1,037	1,384	3,239	1%
Total	**86,264**	**107,830**	**140,179**	**334,273**	**100%**

Table 4.6: Natural Gas Program Annual Savings, by Utility

Company	Natural Gas Annual Savings (MMBtu)				Percentage of 3-year Statewide Savings
	2018	2019	2020	2018-2020	
Liberty	130,072	138,080	146,929	415,081	79%
Northern	33,544	36,707	40,243	110,494	21%
Total	**163,616**	**174,787**	**187,172**	**525,575**	**100%**

Table 4.7: Natural Gas Program Annual Savings, by Sector

Sector	Natural Gas Annual Savings (MMBtu)				Percentage of 3-year Statewide Savings
	2018	2019	2020	2018-2020	
C&I and Municipal	111,811	122,634	132,025	366,470	70%
Residential	42,693	42,474	44,864	130,031	25%
Income Eligible	9,112	9,679	10,283	29,074	6%
Total	**163,616**	**174,787**	**187,172**	**525,575**	**100%**

Additional Fuel Neutral Savings

The NH Electric Utilities programs also generate additional MMBtu savings from other fuels including oil, propane, kerosene and wood. These energy savings do not contribute to the statewide EERS electric and natural gas savings goals, yet they are an important part of the comprehensive energy savings programs, contributing significant benefits to NH customers. These savings are particularly important to reduce the energy cost burden of residential customers, especially those who are income-eligible, as well as municipal customers whose costs are borne by local taxpayers. These MMBtu savings also contribute to the programs' cost-effectiveness. The savings that will be acquired in these sectors is reflected in Table 4.8.

Table 4.8: Expected Savings from Other Fuels, by Sector

Annual Savings From Other Fuel Sources, by Sector (MMBtu)					
	2018	2019	2020	2018-2020	Cumulative Lifetime
Income Eligible	19,695	25,622	35,271	80,587	1,673,333
Residential	34,991	54,133	81,601	170,725	3,519,828
Municipal	3,926	3,904	3,876	11,705	176,586
Total	**58,612**	**83,659**	**120,747**	**263,018**	**5,369,746**

4.2 Program Funding

Electric Energy Efficiency Funding

The NHSaves programs offered by the NH Electric Utilities are funded through three main sources: 1) a portion of the System Benefits Charge (SBC) that is applied to the electric bills of all customers receiving delivery service through one of the NH Electric Utilities; 2) a portion of the Regional Greenhouse Gas Initiative (RGGI) auction proceeds; and 3) proceeds earned by each of the NH Electric Utilities from ISO-NE for participation in ISO-NE's Forward Capacity Market (FCM). All electric utility FCM revenues are derived from demand reductions from the energy efficiency programs and support the NHSaves Electric Programs.

Additionally, any unspent funds from prior program years are carried forward to future years, including interest applied on the monthly balance at the prime rate.

The 2018 SBC revenues are estimated based on a forecast of each utility's 2018 sales and a proposed SBC energy efficiency program rate of $0.00275 per kilowatt-hour. The proposed SBC rate is a $0.00077 increase from the 2017 SBC energy efficiency program rate of $0.00198 per kilowatt-hour, but is approximately 11 percent lower than the estimated SBC energy efficiency program rate of $0.00309 that was included in the Settlement Agreement that led to the

Commission's Order No. 25, 932[30] in the EERS proceeding.

The estimated RGGI revenues to be made available to the NHSaves programs are provided to the NH Electric Utilities by the Commission's staff. The FCM revenues are estimated based on forecasted prices for the energy efficiency on peak demand resources. These differ by electric company and are subject to adjustment based on future performance.

Table 4.9: Annual Funding Source, Electric

Source	Annual Electric Funding ($000)				Percentage of 3-year Budget
	2018	2019	2020	2018-2020	
System Benefits Charge (SBC)	29,448	39,996	56,803	126,247	82%
Carry forward & Interest	(295)	-	-	(295)	0%
Regional Greenhouse Gas Initiative (RGGI)	2,591	2,573	2,555	7,719	5%
ISO-NE Forward Capacity Market (FCM)	6,891	6,919	6,661	20,471	13%
Total	**38,635**	**49,488**	**66,019**	**154,142**	**100%**

Natural Gas Energy Efficiency Funding

The NHSaves programs offered by the NH Natural Gas Utilities are funded by a portion of the Local Distribution Adjustment Charge (LDAC), which is applied to bills of natural gas customers in New Hampshire [Table 4.10]. As with the electric programs, any unspent funds from prior program years are carried forward to future years, including interest earned on monthly balances applied at the prime rate.

The NH Natural Gas Utilities determine the overall budget requirements to deliver the NHSaves programs to customers that will meet the required energy savings targets. LDAC rates are then set individually and modified annually by each natural gas utility and by customer class based on a forecast of each utility's sales projections. Energy efficiency rates for 2018 can be found in Attachments I3 and J3 for the NH Natural Gas Utilities.

[30] New Hampshire Public Utilities Commission (2016, August 8), Order No. 25,932, "Energy Efficiency Resource Standard – Order Approving Settlement Agreement". Retrieved from http://www.puc.state.nh.us/Regulatory/Orders/2016orders/25932e.pdf

Table 4.10: Annual Funding Source, Natural Gas

Source	Annual Natural Gas Funding ($000)				Percentage of 3-year Budget
	2018	2019	2020	2018-2020	
Local Distribution Adjustment Charge (LDAC)	9,457	10,580	11,502	31,539	100%
Carry forward & Interest	0	(72)	(70)	(142)	0%
Total	**9,457**	**10,508**	**11,432**	**31,397**	**100%**

4.3 Annual Program Budgets

Over the course of the 3-Year Plan, the NH Utilities estimate that total program expenditures—electric and natural gas—will exceed $176 million. The electric portfolio will account for 83 percent of the budget and natural gas will account for the remaining 17 percent. Tables 4.11 and 4.13 outline the annual budgets by utility for electric and natural gas programs, respectively. The budget data does not include the estimated performance incentive, which is included in Attachment D for each utility.

Table 4.11: Annual Electric Budget, by Utility

Company	Electric Budget ($000)				Percentage of 3-year Budget
	2018	2019	2020	2018-2020	
Eversource	27,125	35,060	46,633	108,818	74%
Liberty	3,159	3,997	5,267	12,424	9%
NHEC	2,183	2,916	4,023	9,122	6%
UES	4,157	4,938	6,656	15,751	11%
Total	**36,624**	**46,911**	**62,580**	**146,115**	**100%**

Figure 4.12: Electric Budget, by Sector

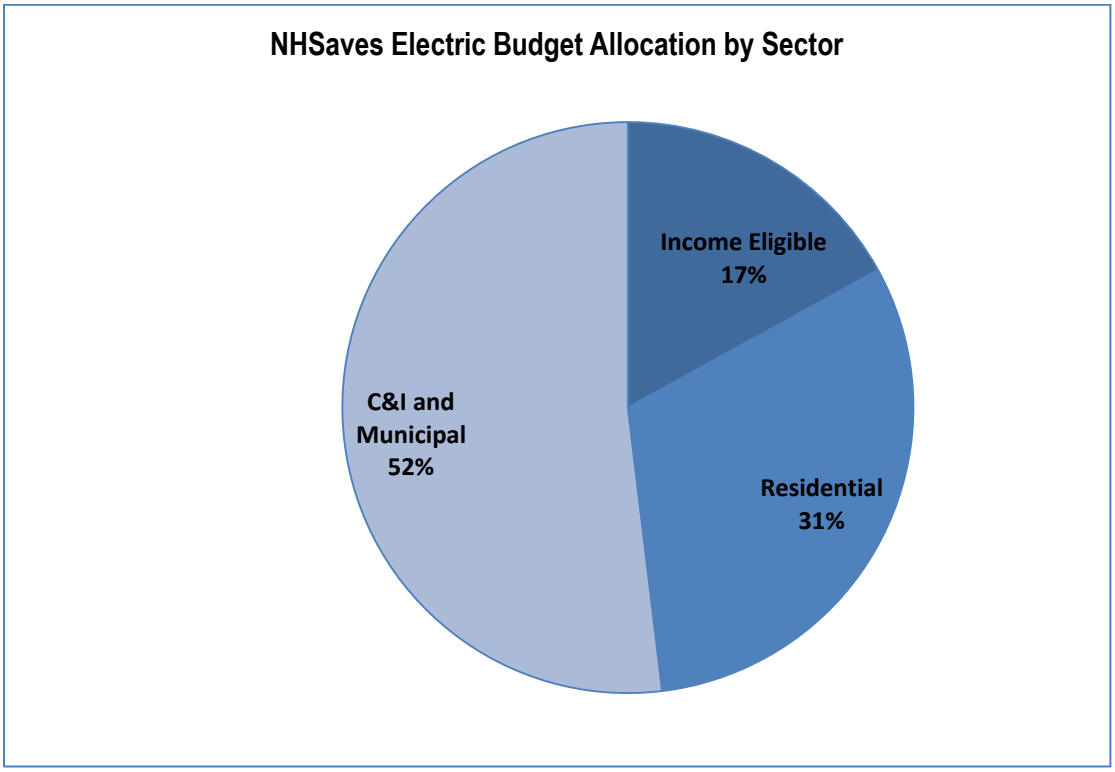
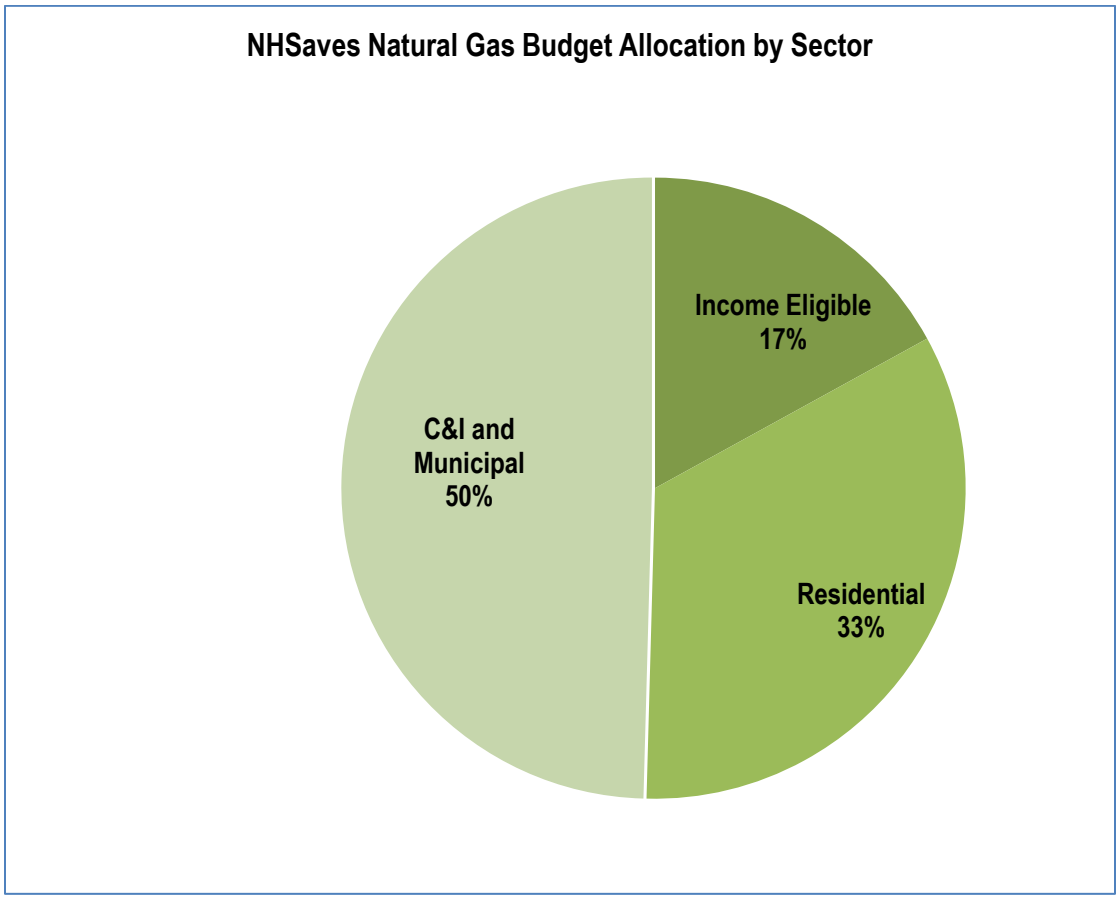


Table 4.13: Annual Natural Gas Budget, by Utility

Company	Natural Gas Budget ($000)				Percentage of 3-year Budget
	2018	2019	2020	2018-2020	
Liberty	7,161	7,828	8,489	23,478	78%
Northern	1,997	2,200	2,413	6,610	22%
Total	**9,158**	**10,029**	**10,902**	**30,089**	**100%**

Figure 4.14: Natural Gas Budget, by Sector



Budget allocations by sector are informed by the source of the funds, and each utility's forecasted delivery sales to each sector. The income-eligible Home Energy Assistance (HEA) program budget is equal to 17 percent of each utility's total portfolio budget, excluding any funds carried forward from prior years in the Municipal Program. This exclusion is made to avoid applying the income-eligible set aside to the previously budgeted, but unspent, funds for a second time.

There are several factors that may impact budget levels. Any difference between the actual spending in each program year and the total actual energy efficiency funds received, exclusive of the actual earned performance incentive, is carried forward into future year program budgets. This value may be positive or negative. Unspent fund balances earn interest monthly at the prime rate on the average net balance of the total revenue and proceeds received less funds expended for programs and services. Funding amounts from the SBC and LDAC are based on each company's sales projections. Actual sales may differ, resulting in proportionately more or less SBC or LDAC revenue available for energy efficiency programs. In addition, RGGI and FCM proceeds are estimated and are also subject to change.

Interim Changes in Program Budgets

Individual programs are defined as the programs listed in each utility's Program Cost Effectiveness Reports, included in this Plan as Attachments E1, F1, G1, H1, I1 and J1. Specifically,

- Once the budgets are approved, there will be no movement of funds between the Residential and Commercial & Industrial sectors unless specifically approved by the Commission. In addition, no funds shall be transferred from the Home Energy Assistance Program without prior approval by the Commission.
- The NH Utilities shall provide notification to the Commission if an individual program's actual expenditures are forecasted to exceed 120 percent of the program's budget.

Multi-year Project Budget Approval

The NH Utilities request the Commission's authorization to make customer commitments during 2018, 2019 and 2020 for projects to be completed in the subsequent years using the following criteria.

- All customer classes eligible to participate in the NHSaves Programs are eligible for multi-year project approvals. An incentive offer, a letter of intent or a memorandum of understanding outlining the terms of the approval may be issued by a utility.
- The NH Utilities will only make commitments to customers who have presented definitive plans for projects to be completed in subsequent years.
- The energy efficiency measures will include those measures offered under the NHSaves Programs and the Utility-specific programs in effect at the time. All of the 2018, 2019 and 2020 program guidelines and rules will apply to future year commitments.
- Customers receiving commitments in 2018, 2019 and 2020 will not be precluded from participating in any new programs introduced in the future that supplement or supplant the existing programs.
- The funds for future projects will be paid using the budget in the year the project is implemented; however, the commitment to the customer will be made contingent upon the continuation of funding of the NHSaves Energy Efficiency Programs.

The NH Utilities work with customers as they plan and budget for large capital projects with multi-year lead times. Construction projects, renovations and replacement of existing equipment are frequently developed a year or two in advance, and the resources necessary to fund such projects need to be arranged when customers make these decisions. Large C&I customers often have multi-year planning horizons for large capital expenditures, and these expenditures are essential to the growth of the New Hampshire economy. Home builders also plan construction starts for the following year based on many factors, including the availability of funding in the ENERGY STAR Homes Program.

4.4 Program Continuity

The NH Utilities have designed the NHSaves energy efficiency programs to be open and available for the entire year to maximize customer satisfaction and minimize market disruption with key channel partners such as contractors, equipment suppliers and distributors. However, in order to be responsive to the market, ensure consistent program availability and minimize program oversubscription challenges, the NH utilities may make specific program changes as needed during the year, including:

- Adjusting program marketing activity levels to ramp up or slow down demand;
- Modifying incentive levels for certain programs or measure categories;
- Introducing time-based incentives, which could involve promoting more limited period offerings, as well as potentially promoting higher incentive offers during periods of lower or seasonal demand where there may be greater contractor availability;
- Introducing a rebate reservation system process where customers submit an initial application to reserve funds, and those who do not make the initial reservation list are moved onto a waiting list. Customers on the waiting list can move forward once initial reservation list customers have been served, or they can be moved into the following year;
- Transferring available program funds from underperforming programs into programs with higher demand within the same sector;
- Amending per customer maximum project cap levels to help extend program availability;
- Making commitments for a future program year in lieu of a current year incentive.

The NH Utilities will continue to leverage tools such as rebate availability trackers and graphs on NHSaves.com to show up-to-date program status. These types of tools help to better manage customer and trade-ally expectations and provide for a more positive customer experience.

In the scenario that a program becomes oversubscribed, the NH Utilities will deploy a communication plan to properly notify customers, trade-ally partners and the supply chain regarding the program status. The communications will provide information about future opportunities and let partners know how when the program will re-start. The NH utilities will continually seek to understand what is driving customer demand and how the programs can be adjusted to prevent interruptions going forward.

5.0 Customer Experience, Marketing, & Education

The NH Utilities will place increasing emphasis on transforming the energy efficiency marketplace through a coordinated marketing strategy, a more streamlined customer experience, and comprehensive customer outreach and education. These market transformation efforts help influence customer decisions and behaviors and help change the marketplace for the long term.

5.1 Customer Experience

"Customer experience" refers to the rational and emotional perceptions customers develop as they interact with a service provider. In the energy efficiency context, utilizing best practices in customer experience management will benefit our customers as well as improve the effectiveness of our programs. Successful customer experience integration also increases customer trust and engagement that can drive program participation.
In response to customer feedback, we have undertaken numerous adjustments. For example, we have:

- Enhanced the online application process for ENERGY STAR Products' electric appliance rebates and introduced a tool to allow customers to process gas heating and water heating system rebate applications online. The NH Utilities will investigate adding online application options for our business and municipal customers.
- Deployed our account representatives to work one-on-one with business and municipal customers to help them through the efficiency project process and provide a single point of contact.
- Structured a markdown approach for residential lighting incentives to help streamline the process not only for retailers, but also for customers, helping them to quickly identify and purchase high-quality efficient options at a discounted price.
- Leveraged a turnkey approach for small businesses to provide them a streamlined decision making and implementation process.

The 2018-2020 Plan will expand upon our efforts to support a positive customer experience through coordinating tactics from initial customer engagement opportunities such as marketing, education, and training, often delivered in concert with rebates or other financial incentives.

A key resource for engaging with customers and partners and providing a positive experience is the NHSaves.com website. The site has been redesigned and updated recently based on

customer feedback and provides easier access to program incentives and educational information. The site has also been improved to be compatible and responsive to mobile platforms, and up-to-date with contemporary web site design features.

The utilities are working now on a further site redesign to be launched in early 2018 to improve the customer navigation and make it easier for customers and partners to find the relevant content they are looking for, whether it is rebate and incentive information, tools or technical information, the ability to sign-up for events, or simply utility contact information. An additional intended outcome of the site redesign is to allow for more flexibility in changing content, program promotions and highlighting specific, relevant initiatives. The utilities recognize that consumer preferences for interacting online will continue to evolve based on changing trends and best practices with other web sites and therefore the utilities plan to continue to periodically survey customers on their experience interfacing with the NHSaves.com site and applying improvements as necessary.

5.3 Program Marketing

Our marketing strategy is focused on helping customers achieve deeper energy savings while positioning the NH Utilities to reach the increasing EERS savings goals. The NH Utilities will primarily market to three general customer groups:

1) **Residential Customers**–marketing will focus on residents of single family and multifamily homes, as well as to builders, contractors, property managers and retailers to inform these stakeholders about various products, systems, and financing options available.
2) **Commercial and Industrial Customers** – marketing will focus on a variety of business segments and facility types and will leverage internal utility resources and mechanisms such as key account representatives and customer service personnel to promote the programs. The utilities will also work closely with various trade ally and channel partners, such as Architects, Builders, Contractors, Developers, Electricians, Equipment Manufacturers and Suppliers, Engineers, and Facility and Property Managers, just to name a few, as well as with a variety of trade associations, who have established relationships with our customers and their own marketing initiatives.
3) **Municipal Customers** - marketing will focus on working closely with town, school and community officials and leveraging our internal resources to market the NHSaves programs, extending a greater level of personal contact on our offerings.

The NH Utilities will focus on three broad marketing objectives for the 2018 – 2020 programs and beyond:

1. Increase Knowledge, Build Awareness, and Demonstrate the Value of Energy Efficiency
2. Drive Deeper Customer Participation in the Programs
3. Increase Trade and Channel Partner Participation in the Programs

Each objective encompasses a mix of marketing and communications strategies to reach multiple customer groups within the residential, business and municipal customer groups. These marketing strategies, along with a comprehensive set of program solutions, are designed to overcome specific barriers that may prevent the NHSaves programs from achieving its goals.

1. Increase Knowledge, Build Awareness, and Demonstrate the Value of Energy Efficiency.

Strategies designed to support increasing customer knowledge, building awareness, and helping better demonstrate energy efficiency's value include:

- **Performing market research** beginning in 2018 to increase our understanding of New Hampshire customer behavior, assess overall knowledge of energy efficiency, utility programs, awareness of the NHSaves brand, motivators/barriers to participating in programs, and past efficiency investments. The utilities will leverage this research to inform its specific marketing campaign strategies and areas of needed focus.
- **Developing a statewide, fully integrated, umbrella marketing campaign** to support the programs. The campaign is expected to be on-going throughout the 3-year period and will be launched following the initial benchmark research to be performed. The campaign will focus on deploying engaging content to strengthen customer knowledge of the energy efficiency programs through traditional, digital and social activities. The utilities will also perform post campaign research to inform and improve strategies throughout the 3-year plan term. The utilities will work with a marketing agency partner to help develop, design and implement this campaign.
- **Expanding usage of social media** to build a larger audience and develop coordinated efforts and messaging across all utilities that promotes the NHSaves programs and incentives using channels and tactics according to audience personas and specific social media outreach (i.e., Facebook®[31], Twitter®[32], YouTube®[33], etc.). The utilities will continue using a social media content calendar of planned campaigns/promotions and engaging messaging to be implemented throughout the 3-year term. The utilities will consistently

[31]Facebook (2017). Retrieved from www.facebook.com
[32]Twitter (2017). Retrieved from www.twitter.com
[33]YouTube (2017). Retrieved from www.youtube.com

monitor the effectiveness of these campaigns and will adjust parameters as necessary in order to capture the high levels of reach and engagement.

- **Deploying consistent customer communication materials** and resources across utilities leveraging the NHSaves brand. The utilities will develop program-specific collateral and marketing materials that can be disseminated to customers and vendors at conferences, seminars, trade shows, workshops, through staff/vendor contact, etc.
- **Leveraging national and regional energy efficiency partnership campaigns**, such as EPA's ENERGY STAR® program[34] and the regional GasNetworks®[35] collaborative to promote our programs and services. The ENERGY STAR brand is well known[36] with consumers in New England and nationally, and this program benefits from the advertising efforts that the US Department of Energy and the EPA implement. Both the EPA ENERGY STAR program and GasNetworks perform regular communication initiatives and have numerous tools and off-the-shelf content that the utilities can leverage to help promote the programs.
- **Performing segment-specific campaigns** with targeted messaging to key audiences will yield greater return on marketing investment. Examples of key segments to be targeted include multifamily buildings, schools, hospitality, healthcare, food service/restaurants, office, high-use customers and past-programs participants.
- **Expanding customer case study/testimonial series** that showcase customer participation and program impacts featuring customers who have implemented successful energy efficiency projects. The utilities intend to develop written and video testimonials that can be promoted and accessed online.
- **Performing community campaigns** in tandem with local businesses, municipalities and community organizations by providing education and outreach through tactics such as direct mail, events, grass roots efforts and other means to promote energy efficiency programs and incentives to the community. The Utilities will implement technology and/or customer segment-specific training seminars to the residential, commercial, industrial and municipal customer markets, all accessible via the NHSaves.com website.

2. Drive Deeper Customer Participation in Energy Efficiency Programs.

Strategies to achieve deeper customer participation include:

- **Leveraging improved and more granular customer data and market research** to develop market-segmented approaches, including examining energy needs and consumption

[34]ENERGY STAR (2017). "ENERGY STAR – About". Retrieved from https://www.energystar.gov/about
[35]GasNetworks (2017). "GasNetworks – About". Retrieved from http://www.gasnetworks.com/about-gasnetworks/
[36] Consortium for Energy Efficiency, Inc. (2017, April 27). "Ninety Percent of US Households Recognize the ENERGY STAR® Label". Retrieved from https://www.cee1.org/content/ninety-percent-us-households-recognize-energy-star%C2%AE-label

attributes (i.e., housing stock and customer type). Example efforts to include:

  - Targeting past program participants and previous customer interactions to pursue additional savings opportunities among those who are already engaged with the programs. The utilities have a large database of past program participant data that can be mined for promoting specific, additional energy savings opportunities.
  - Targeting and providing solutions to hard-to-serve customers in segments that have been historically difficult to assist, such as certain small businesses, multifamily housing and microbusinesses.

- **Enhancing the user experience of NHSaves.com** by making improvements to the navigation and features, such as adding rebate search functionality, blog sorting features, and an improved events management system.
- **Deploying common platforms** to capture customer insights such as dedicated landing pages on NHSaves.com and utility web sites for campaign-specific initiatives to improve the process of converting responses into qualified leads and properly capturing customer inquiry information.
- **Expanding into online marketplaces** to promote sales of energy efficient products and explore additional product offerings, such as including products rebated through both the gas and electric programs.
- **Utilizing campaign messaging** focused not only on programs and rebate sign-ups but solution-based themes targeting specific customer needs and encouraging comprehensive improvements, not just single upgrades.
- **Focusing on intervening during early project design phases** through direct outreach, seminars, and interaction with appropriate trade organizations to facilitate a more impactful role in design decisions before plans for less efficient systems have been committed to.
- **Deploying neighborhood blitz initiatives** targeting specific customer segments, such as restaurants and grocery/food service stores, with community canvassing where instant savings measures can be installed as part of a site visit and additional, incremental energy efficiency opportunities can be promoted.
- **Leveraging the Home Energy Reports program** and other utility communications to cross promote the portfolio of program offerings

3. Increase Trade Channel Partner Participation in Programs.

Strategies to increase trade and channel partner participation include:

- **Performing targeted communications** to key trade allies such as architects, engineers, builders, installers, distributors, property managers, etc., to further build relationships and

partnerships to demonstrate the value and benefits of energy efficiency for customers.

- **Executing joint, direct marketing initiatives** with key implementation vendors and complimentary service providers who have similar goals and objectives and offer cooperative advertising programs, such as co-branding customer mailings or events. To help support this, in addition to our current NHSaves brand guidelines for the NH utilities, we will create partner brand identity guidelines specific for approved, third party use. These guidelines may be used by marketing partner consultants and approved third parties who use the NHSaves brand to promote energy efficiency services and programs.
- **Expanding partnerships with statewide and regional business and trade associations** to get greater access to facility managers, key business decision makers and corporate-level managers. For example, prior practice has been to sponsor events/publications in exchange for banners and ad placements. The utilities will be working on developing more meaningful partner-focused relationships that drive event/publication content and add value to NHSaves and the trade organizations.
- **Increasing presence at retailers and equipment distributors/suppliers** where the utilities have been able to generate consistent, qualified leads to help increase awareness of the benefits of energy efficiency, and awareness of eligible program incentives. Also, pursuing relationships with additional entities, such as Architects & Engineers, and HVAC installers. This approach is typically customized to meet the needs of the trade ally. Some example activities include:
    - Performing sales staff training of energy efficiency best practices, use of incentive programs and energy efficiency sales techniques.
    - Attending trade ally's respective trade shows to be supportive of their involvement of energy efficiency and to help answer questions.
    - Serve as full partners on large-scale events.

Overall, these marketing strategies will help the utilities to effectively reach customers and partner allies to drive program activity and achieve the EERS goals for 2018 – 2020.

5.4 Education and Training

The NH Utilities offer a variety of educational programs that improve the understanding of energy efficiency throughout New Hampshire. Through these programs, we raise awareness of the benefits of energy-efficient products, homes, and businesses and establish a foundation for a more positive customer experience. Educating the market facilitates increased efficiency program penetration and engages and empowers customers to enhance their energy management practices, thereby reducing energy costs and supporting a robust energy efficiency market in New Hampshire.

The NH Utilities support three primary areas of education:

- **Residential Education** provides training to customers and contractors in the form of workshops and presentations in local communities
- **Commercial, Industrial, and Municipal Education** provides training to customers, contractors, and trade allies in the form of workshops, certifications, and presentations
- **School Education** provides young people and educators throughout New Hampshire a greater understanding of and interest in energy efficiency

Residential Education

The NH Utilities are working to expand customer, contractor, and trade ally education. Our goal is to increase awareness of and compliance with residential energy codes, as well as drive adoption of energy efficiency products. We also seek to increase awareness of the NHSaves brand, its programs and benefits.

Studies of the New Hampshire residential market have revealed some interesting insights. For example, New Hampshire residents are more proactive, compared to the U.S. and the Northeast region, in participating in energy conservation activities such as adding insulation, installing weather stripping and sealing air leaks, installing efficient windows and receiving lighting rebates, but are less proactive in installing LED bulbs, upgrading their heating and cooling system to high efficiency units and participating in whole-house energy audits[37].New Hampshire residents are also less familiar with Home Energy Management (HEM) systems and more likely to report having a manual thermostat (as opposed to a programmable or wireless) in their dwelling[37].

This information suggests that the NH Utilities have additional education opportunities for both contractors and customers that can lead to increased awareness and adoption of energy efficiency measures. As part of the effort to expand the residential education program, the NH Utilities have identified the following opportunities for the residential market in 2018 - 2020:

- Training and presentations at regional trade shows, such as the NH Home Builders Association Annual Home Show as well as other regional home shows.
- Presentations to real estate professionals, as well as and insulation and HVAC contractors
- ENERGY STAR literature to builders and their customers
- In-field builder and installer training
- Presentations to auditors, Home Energy Raters, and builders on ENERGY STAR developments

[37]E Source (2017). “Residential Customer Insights Center”. Retrieved fromhttps://customerinsights.esource.com/ (Member sign-on required)

- Energy code training for building professionals and inspectors
- Articles on programs and efficiency in trade ally newsletters
- Social media and bill inserts featuring customer testimonials
- Homeowner education workshops sponsored in collaboration with local energy committees
- Contractor recognition events (e.g., most savings and most improved etc.)
- Training and product demonstrations for employees at participating ENERGY STAR Product program retailers

These efforts allow NH Utilities to cultivate trust with customers and contractors while promoting acceptance of the technologies and program requirements. Trust and education are key components to achieving deeper energy savings in the residential market.

Commercial, Industrial, and Municipal Education

For many years, the NH Utilities have held educational seminars that provide training to customers and contractors. These seminars include but are not limited to, workshops on high efficiency equipment and processes, and opportunities for contractors to obtain certifications on energy management and energy efficient equipment.

The NH Utilities will continue to offer live and web-based seminars, both on technology topics such as lighting or compressed air and on specific segment needs. For example, an energy efficiency seminar for grocers might include information on lighting, HVAC opportunities, kitchen equipment, building shell, and refrigeration, along with financial messaging that is targeted to this industry.

To gain further insight into educational opportunities, we have reviewed market analysis on our commercial and industrial customers[38]. These analyses have shown that businesses primarily cited the ability to take advantage of utility rebates as the reason for participating in energy efficiency projects, followed by reducing the need for maintenance or maintenance costs, and to get a return on investment or payback. In addition, of those business customers who stated a specific barrier to pursuing energy efficiency projects, most cited a lack of funding to engage in this type of project or high upfront costs. The studies also indicate that utilities are the most trusted resources for energy efficiency advice and education compared to all other sources including colleagues at a similar business, governmental agencies, contractors and their own corporate energy managers.

[38]E Source (2017). "Business Customer Insights Center". Retrieved from https://biz-customerinsights.esource.com/

This analysis provides valuable information about the types of education that will address barriers to participation in the commercial and industrial marketplace. Focusing on the financial benefits of energy efficiency is likely to have the most impact.

The NH Utilities have identified the following Commercial and Industrial training opportunities for 2018 – 2020:

- Building Codes - training on the proper implementation of New Hampshire's commercial energy building code and best practices to exceed code requirements.
- Advanced energy efficiency equipment technology training seminars to commercial, municipal and industrial customers on focused topic areas including lighting, motors & drives, building shell, equipment controls and kitchen technologies.
- Public speaking engagements, tradeshows and customer events to promote programs and incentives
- Customer testimonials and case studies delivered at live events, on NHSaves.com and via social media will be done to highlight achievements and educate the commercial and industrial market on the benefits of energy efficiency

As an important part of our commercial and industrial market, our municipal program education focuses on direct outreach to municipal customers to educate them about the benefits of both electric and fossil fuel energy efficiency and the incentives and financing available to them. The NH Utilities will continue to leverage our relationships with the New Hampshire Local Energy Solutions Work Group (LESWG)[39], the New Hampshire Municipal Association[40], the Granite State Rural Water Association[41], the New Hampshire Department of Environmental Services (Wastewater Engineering Bureau)[42] and municipal employees to support education on energy efficiency for our municipal customers.

School Education

Educating students on energy efficiency has the double benefit of empowering students to help their schools set and achieve energy efficiency goals, while also arming them with information to take home and improve efficiency and performance where they live. The NH Utilities School Education efforts focus on giving energy efficiency presentations to students and educators in schools throughout New Hampshire. The NH Utilities will continue to partner with schools around the state to give presentations and explore additional educational opportunities with these valuable customers of the future who can also make big impacts now.

[39] New Hampshire Local Energy Solutions Work Group (2017). Retrieved from http://www.nhenergy.org/les-work-group.html
[40]New Hampshire Municipal Association (2017). Retrieved from https://www.nhmunicipal.org/
[41]Granite State Rural Water Association (2017). Retrieved from http://www.granitestatewater.org/
[42]New Hampshire Department of Environmental Services – Wastewater Engineering Bureau (2017). Retrieved from https://www.des.nh.gov/organization/divisions/water/wweb/index.htm

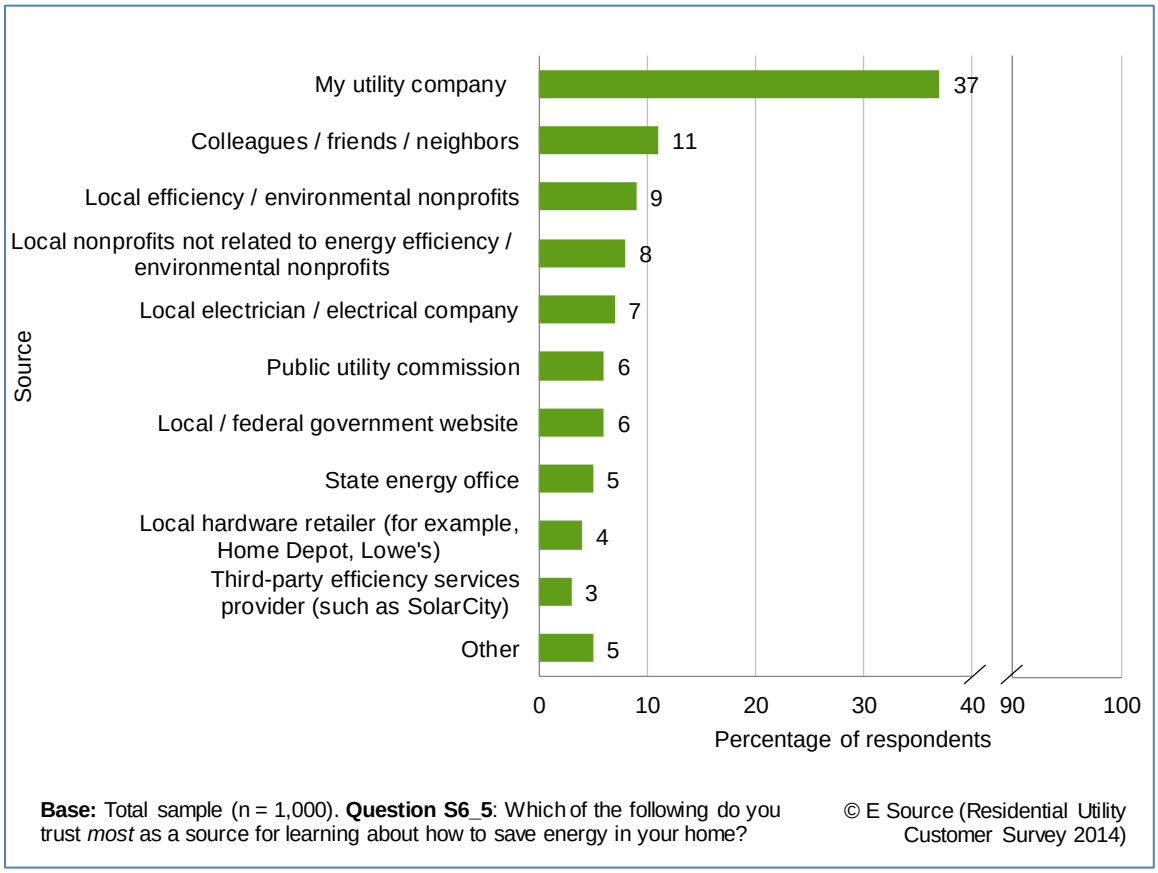
6.0 NHSaves Residential Programs

The NH Utilities offer a variety of programs that improve the energy efficiency and comfort of New Hampshire's existing and newly constructed housing stock. We raise awareness of the benefits of energy-efficient products and homes through these programs and our associated support network, and promote their adoption through outreach, education, incentives, and training. Our programs improve the efficiency of single-family and multifamily homes, reduce energy costs, and support a robust energy-efficiency market in New Hampshire.

The NH Utilities are uniquely equipped to deliver energy-efficiency information and programs to our customers. Our residential customers trust us the most to deliver these solutions (**Figure 6.1**).

FIGURE 6.1: Residential customers trust their utility for energy-saving advice

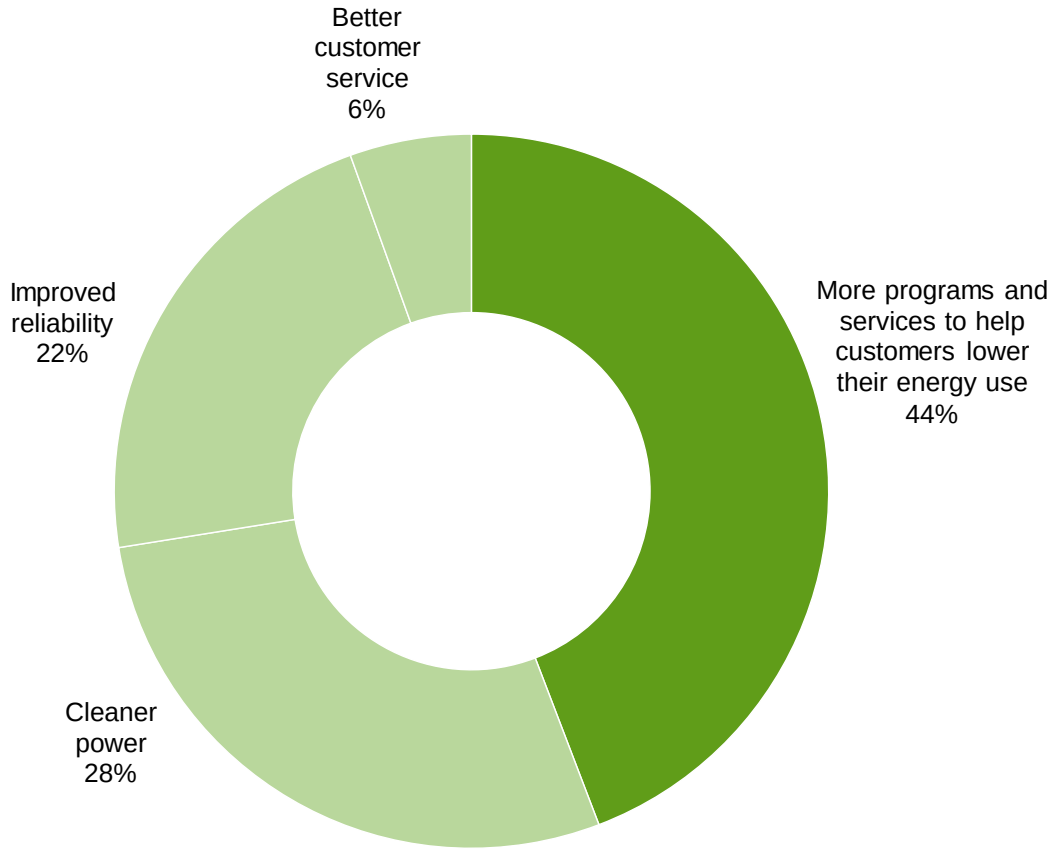
"My utility company" is by far the top-rated source reported among residential utility customers, when asked who they trust most as a source for learning about how to save energy in their home.



Moreover, research from E Source demonstrates that there is clearly an appetite for more energy-efficiency initiatives (**Figure 6.2**).

FIGURE 6.2: Nearly half of customers want more energy-efficiency programs from their utility

In the Nielsen Company's 2013 Energy Behavior Study nearly half of residential customers across the US said they wanted more programs and services to help them lower their energy use (such as appliance rebates, weatherization services, or energy-savings information) when asked what they would most like to see their electric utility invest in if it were given a federal or state grant to improve part of its business. Offering more energy-efficiency programs was the top choice, over cleaner power, better customer service, and improved reliability.



Question 13: If your electric utility was given a federal or state grant to improve part of their business, which one of the following would you most like to see them invest in? **Note:** This question was asked only of those who reported having electricity in their home (n = 31,358).

To help meet customer expectations, the NH Utilities provide four statewide programs to ensure that customers receive comprehensive energy-saving solutions to reduce their bills, regardless of housing stock or income.

- **Home Energy Assistance ("HEA")** provides energy-saving support to income-eligible residents.
- **Home Performance with ENERGY STAR ("HPwES")** provides comprehensive improvements for those who are improving the efficiency of an existing home.
- **ENERGY STAR Homes ("ESHomes")** provides certification and incentives to customers who are constructing new highly efficient homes.
- **ENERGY STAR Products ("ESProducts")** encourages customers to take advantage of individual energy-saving measures such as lighting, appliances and heating systems.

These residential programs account for an important share of the NH Utilities' electric and natural gas energy savings: approximately 22 percent and 31 percent, respectively. Each program provides a mix of training, education, and general outreach to assist local partners with delivering energy-saving projects and to bridge the information gap that prevents residential customers from pursuing energy-efficiency projects.

The NH Utilities also offer complementary initiatives and tools that support the statewide programs. These additional initiatives may be offered selectively or vary in design, based on utility territory.

- **Home Energy Reports** compare energy performance among homes and encourage greater efficiency.
- **Customer Engagement Platform** utilizes self-service tools to help customers learn more about energy efficiency and develop a customized energy savings plan.
- **Financing** mitigates first-cost barriers to energy efficiency.

Customer Barriers, Program Interventions, and Outcomes

As a comprehensive set of solutions, these programs and initiatives are designed to overcome a variety of barriers that would otherwise hinder the adoption of energy-efficiency measures (Figure 6.3). Through these program interventions, the NH Utilities aim to achieve the outcomes outlined in this table.

FIGURE 6.3: Residential Barriers, Program Interventions, and Outcomes

Market Barrier	Program Intervention	Program Outcome
▪ Lack of understanding of the behaviors and technologies that affect home energy use	▪ Education for home buyers, renters, property owners, and contractors	▪ Face-to-face interactions so that customers feel comfortable taking action on recommended projects
▪ Lack of understanding of benefits and impacts of efficiency projects	▪ Grassroots outreach approaches partnering with community groups, contractors, and local partners ▪ Case studies to show success stories	▪ Word-of-mouth referrals from trusted sources lead to increased participation
▪ Uncertainty regarding how to access programs and services	▪ Clear information on available rebates and application process provided on NHSaves.com, in retail locations, and through knowledgeable contractors	▪ Increased applications for program services and greater customer satisfaction with the process
▪ Lack of urgency to act on energy-saving projects in a low-cost energy environment	▪ Training for contractors to effectively identify and promote energy-saving opportunities as well as to highlight the importance of non-energy impacts	▪ A trusted network of subject matter experts who can help customers implement home projects and explaining the full benefits
▪ High costs associated with home improvement projects and energy efficiency upgrades	▪ Availability of low-interest loans ▪ Financial Incentives for qualifying measures	▪ Decreased cost barriers and increased market penetration of energy efficient homes and equipment

6.1 Home Energy Assistance (HEA)

Program Objective

The NH Utilities are striving to transform New Hampshire's income-eligible housing stock to make it more efficient, more comfortable, and safer. Income-eligible households pay a higher share of their income on energy costs accounting for 8 to 22 percent of their income in 2012.[43] "Energy poverty" is recognized when a household spends 10 percent or more of their income on energy-related expenses. In many cases, these high costs also result from older housing stock that is poorly insulated and in which maintenance has been deferred both inside and outside the home. The good news is that weatherization services can bring those costs down and make the home safer and more comfortable for residents.

Weatherization improvements offered through HEA include sealing doors, windows and other areas where outside air is prone to infiltrate, adding insulation to the attic, basement and walls, and replacing inefficient heating and cooling systems. All of these measures can provide a long-term fix for customers with a high energy burden by reducing home inefficiencies that are commonly at the root of high utility bills. In addition to these common energy-saving projects, the HEA program also helps address certain health and safety measures such as old wiring, inadequate ventilation, and damaged insulating materials. These improvements help improve health, safety, and other quality-of-life benefits and allow for additional energy saving measures for New Hampshire's income-eligible residents.

Vision for 2018 - 2020[44]

Moving forward, the NH Utilities recognize significant opportunities to expand the reach of the HEA program, reduce customer energy costs, reduce energy burdens and help to reduce the waiting lists for weatherization services at the Community Action Agencies that deliver the programs in coordination with the NH Utilities.

- *Provide a portfolio of cost effective and comprehensive electric and natural gas programs available to all customers with a secondary focus on fuel neutral savings*
    - The HEA Program plays a critical role in ensuring that energy efficiency opportunities are available to all customers, regardless of income. HEA is designed to assist income-eligible customers with comprehensive fuel neutral weatherization and electric savings measures.

[43] Teller-Elsbert, J., Sovacool, B., Smith, T. & Laine, E. (2014, December)."Energy Costs and Burdens in Vermont: Burdensome for Whom?"Prepared by the Institute for Energy and the Environment at Vermont Law School. Retrieved from http://www-assets.vermontlaw.edu/Assets/iee/VLS%20IEE%20Energy%20Burden%20Report.pdf

[44] Italicized vision statements refer to section 3.1 2018-2020 Plan Vision.

- The electric HEA program provides 31 percent of the portfolio fuel neutral MMBtu savings and 1 percent of the portfolio electric savings. The natural gas HEA program provides 6 percent of the portfolio natural gas MMBtu savings. The HEA program is cost effective with an overall B/C ratio of 1.45 for the electric program and 1.09 for the natural gas program.

- *Scale up to deliver increased energy savings while stimulating market transformation*
  - *Expand the reach of existing programs by serving more customers*
    - The percent of total funding dedicated to the income-eligible program increased from 15.5 percent to 17.0 percent in 2017 and will continue at the higher level of 17.0 percent from 2018-2020.
  - *Enhance Customer Experience*
    - A consistent entry point through the Community Action Agency's (CAA's) allows coordination with other income-eligible services offered by these community-based nonprofits, ensuring efficient and cost effective program delivery.
    - Increased outreach and training to income-eligible customers and pursuit of high usage projects will help customers understand how to control their electricity and heating bills.
  - *Engage stakeholders to increase customer participation and energy savings*
    - Continue to collaborate closely with the network of Community Action Agencies[45] throughout the State, as well as the NH Office of Strategic Initiatives[46] ("OSI", formerly the Office of Energy and Planning, "OEP"), which administers the U.S. Department of Energy Weatherization Assistance Program[47], and other advocates serving the income-eligible population to ensure the most effective deployment of statewide resources for this population.
  - *Expand Product and service provider infrastructure*
    - The NH Utilities are working one-on-one with CAAs to ensure that their weatherization contractors are fully equipped and qualified to meet the unique needs of this housing stock, and that there is the sufficient capacity to meet program and customer needs.
  - *Stimulate customer and other private investment*

[45]The Community Action Agencies in New Hampshire (2017). Retrieved from http://www.nhcommunityaction.org/contact-us
[46]New Hampshire Office of Strategic Initiatives (2017). Retrieved from https://www.nh.gov/oep/
[47]The U.S. Department of Energy Weatherization Assistance Program (2017). Retrieved from https://energy.gov/eere/wipo/weatherization-assistance-program-1

- The HEA program is designed so that no customer co-pay is required for this program. The NH Utilities will continue to work with NH OSI, the CAA's, NH Legal Assistance[48], NH Housing Finance Authority[49], and local affordable housing agencies and other partners engaged with the income-eligible population to identify other collaborative funding opportunities.

Program Budget and Goals

Table 6.4: Home Energy Assistance Energy Savings and Budget

	Home Energy Assistance Program				
	2018	2019	2020	2018-2020	Cumulative Lifetime
Electric					
Budget	6,225,885	7,974,902	10,638,618	24,839,404	N/A
kWh savings*	817,881	1,036,792	1,384,231	3,238,904	43,976,812
kW reduction	114	148	199	461	NA
MMBtu savings*	19,695	25,622	35,271	80,587	1,673,333
Electric participants	769	1,004	1,377	3,151	N/A
Natural gas					
Budget	1,556,830	1,704,868	1,853,441	5,115,139	N/A
MMBtu savings*	9,112	9,679	10,283	29,074	596,711
Gas participants	322	339	360	1,020	N/A

Note: kWh = kilowatt-hours; kW = kilowatt; MMBtu = million British thermal units

***Annual savings except for the Cumulative Lifetime column, which is lifetime savings**

The NH Utilities not only develop budgets and savings goals for HEA, we also work with the CAAs to develop the number of participants to be served each quarter and by county. To assure the services are being delivered throughout the state. Tables 6.5 and 6.6 display the 2018 HEA Quarterly Project Schedule and the 2018 HEA Project Distribution by county. Quarterly numbers are benchmarks and may vary slightly.

[48]New Hampshire Legal Assistance (2017). Retrieved from http://www.nhla.org/
[49]New Hampshire Housing (2017). Retrieved from http://www.nhhfa.org/

Table 6.5: 2018 HEA Quarterly Project Schedule

The project schedule reflects the expected number of homes served (Jobs) by the HEA Program by quarter.

Utility	Total Jobs	1st. Qtr.	2nd. Qtr.	3rd. Qtr.	4th. Qtr.
		23%	30%	30%	18%
LU-Electric	48	11	15	17	5
NHEC	42	7	16	15	4
Eversource	596	144	174	173	105
UES	83	19	21	26	17
LU-Gas	262	54	82	74	52
Northern	60	11	17	20	12
TOTAL Electric	**769**	**181**	**226**	**231**	**131**
TOTAL Gas	**322**	**65**	**99**	**94**	**64**
Cumulative TOTAL		246	571	896	1,091

Table 6.6: 2018 HEA Project Distribution

The project distribution table outlines how projects will be allocated by county.

BY COUNTY	LU-Electric	NHEC	Eversource	UES	LU-Gas	Northern	Grand Total
Belknap		7	55		27		**89**
Carroll		5	40				**45**
Cheshire	2		21				**23**
Coos		3	47		0		**50**
Grafton	21	14	22				**57**
Hillsborough	7		257		203		**467**
Merrimack		5	47	29	27		**108**
Rockingham	14	3	57	54	5	38	**171**
Strafford		0	30			22	**52**
Sullivan	4	5	20				**29**
Program Totals	48	42	596	83	262	60	**1,091**

Target Market

The HEA program targets income-eligible customers who have a need for weatherization services in their residence. According to The Way Home, approximately 20 percent of New

Hampshire residents are at or below 200% of federal poverty guidelines and would qualify[50] for HEA based on current program income eligibility requirements. In 2016, more than 30,000 customers qualified for HEA through their fuel assistance application and eligibility. Of those, roughly one –third of them specifically asked for weatherization when applying for fuel assistance.

Implementation Process

HEA uses a streamlined whole-house approach from energy audit through installation and inspection.

- The CAA selects a customer for weatherization based on a waiting list for services maintained by each agency.
- The CAA or their contractor first performs an audit of the home to identify energy efficiency measures, calculate potential savings, and serve as the basis for quality assurance.
- Based on the audit, the CAA or their contractor then installs the needed measures.
- The NH Utilities pay the CAA's directly after the job is complete.
- In cases where full weatherization measures are not feasible due to other issues in the home that cannot be cost effectively resolved, direct install measures may be installed at the time of the audit so that customers can still achieve energy savings through the program, while and until the identified issues can be resolved.

- **Quality Assurance:** The HEA program includes a desktop review of each job by utility program administrators. In addition to this desktop audit, a third-party inspector physically reviews and inspects approximately 10 percent of completed jobs.

- **High Electric Use Offering:** The NH Utilities will provide additional information to income-eligible customers with high electric use. Additional training will also be provided to the staff at the CAAs to help them identify high usage areas in a home with the objective of reducing or removing the inefficient load, or providing behavior changing information or education to the customer to help reduce unnecessary high use.
- This additional training and focus on identifying high electric use areas will be especially beneficial for those customers who are experiencing abnormally high electric bills and may help identify additional energy savings measures for the HEA program. Identifying and addressing these additional energy saving opportunities may have an added benefit of

[50]New Hampshire Public Utilities Commission (2016, August 8), Order No. 25,932, "Energy Efficiency Resource Standard – Order Approving Settlement Agreement". Retrieved from http://www.puc.state.nh.us/Regulatory/Orders/2016orders/25932e.pdfhttps://www.puc.nh.gov/Regulatory/Docketbk/2015/15-137/ORDERS/15-137_2016-08-02_ORDER_25932.PDF

also reducing reliance on the Electric Assistance Program (EAP)[51].

Delivery Mechanism

- **Community Action Agencies:** The NH Utilities partner with local CAAs to deliver program benefits and connect with the community. CAAs are excellent partners because they serve as a one-stop shop for multiple forms of assistance and support for income-eligible families. They are a consistent and reliable presence within the community, have established relationships with multiple service providers that help promote trust and social acceptance, and have access to a variety of local, state and federal funding sources that improve services and outcomes for the same income-eligible customers.

- **Customer Intake:** The CAAs are the most qualified entities to manage customer intake for this program. All income-eligible inquiries received by the NH Utilities are referred to the CAAs, which have the expertise to fully qualify, prioritize and serve income-eligible customers with a variety of complex needs. City and town welfare offices, 211 operators and others also make referrals to the CAAs. The HEA program also coordinates with income-eligible housing authorities and other non-profits around the state to identify eligible projects.

- **Coordination with EAP and FAP:** This program is closely coordinated with the NH Electric Assistance Program (EAP) and the NH Fuel Assistance Program (FAP). The NH Fuel Assistance Program is funded by the federal Low Income Home Energy Assistance Program (LIHEAP)[52]. Working with EAP and FAP participants to reduce their energy burden has the further benefit of increasing the EAP and FAP funds available to other customers in need of assistance.

- **Coordination with Federal Weatherization Assistance Program (WAP)[53]:** Customers served by CAAs may also be eligible for the U.S. Department of Energy's weatherization funding. The NH Utilities collaborate with the CAAs and the NH OSI, which administers the federal program on behalf of the State, to maximize the number of projects jointly funded by the HEA program and WAP. Together with these partners, the NH Utilities ensure that comprehensive weatherization services are provided to the income-eligible population across the state.

[51]New Hampshire Public Utilities Commission (2017). "Electric Assistance Program". Retrieved from https://www.puc.nh.gov/consumer/electricassistanceprogram.htm
[52]U.S. Department of Health & Human Services (2017). "Low Income Home Energy Assistance Program." Retrieved from https://www.acf.hhs.gov/ocs/programs/liheap
[53]The U.S. Department of Energy Weatherization Assistance Program (2017). Retrieved from https://energy.gov/eere/wipo/weatherization-assistance-program-1

- **Streamlined contact for multiple services:** The program design makes it easy for customers to participate due to the accessibility of one contact agency for multiple services. The CAAs are able to provide the most relevant and comprehensive services for customers while limiting the number of interactions (and opportunities to drop out).

Measures Promoted

- **Standard Measures:** The HEA program allows for comprehensive, fuel neutral weatherization. Eligible measures typically include air sealing, insulation, high efficiency lighting, low-flow showerheads, faucet aerators, programmable and/or Wi-Fi thermostats, hot water pipe insulation, duct sealing, refrigerator replacements, freezer replacements, hot water temperature setback, HVAC system cleaning, window and door replacements and a variety of health and safety measures.
- The NH Utilities will incorporate new efficient appliances beyond refrigerators directly within the HEA program. Offerings may include high efficiency, clothes washers, clothes dryers, and other energy savings measures when doing so is cost effective.

- **HVAC:** If a heating or hot water system is at the end of its useful life or is deemed to be potentially unsafe or otherwise in need of replacement, the contractor can also replace the unit with a high efficiency model.
- The NH Utilities may install ductless heat pump equipment for customers currently using electric resistance heat and/or electric cooling when deemed cost effective.

Individual measures are reviewed and updated during the program year and the NH Utilities may add or remove measures based on market availability, cost effectiveness or other needs.

Incentives

- **Standard Incentive:** The HEA program covers the total cost of cost effective energy-saving projects up to a cap of $8,000 in basic program services with no out-of-pocket cost to the customer. Natural gas customers who qualify can receive an incentive from both the electric and natural gas companies for a total rebate of up to $16,000.
- The CAAs may also leverage other funding sources, such as WAP funds, so that the HEA funds can serve more homes. However, due to the variability of other funding sources, the NH Utilities have set the rebates at a level that ensures a comprehensive project can be done on most homes even if there is no additional funding available to leverage.

- **Additional Incentives:** Expenditures above the cap are allowed for the replacement of space heating and/or water heating equipment under the following conditions:
    - The equipment installed will be ENERGY STAR–certified whenever possible. In

cases where ENERGY STAR–certified equipment is unavailable or a cost-effective substitution is unavailable (which is the case in some manufactured homes), the equipment must meet the ENERGY STAR annual fuel utilization efficiency (AFUE) minimum requirements.
    - Space and water heating equipment replacements are only allowed in homes that are being weatherized.
    - The NH Utilities will strive to limit the amount of funds spent on space and water heating equipment to 25 percent of each company's annual HEA budget to ensure that the majority of funds are used for weatherization services.

- **Lead Utility:** In order to ensure efficiency in program delivery, the NH Natural Gas Utilities take the lead on homes heated with natural gas, while the Electric Utilities take the lead on homes heated with other fuels. Should the needs of a home heated with natural gas exceed the $8,000 program cap (not including heating or water heating equipment) the relevant electric utility may elect to supplement the weatherization rebate for up to another $8,000.

Eligibility and Enrollment

- **Customer Eligibility:** The eligible pool of customers for the HEA program includes all NH Utility customers who meet the eligibility criteria for participation in the Fuel Assistance Program, the NH Electric Assistance Program, and anyone residing in subsidized housing or municipal or nonprofit organizations serving those in need.

- **Delivery Partner Eligibility:** The NH Utilities require the CAAs to meet specific partnership standards. The CAAs have the right of first refusal to deliver services under the HEA program provided they meet a set of statewide standards for bidding, pricing, and program delivery.
- Should a CAAs be unable to provide income-eligible energy-efficiency services in accordance with the approved weatherization production plan, or decline to deliver the services, the work will be assigned to other qualified contractors that can meet the NH Utilities' standards for pricing, customer responsiveness, and work quality.

Marketing and Outreach

Participants in this program are principally acquired through referrals from the CAAs, other social service agencies, the EAP and FAP programs, and the NH Utilities' customer service organizations. Well known and trusted in the region, these groups already have a strong familiarity with the target customer sectors. Partnering with them to broadcast information about this program helps ensure that the required information gets to the right audience.

This program has an educational component specifically tailored for income-eligible customers and designed to help them better understand the efficiency of their home and the factors that affect their energy usage.

Lastly, rather than treating this customer group as a homogenous entity with uniform needs and behaviors, the NH Utilities will attempt to segment this group further to better understanding who these customers are and tailor our marketing approach to drive activity and increase program participation.

Success Stories

The NH Utilities' income-eligible customers have reported significant benefits resulting from their participation in the HEA program, and we are proud to count their satisfaction among our program successes.

Long story short we were extremely blessed with a new furnace, energy efficient refrigerator, a bathroom fan that allowed the house to "breathe" and all of that topped off with water saving fixtures in our kitchen and bath. A new digital thermostat, a carbon monoxide detector and all new dryer venting. Our home is completely insulated! Through this whole process everyone involved was courteous and professional. The work is something we could never afford! We are forever grateful for everything. As a result of these services we have experienced a major reduction in our energy costs! Our home is warmer (no cool spots) and stays cooler in the summer. " M*anchester HEA Participant*

I've been on the [fuel assistance] program since 2009. Due to financial hardships, it put me at ease to know that my home is now energy efficient and that I can continue to afford the utilities. I have shared my positive experience to many people, and hopefully, they can share my enthusiasm. Words are hard to find to let you know how much this means to me to have a great program such as yours." *Nashua HEA Participant*

When I applied for Fuel Assistance they told me about this program. This program has helped me out so much I can't thank you enough. I'm on [a fixed income] and I can only stretch it out so much. This program saves me from buying kerosene so often. The best part is I'm nice and cozy now. Thank you!" *Londonderry HEA Participant*

Recent or Planned Evaluations

The most recent impact evaluation of the Home Energy Assistance Program was completed by Opinion Dynamic Corporation in 2006[54]. This evaluation estimated an electric savings realization rate of 86.9 percent and a fossil fuel savings realization rate of 98.1 percent, which have been applied to gross savings calculations ever since. The NH Utilities intend to perform both an impact and process evaluation on both the electric and natural gas programs, with an emphasis on the opportunity for effectively integrating emerging technologies during the 3-year term, and further engaging partner agencies in identifying opportunities to improve the program.

Leveraging extensive work that has been undertaken at the federal level as well as in nearby jurisdictions on the value of energy efficiency programs beyond energy impacts, additional research will be done to identify and quantify non-energy benefits for customers served.

3-Year Deployment Strategy

The HEA deployment strategy focuses on increasing the number of customers served, by nearly doubling the yearly number of participants by 2020.

2018	• Working with CAA's to ramp up activity. • Provide additional information and training to help identify and address high electric usage areas • Investigating Food Bank Partnerships
2019	• Work with CAA partners to ensure contractor capacity is adequate as program participation continues to grow. • Deployment of high electric use option or training, if determined viable.
2020	• Across all three years the NH Utilities will be working closely with the federal weatherization program and others to ensure we are coordinating with opportunities to leverage other funds.

[54] Opinion Dynamics Corporation (2016, January 16). "The New Hampshire Electric Utilities' Low-Income Retrofit Program – Impact Evaluation." Retrieved from http://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/PSNH/Final%20Report%20HEA%20Impact%201-26-06.pdf

6.2 Home Performance with ENERGY STAR (HPwES)

Program Overview

The HPwES program serves existing single-family and multifamily housing customers who desire to reduce their energy bills, improve their homes' energy performance, and enhance the durability and comfort of their homes. Existing residential buildings present abundant opportunities to improve energy performance, reduce dependence on fossil fuels, and reduce consumer energy costs. To accomplish program objectives, this program undertakes weatherization measures, certain appliance replacements, heating and hot water saving measures, and lighting upgrades. The program's comprehensive, whole house approach not only reduces energy consumption and saves money, but also improves comfort, health, and provides other quality-of-life benefits that improve the existing housing stock. It also supports the growth of NH firms and professionals in the weatherization industry.

Vision for 2018 - 2020[55]

The NH Utilities will continue the positive momentum from the current, successful HPwES program structure while enhancing program design to improve the customer experience. The program will enroll more customers and extend program benefits through continuous improvement.

- *Provide a portfolio of cost effective and comprehensive electric and natural gas programs available to all customers with a secondary focus on fuel neutral savings.*
    - The HPwES Program provides fuel neutral services to residential customers, an important element of the overall program portfolio. With a focus on comprehensive weatherization, the electric HPwES program provides 45 percent of the portfolio fuel neutral MMBtu savings. The program also contributes to electric savings, making up 1 percent of the portfolio electric kWh savings. The natural gas HPwES program captures 6 percent of the natural gas portfolio MMBtus. The HPwES program is cost effective with an overall B/C ratio of 1.80 for the electric program and 1.22 for the natural gas program.

[55] Italicized vision statements refer to section 3.1 2018-2020 Plan Vision.

- *Scale up to deliver increased energy savings while stimulating market transformation.*
    - *Expand the reach of existing programs by serving more customers.*
        - The HPwES program will achieve comprehensive weatherization projects with increasing numbers of customers for each year of the 2018-2020 Plan, through additional outreach to customers.
    - *Enhance Customer Experience*
        - The NH Utilities will streamline the process by which customers self-select for the HPwES program, and improve the customer experience by enhancing the NHSaves interface, improving financing options, and providing additional training to the weatherization contractors who work directly with customers.
    - *Engage stakeholders to increase customer participation and energy savings*
        - A key component of the marketing plan for this program involves partnering with additional community groups, contractors and other market actors, such as real estate professionals to reach customers at the moment in the process they are most likely to act.
    - *Expand Product and service provider infrastructure*
        - The HPwES program supports a strong service provider network, encouraging capable and knowledgeable professionals to participate, and providing a contractor qualification vetting process to ensure the highest standards are consistently met. Robust quality assurance remains a key part of the process, in which a third-party quality assurance contractor reviews a percentage of treated homes after they have been weatherized, and providing feedback to both the contractor and the NH Utility.
        - Additional products and measures for the program are regularly reviewed and considered for inclusion based on opportunity, cost effectiveness and customer interest.
    - *Stimulate customer and other private investment*
        - The HPwES program provides incentives equal to approximately 50 percent of the cost of the job, and the customer is responsible for the other half. By offering easy-to-access financing in the form of low-interest loans from NH-based banks and credit unions as well as on-bill financing for smaller loans, customers have options to more easily invest in energy efficient home-improvements.

Program Budget and Goals

Table 6.7: Home Performance with ENERGY STAR Energy Savings and Budget

Home Performance with ENERGY STAR					
	2018	2019	2020	2018-2020	Cumulative Lifetime
Electric					
Budget	3,343,716	5,157,513	7,620,866	16,122,095	N/A
kWh savings*	529,286	821,233	1,181,165	2,531,684	39,607,066
kW reduction	91	147	219	457	NA
MMBtu saving*s	22,363	37,747	58,255	118,364	2,384,861
Electric participants	762	1,290	1,992	4,044	N/A
Natural gas					
Budget	950,123	1,025,088	1,141,609	3,116,820	N/A
MMBtu savings*	9,629	9,799	10,157	29,585	551,417
Gas participants	598	615	647	1,861	N/A
Note: kWh = kilowatt-hours; kW = kilowatt; MMBtu = million British thermal units					

***Annual savings except for the Cumulative Lifetime column, which is lifetime savings**

Target Market

- There are approximately 400,000 single family homes in NH[56] and thousands of additional 2-4 unit properties. In order to maximize the potential energy savings from the program, HPwES targets residences with high heating energy use per square foot.

Implementation

HPwES uses a streamlined whole-house approach from energy audit through installation and inspection.

- As part of the enrollment process customers gather energy usage data for the past two years, allowing them to better understand how much energy their homes actually use. Qualification and enrollment are discussed in more detail in the Eligibility and Enrollment section.
- The contractor selected during enrollment first performs an audit of the home to help identify energy projects, calculate potential savings, and serve as the basis for quality assurance.

[56]State of New Hampshire, Office of Energy and Planning (2016, December). New Hampshire's Housing Supply: Current Estimates and Trends". Retrieved from https://www.nh.gov/oep/data-center/documents/housing-estimates-trends.pdf

- Participants pay a $100 upfront fee for the in-home energy audit, which includes diagnostic testing for air leakage. When customers move forward with any of the audit recommendations, the audit fee is applied to the cost of the project. Some direct install measures may be installed at the time of the audit so that customers choosing to not install weatherization measures or whose weatherization measures are not cost-effective can still achieve energy savings through the program.
- Based on the audit report, which includes project cost, rebate availability and payback estimates, customers decide what measures they want to move forward with and whether they want to use the program loan options for their portion of the cost.
- Chosen measures are installed by qualified program contractors. Incentive payments are generally made directly to contractors by the NH Utilities after the job is complete. Customers pay contractors the co-pay portion either directly or through the loan program.

- **Quality Assurance:** The HPwES program includes a desktop review of each job by utility program administrators. In addition to this desktop audit, a third-party inspector physically reviews and performs onsite inspections of approximately 10 percent of completed jobs.

- **High Electric Use Offering:** The NH Utilities will explore a high electric usage program offering. There are myriad contributors to high electric usage that are not tied to heating. By training contractors to identify and address areas of opportunity—such as overloaded circuits, well pumps that are grounding out or stuck in the 'on' position, and poorly operating air conditioning systems —the NH Utilities will seek to further reduce customer bills. In 2018 the NH Utilities will work with program contractors, electricians and/or vendors to explore a high electric use offering through field visitation to a sample of high use homes. The results may lead to new measures, additional contractor training requirements, or the development of educational material to help customers identify and solve high electric use issues on their own.

Delivery Mechanism

- **Qualified Contractors:** The NH Utilities use a network of more than 20 local weatherization contractors to raise consumer awareness, recruit participants, conduct home energy audits, recommend improvements, implement projects, and track progress. HPwES utilizes an expert, local workforce to weatherize homes and demonstrate the benefits of efficiency. Participating contractors must be qualified, including Building Performance Institute (BPI)[57] training and certification, have weatherization experience and undergo an enhanced quality assurance review of their initial jobs performed within

[57]Building Performance Institute, Inc. (2017). Retrieved from http://www.bpi.org/

the HPwES program.

- **Coordinated Services:** The program delivery mechanism makes it easy for customers to participate because one contractor can provide all services from audit through implementation of the measures. Customers are able to choose their contractor from a qualified list, or ask the utility to make an assignment based on location and workload.

- **New Audit Tool:** The HPwES program uses energy audit software to capture energy audit information, calculate energy savings, provide reports to customers, facilitate project review by the NH Utilities and facilitate contractor billing. A new audit tool that improves the gathering of information while providing easily understood recommendations to customers will be implemented during the 3-year plan. Development of requirements, vendor review and selection for consideration will take place in 2018 with potential implementation in 2019.

- **Financing:** In addition to contractor partners, the NH Utilities work with lending partners to offer financing options with low interest rates for the HPwES program, including exploration of a new option for moderate income customers. The NH Electric Utilities also offer an on-bill repayment option at zero percent interest for smaller loans. The Financing section of the energy-efficiency plan addresses these options in greater detail.

Measures Promoted

- **Standard Measures:** The HPwES measures allow for comprehensive, fuel neutral weatherization. Eligible measures typically include air sealing, insulation, high efficiency lighting, low-flow showerheads, faucet aerators, programmable and/or Wi-Fi thermostats, hot water pipe insulation, duct sealing, refrigerator replacements, hot water temperature setback, and a variety of health and safety measures. Additional appliances such as dehumidifiers, clothes washers, clothes dryers, room air purifiers and other measures will be evaluated for incorporation where they are deemed cost-effective.

- **Custom Measures:** Custom measures, such as smart thermostats, HVAC optimization, cold climate heat pumps replacing electric resistance heat, and home energy management systems can also be proposed and evaluated for individual projects.

- **HVAC:** If an oil or propane heating system is at the end of its life, the contractor can also recommend that the customer bring in an HVAC contractor to replace the unit with an ENERGY STAR certified model and receive an additional rebate to help lower the incremental cost when compared to standard equipment.

Individual measures are reviewed and updated during the program year and the NH Utilities may add or remove measures based on market availability, cost effectiveness or other needs.

Incentives

- **Standard Incentives:** Customers who qualify for HPwES can receive approximately 50 percent of the cost of weatherization services, up to $4,000. This incentive structure is designed to be simple for the customer to understand while encouraging deeper customer investment and larger, more comprehensive projects.

- **Lead Utility:** In order to ensure efficiency in program delivery, the NH Natural Gas Utilities take the lead on homes heated with natural gas, while the Electric Utilities take the lead on homes heated with other fuels. Should the needs of a home heated with natural gas exceed the $4,000 program cap the relevant electric utility may elect to supplement the weatherization rebate for up to another $4,000. This structure provides natural gas customers with an opportunity to achieve deeper energy savings and recognizes that they contribute to the system benefits charge on their electric bill as well as the energy efficiency portion of the local distribution adjustment charge on their natural gas bill.

- **HVAC Replacement Incentives:** In the electric programs, additional incentives beyond the $4,000 cap are available for high-efficiency oil and propane space and water heating systems when such equipment replaces end-of-life equipment and is recommended by one of the program's energy auditors. The customer must also implement all recommended, cost effective, insulation and air sealing as part of their HPwES project to qualify for an HVAC replacement incentive. Additional incentives for high efficiency natural gas and heat pumps are also available outside of the HPwES program.

- **Financing Incentives:** Customers who take advantage of the third-party loan offering to cover their portion of the project cost receive an additional incentive in the form of an interest rate buy-down, where the NH Utilities partner with lenders to reduce interest rates for loans on qualifying projects. Customer co-pays for both the HPwES weatherization project as well as eligible HVAC installations are able to receive an interest rate buy-down through the third-party loan offering.

Eligibility and Enrollment

- **Single Family (1-4 units):** Single-family homes are eligible to participate regardless of space heating system type. Residentially metered homes heated by natural gas and are primarily served by their natural gas utility, while non-gas customers are served by their electric utility.

- **Multifamily (more than four units):** Multifamily homes are modeled individually and evaluated for cost-effectiveness using the standard benefit/cost test in order to qualify the home for services under this program. These buildings are eligible to receive specific services depending on the fuel used to heat the home and provided the home qualifies for services, as follows:
    - *Natural gas–heated homes:* Individually metered residential units are served through the residential program. Centrally heated units on a commercial, master-meter account, are served through the commercial and industrial programs.
    - *Electric-heated homes* are eligible for all services, which are provided by the electric utility.
    - *Other fuel-heated homes* are only eligible for incentives on electric baseload measures, which are provided by the electric utility and depend on budget availability. These measures typically include lighting and electric appliances.

- **Determining Eligibility:** Determining eligibility for single-family homes is simple using the NHSaves website. With three primary pieces of information—ZIP code, conditioned square footage of home, and annual heating fuel usage—customers receive a tailored Home Heating Index (HHI) score. The higher the HHI score, the more energy used per square foot and the greater the potential energy-savings opportunity. The home must meet a threshold HHI score in order to qualify for the HPwES program.

- **HHI Threshold:** As higher energy usage customers are served under this program, the qualifying HHI threshold may be adjusted over time. In limited cases, a program administrator may waive the HHI qualification if it is determined that the project is likely to have significant savings and passes the standard benefit/cost test.

- **HPwES Enrollment:** Once qualified, customers complete a brief application form and provide heating fuel data to enroll in HPwES. The NH Utilities will continue to review and adjust the application process to ensure that we're gathering the right set of information and communicating the process clearly to customers and contractors. Also during the 3-year plan, the NH Utilities intend to make enhancements to the HHI tool in order to improve the customer experience.

Marketing and Outreach

Home retrofit programs like HPwES have historically benefited from a grassroots, hands-on marketing approach due to the customized, in-home nature of the program. By necessity, the retrofit program takes place inside customers' homes, and customers may be selective about

who they let in to discuss it. Word-of-mouth referrals, customer service referrals, contractor-initiated marketing, and community partnerships will continue to be a relied upon marketing channel to drive program awareness and customer leads.

The NH Utilities intend to ramp up outreach efforts to achieve increased program energy-savings goals, but will ensure that efforts don't impede or limit contractor-initiated activities, which drive program awareness. The NH Utilities see a significant opportunity to partner with community-based groups and leverage local efforts to encourage energy efficiency. Local energy hubs, municipal energy committees or commissions, and community nonprofits play a vital role in gathering community members and disseminating information. Models like the Energize 360[58] project can serve as examples for working with additional community-based groups. The NH Utilities have heard from a number of community organizations around the state, such as Vital Communities[59], that are interested in working jointly to promote energy efficiency opportunities.

In addition to community-based outreach, the NH Utilities will use an integrated marketing approach of general-awareness tactics including tradition media (direct mail, print and radio), digital media (email, paid search, search engine optimization) and social media (Facebook, Twitter). Tactics may include:

- Emphasizing available financing
- Partnering with participating lenders to advertise program and 2 percent financing in their marketing
- Promoting program awareness and offerings through social media
- Leveraging email awareness campaigns for e-bill customers who don't receive paper bills
- Publishing articles in trade ally newsletters
- Incorporating customer testimonials in social media and bill inserts
- Collaborating with real estate professionals to share program awareness and obtain previous heating-fuel usage history for homebuyers
- Engaging with media outlets through press releases and interviews on radio shows
- Hosting in-person and virtual/webinar homeowner education workshops in collaboration with local energy committees
- Having a presence at local and regional home shows
- Developing a new-contractor handout to provide homeowners with relevant information about programs and availability of home energy scores

[58]Energize360 (2017). Retrieved from http://energize360.org/
[59]Vital Communities (2017). Retrieved from http://vitalcommunities.org/

- Partnering with community groups and organizations to facilitate completion of projects from qualified leads
- Cross promoting the program in tandem with other initiatives such as the utilities respective Home Energy Reports direct mail and email communications

Expanded Eligibility for Natural Gas Customers

The NH Natural Gas Utilities plan to include a new visual audit and direct install offering of instant savings measures for homes that don't qualify for HPwES. This new option for natural gas heated homes will improve the customer experience for those who previously wouldn't have been eligible and will expand the number of participants the NH Natural Gas Utilities can serve. Customers will receive information to better understand the impact of their actions on home energy usage and their home's energy savings potential.

- Enrollment – Incorporation of additional elements into the HHI tool will help facilitate customer entry into the visual audit offering
- Qualifications - Customers will be qualified into the offering based on their respective HHI score and the self-identification of instant savings measure opportunities
- Measure Focus - Offering will be focused on deploying instant savings measures such as Wi-Fi thermostats, low flow showerheads, faucet aerators, pipe wrap, LED bulbs and smart strips, where applicable
- Incentives - Intent is for the visual audit to be a free offering for customers who qualify, with potential customer co-pays on specific EE measures as deemed necessary
- Marketing - Roll-out will include direct customer messaging via bill inserts, Web site and email blasts, social media and cross promotion via other program communication activities
- Timeline - Targeting initial implementation in the first quarter of 2018

The visual audit offering will provide useful information for homeowners and will be a lower-cost option than the standard HPwES audit. Also, information gathered during the walk-through audit may indicate the opportunity for additional energy savings, in which case the utilities can use auditing software, to help justify cost-effectiveness and move the project into the full HPwES program.

The NH Electric Utilities will consider a similar expansion of eligibility later in the 3-year plan. As part of their research, the NH Electric Utilities may utilize the expanded eligibility option for a limited number of customers in 2018.

Success Stories

The EPA recognized the NH HPwES Program in 2011 with an ENERGY STAR Partner of the Year award, citing its effective screening tool and "exceptional" audit-to-implementation closure rate. In 2013, the NH Utilities were recognized again as an ENERGY STAR Partner of the Year for outstanding energy-efficiency program delivery of the HPwES Program.

Participant impacts are impressive. A typical project in 2016 received a rebate of $3,100, which covered half of the project cost with the other half being the responsibility of the homeowner. This investment resulted in an average payback of less than 5 years and over the lifetime of the improvements, will save the home owners about $12,000. Participants have expressed satisfaction with the contractors and the results received through the HPwES program.

I had to write and say how HAPPY I am!! I am so toasty warm and I do not have ONE icicle on my house! … It is like a new house." – *Wende, New London*

This actually exceeds [the] original estimate of [energy] savings so the project will pay for itself much sooner. Additionally, the winter has featured much less wear and tear on us because of the unexpected increase in comfort. As a former geriatric social worker, I can tell you that winter ages people… So I believe your weatherization efforts have a long-term medical pay off also." – *Sherry, Contoocook*

My family wants to thank you for the work done and for the existence of this program. Thank you for all who had a hand in making our house more efficient." *Joey, Piermont*

[The contractor] is very knowledgeable… He made us feel like there were no stupid questions and didn't talk over our heads like a lot of salesmen tend to do. It will be a real pleasure to be doing business with him." *Stacy, Tamworth*

Recent or Planned Evaluations

The Cadmus Group completed an impact and process evaluation on this program June 13,

2011[60]. A further review of the opportunities for ancillary summer and winter peak demand savings due to weatherization and installation of new heating systems was completed in 2013[61]. Over the 3-year period, performing an impact and process evaluation will help identify opportunities for effectively integrating smart lighting, appliances and other emerging technologies into this programs. This will provide valuable insights into program design and delivery as well as verify past program performance and impact.

3-Year Deployment Strategy

The HPwES program will expand and evolve over the 2018-2020 Plan.

2018	• Build upon the existing successful HPwES program with enhanced outreach to bring in more customers as the NH Utilities partner with community groups and increase other marketing tactics. • Contractors will have a new handout for homeowners with relevant information about other related programs. • Provide customers with additional appliance rebates through HPwES program as appropriate. • The natural gas companies will implement the new visual audit option, expanding program eligibility. • Perform test cases for high electric usage offering and consider opportunities for implementation in future years.
2019	• Increased participation through partnerships and marketing efforts. • Exploration of new program software and elements for additional electric savings will be well underway and in some cases ready for implementation. • The NH Electric Utilities will review the initial results from the visual audit option and determine whether expansion to the electric programs is appropriate for 2019 or 2020, depending on factors such as cost, opportunity for savings, program needs and other factors.
2020	• 2020 will see the benefits of the outreach ramp-up from the prior two years and the implementation of new elements. • The NH Utilities will be able to review the success of efforts made during the plan, including results from any evaluation done through the EM&V process, and prepare for future adjustments to the program.

[60]Cadmus Group, Inc., (2011, June 13). "Process and Impact Evaluation of the New Hampshire Home Performance with Energy Star Program (HPwES)."Impact evaluation retrieved from http://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/124%20NH%20HPwES%20Impact%20Evaluation%20Report%20June%2013%202011.pdf; Process evaluation retrieved from http://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/124%20NH%20HPwES%20Process%20Evaluation%20Report%20June%2013%202011.pdf

[61]Cadmus Group, Inc. (2013, April 5). "New Hampshire HVAC Load and Savings Research – Final Report. " Retrieved from http://puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/PSNH/New%20Hampshire%20HVAC%20Load%20and%20Savings%20Research%20-%20Final%20Report%20040513.PDF

6.3 ENERGY STAR Homes

Program Objective

The NH Utilities work closely with new-home builders and homebuyers to construct highly energy efficient and comfortable single-family and multifamily homes. The NH Utilities' ENERGY STAR Homes program provides incentives directly to homebuilders or homeowners who build homes that meet or exceed the ENERGY STAR standards and provides the services of independent home energy raters who ensure quality assurance and certification throughout the construction process. This program intervenes at a critical point in the building process, encouraging and supporting home builders and developers who may not otherwise take a comprehensive approach to home energy performance, especially in a market where net profit margins are commonly thin.[62]

Vision for 2018 -2020[63]

- *Provide a portfolio of cost effective and comprehensive electric and natural gas programs available to all customers with a secondary focus on fuel neutral savings*
    - The ENERGY STAR Homes Program provides electric, natural gas and fuel neutral savings to residential customers. The electric ESHomes program provides 16 percent of the portfolio fuel neutral MMBtu savings. The program also contributes to electric savings making up 1 percent of the portfolio electric savings. The natural gas ESHomes program provides 2 percent of the portfolio natural gas MMBtu. The ESHomes program is cost effective with an overall B/C ratio of 2.09 for the electric program and 1.34 for the natural gas program.

- *Scale up to deliver increased energy savings while stimulating market transformation*
    - *Expand the reach of existing programs by serving more customers*
        - The NH Utilities strive to expand already impressive residential new construction participation in the program as well as introduce nonparticipating builders to the ENERGY STAR Homes program to capture potential energy efficiency savings. To enable this shift, ENERGY STAR Homes will remain the primary focus of the program, while the NH Utilities will simultaneously pursue other program interventions to provide a wider range of incentive options and entry points during the 2018-2020 period.
    - *Enhance Customer Experience*

[62]National Association of Home Builders (2016, March 21). "The Cost of Doing Business Study, 2016 Edition". Retrieved from http://eyeonhousing.org/2016/03/whats-the-average-profit-margin-of-single-family-builders/

[63] Italicized vision statements refer to section 3.1 - 2018-2020 Plan Vision.

- New program elements will enable builders to transition to ENERGY STAR in a way that works for them, through progressive steps, and will also provide customers with even more options when working with their builders.

- *Engage stakeholders to increase customer participation and energy savings*
  - The new elements introduced for the 2018-2020 plan period are all designed to meet contractor and customer needs and to further expand participation in the program. This will help to meet the objective of capturing additional energy savings.
  - Trainings and presentations will disseminate information on high efficiency building practices to contractors in the residential new construction market and information about the program will stimulate participation.
- *Expand Product and service provider infrastructure*
  - The NH Utilities will continue to incentivize customers and contractors to achieve top-tier energy performance, while working to expand incentive opportunities beyond the prescribed path set by the federal program. These efforts will cultivate understanding among contractors, particularly those who have identified the current requirements to be a barrier to their participation in the program. By allowing for other points of entry into the program, the NH Utilities will increase acceptance of energy efficient technologies and engage new actors in the ENERGY STAR Homes program.
- *Stimulate customer and other private investment*
  - The incentives provided by the ENERGY STAR Homes program represent only a fraction of the incremental cost to build a highly efficient new home. Builders and customers are investing significant funds in NH's efficient new housing stock and transferring the knowledge and experience gained through the program into other areas of their professional activity.

Program Budget and Goals

Table 6.8: ENERGY STAR Homes Energy Savings and Budget

	ENERGY STAR Homes				
	2018	2019	2020	2018-2020	Cumulative Lifetime
Electric					
Budget	2,166,065	2,805,646	3,824,769	8,796,480	N/A
kWh savings*	887,234	1,194,124	1,794,275	3,875,633	84,714,906
kW reduction	195	267	387	850	NA
MMBtu savings*	9,390	12,871	18,765	41,026	970,756
Electric participants	689	945	1,378	3,013	N/A
Natural gas					
Budget	381,100	434,751	473,878	1,289,729	N/A
MMBtu savings*	2,895	3,305	3,559	9,759	241,408
Gas participants	108	121	130	360	N/A

Note: kWh = kilowatt-hours; kW = kilowatt; MMBtu = million British thermal units

***Annual savings except for the Cumulative Lifetime column, which is lifetime savings**

Target Market

- The ENERGY STAR Homes program targets all residential new construction in the State of New Hampshire, including multi-family and income-eligible homes. New home construction in NH is rebounding since 2008. New single family home permits[64] in New Hampshire are approaching 1,900 per year, multifamily approaching 1,500 units per year, and manufactured homes nearly 200 per year.
- The NH Utilities have strong relationships with most of the residential builders and many of the most active HVAC contractors in the state, and the program is marketed directly to them. Awareness and participation by builders is high. In 2016, 707 homes (units), which represents approximately 20percent of the 3,556 permits issued in 2015, were certified as ENERGY STAR through utility ENERGY STAR Homes Program.

[64]State of New Hampshire, Office of Energy and Planning (2016, December). New Hampshire's Housing Supply: Current Estimates and Trends". Retrieved from https://www.nh.gov/oep/data-center/documents/housing-estimates-trends.pdf

Implementation

- **ENERGY STAR Homes Program (version 3.0[65]):** ENERGY STAR Homes provides incentives to homebuilders or homebuyers to build high-efficiency single-family or multifamily homes. ENERGY STAR is a national energy-efficiency program coordinated by the US Environmental Protection Agency (EPA). As such, ENERGY STAR sets the requirements for home eligibility at the national level. The NH Utilities work with the EPA to ensure that the NH program requirements meet or exceed the minimum federal ENERGY STAR criteria.
- The program utilizes a Home Energy Rating Score / Index (HERS)[66] as a scoring mechanism, which is analogous to a "miles-per-gallon" sticker for new homes, giving prospective buyers insight into how the home performs in terms of energy efficiency. The lower the HERS performance rating, the more energy efficient the home is compared to one built to standard code.

In additional to the current ENERGY STAR standards, the NH Utilities have identified additional program structures to encourage more participation and meet increased targets for energy savings. These new initiatives include ENERGY STAR Version 3.1[67], Drive to Net Zero Energy Homes challenge, Drive to ENERGY STAR, and an addition/renovation offering.

- **ENERGY STAR Homes Version 3.1:** Version 3.1 makes the efficiency target more rigorous, designed to save on average 15 percent or more relative to the 2012 International Energy Conservation Code (IECC2012)[68]. This new version is designed to ensure that the ENERGY STAR–certified homes will continue to deliver meaningful savings relative to non-certified homes in states, towns and/or cities that have adopted the newer IECC2012 code. The majority of New Hampshire remains[69] under the 2009 International Energy Conservation Code (IECC2009)[70], so builders who strive for and achieve Version 3.1 standards will help the state realize deeper energy savings than Version 3.0. The NH Utilities will encourage adoption of 3.1 standards with HERS Rater support and additional incentives

[65]ENERGY STAR (2017). "ENERGY STAR Certified Homes Version 3 Program Requirements.". Retrieved from https://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_v3_guidelines
[66]Residential Energy Services Network® (2017). "What is the HERS Index?" Retrieved from https://www.resnet.us/hers-index
[67]ENERGY STAR (2017). "ENERGY STAR Certified Homes, Version 3.1 (Rev. 05) National Program Requirements.". Retrieved from https://www.energystar.gov/ia/partners/bldrs_lenders_raters/downloads/ES_Combined_Path_v3.1.pdf
[68]International Energy Conservation Code, 2012. Retrieved from https://archive.org/details/gov.law.icc.iecc.2012
[69]U.S. Department of Energy – Energy Efficiency & Renewable Energy (2017). "Building Energy Codes Program – New Hampshire". Retrieved from https://www.energycodes.gov/adoption/states/new-hampshire
[70]International Energy Conservation Code, 2009. Retrieved from https://archive.org/details/gov.law.icc.iecc.2009

- **Drive to Net Zero Challenge:** To qualify as net zero for the Challenge, a home must meet the ENERGY STAR Homes certification requirements and have a renewable energy system installed, such as solar photovoltaics, a small wind turbine, or a micro-hydro turbine. In 2017, the NH Utilities encouraged builders to move toward net zero new homes through the New Hampshire Drive to Net Zero Challenge. The NH Utilities will pursue the Challenge again during the 2018–2020 Plan and consider additional efforts to encourage adoption of Net Zero Homes.
- Home builders who participate in the Drive to Net Zero Challenge compete for a cash incentive to design and build super high-efficiency, zero-net-energy homes in New Hampshire. Homes are scored on four quantitative achievements and a qualitative technical assessment, with the best score winning a cash prize:
    - Lowest overall HERS index
    - Lowest HERS index prior to renewable installations
    - Most affordable per square foot
    - Estimated total annual net operating cost
    - Technological innovation
    - All challenge participants receive peer recognition, media exposure, and other promotional opportunities that benefit their businesses. The challenge helps demonstrate to builders and the average homebuyer that building to this higher standard of efficiency is achievable and affordable in today's market.

- **Drive to ENERGY STAR (a code plus initiative):** Drive to ENERGY STAR is an initial entry point into efficient building practices. Builders of single-family homes will receive reduced incentives for building homes that are above code yet do not meet all of the ENERGY STAR certification requirements. Some builders find the HVAC requirements for ENERGY STAR to be an initial barrier to pursuing the ENERGY STAR certification. By offering the Drive to ENERGY STAR, the NH Utilities are facilitating opportunity for these builders and their HVAC contractors to better understand the process and recognize the value of certification. The NH Utilities will develop relationships with these builders and HVAC Contractors and tailor information so that they are more likely to move forward with certification in future construction.

- **Major addition/renovation initiative:** Over the course of the 3-year plan, the NH Utilities will explore opportunities for a major addition/renovation incentive option. This initiative would be geared toward construction projects, such as major additions or remodeling that have potential for incorporating highly efficient building practices but are not eligible for ENERGY STAR Homes or Drive to ENERGY STAR.
- In 2018 NHEC will work with builders to identify trial projects. Based on the learning from

NHEC's exploration, the other utilities will decide whether to adopt a similar initiative based on the scale of the opportunity and cost effectiveness.

- **NH's Energy Code:** New Hampshire's current residential building energy code, the International Energy Conservation Code 2009 (IECC2009)[71], went into effect April 1, 2010. To meet ENERGY STAR certification, homes are modeled, tested and certified using this energy code as a baseline. If New Hampshire adopts a newer IECC code in the future, the NH Utilities will make updates to the program at that time.

Delivery Mechanism

- The NH Utilities work hand in hand with Residential Energy Services Network (RESNET)[72] Certified Home Energy Raters, who serve as a critical partner in initiating and completing new construction enrollments in the program. The NH Home Energy Raters perform site visits and evaluate plans prior to construction and perform inspections during construction. When each home is fully built, the raters go back to review final construction and quantify energy performance. Home builders receive a final ENERGY STAR Home Certification Report that includes information collected about the home along with ENERGY STAR, RESNET and Home Energy Rating certifications.
- This independent third-party inspection, verification and diagnostic testing helps to maximize energy efficiency and develop the skills and knowledge among the home builder and contractor community.

Measures Promoted

To earn the ENERGY STAR certification, homes must meet guidelines that make them 15-30 percent more efficient than a standard, code-built home. Homes achieve this level of performance through a combination of energy efficient improvements including:

- Air tight construction
- Effective insulation installation
- High performance widows
- High efficiency heating and cooling equipment
- Well-insulated and sealed heating and cooling ducts
- ENERGY STAR certified lighting and appliances
- Water Protection Systems to effectively drain water from the roofs, walls, and foundations
- Third-party testing and verification to ensure superior energy performance

[71]U.S. Department of Energy – Energy Efficiency & Renewable Energy (2017). "Building Energy Codes Program – New Hampshire". Retrieved from https://www.energycodes.gov/adoption/states/new-hampshire
[71]International Energy Conservation Code, 2009. Retrieved from https://archive.org/details/gov.law.icc.iecc.2009
[72]Residential Energy Services Network (2017). Retrieved from http://www.resnet.us/

Incentives

- The ENERGY STAR Homes program provides incentives to contractors or homeowners to encourage them to build homes that go beyond the minimum EPA national program requirements and covers the cost for Home Energy Raters who certify the homes.
- Incentives are performance-based, using the improvement in HERS rating over a code-built home as the gauge. By rewarding deeper savings, home builders are motivated to achieve higher levels of efficiency.
- Prescriptive incentives are also provided (within a total-project cap) on specific appliances and lighting to promote the adoption of high efficiency technologies.
- As an additional benefit to home builders and homeowners, the HERS certification serves as state code compliance that is used to meet the inspection needs of the town or city. For smaller towns that have limited or no inspectors, the involvement of a HERS raters helps to ensure safe, high-quality construction for those homes participating in the program.

Eligibility and Enrollment

- **Building Eligibility:** All residential single-family and multifamily new construction projects are eligible to participate in this program regardless of the fuel or system used for space heating.
- Manufactured or prefabricated homes are also served under the same program requirements as site-built homes.
- Complete rehabs of existing structures may be eligible to participate if the amount of rehab work meets ENERGY STAR requirements, or potentially through the new major renovation/addition option.
- Homes must be enrolled in the program and inspected prior to installation of any wall covering, in order to meet insulation inspection requirements of the program.

- **Enrollment:** Certified Home Energy Raters working within the program perform outreach to encourage participation by the builder community. The residential implementation staff at the NH Utilities also maintain relationships with many of the new home builders around the state and work with those home builders to enroll eligible projects. Individual customers may enroll by contacting their utility or visiting NHSaves.com and filling out a simple enrollment form.

- **Rater Eligibility:** Home Energy Raters must be certified by RESNET. According to RESNET, “A certified home energy rater or rater is a person trained and certified by an accredited home energy rating provider to inspect and evaluate a home’s energy features, prepare a home energy rating, and make recommendations for improvements that will save the homeowner energy and money.” The raters for the NHSaves program must also

participate in a quality assurance process.

Marketing and Outreach

Marketing will focus primarily on direct outreach to home builders and HVAC contractors, with the goal of enlisting new partners who have not been actively participating in the program and to deepen existing relationships with current builders and Home Energy Raters. In an effort to expand the program, the NH Utilities will work to increase participation through promotion and partnerships with initiatives such as:

- Participation in trade and home shows
- Outreach to real estate professionals and insulation and HVAC contractors
- Presentations at homebuilder and homebuyer seminars
- Deploying ENERGY STAR signs and literature for home builders
- Conducting in-field energy code and beyond-code training
- Co-marketing of ENERGY STAR property developments with home builders
- Nominating and promoting program partners for recognition and awards

Success Stories

ENERGY STAR has recognized the exemplary performance of the NH program multiple times over the years, and they have also recognized NH home builders and HERS raters for their dedicated participation. In the past decade, more than 7,311 ENERGY STAR homes have been certified through the NH program. The market share for ENERGY STAR homes has grown from an initial 2 percent to close to 20 percent.[73]

The NH program partners have also received recognition for outstanding performance. Chinburg Properties, a participating homebuilder, was recognized by U.S. EPA with the ENERGY STAR Partner of the Year award as New Home Builder and Affordable Housing in both 2016 and 2017, and GDS Associates, was recognized in 2016 and 2017 with the ENERGY STAR Partner of the Year as New Hampshire Home Energy Rater.

[The ENERGY STAR Certification] is one of the things that attracted me to this community. I have loved working with [my builder] and the quality of the build is beyond others."—*Janine, Londonderry*

[73]State of New Hampshire, Office of Energy and Planning (2016, December). New Hampshire's Housing Supply: Current Estimates and Trends". Retrieved from https://www.nh.gov/oep/data-center/documents/housing-estimates-trends.pdf

Recent or Planned Evaluations

A process and impact evaluation started in 2016 and is expected to be completed at the end of the third quarter of 2017. Energy & Resource Solutions (ERS), the third-party evaluation company that is conducting the evaluation, is recommending that the baseline being utilized as a point of comparison for savings should be updated based on the standard building practices in residential new construction. As a result, the NH Utilities have prospectively adjusted electric and fossil fuel savings estimates per unit for the 2018-2020 plan.

In terms of other findings, the evaluation is finding a very high awareness of and participation in the NH Homes program by residential builders and good market share. In addition, customer satisfaction with the program and the homes that are built was found to be high, with potential room for greater savings through education of occupants about how to reduce energy use. These are all preliminary findings and pending a report and presentation by ERS.

3-Year Deployment Strategy

2018	• Introduction of Drive to ENERGY STAR and ENERGY STAR Homes Version 3.1 • Review of 2017 Drive to Net Zero Challenge and make any adjustments for 2018 • NHEC begins exploration of major addition/renovation option.
2019	• Review new elements and make adjustments as needed
2020	• Review new elements and make adjustments as needed. • Continue monitoring smart home technologies for use in this program.

6.4 ENERGY STAR Products (ESProducts)

Program Objective

The ENERGY STAR Products program focuses on energy savings potential in the consumer lighting and small appliances market by encouraging customers to recognize and purchase ENERGY STAR–certified lighting, appliances, and space/water heating and cooling products. The program also provides easy-access recycling options for certain old, inefficient appliances, removing them from the residential plug load and disposing of them safely and responsibly. By focusing on vendor partnerships and consumer education, the NH Utilities have designed the program to help retailers and consumers understand the value associated with purchasing ENERGY STAR goods, and remove the barrier posed by the higher upfront cost of efficient equipment. Purchasing ENERGY STAR products—which are independently certified to save energy over standard efficiency products with similar features and functionality—helps our residents to be energy conscious consumers, saving both energy and money.

Vision for 2018 - 2020[74]

- *Provide a portfolio of cost effective and comprehensive electric and natural gas programs available to all customers with a secondary focus on fuel neutral savings*
    - The ESProducts program provides significant cost-effective savings to a diversity of residential customers at relatively low cost per participant. The electric ESProducts program provides 11 percent of the portfolio electric savings and 4 percent of the portfolio fuel neutral MMBtu savings. The natural gas program provides 11 percent of the portfolio natural gas MMBtu. The ESProducts program is cost effective with an overall B/C ratio of 1.73 for the electric program and 1.08 for the natural gas program.
    - Measures in the ESProducts program help to ensure that all customers have access to energy savings opportunities, providing low-cost options such as lighting replacement and single measure incentives for those customers who want to take action even where a more comprehensive whole house project is not appropriate or feasible.
    - The marketplace for energy efficient products is rapidly evolving. As the program matures and federal energy efficiency standards evolve, the NH Utilities will continue to keep a careful eye on energy savings opportunities to ensure eligible measures and delivery mechanisms meet energy savings goals and adapt to changing market demand.

[74] Italicized vision statements refer to section 3.1 2018-2020 Plan Vision.

- Although the ESProducts program is focused predominantly on electric lighting and appliances, and natural gas saving heating and hot water saving equipment, some measures also save propane, oil, and water resources, providing additional benefits to participants.

- *Scale up to deliver increased energy savings while stimulating market transformation*
  - *Expand the reach of existing programs by serving more customers*
    - The increased savings goals and resources under the EERS have led the NH Utilities to expand their retail channel partners, deepen relationships with existing partners, and increase NHSaves' online presence to streamline the process for participating customers. All of these efforts will facilitate increased sales of qualifying equipment and lead to the capture of otherwise lost opportunities for energy savings.
  - *Enhance Customer Experience*
    - Expanding markdowns to additional retailers will bring a streamlined process for purchasing efficient lighting to customers throughout the state in both urban and rural areas.
    - Continual improvement in the online rebate submission process, and increasing customer awareness of online submission options will help to streamline the process for appliance incentives.
  - *Engage stakeholders to increase customer participation and energy savings*
    - The NH Utilities' retail partners and HVAC contractors are major stakeholders in the ESProducts program. The NH Utilities will strengthen existing relationships with these partners as we implement changes to the ESProducts program.
  - *Expand Product and service provider infrastructure*
    - In 2018 and beyond we will expand lighting markdowns and will further leverage online channels where more customers are choosing to buy products.
  - *Stimulate customer and other private investment*
    - The incentives are intended to help customers cover some or all of the incremental cost between a standard efficiency unit and the more expensive ENERGY STAR products. Distributors and retailers are also making investments to stock higher efficiency units in their inventory to be sold with or without the incentive. Some HVAC contractors further stimulate private investment by facilitating customer financing for the installation of the air source and ductless heat pump mini split systems as well as natural gas heating and hot water systems.

Program Budget and Goals

Table 6.9: ENERGY STAR Products Energy Savings and Budget

ENERGY STAR Products	2018	2019	2020	2018-2020	Cumulative Lifetime
Electric					
Budget	4,417,154	4,921,565	5,899,396	15,238,116	N/A
kWh savings*	11,994,595	12,598,436	12,547,235	37,140,267	276,701,641
kW reduction	1,469	1,584	1,643	4,695	NA
MMBtu savings*	3,238	3,515	4,582	11,335	164,210
Electric participants	136,954	175,569	216,056	528,578	N/A
Natural gas					
Budget	1,385,311	1,501,137	1,594,176	4,480,624	N/A
MMBtu savings*	17,708	19,100	20,478	57,287	980,387
Gas participants	2,152	2,327	2,506	6,984	N/A

Note: kWh = kilowatt-hours; kW = kilowatt; MMBtu = million British thermal units

***Annual savings except for the Cumulative Lifetime column, which is lifetime savings**

Target Market

New Hampshire has more than 520,000 households[75], all of which have dozens of energy-consuming devices. Many of the incentives are based on customers replacing lighting and appliances upon burnout, or at the end of their useful life. In addition, the incentives raise awareness of the cost-effectiveness of energy efficiency and motivate some customers to replace working products with more efficient ENERGY STAR alternatives.

Implementation

The ESProducts Program utilizes a variety of implementation and delivery mechanisms to reach customers at multiple points in the process. The most traditional method is mail-in incentives, which have been supplemented in recent years by point-of-purchase product markdowns, and online incentives on certain ENERGY STAR–certified appliances and lighting. This diversity of entry points ensures that consumers have the opportunity to choose more-efficient options

[75]United States Census Bureau (2017). "Quick Facts Selected: New Hampshire." Retrieved from https://www.census.gov/quickfacts/NH

than the standard efficiency baseline.

Lighting: To the extent possible, the NH Utilities will move to implement the markdown model at all participating lighting retailers beginning in 2018.

- Markdowns involve a collaboration among the utility efficiency program, a retailer and a manufacturer in which all agree to apply program incentives and/or special promotions on targeted energy efficiency products. The customer is motivated by the lower sale price in the store when making their product selection and receives the reduced price automatically at the register without having to provide their contact information. This removes barriers to participation on the part of both the customer and the retailer. Signage indicates that the lower price is due to the product(s) being ENERGY STAR certified and part of the NH energy efficiency program.
- The NH Utilities will make other options available to those few retailers that may be unable to enter into a markdown agreement. This approach ensures the lighting discounts are available throughout the state. For any retailers not able to adopt markdowns in 2018, the NH Utilities will revisit the potential for markdowns during 2019 and 2020.

- **Appliances:** Incentives for ENERGY STAR appliances are available through rebate forms that customers can access in-store at retail partners or online. The forms and supporting documentation can either be mailed in or submitted through an online system by customers, and customers receive a check for their incentive amount via a rebate fulfillment vendor under contract to the NH Utilities.
- The NH Utilities continue to explore ways to streamline access to these incentives through enhanced in-store materials, adjustments to the online submission, and messaging to ensure that customers are aware of the online options.

- **Appliance Recycling:** Residents are encouraged to remove old, high energy usage appliances from their homes while ensuring these appliances are disposed of properly. Through the appliance recycling offering, more than 90 percent of each unit is recycled in an environmentally safe manner.
- Incentives for appliance recycling can be accessed by scheduling a pick-up time with the recycling vendor either through an online form or over the phone. The vendor picks up the old refrigerator or freezer at the customer's home and the customer receives an incentive check in the mail.
- The NH Utilities will plan a recycling event in which room air conditioners will be accepted at a convenient collection location and recycled at no additional cost to the customer.

- **Heating, Cooling and Water Heating:** Customers can access incentives for high efficiency electric and natural gas heating, cooling and hot water heating equipment by filling out a mail-in rebate form or on-line application along with contractor invoices. Measures are typically installed by HVAC contractors chosen by the customer.

Delivery Mechanism

- **Program Partners:** The NH Utilities have formed a large network of partners to deliver program incentives, including more than 200 retail locations, equipment suppliers, distributors, and installation contractors to promote the program's offerings to customers. Through these efforts, the NH ESProducts program supports the state's economy by working with local hardware merchants as well as larger retail stores to encourage purchasing products locally. Customers can also purchase products online.
- Natural gas heating and water heating equipment is marketed and installed by HVAC contractors under the brand GasNetworks®, a three-state initiative that includes MA and RI. Installers use the incentives to convince customers to choose energy efficient equipment at the end of the equipment's life, upon failure, or prior to new construction.

- **Circuit Rider:** To ensure consistent messaging and availability of services across the state, the NH Utilities employ a circuit rider—an individual (or individuals) who travels to the NH retail partners to ensure availability and visibility of the qualifying ENERGY STAR products as well as promotional materials. The circuit rider checks the status of point of purchase kiosks and marketing materials, monitors in-store stocking and display activities, and ensures rebate forms and incentive coupons are available and up to date. The circuit rider also helps to process incentives, develop cooperative advertising, and perform periodic training of retail store sales staff.

Measures Promoted

- **Lighting:** ENERGY STAR–certified LED lighting fixtures and bulbs including standard A-line bulbs, candelabras, specialty bulbs and fixtures.

- **Appliances:** ENERGY STAR – certified clothes washers, refrigerators, clothes dryers, room air purifiers, room air conditioners, dehumidifiers, and pool pumps.

- **Recycling:** Refrigerators and freezers are eligible for pick-up and fee-less recycling. A room air conditioner can be removed at no additional charge to the customer when an eligible refrigerator or freezer is being picked up.

- **Heating, Cooling and Water Heating:** ENERGY STAR-certified, high-efficiency space heating and cooling systems, such as high efficiency air-source and ductless mini-split heat pumps; heat pump water heaters; central cooling systems; and natural gas furnaces, boilers, water heaters, and thermostats.

The NH Utilities will continue to review new and emerging energy-efficient products as they enter the marketplace to determine whether they should be included in the suite of program offerings. These products will be evaluated based on their potential energy savings, incremental costs and if cost effective, an incentive will be provided. Products that may undergo such review in the future may include ventilation fans, linear lighting, new-to-market Wi-Fi thermostats, and home energy management systems.

Incentives

Qualifying products available, the associated incentives, and delivery strategies may be adjusted periodically based on market conditions.

- **Incremental Cost:** Incentives for lighting and appliances are based on incremental cost of ENERGY STAR equipment, or the difference in cost between a standard item and an equivalent high efficiency item.

- **Tiered Incentives:** The NH Utilities will introduce tiered incentives for clothes washers, clothes dryers and refrigerators starting in 2018. More efficient units will receive higher incentives, which will be based on industry standard research and documentation provided by the Consortium for Energy Efficiency ("CEE") (Tiers 1, 2 and 3)[76] or EPA (Most Efficient)[77].

- **HVAC Incentives**: Incentives for heating/cooling are designed to reduce or remove the incremental cost barrier of energy efficient units. Given the relatively long measure life of these units, ensuring a high efficiency choice at the time of purchase prevents a lost opportunity for the customer and the program to capture energy and cost savings over standard efficiency products for the operational life of the unit.

Eligibility and Enrollment

- All residential customers of the NH Utilities are eligible to participate in the program. Participating customers will either receive the discounted price at the point of purchase,

[76]Consortium for Energy Efficiency, Inc. (2017). "CEE Tiers and ENERGY STAR." Retrieved from https://www.cee1.org/content/cee-tiers-and-energy-star
[77]ENERGY STAR® (2017). "ENERGY STAR Most Efficient 2017 Criteria." Retrieved from https://www.energystar.gov/index.cfm?c=partners.most_efficient_criteria

or receive a rebate in the mail after filling out a form or applying on line.

Marketing and Outreach

Consumers face a bewildering array of LED options, appliance efficiencies, sizes and other considerations, as well as a host of manufacturer marketing claims. The NH Utilities will implement an integrated marketing and outreach approach to facilitate consumer understanding about how to select the most energy efficient consumer products or equipment for their needs. Additionally, the NH Utilities will increase general awareness of the ENERGY STAR® and NHSaves brands. Examples of marketing efforts may include:

- Focusing on education via in-store promotions, and point-of-purchase materials and signage that compares costs to operate equipment. (for example, halogen versus ENERGY STAR LED bulbs or electric resistance water heaters versus heat pump water heaters)
- Traditional online and social media marketing campaigns.
- Engagement of field service contractors who work directly with retailers, equipment suppliers and distributors of natural gas equipment.
- Training for retail sales staff, including product demonstrations at participating stores
- Partnering with EPA/ENERGY STAR to leverage national campaigns in New Hampshire throughout the year
- Promoting across various channels including traditional media (company newsletters and bill inserts, print, radio), digital media (email) and social media (Facebook, Twitter, etc.).

Success Stories

The NH Utilities' ENERGY STAR Products program contributes to the widespread awareness of the ENERGY STAR label in the state. In 2016, 91 percent of US households reported recognizing the ENERGY STAR label according the Consortium for Energy Efficiency[78]. The NH Utilities are proud of our contributions to furthering customer understanding and recognition the ENERGY STAR brand and its certification of efficient equipment. And we appreciate the opportunity to help customers be more informed and empowered to influence their purchasing decisions and to lower their energy consumption and utility bills.

Recent or Planned Evaluations

The last impact evaluation was completed in June of 2012 and found a high (95 percent) rate of installation of LEDs purchased by NH customers through the program. The evaluation also

[78]Consortium for Energy Efficiency, Inc. (2017). "National Awareness of ENERGY STAR Surveys." Retrieved from www.cee1.org/content/national-awareness-energy-star-surveys

recommended continuing to build program awareness through bill inserts and point of purchase displays, and to revisit non-participating retailers to encourage their participation in the program.

Given the scale of the ENERGY STAR Appliance program, changes in lighting standards and the evolution of both the lighting and consumer appliance market in recent years, an evaluation of both impact and process is important. The current baseline used in the 2018-2020 Plan is the current and expected federal lighting and appliance standards as published by the U.S. Department of Energy and Environmental Protection Agencies[79]. Measure mixes of different wattage-lumens are based on actual energy efficiency program purchases, and assumed hours of use are based on both NH-specific and regional evaluations, depending on the technology. In-service rates (or the number of purchased items actually installed on site) are based on a recent study of residential lighting purchases of LEDs in Massachusetts[80].

To further refine the extensive secondary research that has been undertaken in preparation of this Plan, a request for proposals for a NH-specific, third-party impact and process evaluation is expected to be issued in September of 2017, with a third-party evaluator selected before the end of 2017. Results and recommendations will be incorporated on a prospective basis in future year Energy Efficiency Plan updates.

3-Year Deployment Strategy

2018	• Work with retailers to implement lighting markdowns in additional stores. • Work with retailers to implement tiered incentives on some appliances. • Review findings from 2017-2018 evaluation and determine whether any additional adjustments need to be made.
2019	• Continual review to determine if new measures should be added to (or removed from) the program. • Implement any changes from recent evaluation
2020	• Other measures begin to take a larger share of program savings, as lighting measures decrease. • Review smart technologies for including in this program.

[79]U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy (2017). "Appliance & Equipment Standards Program." Retrieved from https://energy.gov/eere/buildings/appliance-and-equipment-standards-program

[80]NMR Group, Inc. (2017, April 7). "Lighting Market Assessment Consumer Survey and On-Site Saturation Study." Retrieved from http://ma-eeac.org/wordpress/wp-content/uploads/Lighting-Market-Assessment-Consumer-Survey-and-On-Site-Saturation-Study.pdf

6.5 Home Energy Report (HER) Program

Program Objective

Residential behavior-change programs capture energy savings potential through the use of customized and targeted messaging to utility customers. These programs encourage customers to recognize the value of the ENERGY STAR label and to purchase the more efficient lighting, appliances, and space/water heating and cooling products. One means of achieving this to promote participation in the NH Utilities' energy-efficiency incentive programs. Home Energy Reports provide easy-to-understand energy-use feedback by means of paper and web-based reports that utilize comparisons with 'neighbors' or other customers. The NH Utilities HER Programs are an important method for engaging and empowering customers, helping them to better understand and control their own energy use.

Vision for 2018 - 2020[81]

The energy saving and customer satisfaction impacts of Eversource and Liberty's HER programs have been positive. These two utilities are interested in expanding the pool of participating customers in order to capture additional cost-effective savings in 2018 and beyond. Contingent on the successful resolution of an outstanding Request for Proposals, Unitil NH Gas Operations and Unitil NH Electric Operations intend to initiate an HER Program in 2018, while Liberty Utilities will be adding a behavior program for their Residential Electric sector.

- *Provide a portfolio of cost effective and comprehensive electric and natural gas programs available to all customers with a secondary focus on fuel neutral savings*
    - On an annual basis, the HER programs provides 8 percent of the portfolio electric savings and 6 percent of the portfolio natural gas MMBtu savings.
    - Energy savings are generated by motivating customers to reduce consumption through simple, no-cost changes in their behavior. This helps to reach customers who might not have the money or time to invest in other EE programs.
    - HER Programs are unique in that they do not provide a direct subsidy to customers, but utilize the principals of behavioral science to promote customer change, thereby capturing energy efficiency potential at the customer's initiative.
- *Scale up to deliver increased energy savings while stimulating market transformation*
    - *Expand the reach of existing programs by serving more customers*

[81] Italicized vision statements refer to section 3.1 2018-2020 Plan Vision.

- The HER offering will be expanding over the course of the 3-year plan, as Eversource adds more customers, Liberty adds electric customers in addition to natural gas customers and Unitil begins an HER offering.

- *Enhance Customer Experience*
  - Home energy reports are designed to provide information that is actionable and timely and that promotes customers to save energy. Report content is personalized, timely and dynamic, and targeted messages can be sent to different groups of customers. In addition, HER provides an opportunity to cross-promote other efficiency programs, giving customers useful, up-to-date information on how to save energy.
- *Engage stakeholders to increase customer participation and energy savings*
  - Providing Home Energy Reports to customers is a proven approach for effectively driving energy efficiency investments and program activity beyond just behavioral energy savings activities. Customers are randomly selected to receive HERs and given the option to opt out of receiving reports. While other programs rely on customers to opt in, the opt-out format is necessary for the HER program to ensure that the treatment and controls groups are statistically equivalent, which allows for calculation of energy savings.
- *Expand Product and service provider infrastructure*
  - Home Energy Reports provide tools and mechanisms to facilitate interactions with customers and can help deploy targeted messaging and services.
- *Stimulate customer and other private investment*
  - The HER program stimulates individual action to reduce energy use. There are no incentives directly associated with HER, meaning that the customer makes their own investment of time and resources in response to the information provided. Customer can then choose to invest in other energy efficiency measures and behaviors that are highlighted or recommended in the HER.

Program Budget and Goals

Table 6.10: Home Energy Reports Energy Savings and Budget

Home Energy Reports	2018	2019	2020	2018-2020	Cumulative Lifetime
Electric					
Budget	838,597	1,190,617	1,937,632	3,966,846	N/A
kWh savings*	4,672,788	7,486,587	12,952,358	25,111,734	69,809,447
kW reduction	338	609	1,107	2,054	
MMBtu savings*	0	0	0	0	0
Electric participants	92,000	147,000	232,000	471,000	N/A
Natural gas					
Budget	441,700	351,064	380,295	1,173,059	N/A
MMBtu savings*	12,460	10,270	10,670	33,400	117,000
Gas participants	48,000	48,000	48,000	144,000	N/A

Note: kWh = kilowatt-hours; kW = kilowatt; MMBtu = million British thermal units

***Annual savings except for the Cumulative Lifetime column, which is lifetime savings**

Target Market

Each utility works with its vendor to determine the appropriate treatment group size, or the number of customers who will receive HERs. This must be balanced with a control group of customers with similar attributes so that statistically significant precision on energy savings can be determined.

Each of the HER programs incorporates a randomized control to ensure unbiased savings estimates. The analytics utilized randomly assigns customers to a treatment group or a control group. For example, customers in both the treatment and control groups should be equally likely to take action in the absence of the HER intervention; thus, the savings observed in the treatment group can be attributed to their participation in the HER program.

Implementation Process

Eversource and Liberty Utilities work with their third-party vendor to provide HERs to a treatment group of residential customers whose energy consumption is targeted for reduction.

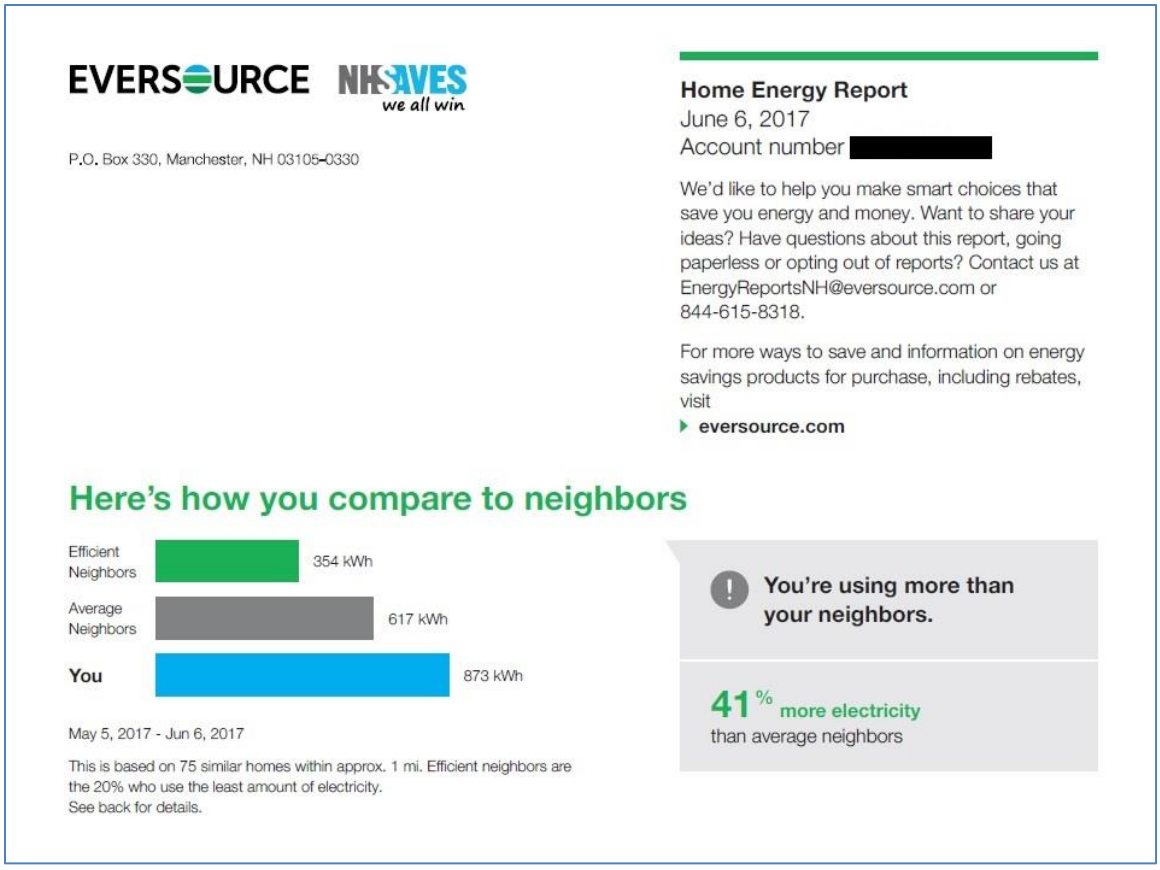
The specific feedback in the customer HERs provides customized insights about their energy consumption. HERs compare customers to their own previous energy use and to similar homes as a benchmark, provide motivational and normative messages, and include specific, seasonally relevant tips to encourage customers to take energy-saving action.

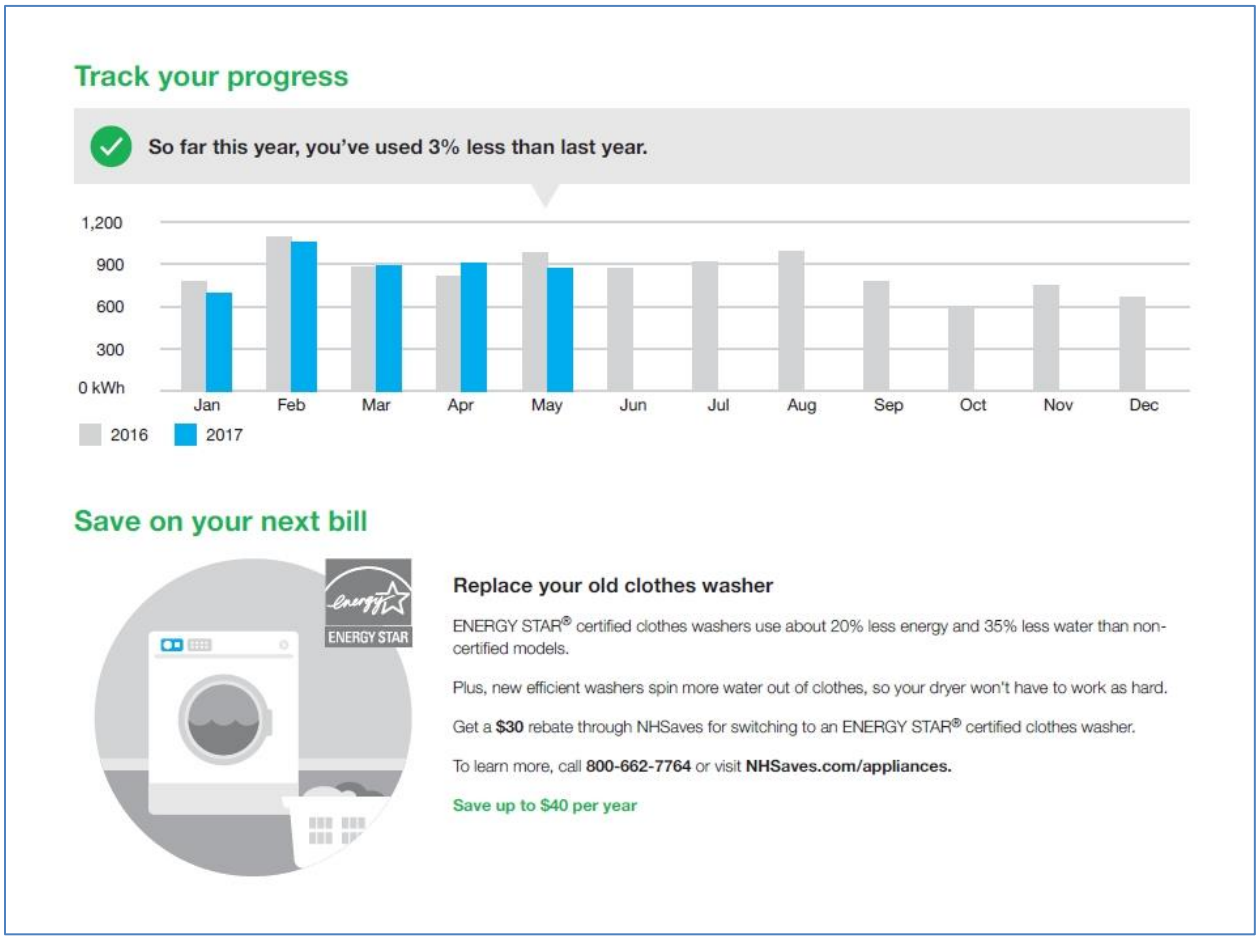
Delivery Mechanism

Customers receive print HERs via mail several times per year, separate from utility bills but utilizing the utility's brand guidelines to eliminate customer confusion. Electronic versions of HERs are also emailed to customers for whom email addresses are available. The emails contain links to utility websites and/or NHSaves to encourage customers to utilize the energy efficiency programs. Both mail and email messaging encourages customers to learn more through a customized online website that contains more granular information about that specific customer's energy use, along with specific information about how to reduce energy use.

FIGURE 6.11: EVERSOURCE Home Energy Report

The Home Energy Report provides customers a comparison of their energy usage against a representative sample of similar homes. Through this comparison, customers are encouraged to adopt behaviors or install measures that will help them reduce their consumption. This image is an excerpt of EVERSOURCE's Home Energy Report.





Measures Promoted

HER encourages behavior change in customers, rather than only promoting the purchase of specific energy efficiency measures. Behaviors promoted include lowering thermostat setbacks in the winter and raising them in the summer, lowering the temperature setting on the hot water heater, proper installation and use of air conditioning, "smart strips" that can help control phantom plug loads, proper maintenance and cleaning of energy using appliances such as dryers, pumps, refrigerators and air purifiers, as well as tricks and tips on do-it-yourself air sealing. Customers are also encouraged to install high-efficiency equipment, and are given information on how to access specific program incentives at seasonally appropriate times.

Incentives

HER programs encourage customers to take energy-saving action without the use of monetary incentives.

Eligibility and Enrollment

- **Eversource** currently sends HERs to approximately 50,000 customers. This includes a sample of 25,000 customers (the initial demonstration customers started in 2014) and

25,000 high-usage customers (an expanded customer cohort starting in 2015). Eversource will continue with 50,000 customers in 2018 and plans to increase the total treatment group to 105,000 customers in 2019 and 190,000 customers in 2020.

- **Liberty Utilities** currently sends reports to 38,000 natural gas customers and is introducing the program for 12,000 electric customers in 2018. Liberty Utilities' program utilizes two channels of communication: paper and digital HERs. Gas customers will receive four paper HERs and six email HERs each year, coinciding with the gas heating season. Electric customers will receive six paper HERs in the first year of the electric program (2018) and four paper HERs in 2019 and 2020, along with monthly email HERs. This program design drives cost-effective savings while leveraging digital channels to further engage customers on a regular basis.

Program design (2018)	Electric Households: 6 paper + email Gas Households: 4 paper + email
Program design (2019)	Electric Households: 4 paper + email Gas Households: 4 paper + email
Program design (2020)	Electric Households: 4 paper + email Gas Households: 4 paper + email

- **UES and Northern** propose to start an HER program for natural gas and electric customers in 2018. The company has recently received responses to its request for proposals (issued in July) and has based planned savings and costs on the information received. The Company intends to select a vendor in 2017 for expected program implementation beginning in 2018.

Marketing and Outreach

The HER program serves as a means to educate and expand awareness of how household behavior impacts energy usage and cost. Typically, HER programs utilize marketing techniques to capture the attention of and motivate customers, but do not require significant additional investment of marketing dollars.

The HER program will be leveraged as a key channel to cross promote other energy efficiency program offerings to customers. As part of each customer's home energy report mailing or email, the utilities have the ability to incorporate personalized promotional modules to

highlight relevant program offerings and content that can help drive additional program activity. The utilities intend to tailor these promotional modules for each report distribution.

Success Stories

Achieving the energy-savings goal is a primary metric for the HER program. On a monthly basis, savings are estimated by the third-party vendor, which compares the aggregate energy usage of the treatment group (customers who receive reports) to the control group (customers who don't receive reports) based on actual billing data. Across the country, HER programs have been shown to result in annual savings in treated homes of between 1.5 - 3.0 percent of household electricity or natural gas usage compared to the treatment group. The energy savings is most pronounced in the first year of the program, but has been shown to persist *even in the absence of continued HERs* for up to five years. With continued intervention through HERs, customers' savings increases year over year, leveling off to a sustained annual savings after about the third year.

Depending on program design and budget, the vendor can also measure non-energy-savings impacts. The NH Utilities can track a variety of customer engagement metrics including monthly opt-out rates, email open and click-through rates, and number of calls and emails received in response to reports. This can lead to more effective messaging and result in improved program performance.

Recent or Planned Evaluations

A 2016 evaluation[82] of Eversource's pilot program demonstrated that the HERs are effective at reducing energy consumption in participating households. Normative messaging in the reports was more effective than customers who were given rewards for participating, and resulted in consumption reductions of 1.50 percent, versus 0.31 percent for customers who received rewards messaging. Based on those findings, all reports currently provide normative messaging.

To find deeper savings, Eversource began sending reports to high-usage households in 2015. The saving impact is slightly higher for the cohort of high-use customers compared to the pilot participants. These customers have reduced usage by nearly 2 percent.

Liberty Utilities Gas has seen encouraging impacts from its program to date, including measured savings in line with projections and also increased participation in the HPwES program. Because of these impacts, Liberty Utilities Gas has recently increased the program's natural gas customer base and Liberty will be adding electric customers in order to capture

[82]Navigant Consulting, Inc. (2016, March 24). "Home Energy Report Pilot Program Evaluation." Retrieved from http://www.puc.state.nh.us/Electric/Monitoring%20and%20Evaluation%20Reports/Eversource%20NH%20HER%20Evaluation%20Report%202016-03-24%20Final.pdf

additional natural gas and electric savings.

3-Year Deployment Strategy

2018	• Liberty introduces program for 12,000 electric customers • UES and Northern introduce HER program, the exact number of customers will be determined in consultation with the winning bidder, after analysis of customer billing data • Eversource reviews program success and areas for improvement prior to planned customer increases.
2019	• Eversource increases from 50,000 customers to 105,000 customers • All NH utilities offering HER program will review messaging and look for opportunities to cross-promote other programs
2020	• Eversource increases to 190,000 customers

6.6 Customer Engagement Platform

Program Objective

Eversource launched the Customer Engagement Platform (CEP) in 2015 to increase participation in energy efficiency programs and the adoption of conservation activities across its operating companies in Connecticut, Massachusetts, and New Hampshire. There are no direct energy savings associated with this initiative.

Program Design

The CEP is an interactive tool that provides customers with targeted and customized energy-efficiency recommendations based on their current energy usage and owner or business profile. CEP provides customers an analysis of their energy use by categories, such as lighting and heating. Customers can compare their usage and costs with customers in their geographic area and customer segment. The platform also provides a personalized experience for each of Eversource's customers by encouraging self-service assessments (where applicable) as well as tracking energy use over time. Customers are asked to input home and fuel information (e.g., natural gas, oil, or propane) to calculate their entire energy usage data, which allows Eversource to recommend customized energy-saving opportunities.

Since the launch of the CEP, Eversource has made significant advancements in New Hampshire. The platform is now available to all New Hampshire residential, commercial and industrial customers and has been updated to include energy efficiency projects that were completed and installed.

The platform now allows residential customers to add their additional fuel source usage information. This information helps provide more accurate energy consumption and savings metrics. A component has been added to use these more accurate metrics to allow commercial customers to view their EPA Portfolio Manager score and residential customers to view the EPA Home Energy Yardstick score based on a combination of both their consumption and profile questions.

Marketing & Outreach

Eversource continues to work on increasing awareness and usage of the CEP through marketing and customer support. The Eversource account representatives who work with large business customers have been trained on using the tool. Training is in progress for the Business Contact Center and Customer Call Centers, who focus on medium and small businesses and residential customers. These trainings will help us to better serve all of Eversource's New Hampshire customers using the CEP. Eversource is also leveraging its own social media channels in NH to

build awareness and consideration for the CEP with customers. Through frequently scheduled posts on the Eversource NH Facebook and Twitter platforms, Eversource is highlighting the functionality and benefits of the CEP to drive both new account registrations, as well as ongoing usage of the tool.

As participation continues to grow, Eversource plans to capitalize on the customer engagement and data usage modules to generate a variety of customer analytics and enable targeted digital marketing campaigns. From this information, Eversource will be able to better understand customers and market segments so that we can provide the best and most appropriate energy-saving recommendations.

Budget

Table 6.12: EVERSOURCE Customer Engagement Platform Budget

Customer Engagement Platform				
	2018	2019	2020	2018-2020
Total	593,000	616,720	641,389	1,851,109

7.0 NHSaves Commercial and Industrial Programs

Small businesses, large commercial and industrial (C&I) buildings, and municipal customers have significant potential for reducing energy consumption in New Hampshire, and account for roughly 78 percent of the NH Utilities' portfolio of planned electricity savings and 70 percent of natural gas savings. These customers, large and small, trust their utility to deliver not only natural gas and electricity but energy-efficiency advice and information as well. Nationally, 60 percent of business customers trust their utility more than any other source for energy-efficiency and energy-saving advice[83].

The NH Utilities offer a variety of programs that improve the energy efficiency, comfort, and operations of New Hampshire's C&I and municipal buildings. Through these programs and a mature network of delivery contractors, the NH Utilities raise awareness of the benefits of energy-efficient products and buildings and promote their adoption by providing design and technical assistance, incentives, education, and training. Our incentives and outreach result in higher-efficiency facilities, which in turn reduce energy costs, and support a robust market for energy-efficiency services in New Hampshire.

Energy-efficiency projects provide value to our business and municipal customers. In addition to reducing energy bills, these projects help create a high-performance workplace by providing comfortable surroundings, better lighting, and improved air quality, all of which lead to greater productivity and worker health and well-being. Because the typical office spends more than 85 times as much on salaries as it does to pay the energy bill, increasing productivity even 1 percent through improved working conditions can have as much financially benefit as cutting the energy bill in half.[84]

The NH Utilities deliver three statewide programs to ensure that customers have access to comprehensive energy-saving solutions that reduce their electric and natural gas bills, regardless of business size or segment.

---

[83]E Source, Inc (2014). "Large Business Gap and Priority Benchmark, 2014."; and "Small and Midsize Business Gap and Priority Benchmark, 2014."respondents were allowed to select more than one answer (n = 5,879).

[84]E Source, Inc. (2015). "Non-Energy Benefits Can Tip the Scales in Favor of an Energy-Efficiency Project.",)

- **Large Business Energy Solutions (Retrofit and New)** provides incentives and other support to large commercial and industrial customers who are retrofitting existing facilities or equipment, constructing new facilities or additions, adding or replacing equipment that is at the end of its useful life.
- **Small Business Energy Solutions (Retrofit and New)** provides retrofit and new equipment and construction incentives which can be paired with professional turnkey energy services for small commercial customers who lack the time, resources, or expertise to implement energy-saving solutions on their own.
- **Municipal Energy-Efficiency Program** provides incentives for electric, natural gas and other fossil fuel equipment to municipal customers who are constructing new facilities or retrofitting existing facilities.

Eversource also offers a utility-specific program called the Energy Rewards RFP Program as part of its large commercial and industrial program.

- **Large Business Energy Rewards Program** encourages customers to propose comprehensive projects as part of a competitive bid process for financial incentives, which may be enhanced to provide opportunities for multi-year agreements that help implement a broad set of energy saving solutions over a longer period of time.

Availability of C&I Programs

To manage the overall budget and to help achieve an equitable distribution of program funds, each utility will establish caps on the level of incentives offered. The caps will serve as guidelines to be used in dispersing incentives, and will not be absolute limits on the amount of incentive to be provided to any particular customer. Each utility reserves the right to provide incentive payments in excess of its cap on a case-by-case basis. Commercial and industrial customers who supply a portion of their energy needs through means which by-pass their utility meter and for which no System Benefits Charge revenues are collected, will be eligible for incentives based on the level of kilowatt-hours billed under the System Benefits Charge in the most recent preceding twelve-month period.

Customer Barriers, Program Interventions, and Outcomes

Each of the NH Utilities' programs provides a mix of training, incentives, education, and general outreach to address the most common barriers to adoption of energy efficiency solutions. The NH Utilities deliver energy-savings projects and bridge the information gap that often prevents or delays commercial, industrial, and municipal customers from pursuing energy-efficiency projects (Figure 7.1, next page).

NHSAVES
we all win

TABLE 7.1: Market Barriers, interventions, and outcomes

The NH Utilities' designed the commercial, industrial, and municipal portfolio to overcome a variety of barriers that hinder the adoption of energy-efficiency measures or specific behaviors. Through these program interventions, the NH Utilities are aiming to achieve the outcomes outlined in this table.

Market Barrier	Program Intervention	Program Outcome
▪ Lack of awareness of energy and non-energy benefits of energy efficiency (EE)	▪ Targeted messages to explain benefits of EE improvements	▪ Improved awareness of the business value of EE projects so that customers feel more compelled to invest
▪ Lack of awareness of process to receive incentives or EE services offered by the utility	▪ Direct contact by utility representatives to explain the benefit of and opportunities for EE	▪ Increased program participation and customer satisfaction with process
▪ Limited bandwidth and lack of time to identify and implement EE	▪ Turnkey, direct-installed solutions for smaller businesses	▪ Streamlined approach to identify and implement projects so that customers can achieve immediate savings and benefits
▪ Uncertainty around customer savings and difficulty identifying, prioritizing, and planning projects, especially for large businesses	▪ Technical assistance and project evaluation, equipment monitoring ▪ Ability to make longer term project commitments through Energy Master Planning	▪ More comprehensive customer projects
▪ Uncertainty selecting a vendor and lack of relationship with vendors	▪ Training for contractors to effectively promote their work, identify projects, and install measures	▪ Expanded network of experts who can help customers implement projects and meet quality standards so that customers have confidence in savings and outcomes
▪ Internal competition for limited capital dollars	▪ Financial incentives and streamlined financing options	▪ Increased program participation
▪ Project is already designed and it's too late to include energy-efficiency upgrades	▪ Training of vendors, contractors, and key account representatives to identity and target key decision-makers early in the design process	▪ Increased program participation and a deeper level of savings

7.1 Large Business Energy Solutions (Retrofit and New Equipment and Construction)

Program Objective

The Large Business Energy Solutions program provides prescriptive (i.e., the same for all customers) and custom incentives (based on the specific site conditions) to reduce the up-front costs of equipment for retrofit and new construction projects. NH Utilities' energy efficiency staff, key account representatives and energy service contractors work closely with customers to design, build, or retrofit large C&I facilities to increase energy efficiency, as well as improve productivity, comfort, operability, air quality and worker safety.

Vision for 2018 - 2020[85]

- *Provide a portfolio of cost effective and comprehensive electric and natural gas programs available to all customers with a secondary focus on fuel neutral savings*
    - The Large Business Program provides significant cost effective energy savings for both the natural gas and electric portfolios. The scale of energy use in large facilities provides significant opportunity for energy savings. The electric Large Business program contributes 51 percent of the portfolio electric savings. The natural gas program contributes 43 percent of the portfolio natural gas MMBtu. The Large Business program is cost effective with an overall B/C ratio of 2.37 for the electric program and 1.58 for the natural gas program.

- *Scale up to deliver increased energy savings while stimulating market transformation*
    - *Expand the reach of existing programs by serving more customers*
        - Through the use of market segmentation, the NH Utilities will strategically target customers to identify common opportunities for energy savings within each segment and provide tailored technical assistance and trade ally expertise to target and deliver savings.
    - *Enhance Customer Experience*
        - The NH Utilities will refine strategies to identify explicit needs of customer segments, design services to target those segments, and create case studies that highlight customer energy-saving achievements, providing a guide for other businesses in the same segment. Market segmentation allows program implementers and vendors to focus on understanding the needs of specific groups of customers, and the market forces driving decisions. This understanding helps the NH Utilities to work

[85] Italicized vision statements refer to section 3.1 2018-2020 Plan Vision.

with trade allies to overcome barriers to action, better understand energy-savings potential, and implement cost-effective project strategies within each segment.

- *Engage stakeholders and customers to increase customer participation and energy savings*
  - The NH Utilities will work to secure longer-term commitments for energy savings from their large businesses to help companies sustain long-term savings. By establishing multi-year energy efficiency and operational strategies, customers achieve sustained savings from efficient equipment, streamline their operations, and increase the capacity for additional capital investments in efficiency improvements.
- *Expand Product and service provider infrastructure*
  - Larger customers have the same equipment (e.g., HVAC, Lighting and Refrigeration, etc.) that smaller customers have, but typically at higher capacity or output or in greater numbers. These customers may also have more complex technologies and specialty equipment such as air compressors, injection molding machines, very large chillers with integrated energy management systems, and sophisticated building controls. By working directly with customers and customer segments, and providing technical assistance on specialty or custom projects, the NH Utilities will identify emerging technologies and innovative service approaches for this customer group.
- *Stimulate customer and other private investment*
  - Large Business customers have the capacity to invest significant resources into their energy efficiency projects. Some customers have in-house professionals focused on energy use and costs and look for opportunities to leverage program incentives to facilitate the approval process for projects at their sites.
  - While the incentives can help the project(s) receive internal approval, customers frequently make additional investments in staff time to procure the more efficient equipment, as well as install and monitor the equipment going forward.
  - Energy efficiency projects may be paid for through customers' existing operating budgets, through capital budgets, or through financing or bonding. For retrofit projects, participating customers typically contribute 65 percent of the total installed cost of the project. For New Equipment and Construction ("NEC") projects, customers pay the full cost of what

the standard efficient equipment would cost, plus at least 25 percent of the incremental cost of the more efficient product.

Program Budget and Goals

TABLE 7.2: Large Business Energy Solutions Energy Savings and Budgets

Large Business Energy Solutions					
	2018	2019	2020	2018-2020	Cumulative Lifetime
Electric					
Budget	9,499,712	12,271,495	16,454,849	38,226,056	N/A
kWh savings*	43,446,207	54,717,623	71,820,033	169,983,863	2,291,969,041
kW reduction	4,761	5,998	7,879	18,638	NA
Electric participants	489	694	970	2,153	N/A
Natural gas					
Budget	2,516,426	2,798,338	3,086,692	8,401,456	N/A
MMBtu savings*	70,641	75,197	80,214	226,052	2,953,217
Gas participants	160	181	202	543	N/A
Note: kWh = kilowatt-hours; kW = kilowatt; MMBtu = million British thermal units					

***Annual savings except for the Cumulative Lifetime column, which is lifetime savings**

Target Market

- Large businesses electric customers (i.e., those using more than 200 kW and 100,000 kWh) account for approximately 1 percent of New Hampshire's non-residential electric customers, but consume nearly 53 percent of the C&I sector's electricity. On the natural gas side, large business customers (i.e., those using more than 40,000 annual therms) account for approximately 3 percent of the non-residential electric customers, but consume 52 percent of the sector's natural gas.
- The largest energy consumers in New Hampshire are concentrated in manufacturing, healthcare, colleges and universities, ski areas, hospitality and large retail facilities. These customers are generally well informed about the opportunities for energy-efficiency improvements and are typically already familiar with the NHSaves programs. They are very interested in controlling operating costs and eliminating waste, and they often have in-house staff that maintain their facilities, monitor energy use and costs, and evaluate and propose energy-efficiency improvements.

Implementation

- **Intake:** Wherever possible, program implementers target customers during the design stage of a renovation or new construction project to promote the myriad benefits of selecting high-efficiency equipment and design and to ensure the cost and rebates associate with the high efficiency equipment are incorporated into the project budget. To identify appropriate projects, the NH Utilities staff leverage multiple channels, including:
    - Account representatives working directly with existing customers
    - The Utilities' economic development staff, who work with existing and potential customers who are relocating to their territory
    - Energy-efficiency program representatives generating leads in complementary markets such as the building development community and commercial real estate professionals

- **Technical Assistance:** Despite being generally energy-savvy, large commercial customers face various barriers to adoption of high efficiency solutions, including savings and cost uncertainty, and challenges identifying, prioritizing, and planning projects. To address these barriers, the program offers technical assistance including project evaluation, measure identification, equipment monitoring, compressed air analysis, and energy audits.

Large business energy-efficiency projects fall into one of two categories: Retrofit or New Equipment and Construction (NEC).

- **Large Commercial Retrofit.** Retrofit projects are those where existing equipment or systems are currently functioning, but are being replaced with energy-efficient equipment or improved systems. For large business customers to make such an investment, retrofit projects must have an acceptable return on investment while also meeting other corporate goals such as an improved work environment that will lead to greater productivity. As large companies decide how to invest their capital dollars, the program incentives help to ensure that the high efficiency option is competitive with alternatives they may be evaluating, and the support provided by the NH Utilities and their technical assistance providers to identify and quantify energy-efficiency projects and benefits is critical.

- **New Equipment and Construction (NEC).** When existing equipment or systems are failing, or have failed, or where the customer's business needs have exceeded the capacity of the existing system, the customer is eligible for NEC incentives. These projects may also consist of the construction of a new facility, a gut rehabilitation project, or a change of

business use where the customer needs to purchase equipment or engage in an expansion project. The NH Utilities' incentives and assistance for NEC are intended to influence the customer to reject standard construction methods and minimum code compliance in favor of enhanced energy-efficiency options, which are more cost effective over the long run.

- The NEC market presents a few significant barriers, and the timing of information provided to the customer's design team is critical. For example, decisions made early in the design phase may either allow or preclude the inclusion of energy-efficiency enhancements later in the project. Additionally, if a construction project surpasses its initial budget, the up-front cost of efficiency measures beyond code compliance are often the first target for elimination to keep costs down. It is critical to include key decision-makers throughout the design process to reinforce the value of making energy-efficient choices and ensure energy efficient measures remain on track.

- **Performance Path**
    - **NEC Whole Building Path:** The purpose of the NEC Whole Building path is to help the building owner and design team understand the impact of design decisions that affect the lifecycle energy use of the building up front, during the early design phase before decisions are finalized. Projects identified for this path will be engaged by the utility between pre-schematic design and completion of the design phase of project.
    - Utility staff or contractor and project design team will perform an energy analysis in order to identify, discuss, analyze and compare potential building energy efficiency measures along with the corresponding energy code compliant base assumptions and standard practice considerations.
    - **Performance Lighting Path:** An option for customers undergoing new construction or major renovations to their facilities is the Performance Lighting path. Performance lighting is similar to the Whole Building Path in that it takes a holistic approach to lighting systems to achieve the maximum achievable cost-effective savings.

- **Energy Master Planning.** Energy Master Planning and multiyear program commitments provide additional options to help large customers identify comprehensive energy-savings opportunities and implement projects over time. Building on a successful set of customer workshops held in the fall of 2016, the NH Utilities will look at ways we can help our customers create Energy Master Plans. Through these plans, we can help embed long-term (three or more years) energy-management practices within companies. This approach enables customers to achieve ongoing savings from conservation, streamline their operations, and increase cost-effective capital investments. In addition to long-term planning, the NH Utilities can help customers implement those plans through multiyear

program commitments.

Delivery Mechanism

- NH Utilities' account representatives and energy-efficiency staff work one on one with customers or their contractors to explore efficiency opportunities and then assist them through the application and participation process.
- Energy Service Companies (ESCO's) provide a comprehensive approach to large users such as manufacturing, ski areas, hotels, and hospitals. They collaborate with the program and help customers identify efficient products, develop projects to reduce, control their energy consumption and demand and improve processes. ESCOs include electrical companies, lighting certifiers, compressed air services, HVAC contractors and other comprehensive services.
- Engineering firms can also provide customers with comprehensive technical assistance, from whole building audits to specific system reviews.
  Customers often have energy committees or facilities teams that focus on energy use and costs and are continually looking for ways to identify and justify projects to make their business, more efficient.

- **Midstream Distributor Relationships:**
  - **Natural Gas Water Heaters:** The NH Natural Gas Utilities will join the MA and RI Program Administrators and their implementation vendor in the MA/RI Upstream Water Heater program. The program is designed to transform the market by providing incentives directly to distributors so that distributors will stock and promote the sale of energy efficient equipment. Distributors price their products with the incentive in mind and pass through a portion of the incentive to the equipment installers.
  - **Natural Gas Heating Equipment** is marketed and installed by HVAC contractors under the brand GasNetworks®, a three-state initiative that includes MA and RI. Installers use the incentives to convince customers to choose energy efficient equipment at the end of the equipment's life, upon failure, or prior to new construction.

Measures Promoted

- **Prescriptive Measures:** Prescriptive measures include a list of common, prequalified equipment including lighting, lighting controls, programmable thermostats, Wi-Fi thermostats, spray rinse valves, HVAC equipment, air compressors, motors, and variable speed drives.

- **Custom** Measures**:** The NH Utilities and service providers also actively look for items that

save kWh and natural gas MMBtu. Customers or their contractors may propose custom measures as well.

- Examples of custom measures include items such as large chillers and boilers, chiller pumps, air compressors, injection molding machines, weatherization measures, energy management systems, retro-commissioning, and specialized equipment such as polymer bead washing machines.

The NH Utilities will continue to work with equipment manufacturers, distributors, neighboring states efficiency program administrators and regional and national trade groups to monitor and evaluate new and emerging technologies to determine when and how to incorporate them into the New Hampshire programs. Qualifying measures and the associated incentives may be adjusted periodically.

Incentives

The monetary incentive is designed to offset barriers associated with lack of funding or insufficient payback thresholds, which are the most significant barriers to project implementation.

The incentive approach varies based on the type of project.

- **Prescriptive incentives** encourage customers to choose equipment from a prequalified list of measures and receive an incentive that covers a significant percentage of installed cost of retrofit projects and incremental installed cost of NEC projects. This approach provides a standardized, streamlined option for the NH utilities and their customers who are installing those technologies. The assumptions of incremental cost and savings are based on years of experience and data both in New Hampshire and in other jurisdictions and are updated annually to reflect the latest codes and standards. Incentives are set at a level designed to move the customer to choose the high efficiency option, while also encouraging the customer to make their own investment in the measures across a broad set of applications.

- **Custom incentives** encourage customers to consider energy efficiency technologies for complex projects for which prescriptive savings are not applicable. NH Utilities assess project eligibility and incentives on a case-by-case basis and typically perform a technical analysis to detail energy-savings opportunities and overall project costs.

- **Performance-Based Incentives** can encourage even deeper savings and will be utilized in certain cases as an alternative to prescriptive and custom incentives. Performance-based incentives may be based on, for example, watts saved per square foot of treated space, or

dollars per kWh or MMBtu saved or achieved above code. This approach can help the customer achieve even greater savings by considering the system as a whole, rather than as the sum of specific equipment parts. The NH Utilities will offer performance-based incentives for NEC performance lighting and NEC whole building projects.

Eligibility and Enrollment

- All C&I customers with an average demand of 200 kilowatts (kW) or greater and natural gas customers with an average annual energy usage of 40,000 therms or greater are served under the Large Business Energy Solutions program.

- **Multifamily Enrollment:** The NH Utilities' C&I programs are available to multifamily customers. Depending on the heating fuel type, usage and demand, Multifamily buildings may access program services through different points of entry. Common-area lighting and master-metered natural gas heat are served through commercial program funding, while other measures, such as lighting and water saving devices, appliances, and plug load measures in individual resident units, are served through the residential programs.
- The commercial and residential program staff from the relevant natural gas and electric utility coordinate on multifamily projects to minimize the number of different points of contact for the customer. Over the course of the 3-year plan, the NH Utilities will identify barriers to multifamily building participation in the programs, research approaches to this segment in other jurisdictions, and explore formalizing a multifamily offering that provides an even more streamlined approach for this sector.

Marketing and Outreach

Utility representatives, vendors, and energy service providers will market the program primarily through one-on-one personal outreach, seminars, and NH Utilities sponsored training sessions. The NH Utilities also target outreach efforts to property managers, builders, architects and engineers who typically have existing relationships or work with our large business customers.

In addition, the NH Utilities periodically leverage marketing tactics such as direct mail, email and outbound calling for specific initiatives, as well as create and deploy segment-specific content and collateral including case studies. Utility Staff also participate in sector or technology-specific events and webinars, and facilitate energy-efficiency expos and training sessions. Lastly, customer messaging will focus on comprehensive improvements and optimization of processes within facilities as well as highlight the benefits of specific equipment replacements and upgrades.

Success Stories

We measure the success of our Large Commercial Program not only by the energy savings but also by customer participation and satisfaction with the cost-effective solutions we work together to implement. Our programs help customers save money and allow them to both maintain and expand their commercial and industrial operations in the state.

> Working with Eversource to obtain an incentive for the upgrades at our facility was an important part of the company's ability to complete this comprehensive project. Reducing our energy costs means we will have more money to invest in our business and the local economy. — *Pam Simonds, General Manager, Amphenol*

> I knew there were improvements that needed to be made, but honestly, I was concerned about the up-front cost to make improvements to the apartments."– *Diane Ventresca, Property Manager, Forest Ridge Apartments*
>
> NHSaves Liberty Utility incentives reduced the out of pocket cost for improvements at Forest Ridge by 50 percent. Forest Ridge now enjoys $50,000 in natural gas savings every year and a payback period of just 3.8 years.

Recent or Planned Evaluations

A Baseline Evaluation of the New Equipment & Construction Program was completed in March 2014[86] and recommended updates to baseline assumptions for some lighting, ECM Motors, and air compressor measures. The study also found that the assumptions and algorithms being used to determine the baseline of unitary HVAC systems, heating and water heating equipment, controls and commercial kitchen equipment were reasonable.

Additionally, an impact evaluation of the large C&I programs was completed in September 2015[87] and found that realization rates of 97.6 percent-103.6 percent for the electric programs (Retrofit, New Equipment & Construction and RFP), and 90.9 percent-91.7 percent for the

[86]Energy & Resource Solutions (2014, March). "New Construction Program Baseline Evaluation for the NH Monitoring and Evaluation Team: Final Report." Retrieved from http://www.puc.state.nh.us/Electric/Monitoring%20and%20Evaluation%20Reports/NH%20CI%20New%20Construction%20Baseline%20Evaluation%20Study_Final_3-4-14.pdf

[87]DNV-GL, Inc. (2015, September 25). "New Hampshire Utilities Large Commercial & Industrial (C&I) Retrofit and New Equipment & Construction Program Impact Evaluation: Final Report." Retrieved from http://www.puc.state.nh.us/Electric/Monitoring%20and%20Evaluation%20Reports/New%20Hampshire%20Large%20C&I%20Program%20Impact%20Study%20Final%20Report.pdf

natural gas programs (Retrofit and New Construction). These adjustments to baselines and the revised realization rates were incorporated into the program savings calculations, and action was taken to improve the accuracy of project tracking supporting documentation.

The vast majority of respondents (94 percent) felt that hearing about the programs through their utility account representative was the best way for them to learn about the programs. Since this study was performed on projects from prior years, a new impact evaluation for this program is recommended for the 2018-2020 time period.

3-Year Deployment Strategy

2018	• Begin implementing performance based incentives for new construction lighting and whole building systems. • Work with customers to develop multi-year energy efficiency plans.
2019	• Participate in an Impact Evaluation to verify results and review and refine savings calculations. • Continue working on segmentation implementation strategies and adjust as needed.
2020	• Review and make adjustments from above initiatives in preparation for the next 3-year plan.

7.2 Small Business Energy Solutions

Program Objective

The Small Business Energy Solutions Program serves New Hampshire's small and midsize businesses that seek to reduce their energy costs by improving their building's energy performance. This program offers incentives to encourage businesses to increase equipment efficiency through Retrofits or New Equipment & Construction (NEC). For those customers needing more assistance, a turnkey service option is available that is tailored to the unique needs of small businesses, which are a diverse customer base in terms of technical capabilities, financial resources, and how they use energy.

Vision for 2018 - 2020[88]

- *Provide a portfolio of cost effective and comprehensive electric and natural gas programs available to all customers with a secondary focus on fuel neutral savings*
    - The electric program provides 20 percent of the portfolio electric savings. The natural gas program provides 27 percent of the portfolio natural gas MMBtu reduction target. The Small Business program is cost effective with an overall B/C ratio of 1.79 for the electric program and 1.59 for the natural gas program.

- *Scale up to deliver increased energy savings while stimulating market transformation*
    - *Expand the reach of existing programs by serving more customers*
        - The 3-year plan includes a significant increase in the number of customers served through the small business program, with the electric program almost doubling the number of participants over the three years and the natural gas program increasing participants by 25 percent.
    - *Enhance Customer Experience*
        - Market segmentation provides an opportunity to understand specific groups of customers, their needs and the market forces on their businesses. Because the small business sector is so diverse, there is significant benefit to identifying explicit needs of different customer segments and designing services to target those segments.
    - *Engage stakeholders to increase customer participation and energy savings*
        - Partnerships with affinity groups and trade allies will allow broader outreach and tailored offerings to achieve energy savings within each segment.
    - *Expand Product and service provider infrastructure*

[88] Italicized vision statements refer to section 3.1 - 2018-2020 Plan Vision.

- The NH Utilities utilize a network of contractors to raise consumer awareness, recruit participants, conduct audits, recommend improvements, implement projects, and track progress. This program helps develop an expert workforce capable of communicating the benefits of efficiency, selling effective technologies, and packaging projects that get customers to think comprehensively about the energy performance of their facilities and operations.
- Partnering with installers and distributors on trade shows and training for their staff will be an important way to strengthen service provider infrastructure while also providing opportunities for discussing, defining and deploying program innovations.

- *Stimulate customer and other private investment*
  - Customers contribute significant investments of their own funds in their energy efficiency projects. Anywhere from 25-65 percent of the project cost is covered by customer capital, depending on the measure and incentive level.
  - Customers make this investment in a variety of ways, through existing capital, operations budgets, loans from their existing lenders or in some cases loans from their utility. As discussed in the Financing section of this plan, the NH Utilities will explore additional lending options for small businesses over the course of the 3-year plan to overcome barriers faced by customers in making investments in energy efficiency.

Program Budget and Goals

TABLE 7.3: Small Business Energy Solutions Energy Savings and Budgets

Small Business Energy Solutions					
	2018	2019	2020	2018-2020	Cumulative Lifetime
Electric					
Budget	5,974,800	7,805,041	10,599,286	24,379,127	N/A
kWh savings*	16,453,913	21,283,705	28,436,366	66,173,983	883,876,527
kW reduction	2,312	3,018	4,005	9,335	NA
Electric participants	736	1,014	1,442	3,193	N/A
Natural gas					
Budget	1,831,623	2,112,527	2,265,611	6,209,761	N/A
MMBtu savings*	41,171	47,437	51,811	140,418	2,069,204
Gas participants	964	1,154	1,288	3,406	N/A
Note: kWh = kilowatt-hours; kW = kilowatt; MMBtu = million British thermal units					

***Annual savings except for the Cumulative Lifetime column, which is lifetime savings**

Target Market

- The small and midsize business sector makes up approximately 97 percent of New Hampshire's commercial customer accounts, representing many opportunities to capture cost-effective energy savings.
- Small business owners are a hard to reach segment with diverse needs and priorities. This segment includes owners of office buildings, restaurants, retail stores, repair services, dry cleaners, private schools, and commercially or master metered multi-tenant facilities, among many others. Small businesses are far less likely to have dedicated staff focused on energy use and efficiency opportunities than large businesses, and it can be difficult for the program implementers to identify and reach key decision makers. Market barriers include shortage of capital, lack of staff dedicated to facilities issues, less awareness or understanding of efficiency opportunities, and split incentives between building tenants and owners.
- Small Business Energy Solutions specifically targets customers with a variety of efficiency-related needs, including those that are planning to undertake new construction or major renovations, to replace failed equipment, or to address aging, inefficient equipment and systems.

Implementation

- **Intake:** The NH Utilities consult with customers who are interested in the program in order to learn about their business, their energy concerns and their interest in efficiency. As part of the fact finding, the utility may review energy usage history with the customer to determine high use months and identify factors that may contribute the most to energy costs.

- **Technical Assistance and Project Identification:** Based on customer intake, initial energy efficiency measures are identified. The NH Utilities provide technical guidance on the measure(s) and determine with the customer the most appropriate delivery mechanism. Examples of technical assistance include phone and email consultation, savings and payback analysis, facility walk-throughs, targeted audits on problem systems, HVAC reviews, site analysis, and lighting and refrigeration audits.

Small business energy-efficiency projects fall into one of two categories: Retrofit or New Equipment and Construction (NEC).

- **Retrofit** projects replace functioning equipment with energy efficient equipment.
- **New equipment and construction** projects consist of the replacement of failed or end of life equipment as well as the acquisition of new equipment during the construction phase of a new or expanded space.

- **Performance Path:** Small businesses can utilize the Performance Path options described in the Implementation section of Large Business Energy Solutions. Performance Path includes the NEC Whole Building Path and the Performance Lighting Path.

- **Quality Assurance:** When the project is completed, the NH Utilities often reach back out to the customer. Depending on the size, cost and complexity of the project, this may include a phone call or a site visit to inspect the equipment. This outreach and inspection process ensures that the customer is satisfied and that the project was installed as planned.

- **Planning for next steps:** The quality assurance process also provides an opportunity to determine whether the customer is interested pursuing additional efficiency projects. The goal with many small business customers is to engage with them to implement a series of energy efficiency projects over time, depending on budget and urgency.

Delivery Mechanism

Utility program coordinators administer the program and work directly with customers and contractors.

- **Turnkey Service:** The turnkey service option helps to overcome two of the most significant barriers to small business participation in energy efficiency programs: a lack of energy expertise to identify, design, and implement energy/cost savings solutions, and the time necessary to complete projects. The NH Utilities work with skilled trade allies to overcome these barriers by delivering full service solutions to our customers.
    - Turnkey vendors perform an initial assessment of the existing equipment, recommend energy-efficient improvements-often targeting lighting and refrigeration upgrades-and install the appropriate measures.

- **Customer Installed Projects:** Customers who want to self-install measures can apply for incentives on eligible projects. The NH Utilities will review vendor product quotes and proposed measures for eligibility prior to project implementation and then will verify installation upon completion.

- **Midstream Distributor Relationships**: Midstream distributor relationships are utilized for natural gas water heaters and natural gas heating equipment. This approach is described in detail in the Delivery Mechanism section of Large Business Energy Solutions.

Measures Promoted

- **Prescriptive Measures:** The NH Utilities maintain a list of common, prequalified measure types, including, lighting, lighting controls, programmable thermostats, Wi-Fi thermostats, spray rinse valves, HVAC equipment, air compressors, motors, variable speed drives and water heating.

- **Custom Measures:** The NH Utilities and service providers also actively look for on-site opportunities to save kWh and natural gas MMBtu. The customer or contractor may also propose custom measures that will result in energy savings.
- Examples of custom measures include large chillers and boilers, chiller pump upgrades, integrated air compressors, injection molding machines, weatherization measures, energy management systems, retro-commissioning, and specialized equipment such as polymer bead washing machines.

The NH Utilities will continue to work with equipment manufacturers, distributors, neighboring states and regional and national trade groups to monitor and evaluate new and emerging

technologies and determine to the most effective way to incorporate them into the New Hampshire programs. Qualifying measures and the associated incentives may be adjusted periodically.

Incentives

Small Business Solutions incentives vary based on the type of project.

- **Prescriptive incentives** allow customers to choose equipment from a prequalified list of measures and receive an incentive that covers a percentage of installed cost for retrofit projects and incremental installed cost for NEC projects. This approach provides a standardized, streamlined option for customers that are installing common technologies.

- **Custom incentives** rely on engineering calculations to estimate energy savings and evaluate whether the project is cost-effective. The custom approach allows customers to evaluate energy efficient technologies that are generally not on the prescriptive list. This method allows for a more comprehensive and creative consideration of projects that are often more complex than the prescriptive option allows.
- Project eligibility and incentives are assessed on a case-by-case basis and may be determined by a technical study by an independent engineering firm that details energy savings and project costs. This more sophisticated energy project approach requires deeper expertise and additional time and analysis, but can result in significantly higher energy savings, especially for the unique energy systems and needs of certain small business customer facilities.

- **Turnkey service** offers a streamlined approach for incentives through skilled trade allies for common measures such as LED Lighting, lighting controls, programmable or Wi-Fi thermostats, refrigeration measures and natural gas HVAC measures. Turnkey services may also result in the installation of cost-effective custom measures that save natural gas and electricity, including weatherization.

Eligibility and Enrollment

- All NH Utilities business customers with an average electric demand of less than 200 kW and natural gas customers with an average annual energy usage of less than 40,000 therms are eligible to participate in the NH Small Business Energy Solutions Program.

- **Multifamily Enrollment:** Multifamily properties are eligible for services on common-area lighting and master-metered natural gas heat, as described in the Eligibility and Enrollment section of Large Business Energy Solutions.

Marketing and Outreach

Marketing tactics for this program will focus primarily on direct outreach to customers via traditional mail and email, outbound calling, and working closely with key allies and trade organizations.

Segmentation strategies will be used given the fact that specific energy savings opportunities and value propositions vary greatly between one customer segment and another. For example, the targeted measures for restaurants and food services businesses will differ dramatically from those of healthcare or dry cleaning facilities, requiring different messaging and timing to achieve the greatest impact.

The NH Utilities will also employ additional channels to reach small business customers as needed, including:

- Partnering with affinity groups to engage with their member businesses in order to disseminate targeted information and identify energy efficiency opportunities
- Implementing direct mail campaigns and possibly performing targeted, door-to-door canvassing initiatives where specific clusters or segments of business can be targeted in a small geographic area.
- Participating in public speaking engagements, tradeshows, seminars and customer events to promote programs and incentives.
- Establishing partnerships with trade allies, contractors and builder community to ensure incentives are referenced in their proposals, bids, and other customer communications.
- Building print and video customer testimonials and case studies to highlight achievements.

Success Stories

We measure the success of our Small Business Program not only by the energy saved but also by customer participation and satisfaction with the program's cost-effective solutions.

> The incentive from Eversource was an important part of our decision to move forward with these additional lighting upgrades. We have had a lot of positive comments from customers on our new look and are thrilled with the initial cost savings we have already achieved. —*Dennis Reed, owner, SportsZone*

In addition to saving on electricity costs for lighting, SportsZone will save money on maintenance due to the fact that the LEDs will last up to 10 times longer than the fluorescent lights they replaced. And because LEDs emit less heat than fluorescent lights, SportsZone will likely see some savings on cooling costs.

> This project would not have been accomplished without the available energy rebate incentive and the effort of Unitil's Energy Efficiency program coordinator. The entire process was handled efficiently, and in a timely manner." *Dale Moore, Facilities Manager, Center at Triangle Park*

Recent or Planned Evaluations

The EM&V Team (i.e., Commission Staff and the NH Electric Utilities) are currently working with DNV-GL, a third-party evaluator contracted by the Massachusetts' energy efficiency program administrators to undertake an impact evaluation on small business and municipal lighting. This collaboration with program administrators in a neighboring state has been identified by the "Six-Year Evaluation Plan for CORE Energy Efficiency Programs: Final Report" Study by TecMarket Works (2014)[89] as well as affirmed by stakeholders as an appropriate approach to evaluation of New Hampshire energy efficiency programs.

This study will allow the NH Electric Utilities to meet the FCM precision and accuracy requirements for a substantial end use (commercial lighting). It is anticipated that the impact evaluation will be complete in advance of planning for the 2019 energy efficiency plan update.

3-Year Deployment Strategy

2018	• Working with service providers to ramp up programs • Identifying and implementing outreach to the first group of target segments and affinity groups
2019	• Refining segment targets and adding additional segments as necessary • Start seeing more non-lighting energy efficiency projects and measures.
2020	• Continued transition to non-lighting energy efficient projects and measures

[89]TecMarket Works, Inc. (2014, September 15). "Six-Year Evaluation Plan for Core Energy Efficiency Programs: Final Report." Retrieved from http://www.puc.state.nh.us/Electric/Monitoring%20and%20Evaluation%20Reports/NHPUC%20-%20Six-Year%20Evaluation%20Plan%209-15-2014%20Final%20Report.pdf

7.3 Municipal Program

Program Objective

The municipal program is designed to overcome the unique barriers faced by cities, towns, and local governments. The municipal sector is a large and important electric and natural gas[90] customer group, and has a critical need for operational cost savings. By reducing energy-related costs, the NH Utilities energy efficiency programs help municipalities better serve public interests by reducing taxpayer costs and making public spaces a model for energy efficiency.

Vision for 2018-2020[91]

- *Provide a portfolio of cost effective and comprehensive electric and natural gas programs available to all customers with a secondary focus on fuel neutral savings*
    - The municipal program is designed to meet the specific needs of New Hampshire's municipalities and assist them in reducing both electric and fossil fuel energy use.
    - The Municipal program provides 4 percent of the portfolio electric savings and 4 percent of the fuel neutral MMBtu savings for the portfolio. The Municipal program is cost effective with an overall B/C ratio of 1.43.

- *Scale up to deliver increased energy savings while stimulating market transformation*
    - *Expand the reach of existing programs by serving more customers*
        - The NH Utilities have found peer to peer sharing to be a useful way to help various municipalities identify cost-effective project opportunities and learn how to successfully navigate the unique approval process required for public investments in energy efficiency.
        - Peer to peer efforts have been successfully used by the NH Utilities in partnership with EPA, DES and municipalities in the "Leading NH's Wastewater Facilities to Energy Efficiency" grant. There is further opportunity to utilize peer to peer sharing on other types of common municipal building types or equipment.
        - From 2018-2020 the NH Utilities will focus on engaging with our municipality customers to provide education, identify opportunities, and implement projects that benefit cities, towns and school districts and by extension the local residents.
    - *Enhance Customer Experience*

[90] Municipal natural gas customers are served via the Small Business and Large Business Energy Solutions programs

[91] Italicized vision statements refer to section 3.1 - 2018-2020 Plan Vision.

- The NH Utilities seek to deepen our connection with municipal and school district personnel, providing the technical assistance needed to move projects forward and engaging with local energy committees and other groups that work directly on municipal energy issues.

- *Engage stakeholders to increase customer participate and energy savings*
  - Energy use by towns, cities and school districts impacts every New Hampshire resident. Municipal and school district operating budgets include the cost of energy use, and citizens have the opportunity to directly or indirectly review and approve those costs through town meetings or elections. Town and school board meetings, new buildings and improvement bond items, and the decision to form or participate in an Energy Committee or Commission all present opportunities to educate and raise awareness about energy use and cost, and to control municipal energy costs and ultimately taxpayer burden.
  - Working with Local Energy Committees can help identify appropriate projects and provide opportunities for the NH Utilities and their partners to justify investment and gain approval to move forward.
- *Expand Product and service provider infrastructure*
  - The NH Utilities utilize a network of contractors to raise consumer awareness, recruit participants, conduct audits, recommend improvements, implement projects, and track progress. This program helps develop an expert workforce capable of communicating the benefits of efficiency, selling effective technologies, and packaging projects that get municipalities and school districts to think comprehensively about their energy use and performance.
  - Partnering with installers and distributors at trade shows and training for staff will be an important way to strengthen NH's service provider infrastructure while also providing program information.
- *Stimulate customer and other private investment*
  - Municipalities make significant investments in the energy efficiency projects they undertake with the support of program financial incentives.
  - Municipalities make this investment in a variety of ways, through existing capital, operations budgets, municipal bonds or in some cases loans from their Utility. As discussed in the Financing section of this plan, the NH Utilities all offer either Smart Start or on-bill financing for our Municipal customers.

Program Budget and Goals

TABLE 7.4: Municipal Energy Solutions Energy Saving and Budgets

Municipal Energy Solutions					
	2018	2019	2020	2018-2020	Cumulative Lifetime
Electric					
Budget	2,000,707	2,000,000	2,000,000	6,000,707	N/A
kWh savings*	4,768,231	4,486,133	4,114,659	13,369,023	189,556,855
kW reduction	368	346	319	1,033	NA
MMBtu savings*	3,926	3,904	3,876	11,705	176,586
Electric participants	132	133	131	396	N/A
Note: kWh = kilowatt-hours; kW = kilowatt; MMBtu = million British thermal units					

***Annual savings except for the Cumulative Lifetime column, which is lifetime savings**

Target Market

There are 234 municipalities (221 towns, 13 cities) in New Hampshire[92], each one has multiple buildings with opportunity for energy efficiency improvements. The municipal segment has a wide diversity of building types, ranging from warehouses and town clerk's offices to police/fire stations and schools, thus, most of the energy technologies and services appropriate for commercial office space are also relevant for government buildings. The NH Utilities offer the same complete spectrum of commercial and industrial solutions to our municipal customers.

Implementation

The municipal sector differs from its commercial counterparts in a few ways, including decision-making, financing options and preferences, and ability to implement demonstration projects. Recognizing the special considerations of this segment, the Municipal program offers enhanced incentives for projects including a fuel-neutral component, a flexible approach for technical assistance, and financing options.

- **Intake:** The NH Utilities work with customers who are interested in the program in order to learn about their buildings, their energy concerns and their interest in efficiency. As part of the fact finding, the utility may review customer usage with them to determine high use months and identify contributing factors.

[92]State of New Hampshire (2017). "NH Cities and Towns." Retrieved from https://www.nh.gov/municipal/

- **Technical Assistance and Project Identification:** Based on customer intake, initial energy efficiency measures are identified. The NH Utilities provide technical guidance on the measure(s) and determine with them the appropriate delivery mechanism. Examples of technical assistance include; phone and email consultation, savings and payback analysis, staff walkthroughs, targeted audits on problem systems, HVAC reviews, site analysis, and lighting and refrigeration audits.

Municipal energy-efficiency projects fall into one of two categories: Retrofit or New Equipment and Construction (NEC).

- **Retrofit** projects replace functioning equipment with energy efficient equipment.
- **New equipment and construction** projects consist of the replacement of failed or end of life equipment as well as the acquisition of new equipment during the construction phase of a new or expanded space.

- **Performance Path:** Municipalities can utilize the Performance Path options described in the Implementation section of Large Business Energy Solutions. Performance Path includes the NEC Whole Building Path and the Performance Lighting Path.

- **Quality Assurance:** Post implementation inspections are performed on projects based on complexity, size and cost. Most projects result in either a phone review with the customer or an onsite inspection to ensure satisfaction with the installation, that everything is working as planned, and that all the work has been completed.

- **Planning for next steps:** When the project is completed, often during the post inspection, the NH Utilities check in with the customer and use this opportunity to determine whether they are interested in looking at additional efficiency projects. In this way, we are able to engage with customers to implement a series of projects over time, which is an approach that often works well for NH cities and towns.

- **Additional Technical Assistance:** Some municipalities and schools have internal expertise that they leverage to work with the Utilities in project development, or they may be working with an ESCO. For those that do not have these resources, the NH Utilities provide additional technical assistance to help these customers understand project options, review proposals, and discuss projects with the community at town or school board meetings and other events.

Delivery Mechanism

- **Contractor Partners:** The NH Utilities partner with expert contractors to provide the necessary design, development, and implementation services that help municipalities understand and realize the numerous benefits of investing in energy efficiency. Our non-utility partners comprise a growing network of expert energy auditors, energy engineering firms, energy service companies, equipment distributors, installers, and commissioning resources that leverage our incentives to inspire investment in the latest, most efficient cost-effective technologies available.

- **Turnkey Service:** The turnkey service option helps to overcome two significant barriers: a lack of energy expertise to identify, design, and implement energy/cost savings solutions, and the time necessary to complete projects. The NH Utilities work with skilled trade allies to overcome the barriers by delivering full service solutions.
    - Turnkey vendors perform an initial assessment of the existing equipment, recommend energy-efficient improvements—often targeting lighting and refrigeration upgrades—and install the appropriate measures.

- **Municipal Installed Projects:** Municipalities that want to self-install measures can apply for incentives on eligible projects. The NH Utilities review vendor product quotes and proposed measures for eligibility prior to project implementation and then upon completion will verify installation.

- **Midstream Distributor Relationships**: Midstream distributor relationships are utilized for natural gas water heaters and natural gas heating equipment. This approach is described in detail in the Delivery Mechanism section of Large Business Energy Solutions.

Measures Promoted

- **Prescriptive Measures:** Prescriptive measures include a list of common, prequalified project types, such as lighting, HVAC systems, programmable thermostats, Wi-Fi thermostats, hot water measures, spray rinse valves and refrigeration measures.

- **Custom Measures:** The customer or contractor may propose custom measures that save kWh, natural gas MMBtus or other fossil fuels. The NH Utilities and service providers actively look for items that save kWh and natural gas or other fossil fuels. When a particular measure is seen frequently through the custom process the NH Utilities review whether it has the repeatability and volume to move to the prequalified list of prescriptive measures.

- **Fuel Neutral Measures:** HVAC systems, furnaces, boilers and weatherization

Incentives

Municipal customers are eligible to receive the suite of incentives available to small and large commercial customers as well as some municipal-specific incentives:

- **Prescriptive incentives** allow customers to choose equipment from a prequalified list of measures and receive an incentive that covers a percentage of installed cost for retrofit projects and incremental installed cost for new equipment projects. This approach provides a standardized, streamlined option for customers installing those technologies where the program has enough data to predict savings for a measure across a broad set of applications.

- **Custom incentives** rely on engineering calculations to estimate energy savings and evaluate whether the project is cost-effective. The custom approach allows customers to request a technical assessment of measures that are not on the prescriptive list. This method allows for a more comprehensive and creative consideration of projects that are often more complex than the prescriptive option allows. We assess project eligibility and incentives on a case-by-case basis and determine them by a technical study that details energy savings and project costs.

- **Turnkey service** offers a streamlined approach for incentives through skilled trade allies for common measures such as LED Lighting, lighting controls, programmable or Wi-Fi thermostats, refrigeration measures and natural gas HVAC measures. Turnkey services may also result in the installation of cost-effective custom measures that save fossil fuels (i.e., natural gas, liquid propane, oil) and electricity, including weatherization.

- **Energy-efficient schools:** Incentives of up to 100 percent of incremental costs of new equipment and construction projects

- **Fuel Neutral Funding:** Focused funding from the Regional Greenhouse Gas Initiative in the form of the Energy Efficiency Fund provides priority access to funds for municipal customers[93]. These funds allow installation of fuel neutral measures such as HVAC

[93] State of New Hampshire (2017). "Title X, Public Health, Chapter 125-0, Multiple Pollutant Reduction Program, Regional Greenhouse Gas Initiative, Section 125-0:23, RSA 125-O:23."Retrieved from http://www.gencourt.state.nh.us/rsa/html/X/125-O/125-O-23.htm

systems, boilers, and weatherization in addition to electric saving measures.

- **Funding Availability:** In 2018 and beyond, per RSA 125-O:23, the NH Electric Utilities will ensure municipal customers have priority access to funds.
- The statute indicates that if after the first four months of the calendar year, program funding is not fully expended or reserved, the dollars can be offered to other business customers who contribute to the Systems Benefit Charge. In practice, the NH Utilities recognize the longer planning schedules of municipalities and frequently develop multi-year projects.
- If the specified funding for the Municipal program is fully utilized, municipalities still have access to programs, services and funding through both the Large and Small Business programs.

- **Natural gas programs:** The legislatively directed funding for the Municipal Program goes specifically to the electric programs and not to the natural gas programs. Although there is no specific natural gas municipal program, municipalities continue to be served by the NH Natural Gas Utilities for natural gas measures through the Large and Small Business programs.

Eligibility and Enrollment

- All municipal, local government energy-efficiency projects are eligible, including projects by local governments that operate their own municipal utilities,[94] school districts, counties and other local government bodies.

Marketing and Outreach

Municipal program marketing focuses on direct outreach to municipal customers to educate them about incentives and participation. The NH Utilities may employ multiple additional channels to reach municipal customer including:

- Direct outreach through employees who work closely with the municipalities
- Coordination with contractors and trade partners
- Leveraging partnerships such as the New Hampshire Local Energy Working Group (LEWG) to support community engagement

[94] Ashland, Littleton, New Hampton, Wolfeboro, Woodsville

Success Stories

We measure the success of our Municipal Program not only by the energy saved, but also by municipal and local government customer participation and satisfaction.

An example of the positive outcome we strive for is illustrated by Pelham High School[95], which recently built an addition that includes a gymnasium, auditorium, and classrooms. When the project was in the planning stages, the school department worked with Liberty Utilities to specify energy-efficient lighting throughout the building. They installed various LED fixtures with advanced controls. Many fixtures have sensors that detect ambient light and automatically adjust to provide only the light levels needed. The school received a $35,000 rebate for the measures and installation, and it now saves $31,000 per year in energy costs – a payback of one and a half years.

Recent or Planned Evaluations

Evaluations will help determine program changes, if needed, over time to address market barriers. The NH electric utilities are currently working with DNV-GL, a third-party evaluator contracted by the Massachusetts' energy efficiency program administrators, to undertake an impact evaluation on municipal (and small business) lighting. An annual report to the Commission highlights the services provided each year to municipalities, school districts and other local government entities.

3-Year Deployment Strategy

2018	• Engage municipalities on long-term energy plans by encouraging energy benchmarking to prioritize opportunities and plan for funding initiatives • Work with service providers to address the varied needs of cities and towns • Foster peer-to-peer sharing of successful municipal energy projects with other communities to build upon best practices and lessons learned.
2019	• Develop targeted initiatives to expand expertise and leverage implementation options • Cost-share energy audits and studies of building systems or operations if municipality commits to some level of follow-through
2020	• Develop community based programming that encourages grassroots awareness of energy efficiency for towns, businesses and residents with opportunities to communicate successes

[95]NHSaves (2017). "Savings Profiles: Pelham High School." Retrieved from http://www.nhsaves.com/save-municipalities/municipalities-savings-profiles/pelham-high-school/

7.4 Combined Heat and Power (Utility Specific Measure)

Combined Heat and Power is a utility specific measure that could be utilized within any of the three programs, Large Business, Small Business or Municipal. Liberty electric and UES will pursue CHP projects for efficient units with an investigation into participation from the NH Natural Gas Utilities to incent customers to install the highest efficient units.

Knowledge and Experience

UES and Liberty have NH based staff with experience in CHP.

History

UES was approved to conduct a CHP pilot measure in the 2013-2014 plan but was unable to close a project during the short timeframe of the pilot. At that time, there were interested customers.

Background

- CHP uses waste heat off its generator for thermal needs (heat or hot water).
- CHP is more efficient than grid power coupled with a boiler or a furnace heating system. Grid power is about 50 percent efficient while CHP is 60 to 85 percent efficient or higher.
- A basic explanation of CHP can be found on the U.S. Department of Energy website[96].
- CHP projects have long lead times – one to three years
- CHP projects require a commitment by customers beyond, for example, installing lighting equipment. There are risks associated with maintenance costs and input fuel cost variability.
- CHP projects can use any input fuel but generally natural gas is the choice due to reliability of equipment and low cost of fuel.
- CHP can also be used as backup generator and can be used as a demand shedding resource.
- Customers that are good candidates for CHP include hotels, nursing homes, hospitals, manufacturers with a significant thermal process load, gymnasiums and schools with swimming pools.
- The MA Program Administrators eliminate the federal tax credit (now 10 percent) for CHP installations from the cost-benefit analysis. This is based on Order 07-49 January 9, 2008. Liberty and UES will follow this approach.
- CHP projects are very site specific. There are a limited number of customers that qualify, however, the savings potential is sizeable for these customers.

[96]U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy (2017). "Combined Heat and Power Basics." Retrieved from https://energy.gov/eere/amo/combined-heat-and-power-basics

Measure Structure

- The baseline is doing nothing, therefore, the electric production will constitute kWh and kW savings, the thermal production will constitute MMBtu savings, and the fuel usage will constitute a fuel penalty in MMBtus.
- The Companies will make a determination as to what constitutes an efficient unit vs. a high efficient unit. The natural gas utility will participate in order to incent customers to install high efficient units. In this case, the baseline for the natural gas company will be the efficient unit. It may be determined that this would be on a case-by-case basis.
- Systems must be designed to be thermal led, meaning, when there is a call for heat or hot water, the system turns on producing kWh, kW and MMBtu of heat.
- Incentives will be custom up to 35 percent of the installed cost for the electric company and up to 100 percent of the incremental cost for the natural gas company for the project to transition from an efficient project to a high efficient project.
- The utilities will own rights to the "regular" ISO-NE FCM revenue similar to our other EE measures. Determination of the availability for summer peak, summer critical peak demand shedding and the cost and value is it for customers to participate in one of ISO-NE's programs. In these cases, the systems will operate on electric led mode.
- Utilities will seek customers with 6,000 hours per year of thermal requirements (heat and/or hot water).
    - Review of customers based on current knowledge of their buildings usage
    - Conduct billing analysis to determine other potential customers
    - Each project will be reviewed as follows:
        (a) Conduct an in-house review of the project economics furnished by the developer. This will include a cost-benefit analysis.
        (b) Send the project information for a third-party review, which could increase or decrease savings projected by the developer.
        (c) Re-calculate the cost-benefit ratio if there are changes from the third-party review.
        (d) Make the customer an incentive offer via our rebate application process.
        (e) Customer ordering and installation could take six to twelve months.
        (f) Customer must file an interconnection application with the electric utility, which will take several months to process.

Timeline

- January 2018 – Utilities contact customers for which a 6,000-hour thermal load is known
- March 2018 – Utilities conduct billing analysis to determine other customers that could be good candidates for CHP
- April 2018 – Utilities begin contacting these other customers

- May 2018 – Utilities make determination for distinguishing between an efficient system and a high efficient system such that the natural gas companies can incent high efficient systems (higher savings)
- June 2018 – work with customers to begin receiving proposals from CHP developers
- July 2018 – utilities start analyzing proposals
- September 2018 – make incentive offers to customers
- October 2018 – customers begin decision making process

7.5 Energy Rewards Request for Proposals (RFP)

Program Objective

The Energy Rewards program encourages market growth and demand for energy efficiency by awarding funds for cost-effective projects on a competitive basis. The program allows customers to determine the incentive price they truly need to implement projects. The competitive structure also provides insight into what level of incentive is needed for customers to get approval to move forward with multi-measure or comprehensive projects. The program also allows greater flexibility to select projects that align better with internal program goals. Currently, Eversource is offering this program and will be looking into program options that enable customers to propose multi-year projects.

Program Budget and Goals

Table 7.5: Energy Rewards Energy Savings and Budgets

Energy Rewards RFP Program					
	2018	2019	2020	2018-2020	Cumulative Lifetime
Electric					
Budget	801,060	1,263,185	1,837,304	3,901,549	N/A
kWh savings*	2,693,943	4,205,420	5,948,560	12,847,924	158,377,698
kW reduction	364	714	1,010	2,089	NA
Electric participants	26	44	68	139	N/A
Note: kWh = kilowatt-hours; kW = kilowatt					

***Annual savings except for the Cumulative Lifetime column, which is lifetime savings**

Target Market

- Industrial and other large customers tend to require several years to plan and implement more-complex projects. A multiyear program structure extends the window for customers to develop and approve projects internally, submit comprehensive proposals, and complete projects accepted. Eversource has the opportunity to capture additional savings, provide a better customer experience, and develop long-term project plans with some of the state's largest energy users.
- The program appeals to a variety of customer types. Most often, interested parties are customers with in-house technical and engineering staff. The program also appeals to customers who have hired firms to specialize in implementing energy-efficiency projects. These agencies have a staff of professionals who can identify opportunities, calculate energy savings, design the improvement projects, manage construction and installations,

and monitor energy performance.

Implementation

- Eversource hosts an annual conference where potential bidders learn how to submit an RFP bid. Third parties acting on behalf of customers can also submit an efficiency project bid.
- Projects that pass a preliminary evaluation move on to a more-detailed, final evaluation. The utility evaluates bids based on energy savings, incentive price, and non-price variables. Non-price variables may include energy savings measure mix, for instance, assessing the energy savings from measures other than lighting. Non-price variables also include environmental impacts and waste stream impacts. Regardless of the variable, all projects must pass established cost-effectiveness criteria.

- The program solicits Project Track and Study Track proposals.
    - **Project Track** seeks proposals that can be developed in a short time. These proposals typically are for less complex projects or may involve measures or projects that have been previously studied. Project Track proposals that reach final evaluation but aren't awarded funding are eligible to compete for Study Track project funding.
    - **Study Track** seeks project proposals that appear to have sufficient energy savings but need additional evaluation due to complexity, costs, or other reasons. Study Track proposals first will compete for a fixed pool of study funding. Once studies are completed, the detailed proposals will compete a second time for available project funding.

Delivery Mechanism

- Most often, interested parties are customers with in-house technical and engineering staff. The program also appeals to customers who have hired firms to specialize in implementing energy-efficiency projects. These agencies have a staff of professionals who can identify opportunities, calculate energy savings, design the improvement projects, manage construction and installations, and monitor energy performance.
- A multi-year approach will also enable Eversource to pursue other project types and agreement structures with customers. It will also enable the utility to develop memorandums of understanding (MOU) with customers that could establish energy-efficiency goals for large customers and provide performance-based financial incentives for meeting energy-efficiency targets.

Measures Promoted

Customers propose the measures that they wish to implement. All measures that cost-effectively save electricity are considered.

Incentives

The incentive is market-driven by the bidders. Customers submit a request for the incentive amount they need to install an energy-efficiency project or series of projects. Eversource awards incentives on a case-by-case basis through the competitive bid process.

Eligibility and Enrollment

The program is open to large C&I customers with at least 200 kW demand, individually or in aggregate. Participants must have minimum estimated energy savings of 100,000 kWh per year (aggregate sites or single site) and a project cost of at least $150,000. The program is designed for retrofit projects.

Marketing and Outreach

Eversource promotes the annual bidders conference on our website as well as on the NHSaves website. Utility account representatives are also crucial to raise awareness with customers and help generate projects for the Energy Rewards program. This program targets large energy users with the potential to save a lot of energy, and account representatives serve as the marketing arm for the Energy Rewards RFP program due to their close customer relationships.

Success Stories

Manufacturer, Sturm Ruger, of Newport, recently completed several energy efficiency projects that will provide the company with more than a half-million kilowatt hour savings. In the photo on the following page, Account Executive Paul Hausmann (pictured center) presents company representatives Business Unit Director Randy Wheeler (left) and Engineer David Cruz (right) with a rebate of more than $68,000, made possible through Eversource's Energy Rewards RFP Program for the purchase of energy-efficient equipment ranging from variable frequency drives on exhaust fans to LED lighting.

Photo: Account Executive Paul Hausmann (pictured center) presents company representatives Business Unit Director Randy Wheeler (left) and Engineer David Cruz (right) with a rebate check made possible through Eversource's Energy Rewards RFP Program.

Recent or Planned Evaluations

An impact evaluation of the large C&I program was completed in 2015[97]. The evaluation found that the programs (including large C&I retrofit, new equipment, and Eversource's RFP) had a high customer satisfaction rate. An impact evaluation of the large C&I programs was completed in September 2015 and reported realization rates of 97.6 percent-103.6 percent for the electric programs (Retrofit, New Equipment & Construction and RFP). Since this study was performed on projects from prior years, a new impact evaluation for this program is recommended for the 2018-2020 time period.

[97]DNV-GL, Inc. (2015, September 25). "New Hampshire Utilities Large Commercial & Industrial (C&I) Retrofit and New Equipment & Construction Program Impact Evaluation: Final Report." Retrieved from http://www.puc.state.nh.us/Electric/Monitoring%20and%20Evaluation%20Reports/New%20Hampshire%20Large%20C&I%20Program%20Impact%20Study%20Final%20Report.pdf

8.0 NHSaves Financing Options

8.1 Residential Financing

Third-Party Financing

The NH Utilities partner with local lending institutions to ensure capital and lending expertise is available to customers who want or need it to move forward with efficiency projects. The successful third-party financing program, known as the Residential Energy Efficiency Loan Program, is an important residential financing offering for energy efficiency projects in New Hampshire. In 2015 and 2016, the third-party financing program supported 105 loans and is poised to expand to meet increased demand during the 2018-2020 cycle.

> “I would not have been able to afford this energy conversion were it not for the Liberty Utilities NHSaves Residential Energy Efficiency 2% loan program and I would not have been able to manage this process without the incredible customer service I received from the above mentioned team players who not only gave me personal and detailed instruction, but also kind and helpful guidance throughout while working together as a team to ensure the success of this project.” – Anne, Manchester

The third-party financing program is not designed to support a specific number of loans, but rather to ensure that customers have financing options available to cover the co-pay portion of their projects if needed. These financing dollars help drive more comprehensive projects. In 2016, the average HPwES project was $5,825, while the average project that utilized the loan option was $10,142. This indicates that customers utilizing the third-party financing implemented larger, more comprehensive projects.

The NH Utilities will continue offering the Residential Energy Efficiency Loan Program with our five current lending partners in the 2018-2020 program cycle, and additional lenders will be considered based on customer need and lender interest. The current partners, Granite State Credit Union[98], Meredith Village Savings Bank[99], Merrimack County Savings Bank[100], Northeast Credit Union[101] and Woodsville Guarantee Savings Bank[102], provide convenient branch locations for customers across the state. Through our partnerships, these lenders gain a better

[98]Granite State Credit Union (2017). Retrieved from https://www.gscu.org/
[99]Meredith Village Savings Bank (2017). Retrieved from https://www.mvsb.com/
[100]Merrimack County Savings Bank (2017). Retrieved from https://www.themerrimack.com/
[101]Northeast Credit Union (2017). Retrieved from https://necu.org/
[102]Woodsville Guaranty Savings Bank (2017). Retrieved from https://www.theguarantybank.com/

understanding of efficiency projects while ensuring the loan funds are invested in worthwhile improvement projects within New Hampshire communities.

To encourage customers to install recommended measures, the program reduces the customer's interest rate for unsecured loans from an average of 6.46 percent to 2 percent for qualified measures. Loans can range from $1,000 with a two-year term up to $15,000 with a 7-year term. The NH Utilities approve eligible projects with a Loan Authorization Form so that customers and lenders can be confident the project qualifies for the 2 percent rate. Customer co-pays for the HPwES program are eligible for the loan offering. We utilize two-party checks, which are made out to the customer and the contractor, to ensure loan funds are used to pay for the energy efficiency measures.

The NH Utilities recognize that customers often have a desire for loans for related projects that do not qualify for program rebates or a loan buy-down, such as new windows or siding, or mold remediation. There is an opportunity to work with our lending partners to ensure that customers are aware of the availability of loans for these items, albeit at a higher interest rate than the energy efficiency loan. Cross-marketing to include related measures will allow the NH Utilities and lending partners to engage customers who may be considering installing and financing related projects.

Expanded Accessibility for Moderate Income Customers

Energy efficiency improvements can provide significant value to moderate income customers, who may spend a disproportionate portion of their income on energy costs. However, moderate income customers can have difficulty overcoming barriers to participation in the NHSaves energy efficiency programs. On the one hand, their income may be too high to qualify for the 100 percent rebate offered by the income-eligible Home Energy Assistance program and on the other hand, may be modest enough that they lack the funds or disposable income to cover the co-pay portion of an efficiency project.

One solution to overcome this barrier is to modify loan offerings to make them more accessible to customers with moderate incomes. Over the course of the 3-year plan, the NH Utilities intend to research and explore increasing accessibility for moderate income customers. For example, the VT Heat Saver Loan program[103] provides a successful model to achieve this goal. That program utilizes a lower interest rate tier for customers within a defined moderate income threshold, allowing the customer to acquire a lower monthly payment, making the loan more affordable. The tiered interest rate approach has been successful in Vermont over the past two years, with 80 percent of loans through the VT Heat Saver program offered to low to moderate

[103]State of Vermont (2017). "Heat Saver Loan". Retrieved from http://heatsaverloan.vermont.gov/

income residents.[104] New York State Energy Research and Development Authority (NYSERDA) in also uses a tiered interest rate mechanism to offer lower rates to customers who may not qualify for traditional financing.[105]

The NH Utilities will work with lending partners in 2018 to determine income qualifications, finalize the elements of the offering and sign contracts, and if viable make the offering available to customers by the third quarter of 2018. The NH Utilities will track the number of customers who utilize the moderate income offering in 2019 and do a review of the offering and its effectiveness in early 2020 to determine whether any changes need to be made.

On-Bill Financing

Several of the NH Electric Utilities also offer on-bill financing (OBF) for residential customers participating in the HPwES program. Originally capitalized by a grant from the Greenhouse Gas Emissions Reduction Fund in 2009, these on-bill offerings are currently offered at a zero percent interest rate for customer loans of $2,000 or less. The NH Electric Utilities will continue to offer small on-bill loans at a zero percent interest rate during the 2018-2020 Plan. The maximum amount for on-bill financing may be adjusted by individual utilities depending on their circumstances.

The revolving funds that provide the capital for the current OBF program could be used in a number of ways over the course of the 3-year plan, depending on the needs of individual utilities and the development of the third-party financing programs. Some options may require additional review by the Commission and/or adjustments to the original grant contracts. Options for utilizing the revolving funds include:

- Continuing the zero percent interest rate OBF for residential customers implementing eligible energy efficiency projects
- Utilizing a portion of the funds for non-residential financing
- Utilizing a portion of the funds for other energy efficiency program needs

8.2 Municipal Financing

All of the NH Utilities offer loan options for municipal customers and will continue to offer these options during the 2018-2020 program period.

[104]Thermal Energy Finance Pilot Program "Heat Saver Loan" Program Report, December 1, 2016. http://heatsaverloan.vermont.gov/sites/heatsaver/files/Program_Rept_Dec_2016.pdf

[105]New York State Energy Research and Development Authority (2017). "Residential Financing Options." Retrieved from https://www.nyserda.ny.gov/All-Programs/Programs/Residential-Financing-Options/Residential-Interest-Rate-Estimator

Smart Start Financing

The Smart Start financing offered by Eversource and NHEC provides municipal customers with an opportunity to install energy saving measures with no up-front costs and the ability to pay for the measures over time with the savings obtained from lower energy costs.

Eversource pays all costs associated with the purchase and installation of approved measures. The municipality reimburses the Company through charges added to the customer's regular monthly electric bill. The monthly charges are calculated to be less than or equal to the customer's estimated monthly energy savings. Eversource's Delivery Service Tariff Rate SSP[106] outlines the requirement for service under the Smart Start financing option.

NHEC pays all costs associated with the purchase and installation of the approved measures. A Smart Start Delivery Charge, calculated to be less than or equal to the monthly savings, is added to the member's monthly electric bill until all costs are repaid. NHEC's Delivery Service Tariff Rate SmartSTART SDC[107] outlines the requirements for service under the Smart Start financing option.

On-Bill Financing

Liberty and UES offer a zero-percent OBF revolving loan program pursuant to a grant award from the Greenhouse Gas Emission Reduction Fund. The program is available to municipal customers, as well as commercial and industrial customers. Customers can install energy efficiency measures with no up-front costs and pay for them over time on their electric bills. Under the program, Liberty and UES pay all costs associated with the purchase and installation of the approved measures up to the incentive amount plus a loan amount not to exceed $50,000 per measure for commercial, municipal and industrial customers.

8.3 Commercial Financing

Business customers frequently make energy efficiency investment decisions as part of their capital investment planning, and often have their own relationships and mechanisms in place for accessing capital when needed. NHEC, UES, and Liberty extend their existing municipal financing options to business customers. These financing mechanisms reduce upfront costs, and allow commercial customers to repay loans through their monthly energy bill. NHEC, UES,

[106]Eversource, Inc. (2017). "NHPUC No. 9 – Electricity Delivery, Superseding NHPUC No. 8 – Electricity Delivery. Tariff for Electric Delivery Service." Retrieved from https://www.eversource.com/Content/docs/default-source/rates-tariffs/electric-delivery-tariff.pdf?sfvrsn=26

[107] New Hampshire Electric Cooperative, Inc. (2017). "NHPUC No. 21 – Electricity. 6. SmartSTART (Savings Through Affordable Retrofit Technologies" Retrieved from https://www.nhec.com/wp-content/uploads/2016/12/tariff-document-smart-start.pdf

and Liberty will continue their current business loan offerings in the new planning period.

As the NHSaves programs ramp up for 2018-2020, the NH Utilities will track the number of customers that move from energy audit to adoption of recommended energy efficiency measures to determine whether modified financing mechanisms are needed to overcome the barrier of upfront cost. Meanwhile, there are other financing options that could be helpful to NH business customers, including equipment leasing, and loan options such as those offered by the Community Development Finance Authority (CDFA)[108], the NH Business Finance Authority (NHBFA)[109], Property Assessed Clean Energy (PACE)[110] financing where available, and loans with other lending institutions around the state.

[108]Community Development Finance Authority (2017). Retrieved from http://www.nhcdfa.org/
[109]New Hampshire Business Finance Authority (2017). Retrieved from http://www.nhbfa.com/
[110]The Jordan Institute (2017). "New Hampshire C-PACE, Financing Energy Efficiency". Retrieved from http://cpace-nh.com/index.html

9.0 Planning Elements

9.1 Benefit – Cost Testing

In accordance with Commission Order No. 23,850, in DE 01-057, dated November 29, 2001[111], the NH Utilities use a common benefit cost test and common avoided costs to ensure that program benefits are calculated consistently across utilities. Consistent with Order No. 22,875 in DR 96-150: Electric Utility Restructuring on Requests for Rehearing, Reconsideration and Clarification, the utilities use the Total Resource Cost ("TRC") test to screen programs for cost-effectiveness.

The TRC test estimates benefits via the present value of energy and non-energy impacts over the life of program measures (numerator) and compares that to the costs, defined as the present value of program cost plus out-of-pockets costs that customers pay for energy efficiency measures (denominator). Thus, a program or measure with a benefit/cost ratio of 1.0 or greater is cost effective, which is to say that there are more benefits than costs. Further, the use of common avoided costs by the NH Utilities ensures that the value of programs and services are considered on an equal basis for all New Hampshire customers, preserving equity throughout the state

The NH Utilities strive to ensure each individual program meets a benefit cost ratio of 1.0 or greater, with exceptions for income-eligible, education or start-up programs such as the initial years of a new program. Each sector (Residential and Commercial) is designed to meet a benefit cost ratio of 1.0 or greater.

For the 2018-2020 Plan, the New Hampshire TRC test uses a nominal discount rate of 4.0 percent[112] and a general inflation rate of 1.56 percent[113] within the TRC test to estimate future benefits. The discount rate and inflation rate equate to a real discount rate of 2.40 percent[114] used for benefit calculations. The value of measures is calculated by taking the net present value (using the real discount rate of 2.40%) of applicable real dollar avoided costs over the lifetime of measures. The measure values are summed up to both the program, sector and portfolio levels. For each year of the 2018-2020 Plan, benefits and costs are represented in

[111]NH Public Utilities Commission (2001, November 29). "Joint Petition for Approval of Core Energy Efficiency Programs, Order Approving Settlement Agreement and Joint Request for Modification of Previous Commission Determination." Retrieved from http://www.puc.state.nh.us/Regulatory/Orders/2001ORDS/23850e.pdf

[112]Based on the June, 2017 Prime Rate in accordance with the Final Energy Efficiency Group Report, dated July 6, 1999 in DR 96-150. Retrieved from http://www.moneycafe.com/personal-finance/prime-rate/

[113]Based on the inflation rate from Q4 2015 to Q4 2016, Retrieved from https://fred.stlouisfed.org/series/GDPDEF/ , latest reported values

[114] Real Discount Rate = [(1 + Nominal Discount Rate)/(1 + Inflation Rate)] – 1

nominal dollars corresponding to that program year. For example, benefits and costs for 2018 are both stated in 2018 nominal dollars; benefits and costs for 2019 are both stated in 2019 nominal dollars; benefits and costs for 2020 are both stated in 2020 nominal dollars.

For the purposes of estimating the avoided costs of energy efficiency programs, the New England utilities reference a regional avoided cost study in benefit-cost modelling. *Avoided Energy Supply Costs in New England: 2015 Final Report* ("AESC 2015") was completed in March 2016[115] and includes avoided costs associated with electricity, natural gas, other fossil fuels and wood for all New England states. The AESC study is overseen and receives input by a committee of regulators, utility staff and energy efficiency consultants from throughout New England and serves as the source of most avoided costs for calculation of benefits for New England states.

In December 2016, an interim update of the AESC was completed ("AESC Update")[116]. The AESC Update differs from the original study in that it updated the following input assumptions: crude oil/fuel oil prices, natural gas commodity costs, electric generating capacity retirements, additions and Forward Capacity Market (FCM) results, and created a new ISO-NE capacity zone (Import Constrained Zone) for "Southeast New England". For New Hampshire, the electric avoided costs in the AESC Update were approximately 8 percent lower than the AESC 2015, and natural gas avoided costs were approximately 9 percent lower. The AESC Update avoided costs are used in this Plan.

Currently the NH Utilities and the Commission are participating in the scheduled update to the AESC ("AESC 2018"), which will re-evaluate all avoided costs. The study is scheduled to be completed by March 2018. The NH Utilities will incorporate the results of the AESC 2018 in subsequent updates of this Plan.

Demand Reduction Induced Price Effect ("DRIPE")

DRIPE refers to the reduction in wholesale market prices for energy and/or capacity expected from reductions in demand for energy and/or capacity resulting from energy efficiency and/or demand reduction programs. Electric DRIPE was first quantified in the 2005 AESC[117], and

[115]Hornby, R., Redkevich, A., Schlesinger, B., Englander, S., Neri, J., Goldis, J, Amoako-Gvan, K., He, H., Rivas, A., Tabors, R. (2016, March 25). "Avoided Energy Supply Costs in New England: 2015 Report." Retrieved from http://www.puc.state.nh.us/Electric/Monitoring%20and%20Evaluation%20Reports/AESC_2015_%20w%20App_rev%202016_03_25.pdf

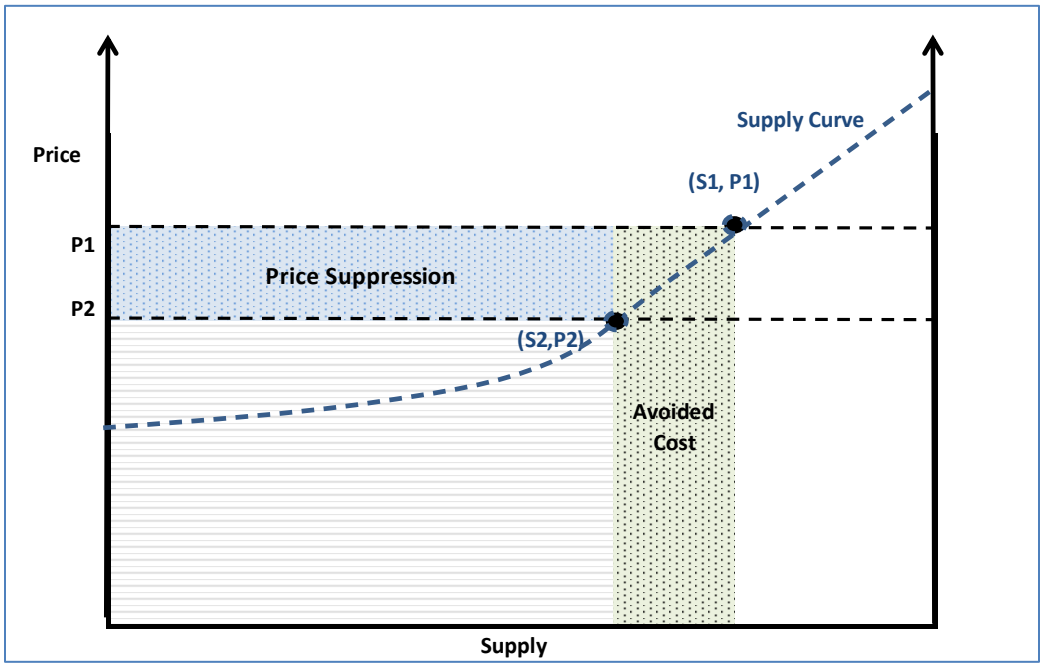
[116]Hornby, R., Rudkevich, A., Schlesinger, B., Englander, S. (2016, December 13). "AESC 2015 Update Results and Assumptions." Retrieved from http://www.puc.state.nh.us/Electric/Monitoring%20and%20Evaluation%20Reports/AESC%202015%20Update%20Results%20and%20Assumptions%202016_12_16.pdf

[117]ICF Consulting (2005, December 23). "Avoided Energy Supply Costs in New England: 2005." Retrieved from http://www.mass.gov/eea/docs/dpu/energy-efficiency/avoided-energy-supply-costs-in-new-england/2005-

natural gas DRIPE was first quantified in the 2013 AESC[118]. The DRIPE values in these studies were based on a detailed analysis of the energy markets in New England. All New Hampshire specific electric and natural gas DRIPE from the AESC are included in the benefit cost screening for the 2018-2020 Plan. Rest of Pool DRIPE is not included at this time.

Figure 4.15 below provides an illustration of the impact of DRIPE. As shown, if supply is reduced (from S1 to S2) as a result of energy efficiency, the price in a competitive market is reduced from P1 to P2 resulting in both direct avoided costs (to the participant) as well as price suppression (DRIPE) that would benefit all customers in the market. While the absolute DRIPE benefit (change in P) may be relatively small, when that number is multiplied by the entire market (S2), the resulting market benefit can be significant.

Figure 9.1: Supply and Demand Curve illustrating avoided costs and price suppression (DRIPE)

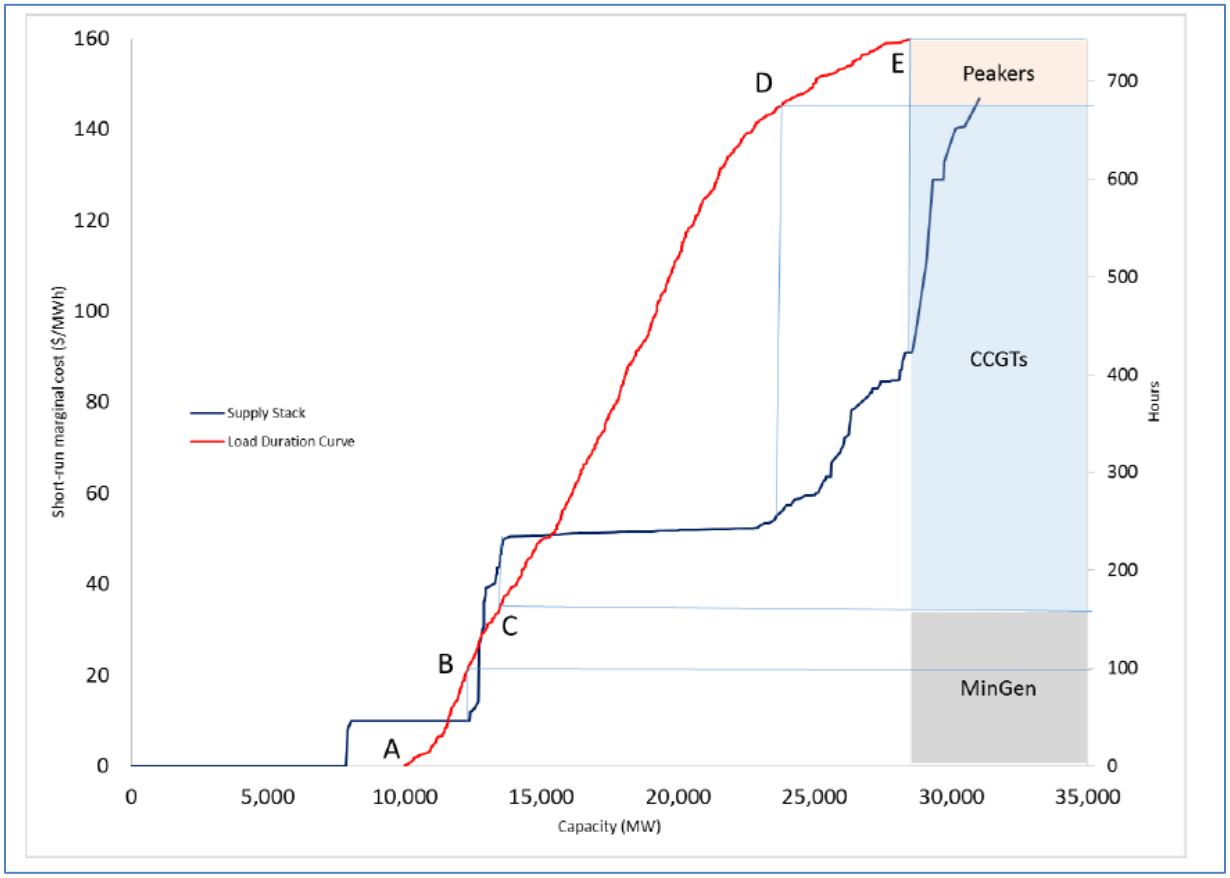


avoided-energy-supply-costs-report.pdf

[118]Synapse Energy Economics, Inc. (2013, July 12). "Avoided Energy Supply Costs in New England: 2013 Report." Retrieved from https://www9.nationalgridus.com/non_html/eer/ne/AESC_Report-With_Appendices_Attached.pdf

While figure 9.1 is an illustrative example of DRIPE, the electricity market is inherently more complex: it includes a mix of generators with varying fuel sources, physical attributes and costs. The AESC 2015 includes an actual supply curve (Exhibit 6-13, shown below in Figure 9.2). This exhibit illustrates how DRIPE impacts can be modelled, how they are a function of the load reduction and when they take place. DRIPE impacts may be small for some reductions (for example, from point D to point C), but significant for other reductions (for example, from E to D). More importantly, this exhibit provides detail on the rigorous analysis supporting the AESC 2015 DRIPE estimates.

Figure 9.2: AESC 2015 – Exhibit 6-13



Included in the AESC 2015 is an estimate of the peak period electric DRIPE coefficient of 1.13 (AESC, Exhibit 7-8, NH). The AESC electric coefficients represent the percent change in average daily price in the state for the relevant period divided by the change in average daily load in the state as a percent of ISO-NE system wide load. AESC provides natural gas wholesale elasticity estimates of 1.52 (AESC 2015, page 7-14). The 1.52 percent elasticity estimate represents a 1.52 percent change in quantity for a 1 percent change in price.

Rest-Of-Pool DRIPE

Rest-of-Pool (ROP) DRIPE are benefits resulting from New Hampshire energy efficiency that flow into surrounding states. ROP DRIPE is not included in the benefit cost screening for this Plan for either electric or natural gas programs.

Impact of DRIPE

Electric DRIPE is less than 0.46 percent of overall electric benefits in the Plan for 2018 and this amount decreases through 2020 to 0.21 percent.

Table 9.3: Estimated Electric DRIPE Impacts

DRIPE Percent of Total Benefits			
	DRIPE	Cross DRIPE	Total
2018	0.005%	0.45%	0.46%
2019	-	0.30%	0.30%
2020	-	0.21%	0.21%

Natural gas DRIPE contributes approximately 1.19 percent of overall gas benefits in 2018 and decreases to 0.62 percent in 2020.

Table 9.4: Estimated Natural Gas DRIPE Impacts

DRIPE Percent of Total Benefits			
	DRIPE	Cross DRIPE	Total
2018	0.16%	1.03%	1.19%
2019	0.15%	0.67%	0.82%
2020	0.14%	0.48%	0.62%

Inclusion of DRIPE

DRIPE benefits have been recognized as a benefit for more than twelve years of avoided cost studies and have been utilized in energy efficiency screening throughout the region. New England states have led the country in studying and accounting for DRIPE (through AESC), and other states outside of our region, including New York, Maryland, Delaware and Ohio, have also quantified DRIPE benefits. In addition, in 2009, the PJM Interconnection published an analysis of how increased energy efficiency could reduce prices in the PJM market.[119]

The National Efficiency Screening Project (NESP)[120] provides guidance on various foundational

[119] *Price Effects of Energy Efficiency: Does More Industrial EE Equal Lower Energy Prices for All,* Colin Taylor, Bruce Hedman and Amelie Goldberg, Institute for Industrial Productivity; Sandy Glatt, U.S. Department of Energy

[120] The National Standard Practice Manual provides a comprehensive framework for assessing the cost-effectiveness of energy efficiency resources. It was developed and reviewed by a nearly 50 member team

elements of cost effectiveness testing. NESP provides several important universal principles that pertain to benefit cost testing including "hard-to-quantify" impacts. NESP states *that it is preferable for cost-effectiveness practices to account for all relevant, substantive impacts using the best available information rather than assuming these impacts do not exist or have no value.*Therefore, based on the NESP framework, and the robust AESC analysis of DRIPE in New England, it is appropriate to include DRIPE benefits as quantified in the AESC in New Hampshire's benefit-cost screening.

Non-Energy Impacts

The NH Utilities propose in this 3-year Plan and the attached testimony (Attachment K1) to include a Non-Energy Impacts (NEI) adder of ten percent to be applied to total electric, natural gas, and other fuel impacts. Ten percent is a conservative proxy for the full value of a multitude of known NEIs. The proposed adder will help ensure balanced, symmetrical treatment of costs and benefits, along with recognition of participant impacts that factor into customer decisions to install energy efficiency measures.

In the absence of New Hampshire-specific NEI evaluations, the NH Utilities based the proposed adder on evidence of neighboring states' NEIs as a percentage of the total benefits of their energy efficiency portfolios, neighboring states' NEI evaluations, and adder levels. The preponderance of evidence supports a portfolio-wide NEI adder of at least ten percent.

The total value of NEIs associated with energy efficiency programs in New England states—including measured NEIs in Massachusetts, Connecticut, and Rhode Island, and adder-based NEIs in Vermont—are equivalent to at least twenty percent of the total resource benefits of the programs in those states, as shown in Table 1 in Attachment L1.

The NH Utilities reviewed evaluations shown in Attachments L2-L7, for methodological rigor and potential applicability to New Hampshire. Although the evaluated NEI values for these other states may differ from the corresponding values for New Hampshire, these evaluations provide a sound basis of support for the proposed adder. In addition, states regularly adopt NEI values from evaluations conducted in other jurisdictions, in the same manner that states regularly adopt energy savings values from evaluations conducted in other jurisdictions, in part to minimize the costs and time of conducting original NEI research. NEI adders in other jurisdictions provide points of comparison that further support the proposed adder.

representing a wide range of industry, government, and non-profit perspectives. See the National Efficiency Screening Project, *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*, May 2017. https://nationalefficiencyscreening.org/

The NH Utilities propose to collect and analyze New Hampshire-specific NEI evidence as discussed and determined by the EM&V Working Group, as part of an overall strategic evaluation plan.

Wholesale Risk Premium

For the 2018-2020 Plan, the electric utilities have incorporated the default 9 percent AESC 2015 risk premium adder onto the electric energy avoided costs. The risk premium reflects that the retail price of electricity over a given period of time is generally greater than the wholesale market price. This increased cost is due to a variety of risk factors including unpredictable weather and economic activity.

Details of the risk premium are different in a vertically integrated market. As such, the 2013 AESC[121] stated that "PSNH and the municipal utilities, program administrators should use a risk premium less than the 9 percent default". Based on this guidance, the New Hampshire Utilities have conservatively not used a risk premium. However, recently Eversource began the process of selling its remaining electric generation assets[122]. Therefore, the inclusion of the 9 percent risk premium in the 2018-2020 Plan is appropriate.

Natural Gas Retail Adder

The avoided cost of natural gas at a retail customer's meter has two components: (1) the avoided cost of natural gas delivered to the local distribution company ("LDC"), and (2) the avoided cost of delivering natural gas on the LDC system (the "retail margin"), (AESC 2015 at 2-54). The AESC 2015 provides avoided natural gas costs both with and without a retail margin for each of the three regions (Southern New England, Northern New England, and Vermont). For the 2018-2020 Plan, the NH Natural Gas Utilities have incorporated the Northern New England cost of natural gas that includes "some avoidable retail margin," because the NH Natural Gas Utilities incur costs to deliver natural gas on the LDC systems that can be avoided by efficiency efforts. Please see AESC 2015 starting at 2-60 for additional information regarding the natural gas retail margin.

Avoided Cost Detail

The summary table on Table 9.5 illustrates the benefits and costs that are included in the New Hampshire TRC Test and Table 9.6 (next page) provides additional detail. The following tables, (Table 9.7 and Table 9.8) summarize the benefit cost ratios of the individual Commercial and

[121]Synapse Energy Economics, Inc. (2013, July 12). "Avoided Energy Supply Costs in New England: 2013 Report. Section 5.2.6" Retrieved from http://www.puc.state.nh.us/Electric/Monitoring%20and%20Evaluation%20Reports/Synapse%20AESC%20Report%20-%20With%20Appendices%20Attached%20FINAL%20REPORT%20071213.pdf

[122]NH Public Utilities Commission (2017). "DE 16-817: Eversource Energy, Auction of Electric Generation Facilities." Retrieved from http://www.puc.state.nh.us/regulatory/docketbk/2016/16-817.html

Residential programs.

Table 9.5: Benefits and Costs for the NH TRC Test

NH TRC Test Summary of Benefits and Costs			
Program(s)	**Benefit**	**Cost**	**Source Note**
Electric, Natural Gas	Electric Energy	Program costs including performance incentive, plus any out-of-pocket customer costs	1
Electric, Natural Gas	Electric Capacity		2
Electric, Natural Gas	Electric and Natural Gas Demand Reduction Induced Price Effect (DRIPE)		3
Electric, Natural Gas	Electric Distribution		4
Electric, Natural Gas	Electric Transmission		5
Natural Gas	Natural Gas		6
Electric	Oil		7
Electric	Propane		8
Electric	Kerosene		9
Electric	Wood and Wood Pellets		10
Electric, Natural Gas	Water		11
Electric, Natural Gas	Other Participant NEIs		12

Table 9.6: Benefits Cost Detail Supporting Information

	Notes:
1	**AESC Update, New Hampshire Exhibit B.** Column a: Winter Peak Column b: Winter Off-Peak Column c: Summer Peak Column d: Summer Off-Peak All values include the Whole Risk Premium adder of 9%
2	**AESC Update, New Hampshire Exhibit B** Column g: Weighted Average Avoided Cost Based on Percent Capacity
3	**Electric - AESC Update, New Hampshire Exhibit B.** Column h: Instrastate Winter Peak Column i: Intrastate Winter Off-Peak Column j: Intrastate Summer Peak Column k: Intrastate Summer Off-Peak Column z: Electric Cross Winter Column aa: Electric Cross Summer **Natural Gas - AESC, Exhibit 13, New England** Column 1: Gas Supply Column 2: Residential Non Heating Column 3: Residential Water Column 4: Residential Heating Column 5: Residential All Column 6: Commercial & Industrial Non Heating Column 7: Commercial & Industrial Heating Column 8: Commercial & Industrial All
4	Statewide average based on utility estimates. Value is $79.98 per kW (2018$).
5	Statewide average based on utility estimates. Value is $19.74 per kW (2018$).
6	**AESC Update, Northern New England Exhibit C, Some Avoided Margin** Column E: Residential Non Heating Column F: Residential Hot Water Column G: Residential Heating Column H: Residential All Column J: Commercial & Industrial Non Heating Column K: Commercial & Industrial Heating Column L: Commercial & Industrial All
7	**AESC Update, Exhibit D** Column C: Residential Distillate Fuel Oil Column F: Commercial Weighted Average
8	**AESC Update, Exhibit D** Column M, Propane
9	**AESC Update, Exhibit D** Column N, Kerosene
10	**AESC Update, Exhibit D** Column J, Cord Wood Column K, Wood Pellets
11	Estimated statewide value of $0.0082 per gallon (2018$)
12	A ten percent adder is applied to the energy benefits (all benefits excluding water)

Table 9.7: Commercial Benefit-Cost Ratios

Commercial Programs Benefit-Cost Results	2018	2019	2020	2018-2020
Electric				
Large Business Energy Solutions	2.37	2.36	2.38	2.37
Small Business Energy Solutions	1.73	1.81	1.82	1.79
Municipal Energy Solutions	1.43	1.43	1.42	1.43
Energy Rewards RFP Program	1.76	1.77	1.77	1.77
Natural gas				
Large Business Energy Solutions	1.54	1.58	1.60	1.58
Small Business Energy Solutions	1.52	1.58	1.67	1.59

Table 9.8: Residential Benefit-Cost Ratios

Residential Programs Benefit-Cost Results	2018	2019	2020	2018-2020
Electric				
Home Energy Assistance Program	1.38	1.43	1.54	1.45
ENERGY STAR Homes	1.87	2.08	2.31	2.09
Home Performance with ENERGY STAR	1.65	1.82	1.95	1.80
ENERGY STAR Products	1.67	1.76	1.75	1.73
Home Energy Reports	1.10	1.76	1.70	1.52
Natural gas				
Home Energy Assistance Program	1.09	1.09	1.10	1.09
ENERGY STAR Homes	1.28	1.36	1.40	1.34
Home Performance with ENERGY STAR	1.25	1.23	1.19	1.22
ENERGY STAR Products	1.04	1.08	1.12	1.08
Home Energy Reports	0.84	1.05	1.04	0.97

9.2 Additional Program Funding Sources

- **Stable and Reliable Program Funding:** The System Benefits Charge and the Local Distribution Access Charge remain the most stable and reliable funding sources for energy efficiency programs. Funding the Plan primarily through these sources is consistent with the way that most other jurisdictions fund their EERS and energy efficiency programs.[123] Forty-Seven States have some level of energy efficiency programs funded through charges included in utility customers' bills. All of the top ten states on the American Council of an Energy-Efficient Economy's (ACEEE) 2016 Energy Efficiency Scorecard[124] rely significantly on the utility customer funding mechanism. The NH Utilities are looking at many of these successful states to learn from their best practices as we ramp up our programs. Those best practices include reliable funding through utility customer charges.

- **Forward Capacity Market**: The NH Utilities have demonstrated our capacity to bring additional funds to the programs through our participation in the ISO-NE Forward Capacity Market ("FCM"). By bidding peak demand savings realized from the energy efficiency programs into the FCM, the NH Electric Utilities have brought additional funds into the energy efficiency programs since 2007. Funds from the FCM have risen from approximately $2.4 million in 2015 to approximately $4.3 million in 2017, and we expect modest growth in revenues as demand savings from the programs increase. The NH Electric Utilities have the capacity and expertise to meet the significant reporting and regulatory requirements that are prerequisite to participation in the FCM, and will continue to participate in the future and reinvest these additional revenues into the energy efficiency programs.

- **Successful Grant Awards:** The NH Utilities have proven successful in accessing additional grant funds to supplement programs.
  - **RGGI Funds:**
    - In 2009 the NH Utilities were awarded[125] a RGGI grant of $7.2 million, which was used to implement multiple program offerings including appliance recycling, expansion of the ENERGY STAR Homes program, fuel-neutral residential weatherization, expansion of the Large Business efficiency program, certification and training classes and on-bill financing.

[123]American Council for an Energy-Efficient Economy (2017). "ACEEE State Policy Database" Retrieved from http://database.aceee.org/

[124]American Council for an Energy-Efficient Economy (2016, October). "ACEEE 2016 State Energy Efficiency Scorecard." Retrieved fromhttp://aceee.org/sites/default/files/publications/researchreports/u1606.pdf

[125]NH Public Utilities Commission (2017). "Sustainable Energy: Greenhouse Gas Emissions Reduction Fund (GHGERF). Retrieved from https://www.puc.nh.gov/Sustainable%20Energy/GHGERF.htm

- In 2015 we were jointly awarded $1.2 million in RGGI funds, beyond those that are statutorily dedicated to the NHSaves programs. This grant, implemented over the course of three years (2016-2018), brings fuel-neutral energy savings opportunities to our retail and large business customers. The NH Utilities will finish the current RGGI grant in 2018 and will pursue additional RGGI funding, if available.

- **Federal Funds:** In addition to RGGI funds, the NH Utilities have partnered several times with the NH Office of Strategic Initiatives (formerly known as the Office of Energy & Planning)[126], to successfully leverage additional federal funding for the energy efficiency programs. The NH Utilities have been able to provide a streamlined process to put available federal dollars to work helping NH citizens implement energy efficiency projects:
  - In 2010, the heating system replacement offering utilized $731,000 in federal ARRA funding to help customers replace aging and inefficient fossil fuel heating systems with new high efficient system.
  - In 2012, the NH Utilities partnered with NH OEP and CDFA to utilize $1.2 million of ARRA funds through the Better Buildings program, expanding the HPwES program to reach additional customers by providing on-bill financing for customer co-pays as well as additional deep dive energy efficiency measures.
  - In 2016, the NH Utilities partnered with OEP and DES on a $197,000 US Department of Energy ("DOE") grant to facilitate energy efficiency projects at municipal wastewater treatment facilities

"A partnership with NHSaves allowed the NH Office of Energy and Planning and the NH Department of Environmental Services to procure a competitive grant from US DOE. This partnership has also been invaluable in helping municipalities understand the types of funding programs available and how to apply for energy efficiency projects. An additional benefit of this partnership is the ability of NHDES and municipally-owned wastewater treatment facility operators to educate NHSaves representatives on the complex nature and energy use of the wastewater industry." *Sharon Rivard, NH DES and Myles Matteson, NH OEP*

- **Demonstrated Capacity to Deploy Grant Funding:** The NH Utilities have the demonstrated capacity to partner with others to identify and successfully deploy grant funding from a variety of sources. In all of the example cases, the NH Utilities were able to provide

[126]New Hampshire Office of Strategic Initiatives (2017). Retrieved from https://www.nh.gov/oep/

successful program options to put grant funding to immediate use in providing energy efficiency measures. We will continue to pursue additional grant funding opportunities during this 3-year plan.

- **Additional Grant Research:** Grant funding can provide valuable support to the energy efficiency programs; however, there is little potential for grant funding to become the primary or even a significant source of funds for the programs. Several years ago a significant effort was undertaken in Massachusetts to identify all potential funding sources for energy efficiency. The MA Program Administrators identified more than 60 potential sources of grants or loans that could potentially be applied to energy efficiency. Each source was vetted to understand eligibility and applicability of the funding to help meet statewide program goals.
    - After review, it was determined that 34 of these potential sources were not applicable to energy efficiency efforts in the state. Of the remaining 29 potential grant sources, only government agencies, small businesses, or individuals were eligible to receive funding. Massachusetts continues to rely on an electric and natural gas public benefits charge, Forward Capacity Market revenues and funds from participation in RGGI to fund their energy efficiency programs.

- The NH Utilities continuously monitor opportunities for grant funding in New Hampshire and have found and pursued multiple opportunities to supplement the program. We have not identified any that could serve as a sustainable long-term funding source.
- Typically, grants are for specific purposes or partnerships, which while providing valuable additions to the efficiency programs, are not a sustainable form of support.

- **Secondary Market Capital**: The NH Utilities have researched the role of secondary market capital in stimulating energy efficiency activity and its applicability to the New Hampshire programs. According to a report published in 2015 by The State and Local Energy Efficiency Action Network,[127]"The question of what role secondary markets can play in bringing energy efficiency to scale is largely untested…only a handful of transactions of energy efficiency loan products have been executed to date, and it is too soon to draw robust conclusions from these deals."
    - The report suggests that if there is no current or foreseeable constraint on the supply of capital for loans from third parties or other sources, that efficiency

[127]State & Local Energy Efficiency Action Network (2015, February)."Accessing Secondary Markets as a Capital Source for Energy Efficiency Finance Programs: Program Design Considerations for Policymakers and Administrators." Retrieved from https://www4.eere.energy.gov/seeaction/system/files/documents/secondary_markets_0.pdf

programs should "focus on continuing to build demand and loan performance history while monitoring secondary market activity."

- Even in jurisdictions where energy efficiency programs have significantly larger loan portfolios, there is no such constraint on local capital supply for energy efficiency projects. Our colleagues in Massachusetts indicate that the relative level of capital supply leveraged through local lenders is sufficient to meet the existing demand for energy efficiency financing even at the scale of $100 million in loans per year.

- **Continued Review and Research:** The NH Utilities will continue to review and research opportunities and models that may provide program funding or other approaches to making capital available to customers in the future. In 2018 we will continue conversations with lenders such as our partner banks and credit unions, the NH Community Development Finance Authority and other institutions to understand potential sources of capital that might complement the existing NHSaves programs. We will continue to learn from other states and stay abreast of secondary market opportunities or other investments that may be applicable to our programs in New Hampshire.

9.3 Capacity Demand Management

Energy efficiency helps utilities and customers in two important ways: lowering overall consumption (kWh) and reducing demand (kW) at the ISO-NE, distribution, and customer level during peak periods. These reductions may help mitigate the need for new capacity and the avoided capacity costs represent a substantial value of energy efficiency measures.

- **Coincident Peak Reductions:** Capacity demand reductions from energy efficiency programs typically result in "coincident peak" reductions, that is, reductions in energy consumption that coincide with reduced capacity charges. Shifting the system peak downward has a financial benefit to all utility customers as a result of reducing the amount of capacity ISO-NE needs to procure (i.e., ISO-NE's Installed Capacity Requirement).
- The NHSaves programs and other utility energy efficiency programs throughout New England have been shown to have saved millions of dollars for New England electric customers by reducing coincident peak through installation of energy efficiency measures.

- **Customer and system peak reduction:** Currently, the other peak energy demand reduction opportunities, including the customer's peak demand as well as local system peak demands, are indirectly served by the NHSaves energy efficiency programs. Most energy efficiency measures, such as efficient lighting, reduce both consumption and

demand. Other control type measures, such as energy management and monitoring systems, building management systems, can further reduce both consumption and demand. These technologies and control systems can help manage demand for the customer and the utility by measuring facility usage patterns and controlling energy use to optimize demand and consumption throughout the day.

- There are many evolving home and business technologies that have add-on or embedded measurement and control systems that could also serve this dual purpose. For example, Wi-Fi or communicating thermostats help customers manage their overall energy consumption by timing needed temperatures with times of occupancy. In addition, these thermostats can contain open access communication systems embedded within them that could allow for future utility control for demand response events to avoid grid emergencies (through emergency dispatch), to assist ISO-NE in reliability conditions, or even to help a utility facing a distribution level constraint.

- **Prior Study in NH:** In 2012, the NH Electric Utilities, in conjunction with the Commission's Staff, contracted with The Cadmus Group to complete a market assessment entitled, "New Hampshire HVAC Load and Savings Research"[128]to study air conditioning equipment in the residential and commercial/industrial sectors, and estimate the impact of such equipment during on-peak hours. This research also studied the drivers of the increasing air conditioning load in both the residential and commercial/industrial sectors, and recommended additional energy efficiency measures to reduce air conditioning electric loads.

    - **Incorporation of Measures**: The research found that air conditioning loads do contribute to the demand for electricity during on peak hours in New Hampshire, and recommended several cooling measures be included in the NHSaves Programs to enhance energy and peak demand reductions.
    - As a result of this research, the NH Electric Utilities previously included incentives within the residential and commercial/industrial NHSaves Programs for high efficiency ENERGY STAR central air conditioning and air source heat pumps, high efficiency ductless mini-split heat pump systems which provide heating and air conditioning, and Wi-Fi thermostats. In addition, the NH Electric Utilities offer incentives on ENERGY STAR room air conditioners, variable speed drives for ventilation and other equipment, and encourage replacement of inefficient HVAC equipment in existing buildings, and highest efficiency equipment in new

[128] The Cadmus Group (2013, April 5). "Final Report: New Hampshire HVAC Load and Savings Research." Retrieved from http://www.puc.state.nh.us/Electric/Monitoring%20and%20Evaluation%20Reports/PSNH/New%20Hampshire%20HVAC%20Load%20and%20Savings%20Research%20-%20Final%20Report%20040513.PDF

construction.
    - Incorporating energy efficiency measures that have the greatest coincidence with the summer peak ensures the programs are well-positioned to have a positive impact on peak demand reduction in New Hampshire.

- **Investigating Future Opportunities:** The NH Utilities are interested in exploring the beneficial and rewarding prospects of multi-solution technologies to maximize both energy efficiency adoption and allow for future possibilities of demand management and demand response participation for grid emergencies or economic dispatch. The NH Utilities will continue to investigate these opportunities to better serve our customers and the state, prepare for future energy and demand goals, and generate cost savings as energy prices and capacity costs rise. There is significant opportunity to learn from the experience and demonstration programs in other states before moving forward with demonstrations or implementation of new measures in New Hampshire. Leveraging the work done elsewhere will help to ensure that we understand the potential market and have good information on cost effectiveness before deciding on any new elements for New Hampshire programs.

- **Demonstrations to Review:** There are several technologies being tested in New England that the NH Utilities will be closely monitoring. In Massachusetts, new initiatives have been proposed that focus on testing peak reduction at commercial, industrial and municipal customer sites including battery storage, thermal storage, demand response and control technologies.
    - The battery storage demonstration includes customer sited, behind the meter batteries at large commercial, manufacturing and retail customers. Key findings hope to answer how dispatch of batteries can be optimized to maximize benefits, what value streams have the most impact on customer adoption and whether oversizing to meet demand events is a viable option.
    - The thermal storage demonstration uses HVAC equipment to create ice at night and then draws on that thermal mass during the day to reduce AC peak loads. Test customers are small and medium commercial customers with 3-20 ton AC units. Key findings hope to answer whether thermal storage is appropriate for a wide range of customers, what value streams sell ice storage to customers and whether ice storage can target peak loads later in the day.
    - The active demand response demonstration is targeted toward ISO-NE events and shaving peak demand to lower Installed Capacity Requirement tags. Demand response is a proven solution for reliability, however the demonstration is needed because the responsiveness to additional dispatches for economic or

other reasons is uncertain. The demonstration hopes to determine how many events can happen before many customers begin to opt-out, and if automated responses using control systems provide an enhanced ability to respond.

- The software and control technology demonstration focuses on customer site controls for HVAC, refrigeration equipment and distributed energy resources. Test sites include big box retail, commercial refrigeration facilities, municipalities, schools and hospitals, as well as midsize businesses and industrial clients. The demonstration will help to determine the level of customer acceptance and the extent of automation that will be tolerated. Key findings hope to determine whether software is a viable approach to reducing demand and whether there are associated energy savings.
- Additionally, Connecticut is also testing software and control technology to manage peak. For residential customers, CT, MA and RI are testing controls to reduce peak demand via homeowner air conditioning.

The NH Utilities will closely monitor these initiatives, will provide updates to NH stakeholders and will look for opportunities to incorporate technologies as appropriate for New Hampshire.

10.0 Evaluation, Measurement and Verification (EM&V)

10.1 Introduction

Evaluation, Measurement and Verification has been an integral component of the efficiency programs in New Hampshire since their inception. EM&V has many objectives, including verifying portfolio energy savings, estimating future energy savings of specific measures and behaviors, and identifying ways to improve program delivery and results. EM&V guides program administrators, policy makers and stakeholders to better understand the extent to which program activities are successfully addressing market barriers to the adoption of energy efficiency measures, and to determine whether they are meeting other goals and objectives. Beyond independent third-party evaluation, EM&V activities include program data collection, analysis and reporting, as well as the software and staff time needed to ensure high quality information on energy efficiency measures and program participants is maintained for all programs.

New Hampshire's statewide energy efficiency programs were established after the 1999 Final Working Group Report of the New Hampshire Energy Efficiency Working Group[129], which also identified the importance of program evaluation. With the introduction of Independent System Operator of New England's ("ISO-NE") Forward Capacity Market ("FCM"), evaluations are also used to verify the energy efficiency demand savings on which the utilities are earning revenues. Since the inception of the statewide energy efficiency programs in 2001, the NH Utilities and Commission Staff have conducted more than 100 studies[130] of the evolving suite of energy efficiency programs. These studies have measured the savings impact of various programs and evaluated their effectiveness over a wide range of issues.

In the context of energy efficiency programs, EM&V includes the systematic collection and analysis of a variety of quantitative and qualitative information to document program effects, evaluate market response, and identify possible program enhancements. EM&V includes impact evaluations, market effects studies, process evaluations, and market characterization studies, defined as follows:

[129]New Hampshire Energy Efficiency Working Group (1999). "Report to the New Hampshire Public Utilities Commission: On Ratepayer-Funded Energy Efficiency Issues in New Hampshire." Retrieved from https://www.puc.nh.gov/Electric/96-150%20%20NH%20Energy%20Efficiency%20Working%20Group%20Final%20Report%20(1999).pdf

[130]https://puc.nh.gov/Electric/Monitoring_Evaluation_Report_List.htm

- Impact Evaluation – Impact evaluations determine how much savings are attributed to energy efficiency measures and programs, by comparing savings to baseline levels.

- Market Effects Evaluation – Market effects evaluations characterize changes in the structure or functioning of a market or the behavior of market participants that resulted from program efforts.

- Process Evaluation – Process evaluations assess program design and implementation in order to understand and improve program performance.

- Market Characterization or Assessment – Market assessments characterize the existing structure and function of markets, identify market participants, and analyze their behavior.

While listed separately, these types of studies and their objectives are sometimes combined within one evaluation in order to provide a holistic picture of impact results, gain an understanding of root cause and effect, and to determine actionable recommendations that will yield accurate and effective program design solutions.

10.2 EM&V Framework

To give the public confidence that customer-funded programs are producing real and verifiable energy savings, high quality and transparent third-party EM&V efforts are essential. After significant research, including review of the TecMarket Work's Evaluation Plan,[131] as well as discussion with stakeholders, the NH Utilities propose to utilize a framework for more efficient and routine evaluation of energy efficiency programs. For the past several years, the NH Utilities have successfully worked side by side with Commission staff to implement an array of program evaluations that measure program impact, assess the design of programs, and identify opportunities for improvement. This approach has addressed the need for program evaluation while meeting the requirements and standards imposed by the ISO-NE, which the electric utilities must meet in order to enter demand resources (from energy efficiency programs) into the FCM.

As approved by the Commission, the Settlement Agreement states that EM&V "activities shall be conducted by independent third parties supervised by the Commission with the advice and

[131]TecMarket Works (2014, September 15). "Six Year Evaluation Plan for Core EE Programs: Final Report." Retrieved from http://www.puc.state.nh.us/Electric/Monitoring%20and%20Evaluation%20Reports/NHPUC%20-%20Six-Year%20Evaluation%20Plan%209-15-2014%20Final%20Report.pdf

participation of the Settling Parties and the EESE Board." It further states that "Settling Parties agree that upon request, an independent expert….will be hired and supervised by the Commission to assist Staff, the Settling Parties, the EESE Board or successor, and others as determined by the Commission, on participating in EM&V activities," As the NH Utilities embark on more aggressive energy efficiency goals under a statewide EERS, the following EM&V Framework is proposed to provide a structure for decision making at all stages of evaluation including: development of a 2018-2020 Strategic Evaluation Plan, issuance and review of requests for proposals from independent third party vendors, management of the evaluation process, and reporting and review of quarterly and annual reports. The Framework defines the roles, responsibilities and activities of a variety of EM&V stakeholders, including but not limited to the following:

- NH Public Utilities Commission and Commission Staff
- EESE Board
- NH Utilities
- EM&V Working Group
- Other stakeholders
- Independent Third-Party evaluators/vendors

The Framework is designed to facilitate the input of all participants and the efficient use of time, personnel and funding to achieve the goals and objectives to be more fully described in a collaboratively developed Strategic Evaluation Plan. The Framework is based on a transparent process in which a) experts are strategically engaged, b) interested stakeholders have opportunities for input into the development of annual priorities and briefings on evaluation findings and results, and c) the NH Utilities are enabled to meet all regulatory requirements related to the measurement, verification and evaluation of programs in a timely fashion.

During the EERS stakeholder review process, stakeholders suggested a number of possible improvements, including expanding current evaluation methodologies, disseminating EM&V results more widely, presenting results and recommendations in layman's terms, and expanding EM&V to program areas that have not received significant attention in the past. This feedback will be incorporated into the Strategic Evaluation Plan ("SEP").

EM&V Working Group

The proposed EM&V Working Group will be developed using the Evaluation Management Group in Massachusetts as a model, in which evaluation experts oversee the day-to-day work of executing the Strategic Evaluation Plan. The EM&V Working group will set a regular meeting schedule to address ongoing evaluation work, as well as to plan for future evaluation activity and discuss topics of special or emerging interest. To the extent necessary, the EM&V Working

Group will establish study sub-committees to review and address specific evaluations, plans or other activities. The EM&V Working Group will consist of:

- Commission staff members
- The independent expert
- NH Utilities' representatives
- An EESE Board member appointed by the EESE Board Chair

This Working Group will develop the SEP and will provide a presentation to the EESE Board prior to finalization. The EESE Board member of the EM&V Working Group will have responsibility for representing the input of the EESE Board for both the SEP as well as other activities of the EM&V Working Group.

For each evaluation or significant project, the EM&V Working Group will identify a utility staff Study Lead who will a) act as the primary point of contact for the independent evaluator, b) facilitate meetings specific to the evaluation topic, c) work to ensure pre-established deadlines are met, d) facilitate the data request process between the evaluator and the NH Utilities, and e) ensure that all Working Group members have signed off before moving on to the next step in the process.

The EM&V Working Group will communicate recommendations to stakeholders in a timely manner and act on or implement as appropriate. If areas of difference among the EM&V Working Group members cannot be resolved, the Working Group parties may appeal to the Commission for resolution.

Procurement of Independent Third Party Evaluators

Working collaboratively, the EM&V Working Group will procure one or more independent evaluation contractors to undertake evaluation activity within a certain research area (e.g., customer sector or technology) over a multi-year timeframe. This is a departure from past practice in which a request for proposals was issued for each planned evaluation. Selecting a limited number of contractors for a broader study area maintains a robust competitive procurement process, while ensuring that the procurement process itself does not become a barrier to cost-effective and timely evaluation of programs.

In certain instances, such as where specialized technical skills are required or where there are opportunities to reduce expenses by joining studies being conducted in other jurisdictions, the EM&V Working Group may procure individual studies as appropriate. The Working Group will outline the general work scope for each evaluation in a competitive Request for Proposals. All

Requests for Proposals will be developed with the input and approval of all members of the EM&V Working Group. Evaluation vendors will be selected using a collaborative approach in which members of the EM&V Working Group score proposals using a weighted scoring matrix developed along with each Request for Proposals.

Once an independent third-party evaluation vendor is selected, it will be the designated evaluator for all programs in the designated research area for the duration of the contract term. The evaluator may supplement their own expertise with that of sub-contractors identified in the response to the RFP and subject to the approval of the EM&V Working Group.

10.3 Strategic Evaluation Plan - 2018-2020

With the Framework in place, the first task will be to fully develop a multi-year Strategic Evaluation Plan (SEP). The SEP will be updated each year and will identify evaluation work currently in process, the studies and assessments proposed to be initiated in the coming program year, changes from prior years, and trends in evaluation or markets that merit further review and consideration. A prioritization and proposed budget will be included for each study or activity, and if known, the lead third party evaluator and EM&V Working Group Study Lead will be identified.

Impact Evaluations

Given the rapid expansion in program activity under an EERS, it is essential that evaluation priorities be established strategically. Using the TecMarket Works multi-year evaluation plan[132] as a guiding document, the highest SEP priority is timely impact evaluations of all electricity and/or natural gas-saving programs. This serves not only to verify savings but also to meet the requirements of ISO-NE's FCM. In addition to the length of time since the last impact evaluation was conducted on the program, priority will be based on the relative size of program savings in the portfolio, the degree of innovation within the program, and recent program changes that might affect savings.[133]

Table 10.1 shows a list of all NHSaves programs and the last impact evaluation conducted on that program.

[132] Six-Year Evaluation Plan for Core Energy Efficiency Programs, TecMarket Works, September 15, 2014 page

[133] Ibid. page 12.

Table 10.1: Impact Evaluations

Program	Publication Date of Last Impact Evaluation	2018-2020 Proposed Impact Study
Large Business Energy Solutions	2015	NA
Small Business Energy Solutions	2012	2017-2018 (Lighting)
Municipal Program	NA	2017-2018 (Lighting)
Energy Star Products		
Lighting	2012	2017-2018
Appliances	2005	2017-2018
Energy Star Homes	2017	NA
Home Energy Assistance	2006	2019-2020
Home Performance with Energy Star	2011 / 2013 on AC	2019-2020
Behavior / Home Energy Reports	2014	NA

Impact evaluations that focus on a specific equipment type (e.g., lighting, refrigeration or HVAC) spanning multiple programs will also be considered where that may be a more effective use of evaluation resources. This strategy can be particularly cost effective for equipment types that contribute a large percentage of portfolio energy savings. An example of this approach is currently being undertaken in conjunction with the Massachusetts programs in which the NH Utilities asked an evaluator to sample New Hampshire Small Business Energy Solutions participants as part of a planned lighting impact study the evaluator is performing on Massachusetts programs.

At the time of filing, the NH Utilities have also prepared a request for proposals for an independent third party evaluator to undertake an impact evaluation of ENERGY STAR Products Program (residential lighting and appliances). This is expected to encompass the bulk of electric and natural gas savings for the residential sector. Results of the study will inform program planning for 2019 and 2020, and verify the savings for the 2016 program year.

The NH Utilities propose to undertake impact evaluations of the Home Energy Assistance and Home Performance with Energy Star programs in the latter half of the 3-year plan. Because these programs result primarily in envelope and heating system savings, their contribution to statewide kWh and MMBtu goals is more modest than other programs.

Process Evaluations

In New Hampshire, evaluations measuring the impact of efficiency programs (i.e., actual energy savings compared to claimed savings) have typically been paired with an evaluation of program

design or the implementation process. Process evaluations entail interviewing program implementers, contractors or retailers, as well as customers, and comparing program delivery against program design. Similar efficiency programs offered elsewhere may also be reviewed in order to help develop recommendations for improvements or changes to program design or delivery. Such improvements may include engaging different market actors, enhancing data collection or reporting, and improving customer experience and satisfaction. Comprehensive evaluations that address both savings impacts and process improvements allow for the efficient use of evaluation resources.

In practice, program administrators evaluate program processes on a continual and informal basis through direct interaction and feedback from customers and trade allies, as well retailers and implementation contractors. In response to this feedback, implementers may make changes such as improvements to marketing materials, including the NHSaves website, adjustments to rebate levels, engagement of new contractors or trade allies, and offering of new measures or 'special offerings'. In addition, best practices identified by various professional associations with which the NH utilities engage (i.e., the Consortium for Energy Efficiency, the Design Lights Consortium, the Northeast Energy Efficiency Partnership, the American Council for an Energy Efficient Economy, etc.) may also be incorporated.

In addition to ongoing program improvements, the purpose of formal process evaluations is to allow for a more in-depth and independent investigation into the effectiveness of program design from the point of view of participants, non-participants and the third-party actors engaged with the utilities to deliver programs. Formal process evaluations are particularly valuable when there are program design changes, changes in rebate structures, or a new program offering.

Market Effects / Characterization Studies

Through the stakeholder engagement process surrounding the EERS, the need has been identified for a market baseline study that will capture current market conditions regarding the adoption of energy efficiency measures and practices in New Hampshire. Changes in the residential lighting and appliance market resulting from changes to energy efficiency standards at the federal level suggest that it may be an appropriate time to perform a market characterization study of New Hampshire. Market studies help identify the remaining energy efficiency potential, barriers to adoption, and best strategies for overcoming such barriers. As part of the Strategic Evaluation Plan, the NH utilities propose to conduct a market baseline study in the first year of the 3-year plan. Market baseline studies are valuable tools for measuring the effectiveness of both individual programs as well as the marketing and education efforts that have been deployed to help transform the New Hampshire energy efficiency market.

Further study of the awareness of and attitudes toward the NHSaves brand is also warranted, as is a study to determine interest in and awareness of financial and technical assistance available through the efficiency programs to residential, commercial, industrial and municipal customers. The market characterization and brand awareness studies conducted in the early part of the first term of the EERS will help the NH utilities to more effectively measure the efficiency programs' impact on the New Hampshire markets over time.

10.4 Stages of Evaluation

Under the EM&V Framework, the various impact and process evaluations as well as market studies will go through a consistent and predictable pathway from proposal to conclusion. This pathway includes six stages.

Table 10.2. Stages of Evaluation

Stage	Description
Stage 1: Conceptual Framework	The third-party evaluator provides a one page summary with a conceptual framework for the project including a very high-level budget and timing, as well as the objective or goal. Once the EM&V Working Group has reviewed and approved the conceptual framework, the evaluation moves to Stage 2.
Stage 2: Work Plan Development	The third-party evaluator provides a work plan with strategies to meet objectives including more detail on the planned research design, sample design and analysis plans (number of surveys, site visits), detailed budget, staffing and milestone deliverables. Once the EM&V Working Group has reviewed and approved the high-level work plan, the evaluation moves to Stage 3.
Stage 3: Evaluation In Progress	The third-party evaluator conducts work in accordance with plan, and reports to the EM&V Working Group in periodic calls and/or status reports.
Stage 4: Reporting	The third-party evaluator provides an initial draft report including specific recommendations followed by EM&V Working Group review and comment, meetings, and revised drafts based on

	feedback, with all comments tracked and responded to (even if not addressed in final report).
Stage 5: Final Report Completed	The third-party evaluator provides the final report for publication, to be disseminated and discussed with stakeholders.
Stage 6: Implementation	Final Report recommendations are incorporated into program design and/or future plans. Recommendations that affect energy savings will be incorporated in an update filing for the next calendar year, provided that the final report is completed no later than two months prior to the date the Plan filing is due.

By proceeding through a predictable pathway, the EM&V Working Group will be able to better manage the evaluation and the review process, as well as plan for more than one study at a time. Stakeholders will have an opportunity to engage in the process during the strategic planning process as overarching evaluation plans are developed and will continue to be invited to participate in presentations of finalized evaluations. The EM&V Working Group may also provide an update on evaluation activities during Commission-hosted quarterly meetings held to review all NHSaves program activity.

Collaboration

Consideration will be given to participating in evaluation studies initiated in other jurisdictions in the region, when appropriate for NH to participate and when there is an opportunity to reduce expenses. Decisions about which studies to join will be made by the EM&V Working Group and to the extent feasible and economical, shall follow NH's Strategic Evaluation Plan. However, studies that are initiated in other jurisdictions that are not formally anticipated in the SEP may be joined if doing so meets longer term goals in a reasonable and cost effective way.

The current Massachusetts small business lighting impact evaluation, which includes a sample of New Hampshire Small Business Energy Solutions participants, is an example of such an approach. By combining the New Hampshire sites in the sample with similar sites in the Massachusetts' service territories of Eversource and UES, the evaluator can achieve statistical significance with fewer sample points than if the study were undertaken exclusively in New Hampshire. Because the work of competitively procuring the evaluator has already been undertaken in Massachusetts, economies of scale can be realized as the evaluation contract incorporates an add-on price for NH.

10.5 Other EM&V Activities

Technical Resource Manual

In advance of filing each year's Program Plan or Update, the NH Utilities work together to review assumptions, identify changes in federal equipment standards, reference neighboring states' technical resource manuals, and update relevant savings algorithms as necessary. These changes are made by each of the NH Utilities and are captured in the common benefit-cost model. For those New Hampshire programs that have not been recently evaluated, the NH Utilities may rely upon studies undertaken in neighboring states as a source of information about prescriptive measure savings assumptions, measure lives, hours of use and other impacts. The NH Utilities also utilize savings estimates from the U.S. EPA's online energy saving tools, which provide savings calculations on a variety of consumer lighting and appliances. This rigorous undertaking ensures that even in the absence of recent New Hampshire specific evaluations or a formal technical resource manual, savings claims are based on the most relevant and up to date information available.

As committed to in the EERS Settlement and ordered by the Commission, a key priority under the Strategic Evaluation Plan will be to compile a New Hampshire specific Technical Resource Manual ("TRM"). Activities that will be undertaken to meet this priority will include:

- Comprehensively reviewing all existing planning assumptions, algorithms and methods of modeling savings for each measure offered in each program based on the benefit cost screening model that is utilized by the electric and natural gas utilities;

- Identifying and documenting evaluations or other sources of information where relevant and available, for all existing or recommended measure assumptions;

- Compiling all savings assumptions the EM&V Working Group agrees to in a written and/or online repository.

Once finalized, the TRM will be published on a public website. In advance of each annual update filing, the same comprehensive review and update process described earlier will incorporate any new measures and updated assumptions into the benefit cost model of the proposed plan.

Non-Energy Impact Studies

During the EERS stakeholder process, non-energy impacts (NEIs) were studied to determine whether or how to account for them in the portfolio of programs proposed by the NH Utilities.

As described in more detail in the testimony accompanying this plan, the NH Utilities have proposed an NEI adder of 10 percent of total electric, natural gas, and other fuel benefits. This is a conservative proxy for the full value of a multitude of known NEIs, based on the preponderance of evidence from extensive research and program evaluations. The adder will help ensure that New Hampshire's energy efficiency cost effectiveness test reflects a balanced, symmetrical treatment of costs and benefits and accounts for benefits that factor into participants' decisions to install energy efficiency measures.

The NH utilities embrace the approach proposed by the EESE Board in a resolution on the topic to further study NEIs throughout the 3-year term in order to more specifically quantify the value of non-energy impacts. As part of that study, and in keeping with the EM&V Framework, the NH utilities propose to leverage the multitude of NEI evaluations that have been completed in other jurisdictions by reviewing underlying methodologies, data, and assumptions and identifying NEIs that can be applied in New Hampshire. The EM&V Working Group will incorporate further NEI studies into its workplan to the extent feasible, and will prioritize NEI evaluations using the criteria established in section 8.4 above, such as the relative size of the NEI's impact within the portfolio and the length of time since they have been evaluated previously.

As with all evaluation-related activity, the EM&V Working Group will periodically report on the progress of NEI research and findings to the EESE Board and the Commission, and will include specific, agreed-upon NEIs in its planning process on a forward-looking basis through each year's annual Update Plan. To the extent that sufficient research and quantification of every possible NEI realized through the programs would not be cost-effective, it is expected that an adjusted NEI adder will continue to be applied in the future, adjusted based on research and discussion under the EM&V Framework.

Avoided Energy Supply Cost (AESC) Study

Every three years a collaboration of energy efficiency program administrators and Public Utility regulators from the New England states engage with a regional study group on a comprehensive economic evaluation of the value of energy supply avoided through energy efficiency programs.[134] An essential undertaking to quantify benefits realized through the energy efficiency programs, the AESC Study is undertaken by an independent consultant retained through a competitive procurement process.

An RFP for the next Study has been issued and proposals are currently being reviewed by the regional study group. Each of the NH utilities as well as the Commission staff are engaged in the

[134]Hornby R., et al. *Avoided Energy Supply Costs in New England: 2015 Report*, March 31, 2015

development of the RFP, the review of proposals, and the development of the final product, which is expected by June of 2018.

EM&V 2.0

Advanced data analytics and improved data collection tools are collectively leading to a new approach—called "EM&V 2.0"—for analysis of energy usage and energy savings. EM&V 2.0 provides new opportunities for energy-efficiency program administrators and utilities to understand how their customers use energy and how to engage them. An increase in data availability (e.g., more frequent, disaggregated, and different types of data) paired with an increase in analytical capability supports the evaluation process.

Despite the ability of EM&V 2.0 to capture and analyze greater volumes of data, challenges remain, including:

- Data Accessibility and Ownership. Program administrators and utilities continue to struggle with accessing customer data from smart device vendors. There are also privacy and security concerns from customers.
- Transparency. Most of the algorithms and methodologies of advanced data analytics are proprietary. Vendors will have to publish their equations and methodologies used to estimate energy savings if the results are going to have the same level of transparency as traditional EM&V efforts.
- Accuracy. The reliability and accuracy of EM&V 2.0 methods depend on the technology, and some technologies are still being assessed. In some cases, these methods may not meet acceptable levels of rigor in a regulatory context.
- Independence. EM&V 2.0 must maintain independence and cannot be influenced by those involved in implementing programs or measuring their success. Data from EM&V 2.0 can support evaluations; however, evaluation requires an independent third party to analyze data, assess baselines, make non-routine adjustments, and determine savings.

In 2017, the NH Utilities are collaborating with NEEP, the Connecticut Department of Energy and Environmental Protection and Lawrence Berkeley National Laboratory on an EM&V 2.0 pilot. The U.S. Department of Energy has awarded grant funding to DEEP and its partners to acquire experience with advanced data collection and analytic tools, while developing standardized EM&V software tool protocols. These streamlined EM&V practices may help provide reliable, standardized, transparent, and cost-effective approaches to quantify energy-efficiency savings.

Evaluation of Demand Savings

Given the evolving and increasing interest in demand savings (kW) as an area of opportunity for the energy efficiency programs, the NH Utilities propose to include evaluation of demand savings in the EM&V Working Group's discussion of prioritization of EM&V activities. Much study is being undertaken on this subject in other jurisdictions, notably Massachusetts and California, where pilot projects to test cost-effectiveness and scalability are underway. The NH Utilities propose that secondary research on demand savings be the first step in developing a strategic subject-area approach to investigating the opportunity and advisability of pursuing peak demand reduction programs through the energy efficiency programs.

Forward Capacity Market Participation and Certification

Each of the electric utilities participates in ISO-New England's FCM, offering summer and winter peak demand savings resulting from the efficiency programs in exchange for compensation at a rate determined through an annual auction process. The revenues from this participation are an important source of funds for energy efficiency programs. Participation in this market is contingent upon the electric utilities compliance with a variety of rules and requirements, including an annual certification by a third-party evaluator of the demand resources that have been or will be placed into the market. This certification process is undertaken independently by each company. In addition to the annual certification of resources, additional data management and reporting is done by each utility as part of the participation process.

Program-Related Software and Tracking Systems

Utility tracking systems are used to manage the data associated with energy efficiency projects and participating customers, and are also used to report savings. Home auditing software is used in the Home Energy Assistance and Home Performance with ENERGY STAR programs. The annual costs and maintenance of these tracking and auditing systems are systems are included in each of the NH Utility's EM&V budget.

Program Reporting

The NH Utilities will continue to submit Quarterly Reports to the Commission on portfolio and program-specific performance towards achieving goals. These reports will be submitted no later than 60 days after the end of each fiscal quarter and will detail progress towards meeting program goals. Specifically, the Quarterly Reports highlight:

NHSaves Programs' performance: A comparison of program achievements against expected performance and goals. The Quarterly Reports highlight program expenses, customer participation, and annual and lifetime energy savings (kWh and MMBtu) for each utility and in aggregate. Additionally, Quarterly Reports include a calculation of

emissions reductions realized by the NHSaves programs, as well as on-bill and third party loan program statistics, and EM&V activities.

Expense by activity: The NH Utilities summarize expenses by specific tracking activities, defined as follows:

Tracking activity	Description
Administration—Internal	Internal utility costs associated with program design, development, regulatory support, and quality assurance. Costs include: employee labor, benefits, expenses, material, and supplies.
Administration—External	Costs associated with external costs of program administration. This includes contractors and consultants used in support of program design, development, regulatory support, and quality assurance.
Customer Rebates and Services	Includes costs associated with incentives that reduce the cost of equipment as well as costs for services to speed adoption. This includes direct rebate dollars paid to distinct participants, as well as indirect incentives for equipment discounts. It also includes services such technical audits, employee and contractor labor to install measures, expenses, materials, and supplies.
Internal Implementation Services	Tracks costs associated with delivering programs to customers, including labor, benefits, expenses, materials, and supplies.
Marketing	Includes costs for marketing, advertising, trade shows, toll free numbers, and NHSaves website. Types of expenses include labor, benefits, consultants, contractors, expenses, materials, and supplies.
Evaluation	Costs for EM&V activities including labor, benefits, expenses, materials, supplies, consultants, contractors, and tracking systems.

Home Energy Assistance (HEA) Program detailed results: The HEA programs addresses the identified priority of lowering energy costs and improving the efficiency of homes for income-eligible customers. The NH Utilities provide additional detailed information on this program including:

- number of participating single family and multifamily projects
- number of projects by county
- number of projects in which federal Weatherization Assistance Program funds have also been utilized
- percentage of program budget spent on heating system replacements.

Forward Capacity Market results: Reports the actual proceeds received from ISO-NE and the expenses incurred to-date associated with each NH Electric Utilities' participation in the market, including reporting, planning, and evaluation.

RGGI-RFP Reporting: Although distinct from the programs being proposed under this Plan, the proceeds of the RGGI auctions that have been provided to the NH Utilities under an RFP from the Commission are also reported on in quarterly reports.

Annual Program Reporting: The NH Utilities propose to continue the schedule of reporting individually to the Commission on annual accomplishments as compared to plan, with a calculation of earned performance incentive.

10.6 Budget

The EM&V budget for the 2018-2020 EERS Plan is proposed to be consistent with past budgeting at approximately 5 percent of the annual program budgets. This includes both internal and external costs of evaluation, measurement and verification, including but not limited to the activities described in this proposed Strategic Evaluation Plan. Any funds budgeted in the EM&V budget activity category that a utility anticipates will not be spent in a given year can be utilized for other program-related purposes. The total evaluation budget for the 2018-2020 Plan is $9 million. Of that figure, approximately $2.9 million will be utilized for other EM&V activities. A tentative list of all evaluation activity is shown in table 10.3 (next page).

Table 10.3 Tentative Evaluation Schedule

Evaluation or Project	priority	2017	2018	2019	2020
Standard Impact and Process Studies					
RGGI Retail / Large Bus fuel blind	Required				
Small Bus and Muni lighting impact Eval	In process				
Consumer Products Process and Impact Eval	In process				
Homes Evaluation follow up (market transformation study)					
HPwES Process and Impact Eval					
HEA Process and Impact Eval					
C&I Non-Lighting Process and Impact (Large, Small & Muni)					
Cross-Cutting Activities					
Avoided Energy Supply Cost Study	Required				
ISO Certification of Utility Demand Resources	Required				
NH PUC Third Party Evaluation Contractor	Required				
NH Technical Resource Manual (TRM)	Required				
Energy Efficiency Market Assessment Study					
NEI study / secondary research					
NEEP, CEE, AESP, E-Source, other professional assoc.			TBD	TBD	TBD
Remaining EE Potential Study		TBD	TBD	TBD	TBD
Other EM&V Activities					
Utility Tracking System Upgrades / Maintenance	Required				
Quarterly and Annual Reporting	Required				
Upgraded Statewide Modeling Software		TBD	TBD	TBD	TBD

11.0 Performance Incentive

11.1 Background

On August 2, 2016, the Commission issued Order No. 25,932 approving a Settlement Agreement establishing an EERS. As part of the Settlement Agreement, the Settling Parties agreed that the Performance Incentive levels shall be identical for the NH Utilities. In addition, the maximum performance incentive percentage is capped at 6.875 percent, with a target of 5.5 percent effective beginning with the 2017 program year, through at least the first triennium of the EERS (2018 – 2020).

11.2 Performance Incentive Formula

Four factors influence the performance incentive (PI) for the electric programs: (1) the actual dollars spent; (2) the ratio of the actual lifetime electric savings achieved to the total actual lifetime electric energy savings achieved (includes both electric and non-electric measures); (3) the ratio of the actual benefit-to-cost ratio achieved to the predicted benefit-to-cost ratio; and (4) the ratio of the actual lifetime kilowatt-hour savings achieved to the predicted lifetime kilowatt-hour savings achieved.

Three factors influence the PI for the natural gas programs: (1) the actual dollars spent; (2) the ratio of the actual benefit-to-cost ratio achieved to the predicted benefit-to-cost ratio; and (3) the ratio of the actual lifetime natural gas savings achieved to the predicted lifetime natural gas savings achieved.

The formula is as follows:

A. For the NHSaves programs offered by the NH Electric Utilities:
    i. The percentage of electric lifetime savings to the total lifetime energy savings achieved by each electric utility is calculated using the following formula:

    Electric Lifetime Savings % = Electric Lifetime Savings / Total Lifetime Energy Savings
    Where:
    Total Lifetime Energy Savings = Electric Lifetime Savings (in kWh) + (Lifetime MMBTU Savings x 293)
    Lifetime Electric Savings = Actual lifetime kilowatt-hour savings achieved by all programs offered under this Plan by each electric utility
    Lifetime MMBTU Savings = Actual lifetime MMBTU savings achieved by all programs offered under this Plan by each electric utility

ii. If the Electric Lifetime Savings % >= 55%, then the PI formula for both electric and non-electric measures is:

$PI = [2.75\% \times ACTUAL] \times [(BC_{ACT} / BC_{PRE}) + (kWh_{ACT} / kWh_{PRE})]$

Where:

PI = Performance Incentive in dollars

ACTUAL = Total dollars spent less the performance incentive

BC_{ACT} = Actual Benefit-to-Cost ratio achieved

BC_{PRE} = Predicted Benefit-to-Cost ratio

kWh_{ACT} = Actual Lifetime Kilowatt-hour savings achieved

kWh_{PRE}= Predicted Lifetime Kilowatt-hour savings

This formula is used to calculate the PI for the Residential and the Commercial & Industrial Program sectors separately; the overall PI is determined by adding the sector PIs.

The Residential and Commercial & Industrial Program sector PIs are each capped at 6.875 percent of actual expenditures. In addition, the kWh savings ratio component and the B/C ratio component are each capped at 3.4375 percent of actual expenditures.

iii. If the Electric Lifetime Savings % < 55%, then the PI formula for both electric and non-electric measures is of the form shown in A.ii. above with the 2.75% multiplier replaced by 2.2%.

The formula is used to calculate the PI for the Residential and the Commercial & Industrial Program sectors separately; the overall PI is determined by adding the sector PIs.

The Residential and Commercial & Industrial Program sector PIs are each capped at 5.5% of actual expenditures. In addition, the kWh savings ratio component and the B/C ratio component are each capped at 2.75% of actual expenditures.

B. For the NHSaves programs offered by the NH Natural Gas Utilities:

The formula is:

$PI = [2.75\% \times ACTUAL] \times [(BC_{ACT}/BC_{PRE}) + (MMBTU_{ACT}/MMBTU_{PRE})]$

Where:

PI = Performance Incentive in dollars

ACTUAL = Total dollars spent less the performance incentive

BC_{ACT}= Actual Benefit-to-Cost ratio achieved

BC_{PRE}= Predicted Benefit-to-Cost ratio
$MMBTU_{ACT}$= Actual Lifetime MMBTU savings achieved
$MMBTU_{PRE}$ = Predicted Lifetime MMBTU savings

The Residential and Commercial & Industrial Program sector PIs are calculated separately and are independent of one another. The Residential Program sector PI is capped at 6.875% of the actual residential expenditures. In addition, the Commercial & Industrial Program sector PI is capped at 6.875% of the actual Commercial & Industrial expenditures. The overall PI is determined by adding the sector PIs.

C. The following threshold conditions are applicable:
   i. For the programs offered by the NH Electric Utilities and NH Natural Gas Utilities, the combined benefit-to-cost ratio for the Residential Program sector must be 1.0 or greater. If not, there is no incentive associated with the program cost effectiveness performance metric. The Commercial & Industrial Program sector component is calculated similarly.
   ii. For the programs offered by the NH Electric Utilities, the actual lifetime kWh savings for the Residential Program sector programs must be 65% or greater than the predicted lifetime kWh savings. If not, there is no incentive associated with the kWh savings performance metric. The Commercial & Industrial Program sector component is calculated similarly.
   iii. For the programs offered by the NH Natural Gas Utilities, the actual lifetime MMBTU savings for the Residential Program sector must be 65% or greater than the predicted lifetime MMBTU savings. If not, there is no incentive associated with the MMBTU savings performance metric. The Commercial & Industrial Program sector component is calculated similarly.

D. The NH Utilities may exceed the approved residential and commercial/industrial sector budgets which include all sources of funding and do not include the performance incentive by up to 5% without further review or approval by the Commission. A utility may apply for approval to exceed the 5% cap demonstrating good reasons why the cap should be exceeded for the program year.

11.3 Performance Incentive Budget

Each NH Electric Utility and NH Natural Gas Utility budgets for a 5.5% PI as follows:

$PI = 5.5\% \times [BUDGET_{TOT} - PI]$

$PI = 0.0521327 \times BUDGET_{TOT}$

Where:

PI = Performance incentive in dollars

$BUDGET_{TOT}$ = Total budget in dollars, including the performance incentive

11.4 Smart Start Financing Performance Incentive

Eversource's Smart Start Financing performance incentive is 6% of the loans repaid.

11.5 Benefit-to-Cost Ratio, Avoided Costs and Assumptions

Refer to Section 3.4 of this Plan for information on avoided costs used to calculate the benefit-to-cost ratios.

11.6 Performance Incentive Calculations

Attachments E1, F1, G1, H1, I1, and J1present each utility's calculations for cost effectiveness, performance incentive, planned benefit-to-cost ratios and planned energy savings for each program.