

2018-2020

NEW HAMPSHIRE STATEWIDE ENERGY EFFICIENCY PLAN

DRAFT

Jointly Submitted by New Hampshire's Electric and Natural Gas Utilities

Liberty Utilities (Granite State Electric) Corp. d/b/a Liberty Utilities

New Hampshire Electric Cooperative, Inc.

Public Service Company of New Hampshire d/b/a Eversource Energy

Unitil Energy Systems, Inc.

Liberty Utilities (EnergyNorth Natural Gas) Corp. d/b/a Liberty Utilities

Northern Utilities, Inc.

NHPUC Docket DE 17-XXX

May 31, 2017

NH SAVES

EVERSOURCE

 Liberty Utilities

 NEW HAMPSHIRE
Electric Co-op

 **Unitil**
energy for life

TABLE OF CONTENTS

1.0 Executive Summary	6
2018 - 2020 Program Vision	7
2018 - 2020 Program Goals	7
NHSaves Accomplishments & Benefits	8
NHSaves Programs Summary.....	10
2.0 Introduction	11
2.1 Energy Efficiency Vision	12
2.2 Energy Efficiency Resource Standard	12
2.3 2018-2020 Plan Vision	13
2.4 Program Benefits.....	18
2.5 NHSaves Program Achievements	21
3.0 The 2018-2020 NHSaves Portfolio	24
3.1 Annual Energy Savings Targets	25
3.2 Program Funding.....	27
3.3 Annual Program Budgets.....	29
3.4 Benefit – Cost Testing	33
3.5 Regulatory & Investigative Updates	37
4.0 Customer Experience, Marketing, & Education	42
4.1 Customer Experience	42
4.2 Program Marketing	42
4.3 Education and Training.....	45
5.0 NHSaves Financing Options	49
5.1 Residential Financing	49
5.2 Municipal Financing.....	51
5.3 Commercial Financing	52
6.0 NHSaves Residential Programs.....	53
6.1 ENERGY STAR Homes.....	57
6.2 Home Performance with ENERGY STAR (HPwES)	62
6.3 Home Energy Assistance (HEA).....	68

6.4 ENERGY STAR Products.....	75
6.5 Home Energy Report (HER) Program.....	79
6.6 Customer Engagement Platform.....	82
7.0 NHSaves Commercial Programs.....	84
7.1 Large Business Energy Solutions (Retrofit and New Construction).....	88
7.2 Small Business Energy Solutions	93
7.3 Municipal Program.....	97
7.4 Energy Rewards Request for Proposals (RFP).....	101
7.5 Combined Heat & Power (CHP)	104
8.0 Evaluation, Measurement and Verification (EM&V).....	106
8.1 Introduction.....	106
8.2 EM&V Framework	108
8.3 EM&V Working Group	109
8.4 Strategic EM&V Focus 2018-2020.....	110
8.5 Independent Evaluation Contractors.....	111
8.6 Stages of Evaluation.....	111
8.7 Technical Resource Manual	113
8.8 Budget.....	113
8.9 EM&V Priorities	114
8.10 Routine Program Reporting	114
9.0 Performance Incentive.....	117
9.1 Background	117
9.2 Performance Incentive Formula.....	117
9.3 Performance Incentive Budget.....	120
9.4 Smart Start Financing Performance Incentive.....	120
9.5 Benefit-to-Cost Ratio, Avoided Costs and Assumptions.....	120
9.6 Performance Incentive Calculations.....	120

TABLES and FIGURES

Table 1.1: Comparison to Previous 3-year Period

Table 1.2: Expected Savings from Other Fuels, by Sector

Table 1.3: Residential Programs Budgets Summary

Table 1.4: Residential Programs Energy Savings Summary

Table 1.5: Commercial Programs Budgets Summary

Table 1.6: Commercial Programs Energy Savings Summary

Figure 2.1: Cost per kWh by Energy Source

Table 2.2: Jobs supported by 2018-2020 NHSaves Programs

Figure 2.3: Additional Benefits from Energy Efficiency

Figure 3.1: Energy savings goals as a percentage of 2014 retail sales

Table 3.2: Electric Program Annual Statewide Savings Goals

Table 3.3: Natural Gas Program Annual Statewide Savings Goals

Table 3.4: Electric Program Annual Savings, by Utility

Table 3.5: Electric Program Annual Savings, by Sector

Table 3.6: Natural Gas Program Annual Savings, by Utility

Table 3.7: Natural Gas Program Annual Savings, by Sector

Table 3.8: Expected Savings from Other Fuels, by Sector

Table 3.9: Annual Funding Source, Electric

Table 3.10: Annual Funding Source, Natural Gas

Table 3.11: Annual Electric Budget, by Utility

Figure 3.12: Electric Budget, by Sector

Table 3.13: Annual Natural Gas Budget, by Utility

Figure 3.14: Natural Gas Budget, by Sector

Table 3.15: Benefits and Costs for the NH TRC Test

Table 3.16: Commercial Benefit-Cost Ratios

Table 3.17: Residential Benefit-Cost Ratios

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

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

Figure 6.3: Residential Barriers, Program Interventions, and Outcomes

Table 6.4: ENERGY STAR Homes Energy Savings and Budget

Table 6.5: Home Performance with ENERGY STAR Energy Savings and Budget

Table 6.6: Home Energy Assistance Energy Savings and Budget

Table 6.7: 2018 HEA Quarterly Project Capacity Schedule

Table 6.8: Home Energy Assistance Project Distribution

Table 6.9: ENERGY STAR Products Energy Savings and Budget

Table 6.10: Home Energy Reports Energy Savings and Budget

Figure 6.11: EVERSOURCE Home Energy Report

Table 6.12: EVERSOURCE Customer Engagement Platform Budget

Table 7.1: Market Barriers, interventions, and outcomes

Table 7.2: Large Business Energy Solutions Energy Savings and Budgets

Table 7.3: Small Business Energy Solutions Energy Savings and Budgets

Table 7.4: Municipal Energy Solutions Energy Saving and Budgets

Table 7.5: Energy Rewards Energy Savings and Budgets

Table 8.1: Stages of Evaluation

ATTACHMENTS

- Attachment A: Summary of Material Changes
- Attachment B: Statewide Goals
- Attachment C: Utility Budgets by Activity
- Attachment D: Utility Goals by Program
- Attachment E1: Eversource – Electric Program Cost-Effectiveness
- Attachment E2: Eversource – Electric Detailed Planning Assumptions by Program
- Attachment E3: Eversource – Electric System Benefits Charge Calculation
- Attachment F1: Liberty Utilities – Electric Program Cost-Effectiveness
- Attachment F2: Liberty Utilities – Electric Detailed Planning Assumptions by Program
- Attachment F3: Liberty Utilities – Electric System Benefits Charge Calculation
- Attachment G1: NHEC – Electric Program Cost Effectiveness
- Attachment G2: NHEC – Electric Detailed Planning Assumptions by Program
- Attachment G3: NHEC – Electric System Benefits Charge Calculation
- Attachment H1: Unitil Energy Systems, Inc. – Electric Program Cost-Effectiveness
- Attachment H2: Unitil Energy Systems, Inc. – Electric Detailed Planning Assumptions by Program
- Attachment H3: Unitil Energy Systems, Inc. – Electric System Benefits Charge Calculation
- Attachment I1: Liberty Utilities – Natural Gas Program Cost-Effectiveness
- Attachment I2: Liberty Utilities – Natural Gas Detailed Planning Assumptions by Program
- Attachment I3: Liberty Utilities – Natural Gas Energy Efficiency Rate Calculation
- Attachment I4: Liberty Utilities – Natural Gas Lost Base Revenue Rate Calculation
- Attachment J1: Northern Utilities – Natural Gas Program Cost-Effectiveness
- Attachment J2: Northern Utilities – Natural Gas Detailed Planning Assumptions by Program
- Attachment J3: Northern Utilities – Natural Gas Energy Efficiency Rate Calculation
- Attachment J4: Northern Utilities – Natural Gas Lost Base Revenue Rate Calculation

1.0 EXECUTIVE SUMMARY

Every aspect of today’s society is dependent on energy. As a result, New Hampshire’s social and economic prosperity depends, to a large extent, on how it manages its energy generation, distribution, and consumption. Managing energy and demand effectively can maximize the benefits energy provides, while improving quality of life and boosting the local economy. A major component of intelligent energy management is to reduce energy consumption and demand, wherever practical.

New Hampshire is now entering a new phase in its energy management strategy. On August 2, 2016 the New Hampshire Public Utilities Commission (“Commission”) approved an Energy Efficiency Resource Standard (“EERS”) that defines long-term energy savings targets for the state’s utilities and a framework that will allow New Hampshire to achieve those goals.

Energy efficiency is a key strategy for building a modern and sustainable energy future for New Hampshire; therefore, it is a central mission for the State’s utilities and the EERS. Energy conservation and energy efficiency are the lowest cost energy resources available—every unit of energy saved is less expensive than the cost of generating a unit of energy. These efforts will continue to save customers¹ money, avoid emissions, and reduce the need to generate additional power.

The NH Utilities are proud of the sustained trust that regulators, legislators, and customers have placed in the companies to deliver energy efficiency solutions to residents and businesses in the State. Through the coordinated and integrated planning of the NHSaves programs, the NH Utilities support capturing the significant energy saving opportunities found in new and existing homes, businesses, and institutions.

The NHSaves brand facilitates consistency in the delivery of programs across the State, while enhancing the long-term relationships each utility company has developed with our customers. Under the new EERS framework, the NH Utilities will build upon our understanding of customer expectations of energy usage and management, deepen existing relationships with stakeholders, expand efficiency programs, and capture additional energy savings.

¹ Hereinafter, the word “customer” will be understood to mean both customers and New Hampshire Electric Cooperative members.



2018 - 2020 Program Vision

The NH Utilities have a common vision for the future of the NHSaves programs, which we believe will enable the state to meet or exceed the new EERS energy efficiency goals for 2018-2020 and beyond. Our vision includes following our energy efficiency guiding principles, enhancing the customer experience, continually engaging stakeholders to increase customer participation and energy savings, expand product and service provider infrastructure, and stimulate private investment. These actions will result in sustained, orderly energy efficiency market development and provide significant economic benefits throughout New Hampshire.

2018 - 2020 Program Goals

The NH Utilities have years of experience operating successful energy efficiency programs in the state, and we have the knowledge, infrastructure, and relationships in place to meet the EERS program goals. Under the EERS, energy efficiency savings goals are increasing. Between 2018 and 2020 the NH Utilities must achieve cumulative energy savings of 3.1 percent of the Electric Utilities 2014 kWh delivery sales and 2.25 percent of the Natural Gas Utilities MMBtu delivery sales. The data in Table 1.1 provides a comparison to the previous 3-year period.

Table 1.1: Comparison to Previous 3-year Period

ELECTRIC PROGRAMS	2015-2017	2018-2020
Cumulative Lifetime MWh Savings	2,271,515	4,025,692
Cumulative Annual MWh Savings	175,168	334,567
Cumulative Annual Savings as a % of 2014 Delivery Sales	1.62	3.1
Cumulative Program Funding	\$83,257,515	\$154,718,000
Program Cost per Lifetime kWh Savings	\$0.037	\$0.038
NATURAL GAS PROGRAMS	2015-2017	2018-2020
Cumulative Lifetime MMBtu Savings	6,908,142	7,455,688
Cumulative Annual MMBtu Savings	447,585	525,570
Cumulative Annual Savings as a % of 2014 Delivery Sales	1.92	2.25
Cumulative Program Funding	\$22,464,480	\$31,541,000
Program Cost per Lifetime MMBTU Savings	\$3.25	\$4.23

NHSaves Accomplishments

Since Inception the NH Saves Programs have:



Saved 13 billion kWh

Saved 27.7 million natural gas MMBtu

Saved customers \$2.2 billion

The NHSaves programs are designed to meet the energy efficiency needs of the diverse customers in the state by offering a suite of solutions. Through business partnerships with the private sector and well-designed rebates and incentives, the NHSaves programs provide highly successful, award winning efficiency programs for the State's residents, businesses, and municipalities.

Since 2002, the NH Utilities have partnered with our customers, energy service providers and other stakeholders to deliver significant energy savings, reduce peak usage, supply an inexpensive source of energy, and provide myriad other benefits to residents and businesses. And stakeholders can have confidence in our results, which are verified through a robust evaluation process.

Benefits Resulting from the 2018-2020 Plan

Energy Savings

The 2018-2020 Plan will result in customer installation of energy efficiency measures that will save more than 4 billion electric kilowatt-hours and 7.5 million natural gas MMBtus over the lifetime of the measures installed. In addition the program will save 5.4 million MMBtu from other fuels such as oil and propane.

Peak Usage Reduction

Energy efficiency programs reduce energy usage across the distribution system, which lowers energy costs for all customers. This is especially notable on "peak" usage days in the summer and winter when additional, and more expensive, power sources are brought on line to meet demand. Peak demand reduction from the 2018-2020 Plan increases from 10 MW in 2018 to more than 39 MW in 2020.

Customer Cost Savings

The energy saved through the 2018-2020 Plan will result in customer cost savings of more than \$838 million over the lifetime of the measures. This breaks down to \$582 million in savings



from reduction in use of electricity, \$132 million in savings from reduction in use of natural gas and \$124 savings from reduction in use of other fossil fuels. These savings are about 4.5 times the cost of the programs.

Economic Impact

When customers spend less on energy they are able to use those funds for other priorities, reinvesting in the local economy. In addition, the investment in energy efficiency measures and services supports jobs. The 2018-2020 Plan will support 2,100 full time equivalents (FTEs) or 4.4 million work hours.

Lower Cost Energy Source

The NHSaves programs provide value to all customers, participants as well as nonparticipants because energy efficiency is a way to provide inexpensive, clean electricity. According to the Energy Information Administration (EIA), energy efficiency can be procured at about one-half the cost of generating electricity from traditional and alternative fuel sources².

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 lower demand. The 2018-2020 Program will lead to a reduction of more than 2.4 million tons of greenhouse gas emissions, the equivalent of taking 520 thousand passenger vehicles off the road for one year.

Quality Assurance

The savings and value of the NHSaves programs are reviewed and confirmed under high standards of accountability. Annual financial audits of the NH Utilities by the Commission, annual third-party certification of savings results to the Independent System Operator of New England (ISO-NE), and quarterly reporting to the Commission and stakeholders on actual program results ensure accountability and transparency. Quality assurance inspections by utility staff and third party experts ensure energy efficiency measures are installed and operating appropriately. Furthermore, program process and impact evaluations are conducted on a regular basis by third-party evaluators to verify energy savings and identify opportunities for improvement.

² http://eia.gov/forecasts/aeo/pdf/electricity_generation.pdf



NHSaves Programs Summary

Electric and natural gas 2018-2020 EERS goals will be accomplished through our residential, commercial & industrial, and municipal programs.

The residential NHSaves programs include:

- **ENERGY STAR® Homes** provides incentives to customers or builders who are constructing highly efficient new homes.
- **Home Performance with ENERGY STAR (HPwES)** provides comprehensive energy efficiency improvements for existing homes.
- **Home Energy Assistance** provides energy-saving support to income eligible residents.
- **ENERGY STAR Products** provides rebates and markdowns to encourage customers to purchase energy-saving products such as lighting, appliances, and heating systems.

The commercial NHSaves programs include:

- **Large Business Energy Solutions** provides incentives to large commercial and industrial customers who are retrofitting existing facilities or equipment, constructing new facilities, adding equipment, or replacing equipment that is at the end of its useful life.
- **Small Business Energy Solutions** provides incentives for new and retrofit projects and also includes turn-key energy services to small commercial customers who lack the time, resources, or expertise to implement energy saving solutions.
- **Municipal Energy Efficiency Program** provides incentives to municipal customers who are constructing new facilities or retrofitting existing facilities.

The NHSaves programs also have utility specific offerings, which include:

- **Home Energy Reports** compare energy performance among homes and encourage greater efficiency.
- **Energy Rewards RFP** encourages customers to submit comprehensive projects as part of a competitive bid process.
- **Customer Engagement Platform** utilizes self-service tools to help customers learn more about energy efficiency and develop a customized energy savings plan.

The NH Utilities are excited to lead New Hampshire's efforts in energy efficiency for the future by continuing to partner with our customers and stakeholders to design and deliver beneficial and cost effective energy solutions. We will also continue to improve these programs and develop new opportunities to maximize program participation and realize deeper cost effective energy efficiency throughout New Hampshire. These programs will help our state support economic growth while also improving the quality of life for all of our citizens.

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 Unil Energy Systems, Inc. (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. (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 customer's ever evolving energy needs. Since 2002, we have worked together to seamlessly deliver energy solutions and services for our customers. 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 and our customers have achieved substantial energy savings over the past 15 years through³ 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 27.7 million natural gas MMBtu over the life of the measures. The energy savings alone have resulted in customer cost savings of \$2.2 billion.

The NHSaves program accomplishments reflect the solid working relationship 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 successful delivery of energy efficiency programs and services to-date and will remain so in the future.

³ The NH utilities provided energy efficiency programs individually prior to 2002

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, institutions, businesses and municipalities. The third element is to deliver cost effective energy savings that provide a significant benefit 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 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 three-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 three-year planning period equates to 3.1% of retail electric sales and 2.25% of retail natural gas sales, relative to a 2014 baseline. 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 MWh and 78,000 MMBtu.

ELECTRIC PROGRAMS	2015-2017	2018-2020
Cumulative Lifetime MWh Savings	2,271,515	4,025,692
Cumulative Annual MWh Savings	175,168	334,567
Cumulative Savings as a % of 2014 Delivery Sales	1.62	3.1
Cumulative Program Funding	\$83,357,515	\$154,718,000
Program Cost per Lifetime kWh Savings	0.0367	0.0384
NATURAL GAS PROGRAMS	2015-2017	2018-2020
Cumulative Lifetime MMBtu Savings	6,908,142	7,455,688
Cumulative Annual MMBtu Savings	447,585	525,570
Cumulative Savings as a % of 2014 Delivery Sales	1.92	2.25
Cumulative Program Funding	\$22,464,480	\$31,541,000
Program Cost per Lifetime MMBTU Savings	3.25	4.23

The EERS will allow the NH Utilities to reach more New Hampshire customers, helping them to install energy efficiency measures and projects through our programs. These goals also drive expanded partnerships and outreach to help our customers achieve more comprehensive energy efficiency. New initiatives to achieve these goals include a new energy audit option for residential customers, new measures, 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-participating customers. Increased efficiency lowers customer energy use overall and can lead to peak load reductions. Saving energy and reducing demand contributes to lower customer energy bills. The energy efficiency industry also significantly supports a growing local and state labor force to design, implement, 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 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 tradesmen 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 home and business energy needs; we are trusted advisors on matters related to energy efficiency.

The ability to achieve the outcomes will be strengthened and supported through 3 key areas:

- Our long-standing guiding principles of energy efficiency
- Our efforts to enhance and streamline the customer experience
- Our continued endeavors to solicit and engage stakeholders

Guiding Principles of Energy Efficiency

In developing the 2018-2020 Plan, the NH Utilities were guided by several overarching and interrelated commitments to energy efficiency planning.



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.



Jointly coordinate program delivery of electric and natural gas programs in order to provide a seamless customer experience. To serve the wide spectrum of customers effectively, the NH Utilities will continue to jointly coordinate programs to optimize their delivery. We have met goals by working together, sharing information and experiences, and providing each other with the depth of knowledge across the state's utilities. This partnership will get stronger and more productive as these programs grow, strengthen the economy, and improve the performance of homes and businesses across the state.



Develop short-term savings targets with the long-term goal of achieving all cost-effective energy efficiency. The EERS framework consists of three-year planning periods and savings goals as well as a long-term goal of achieving all cost-effective energy efficiency. By having a minimum three-year program planning and operation window, the NH Utilities can tailor program design and invest in the capacity to provide a long-term energy efficiency commitment to New Hampshire. It creates

continuity and consistency for contractors, manufacturers, retailers, and other stakeholders who plan for energy efficiency equipment and programs. The three year planning period is a critical component for ongoing success of NHSaves programs and good for businesses throughout New Hampshire.



Drive innovation in technology, outreach, and regulation to accelerate energy efficiency gains. The NH Utilities will continue to explore innovative new technologies for saving energy, new ways to reach customers, and opportunities to engage with regulators and stakeholders to further drive energy efficiency in New Hampshire.

- **Technology:** The NH Utilities will stay abreast of new technologies entering the market with significant energy savings potential including heat pumps, and smart technology. Past successes in lighting transformation demonstrate that utilities are well positioned to continue driving innovation.
- **Program reach:** The NH Utilities will also incorporate new innovative program designs and additional opportunities to capture energy savings. Online marketplaces, behavioral initiatives, and upstream incentives are areas of interest. We will stay informed on best practices from across the country to deliver innovative solutions to customers and drive the adoption of energy efficient products and customer approaches to save energy.
- **Regulatory:** The enhanced stakeholder process initiated through the EERS will help to facilitate input and discussion with interested parties. This opportunity to work through areas of interest can help to streamline and support the regulatory process.



Leverage the private financing market in New Hampshire to support customer investment in energy efficiency. Partnerships with lenders and financing institutions will help to make private capital available so that customers can invest in comprehensive projects. Attractive financing offerings encourage customers to move forward and increase their ability to achieve significant energy savings.



Increase public awareness of the benefits of energy efficiency and the available opportunities. 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 satisfaction among utility customers. The more the NH Utilities are able to make energy consumption awareness messages directly relevant to residents, building owners and occupants, the more that our customers will understand and appreciate efficiency programs and the value they bring to NH.



Enhancing the 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' mission. 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.

Designing, implementing, and managing the NHSaves programs from the customer experience perspective will increase customer engagement, program participation, and benefits for all. Our customers' expectations of NHSaves programs and services are increasing. Like companies in other industries, the NH Utilities strive to stay ahead of customer demands, approaching each interaction as an opportunity to provide information and engagement.

Providing a streamlined customer experience is a necessity to meet customer expectations in today's marketplace. For example, analyzing customer's usage by segment, identifying specific opportunities for each business type, and partnering with installation contractors to deliver appropriate and targeted energy efficiency services is something we are working on to better meet the needs of our customers. Delivering positive experiences will help ensure customer satisfaction, establish trust, facilitate better engagement, and empower customers to take energy efficient actions.

Engaging Stakeholders

The NH Utilities work with a substantial range of stakeholders 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 on the guiding principles of energy efficiency.

2018-2020 EERS PLANNING

In the preparation of this three year plan, the NH Utilities have been working closely with stakeholders. Stakeholder discussions regarding establishing the EERS and 3-Year Plan began in February 2015, when the Straw Proposal 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 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.⁴ In early 2017, the NH Utilities and the EESE Board jointly hosted a series of stakeholder workshops 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 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 by the Board⁵.

- Non-Energy Impacts (NEIs): recommend that the utilities consider an evidence-based approach to valuing NEIs in their proposed EERS plan. (Adopted by EESE Board on 3/17)
- Evaluation, Measurement & Verification (EM&V): Support an approach of using New Hampshire-relevant features of the Massachusetts EM&V process model, including the establishment of an EM&V working group comprised of Commission staff, utility staff, and the EM&V consultant to be chosen by the Commission. (Adopted by EESE Board on 4/21)
- Financing: The Program Administrators should continue to engage and explore new private financing channels and other funding opportunities to facilitate program participation and encourage comprehensive energy efficiency investments. (Adopted by EESE Board on 4/24)

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

⁴ Membership of the EESE Board and EERS Committee can be found on the EESE Board's website <https://www.puc.nh.gov/EESE.htm>

⁵ Minutes from EESE Board meetings can be found on the Board's website

2.4 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

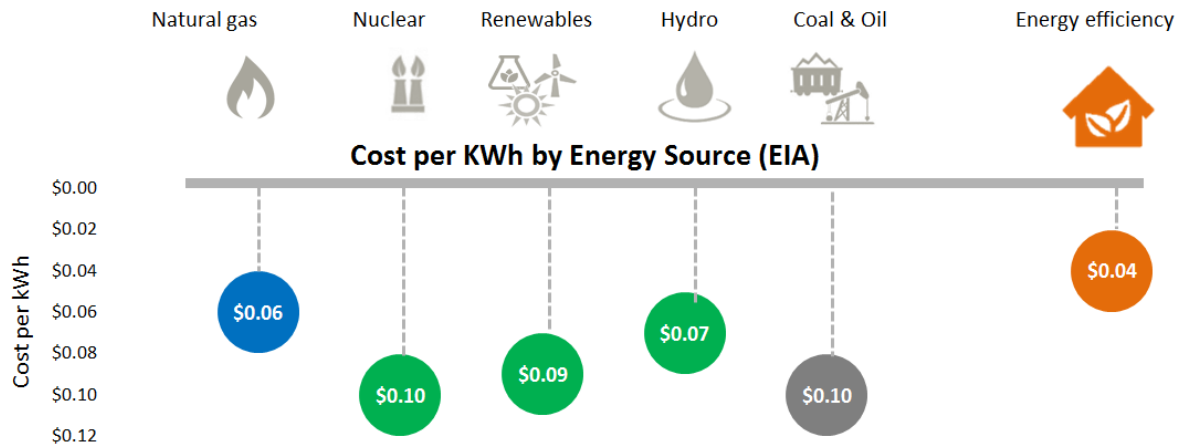
Since 2002, New Hampshire natural gas and electric customers have installed energy efficiency measures that have saved more than 13 billion electric kilowatt-hours and 27.7 million natural gas MMBtus, resulting in cumulative customer savings of in excess of \$2.2 billion. Furthermore, the 2016 ISO-NE Energy Efficiency Forecast Report 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 MMBtu. In addition the program will save 5.4 million MMBtu from other fuels. These energy savings will result in customer cost savings of more than \$838 million over the lifetime of the measures.

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, decreases wear and tear on utility infrastructure, and costs less than new energy generation. Data from the Energy Information Administration demonstrates that energy efficiency is at least half the cost of coal & oil and natural gas. (**Figure 2.1**).

Figure 2.1: Cost per kWh by Energy Source



Sources: Cost data from eia.gov/forecasts/aeo/pdf/electricity_generation.pdf; Resource mix: iso-ne.com/about/key-stats/resource-mix

Environmental Benefits

Energy efficiency efforts help offset energy consumption, which in turn help mitigate greenhouse gas emissions as power plants burn fewer fossil fuels to meet 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 2.4 million tons of greenhouse gas emissions, the equivalent of taking 520 thousand passenger vehicles off the road for one year.

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 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 2,100 full time equivalents (FTEs) or 4.4 million work hours (using 2,080 hours per year for each FTE).

Table 2.2: Jobs supported by 2018-2020 NHSaves Programs

Total Budget	Direct Jobs supported	Indirect Jobs supported
\$ 176.5 million	1,236	865

Direct jobs include those performed by home energy auditors or installation contractors who install insulation and appliances in homes to make them more energy efficient, 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 lumber, 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, 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 plant and 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 and work (**Figure 2.3, next page**). These benefits are particularly important to income qualified and moderate income customers, who spend higher portions of their household budgets on energy and housing costs.

Figure 2.3: Additional Benefits from Energy Efficiency



2.5 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 to share and seek out best practices. Our efforts 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, 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 over 15,000 people. This recognition represents a significant



collaborative effort between the NH Utilities and the building trades in New Hampshire who 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 program⁶

2015 - ENERGY STAR Partner of the Year—Sustained Excellence recognition for its successful implementation of the ENERGY STAR Certified Homes program.

2014 – Partner of the year – Program Delivery for its successful implementation of the ENERGY STAR Certified Homes program.

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) programs⁷.

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 in the New Home Builder and Affordable Housing categories, while GDS Associates won the 2017 ENERGY STAR Partner of the Year award as Home Energy Rater.

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. This is New Hampshire's first ENERGY STAR multifamily high-rise, and is only the second multifamily high-rise in New England to earn this rating. 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 heat pump units for heating, cooling and hot water;
- Highly efficient plumbing fixtures using less water than required by state code; and

⁶ https://www.energystar.gov/about/content/nh_energy_efficiency_team

⁷ <https://www.energystar.gov/ia/partners/publications/pubdocs/POY%202013%20Profiles%20508%20compliant.pdf?4b83-5829>

- Exterior walls lined with R21 spray foam insulation.

Northeast Energy Efficiency Partnership (NEEP) Award

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

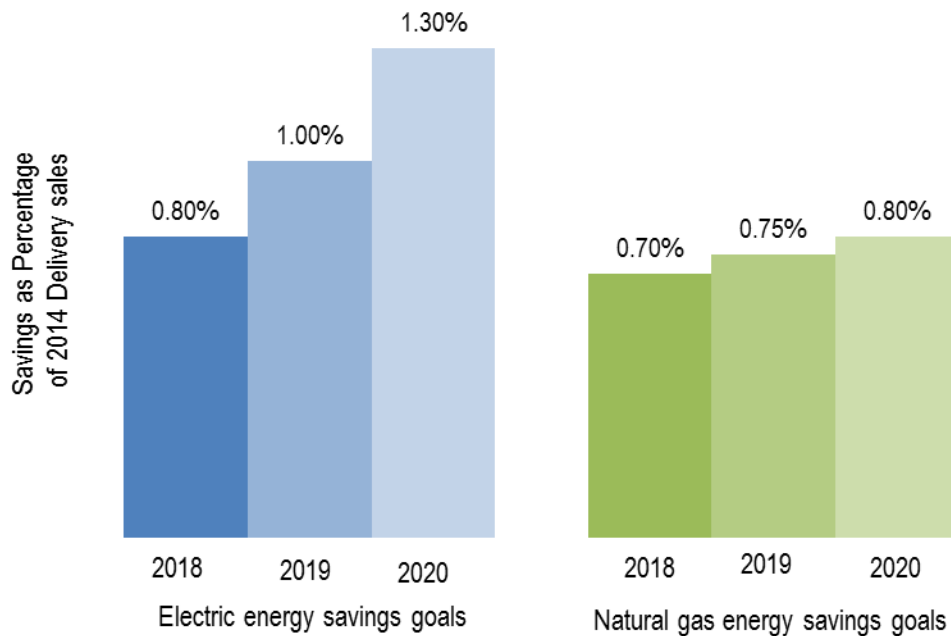
- The Holderness School (2016 Northeast Business Leader for Energy Efficiency and Business Leader State Champion): The Holderness School, a private, co-educational school for grades 9-12, has participated in the NH programs and puts energy efficiency at the heart of its new construction and renovation projects. Holderness has achieved an annual savings of over 191,000 kWh and an annual cost savings of nearly \$370,000.
- Concord Hospital (2015 Northeast Business Leader for Energy Efficiency): 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 kWh. The combined energy savings corresponds to an annual cost savings of approximately \$720,000.
- Dartmouth College (2015 Northeast Business Leader for Energy Efficiency): Dartmouth's far-reaching commitment to energy efficiency has resulted in annual savings of nearly 2.9 million kWh and about \$300,000 in annual electricity costs.
- DevTech Labs, Inc. (2015 Northeast Business Leader for Energy Efficiency): 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 kWh, or about \$351,000 annual savings in electricity costs.

3.0 The 2018-2020 NHSaves Portfolio

Commission Order No. 25,932 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 3.1 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 percent in 2019, and 1.3 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 3.1: Energy savings goals as a percentage of 2014 retail sales

The EERS mandates that the energy savings goals increase incrementally between 2018 and 2020.





Tables 3.2 and 3.3 summarize the statewide energy savings goals for the NHSaves Electric and Natural Gas Programs.

Table 3.2: Electric Program Annual Statewide Savings Goals

Electric Annual Statewide Goals (MWH)				
2014 Delivery Sales (MWH)	2018	2019	2020	2018-2020
10,782,973	86,264	107,830	140,179	334,272

Table 3.3: Natural Gas Program Annual Statewide Savings Goals

Natural Gas Annual Statewide Goals (MMBtu)				
2014 Delivery Sales (MMBtu)	2018	2019	2020	2018-2020
23,352,672	163,469	175,145	186,821	525,435

3.1 Annual Energy Savings Targets

The 2018-2020 NHSaves Program Plan includes 3-year electric energy savings of approximately 334,000 MWh and natural gas energy savings of 525,000 MMBtu. Tables 3.4, 3.5, summarize the energy savings targets for the NHSaves electric program. Tables 3.6, 3.7 summarize the energy savings targets for the NHSaves natural gas programs.

Table 3.4: Electric Program Annual Savings, by Utility

Company	Electric Annual Savings (MWH)				Percentage of 3-year Statewide Savings
	2018	2019	2020	2018-2020	
Eversource	66,316	84,141	108,849	259,306	78%
Liberty Utilities	7,492	8,866	11,841	28,199	8%
NHEC	4,168	5,298	7,072	16,538	5%
Unitil	8,318	9,582	12,624	30,524	9%
Total	86,294	107,887	140,386	334,567	100%

Table 3.5: 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	67,545	84,279	110,208	262,032	78%
Residential	17,945	22,579	28,806	69,330	21%
Income Eligible	803	1,028	1,371	3,202	1%
Total	86,294	107,887	140,386	334,567	100%

Table 3.6: 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%
Unitil	33,542	36,705	40,242	110,489	21%
Total	163,614	174,785	187,171	525,570	100%

Table 3.7: 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	111,420	121,960	130,723	364,103	69%
Residential	42,778	42,750	45,715	131,243	25%
Income Eligible	9,416	10,075	10,733	30,224	6%
Total	163,614	174,785	187,171	525,570	100%



The NH Electric Utilities programs also generate additional MMBtu savings from other fuels such as 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. These savings are particularly important to reduce overall energy usage and the energy cost burden of low-income customers, other residential customers, and municipal customers and contribute to the programs’ cost-effectiveness. The savings that will be acquired in these sectors is reflected in Table 3.8.

Table 3.8: Expected Savings from Other Fuels, by Sector

	Savings From Other Fuel Sources, by Sector (MMBtu)				
	2018	2019	2020	2018-2020	Lifetime
Income Eligible	19,620	25,812	35,236	80,668	1,675,628
Residential	35,149	53,880	81,406	170,435	3,525,315
Municipal	3,914	3,834	3,794	11,542	174,401

3.2 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) which 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 obtained 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 derive from demand reductions resulting 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 \$0.00282 per kilowatt-hour. The proposed SBC rate is a \$0.00084 increase from the current SBC energy efficiency program rate of \$0.00198 per kilowatt-hour, but is approximately 8.7 percent lower than 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 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 demand assets. These differ by electric company and are subject to adjustment based on future performance.

Table 3.9: Annual Funding Source, Electric

Source	Annual Electric Funding (\$000)				Percentage of 3-year Budget
	2018	2019	2020	2018-2020	
System Benefits Charge (SBC)	30,389	40,777	57,324	128,490	83%
Carry forward & Interest	(580)	-	-	(580)	0%
Regional Greenhouse Gas Initiative (RGGI)	2,610	2,610	2,610	7,830	5%
ISO-NE Forward Capacity Market (FCM)	6,379	6,262	6,337	18,978	12%
Total	38,798	49,649	66,271	154,718	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 3.10]. 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 for 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.

Table 3.10: 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)	9,313	10,486	11,365	31,163	99%
Carry forward & Interest	271	57	51	379	1%
Total	9,583	10,543	11,415	31,542	100%

3.3 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 3.11 and 3.13 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 3.11: Annual Electric Budget, by Utility

Company	Electric Budget (\$000)				Percentage of 3-year Budget
	2018	2019	2020	2018-2020	
Eversource	27,192	35,363	46,890	109,445	75%
Liberty	3,219	3,905	5,346	12,470	9%
NHEC	2,293	2,987	4,086	9,366	6%
Unitil	4,074	4,809	6,497	15,380	10%
Total	36,778	47,064	62,819	146,661	100%

Figure 3.12: Electric Budget, by Sector

NHSaves Electric Budget Allocation by Sector

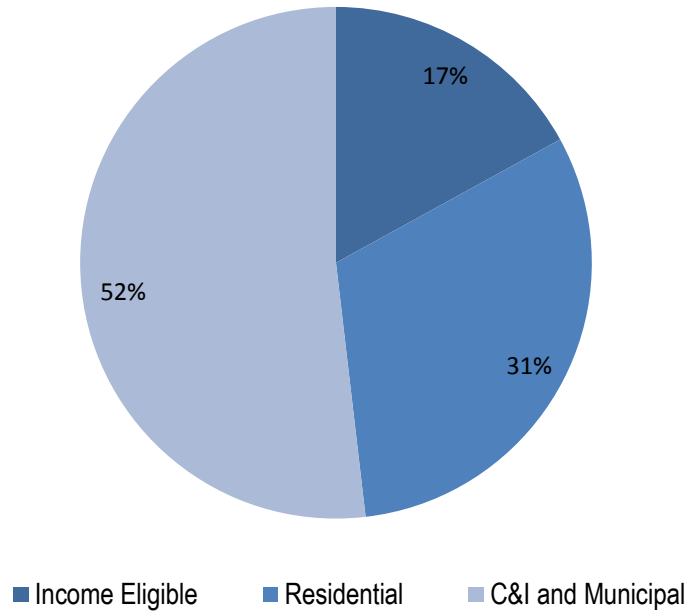
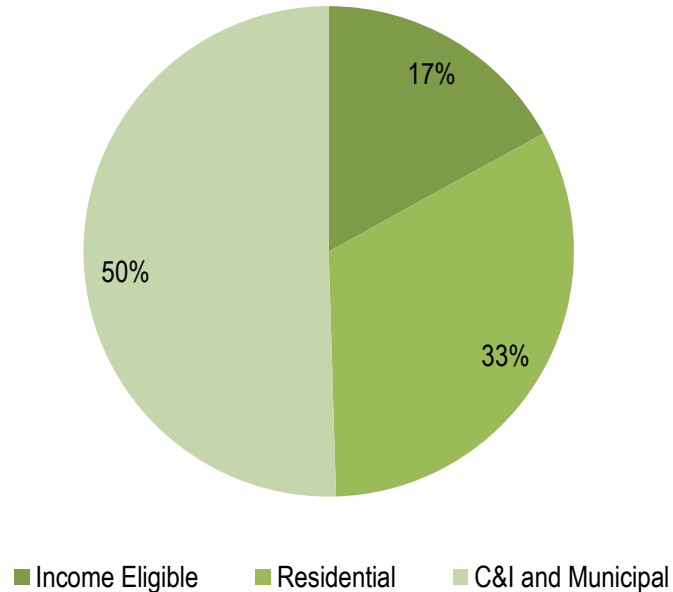


Table 3.13: Annual Natural Gas Budget, by Utility

Company	Natural Gas Budget (\$000)				Percentage of 3-year Budget
	2018	2019	2020	2018-2020	
Liberty	7,161	7,828	8,489	23,478	79%
Unitil	1,923	2,165	2,331	6,419	21%
Total	9,084	9,993	10,820	29,897	100%

Figure 3.14: Natural Gas Budget, by Sector

NHSaves Natural Gas Budget Allocation by Sector



Budget allocations by sector are informed by the source of the funds, and on each sector’s proportional share of each utility’s forecasted delivery sales. 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 the Municipal Program, where applicable. 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. 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 Systems Benefits Charge (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 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 130% of the program's budget.

Multi-year Project Budget Approval

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

- All customer classes eligible to participate in the NHSaves Programs are eligible for multi-year project approvals. 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 and 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 which 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 have found that customers often 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.

3.4 Benefit – Cost Testing

In accordance with Commission Order No. 23,850, in DE 01-057, dated November 29, 2001, 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 the present value of energy and non-energy impacts over the life of program measures (numerator) and compares that to the present value program cost plus any 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 the program or measure generates more benefits than costs. Further, the use of common avoided costs by the NH Utilities ensures that all New Hampshire customers will have access to the same programs and services.

For the 2018-2020 Plan, the New Hampshire TRC test uses a nominal discount rate of 4.0 percent⁸ and a general inflation rate of 1.56 percent⁹ within the TRC Test to discount future benefits.

The New England utilities reference a regional avoided cost study for the avoided costs that are used for benefit-cost modelling. *Avoided Energy Supply Costs in New England: 2015 Final Report* (“2015 AESC”) was completed in March 2016 and includes avoided costs associated with electricity, fossil fuels and wood in several states, including New Hampshire. In December 2016, an interim update of the AESC was completed (“AESC Update”). 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 a new ISO-NE zone. The electric avoided costs in the AESC Update were approximately 8 percent lower than the 2015 AESC, and natural gas avoided costs were approximately 9 percent lower. The AESC Update avoided costs are used in this Plan.

Demand Reduction Induced Price Effects (DRIPE) refers to the effects on energy prices resulting from decreased demand. Consistent with the 2017 Plan Update, all electric and natural gas DRIPE from the AESC are included in the benefit cost screening for the 2018-2020 Plan.

⁸ Based on the June, 2017 Prime Rate in accordance with the Final Energy Efficiency Group Report, dated July 6, 1999 in DR 96-150. <http://www.moneycafe.com/personal-finance/prime-rate/>

⁹ Based on the inflation rate from Q4 2015 to Q4 2016, <https://fred.stlouisfed.org/series/GDPDEF/>, latest reported values.



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

It is standard practice to include non-energy impacts (“NEIs”) into the TRC Test. These NEIs may include resource savings (e.g., water) as well as non-resource impacts (e.g., operations and maintenance). In the past, the only non-energy impacts included in the TRC test were avoided water and sewer costs. In recognition of the value provided by NEIs and based on robust evaluations conducted in several states, the NH Utilities have applied a ten percent adder to electric and fossil fuel benefits. This is a conservative proxy for the full value of a multitude of known NEIs. The NH Utilities recommend the EM&V Working Group, as described in the EM&V section of this Plan, be tasked with the ongoing review and quantification of NEIs for incorporation by the NH Utilities in future Plans.

The summary table on the next page (Table 3.15) illustrates the benefits and costs that are included in the New Hampshire TRC Test. The following tables, (Table 3.16 and Table 3.17) summarize the benefit cost ratios of the individual Commercial and Residential programs.

Table 3.15: 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, plus any 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

Notes:

- 1 AESC Update, New Hampshire Exhibit B, columns 3 - 6. Includes the wholesale risk premium
- 2 AESC Update, New Hampshire Exhibit B, column 9.
- 3 AESC Update, New Hampshire Exhibit B (electric), Exhibit C (natural gas). Includes all forms of applicable New Hampshire electric and natural gas DRIPE.
- 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. Includes avoidable retail margin.
- 7 AESC Update, Exhibit D.
- 8 AESC Update, Exhibit D.
- 9 AESC Update, Exhibit D.
- 10 AESC Update, Exhibit D.
- 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 3.16: Commercial Benefit-Cost Ratios

Commercial Programs Benefit-Cost Results				
	2018	2019	2020	2018-2020
Electric				
Large Business Energy Solutions	2.30	2.31	2.32	2.31
Small Business Energy Solutions	1.74	1.77	1.80	1.78
Municipal Energy Solutions	1.44	1.43	1.42	1.43
Energy Rewards RFP Program	1.75	1.76	1.76	1.76
Natural gas				
Large Business Energy Solutions	1.74	1.73	1.73	1.73
Small Business Energy Solutions	1.74	1.75	1.72	1.74

Table 3.17: Residential Benefit-Cost Ratios

Residential Programs Benefit-Cost Results				
	2018	2019	2020	2018-2020
Electric				
Home Energy Assistance Program	1.36	1.42	1.53	1.45
ENERGY STAR Homes	1.89	2.12	2.28	2.13
Home Performance with ENERGY STAR	1.64	1.80	1.95	1.84
ENERGY STAR Products	1.91	1.99	1.99	1.97
Home Energy Reports	1.20	1.42	1.70	1.52
Natural gas				
Home Energy Assistance Program	1.22	1.21	1.22	1.22
ENERGY STAR Homes	1.36	1.43	1.46	1.42
Home Performance with ENERGY STAR	1.27	1.24	1.22	1.24
ENERGY STAR Products	1.19	1.22	1.25	1.22
Home Energy Reports	1.31	1.32	1.29	1.30

3.5 Regulatory & Investigative Updates

Funding

Across the country, states and utilities are exploring ways to harness private investment opportunities and the secondary market in order to provide additional funding sources for energy efficiency programs. In this section we detail the financing sources the NH Utilities have utilized in the past and funding we plan to utilize for energy efficiency programs in the 2018-2020 portfolio cycle.

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 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 higher levels in the future 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.

The NH Utilities have proven successful in accessing additional grant funds to supplement programs. For example, in 2009 the NH Utilities were awarded 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.

In 2015 we were jointly awarded \$1.2 million in RGGI funds, beyond those that are statutorily dedicated to the 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. We will finish the current RGGI grant in 2018 and hope to pursue additional RGGI funds if available.

In addition to RGGI funds, the NH Utilities have partnered several times with the NH Office of Energy and Planning (OEP) to successfully leverage additional federal funding into the energy efficiency programs. The NH Utilities have been able to provide a streamlined process to immediately put available federal dollars to work helping NH citizens implement energy efficiency projects:

- In 2010, the heating system replacement program used \$731,000 in federal ARRA funding to help customers replace aging and inefficient fossil fuel heating systems.
- 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 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 USDOE. 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

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 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 three-year plan.

Grant funding can provide valuable support to the energy efficiency programs; however, there is little potential for grant funding to become the primary 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. They 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.

We 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.

The NH Utilities have also researched the role of secondary market capital and its applicability to the New Hampshire energy efficiency programs. According to a report published in 2015 by

The State and Local Energy Efficiency Action Network,¹⁰ “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 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 report 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.

The NH Utilities will continue to review and research opportunities and models that may provide program funding sources or other approaches to making capital available to customers in the future. We will continue to review research from other states and stay abreast of secondary market opportunities or other investments that may be applicable to our programs in New Hampshire.

The System Benefits Charge, and the LDAC 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 many other jurisdictions fund their EERS and energy efficiency programs.¹¹

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.

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).

¹⁰ “Assessing Secondary Markets as a Capital Source for Energy Efficiency Finance Programs: Program Design Considerations for Policymakers and Administrators,”

¹¹ ACEEE State Policy Database, <http://database.aceee.org/>



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.

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.

Furthermore, 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, Wifi 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 to even help a utility facing a distribution level constraint.

The NH Utilities are interested in exploring the beneficial and rewarding prospects of these 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 are a number of newer technologies being tested in New England that the NH Utilities will be closely monitoring. In Massachusetts, new initiatives focused on testing peak reduction at commercial, industrial and municipal customer sites include battery storage, thermal storage, demand response and control technologies. Additionally, Connecticut is also testing energy storage and active load controls 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.

4.0 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.

4.1 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 worked to streamline an online application option for ENERGY STAR appliance rebates. Our account representatives work one-on-one with business customers to help them through the efficiency project process and provide a single point of contact. The markdown approach for residential lighting incentives streamlines the process not only for retailers, but for customers, helping them to quickly identify and purchase high-quality efficient lighting options. Our turnkey approach for small businesses provides a streamlined decision making and implementation process. The NHSaves.com website has been redesigned and updated to allow for customer feedback and provide easier access to program and educational information.

Our 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.

4.2 Program Marketing

Our well-designed marketing strategy will help our customers achieve deeper energy savings and, therefore, position the NH Utilities to reach the increasing EERS savings goals. The NH Utilities market to three general customer groups:

- Residential Marketing reaches out to customers, contractors, and retailers to inform these stakeholders about various products, systems, and financing options for residents of single family and multifamily homes.
- Commercial and Industrial Marketing taps various internal utility resources and marketing mechanisms such as key account representatives and customer service personnel to promote our programs and energy efficiency of a variety facility types.
- Municipal Marketing also utilizes 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:

- Increase Knowledge and Awareness, and Demonstrate Value of Energy Efficiency
- Drive Deeper Customer Participation in NHSaves Programs
- Increase Trade and Channel Partner Participation in Programs

Each objective encompasses a mix of marketing and communications strategies to reach multiple customer groups within the residential and business communities. 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 energy savings.

Increase Knowledge and Awareness, and Demonstrate Value of Energy

Efficiency. Strategies designed to support increasing our customers’ knowledge and awareness and help better demonstrate energy efficiency’s value include:

- Perform market research to better understand 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 participation
- Develop a statewide, fully integrated (multi-channel) umbrella marketing campaign to increase program awareness and deploy engaging content to strengthen awareness of the energy efficiency programs through traditional, digital and social presence
- Expand usage of social media and develop coordinated efforts and messaging across all utilities that promotes programs and incentives using channels and tactics according to audience personas (e.g., YouTube, Facebook, Twitter, LinkedIn, etc.)
- More fully and consistently leverage NHSaves as the brand associated with energy efficiency
- Deploy consistent customer communication materials and resources across utilities leveraging the NHSaves brand by developing program collateral/marketing materials

that can be disseminated to customers and vendors at conferences, seminars, trade shows, workshops, through staff/vendor contact, etc.

- Leverage national and regional energy efficiency partnership campaigns, such as ENERGY STAR and Gas Networks to promote our offers and programs
- Perform segment-specific campaigns with targeted messaging to key audiences for yielding greater return on marketing investment
- Expand customer case study/testimonial series that showcase customer participation and program impacts featuring customers who have implemented successful energy efficiency projects.
- Prepare “highlights” detailing qualitative and quantitative program results and to provide public recognition of performance
- Target 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
- Implement quarterly schedule of technology and/or customer segment-specific training seminars to the residential, commercial, industrial and municipal customer markets
- Identify and target hard-to-reach and underserved customers by focusing on education via in-store promos, direct marketing campaigns, online and social media, and signage

Drive Deeper Customer Participation in Energy Efficiency Programs. Strategies to achieve deeper customer participation include:

- Leverage improved and more granular market research to develop market-segmented approaches, including examining energy needs and consumption attributes (i.e., housing stock and customer type)
- Shift from marketing focused on programs and rebate sign-ups to solution-based messaging based on specific customer needs; engage customers and build relationships that encourage comprehensive improvements, not just single upgrades
- Focus 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 laid
- Target past program participants to pursue additional savings opportunities among those who are already engaged with the programs
- Target and provide solutions to hard-to-serve customers in segments that have been historically difficult to assist, such as certain small business segments, multifamily housing, and buildings less than 50,000 square feet

- Target new movers and provide them a “welcome to the neighborhood” message including promotion of energy efficiency information and offerings
- Expand online marketplace to promote sales of energy efficiency products and explore new opportunities with online marketing platforms which could include offering additional products and/or additional incentive offerings on our existing NHSaves online storefront
- Improve navigation of NHSaves.com/website based on industry best practices
- Investigate offering an intuitive residential and non-residential on-line energy audit tool on NHSaves.com
- Explore neighborhood blitz direct install initiative targeting specific customer segments, such as restaurants and grocery/food service stores, with community canvassing and expand to include other small business segments
- Leverage Home Energy Reports program communications to cross promote programs
- Focus on improvements and optimization of processes within industrial customer segments and evolve beyond equipment replacements

Increase Trade Channel Partner Participation in Programs. Strategies to increase trade and channel partner participation include:

- Expand partnerships with regional trade associations and area Chambers of Commerce to get greater access to facility managers, key business decision makers and corporate-level managers
- Perform targeted communications to key trade allies such as architects, engineers, builders, plumbers, property managers, etc., to further build relationships and demonstrate the value and benefits of energy efficiency
- Execute joint marketing initiatives with key implementation vendors and complimentary service providers who have similar goals and objectives and offer cooperative advertising programs
- Increase presence at in-state retailers and equipment distributors/suppliers to help increase awareness of the benefits of energy efficiency, and awareness of eligible program incentives

Overall, these marketing strategies will help the NHSaves energy efficiency programs reach customers to deliver our message so that we may achieve the EERS goals for 2018 – 2020.

4.3 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 EE 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 audits¹². 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 dwelling¹³.

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:

¹² Residential Customer Insights, E Source

¹³ Ibid.

- Training and presentations at trade shows, such as the NH Home Builders & Remodelers Association Annual Home Show
- Presentations to REALTOR® associations, as well as 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
- 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 products 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 achieve deep energy savings in the residential market.

Commercial, Industrial, and Municipal Education

For several years, the NH Utilities have held education 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, with financial messaging that is targeted to the grocery industry.

To gain further insight into education opportunities, we have reviewed market analyses on our commercial and industrial customers. 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.

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
- Equipment and installation training seminars to commercial, municipal and industrial customers
- Public speaking engagements, tradeshow and customer events to promote programs and incentives
- Customer testimonials and case studies to highlight achievements and educate the commercial and industrial market on the benefits of energy efficiency and NHSaves

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 Working Group (LEWG), the Municipal Association, the Granite State Rural Water Association, 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 education opportunities with these valuable customers of the future who can also make big impacts now.

5.0 NHSaves Financing Options

5.1 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 the most important residential financing offering for energy efficiency projects. 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 NH Saves 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. These financing dollars help drive more comprehensive projects. In 2016, the average Home Performance 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, Meredith Village Savings Bank, Merrimack County Savings Bank, Northeast Credit Union and Woodsville Guarantee Savings Bank, provide convenient branch locations for customers across the state. Through our partnerships, these lenders gain a better understanding of efficiency measures while ensuring the loan funds are invested within New Hampshire communities.

To encourage customers to install recommended measures, the program reduces the



applicable 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 and for natural gas heating equipment 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 toward the energy efficiency measures.

The NH Utilities recognize that customers often have a desire for loan funds 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 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 NHSaves energy efficiency programs. On the one hand, their income may be too high to qualify for the 100% rebate offered by the Home Energy Assistance program and on the other hand, may be modest enough that they lack the 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 three-year plan, the NH Utilities intend to research and explore increasing accessibility for moderate income customers. For example, the VT Heat Saver Loan program 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 income residents.¹⁴ NYSERDA in NY State also uses a tiered interest rate mechanism to offer lower rates to customers who may not qualify for traditional financing.¹⁵

¹⁴ 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

¹⁵ NYSERDA – Residential Financing Options, <https://www.nyserda.ny.gov/All-Programs/Programs/Residential-Financing-Options/Residential-Interest-Rate-Estimator>

If a viable offering can be created with our lending partners, the NH Utilities will seek to begin this offering during the 2018 program year.

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 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 zero percent interest rate during the 2018-2020 Plan. The maximum loan amount for on-bill loans 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 three-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 a loan loss reserve as part of the expansion of third-party financing to include more moderate income customers
- Utilizing a portion of the funds for non-residential loans
- Utilizing a portion of the funds for other energy efficiency program needs

5.2 Municipal Financing

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

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

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 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 outlines the requirements for service under the Smart Start financing option.

On Bill Financing

Liberty and Unitil 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 Unitil 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.

5.3 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, Unitil, and Liberty extend their existing municipal financing options to business customers. These financing mechanisms eliminate upfront costs, and allow commercial customers to repay loans through their monthly energy bill. Commercial uptake in these existing offerings has been relatively low. NHEC initiated two Smart Start loans for business customers in 2016 and Unitil initiated two on-bill loans. NHEC, Unitil, 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 might be helpful to NH business customers, including those offered by the Community Development Financing Authority, the NH Business Finance Authority, possible PACE financing where available, and loans with other lending institutions around the state.

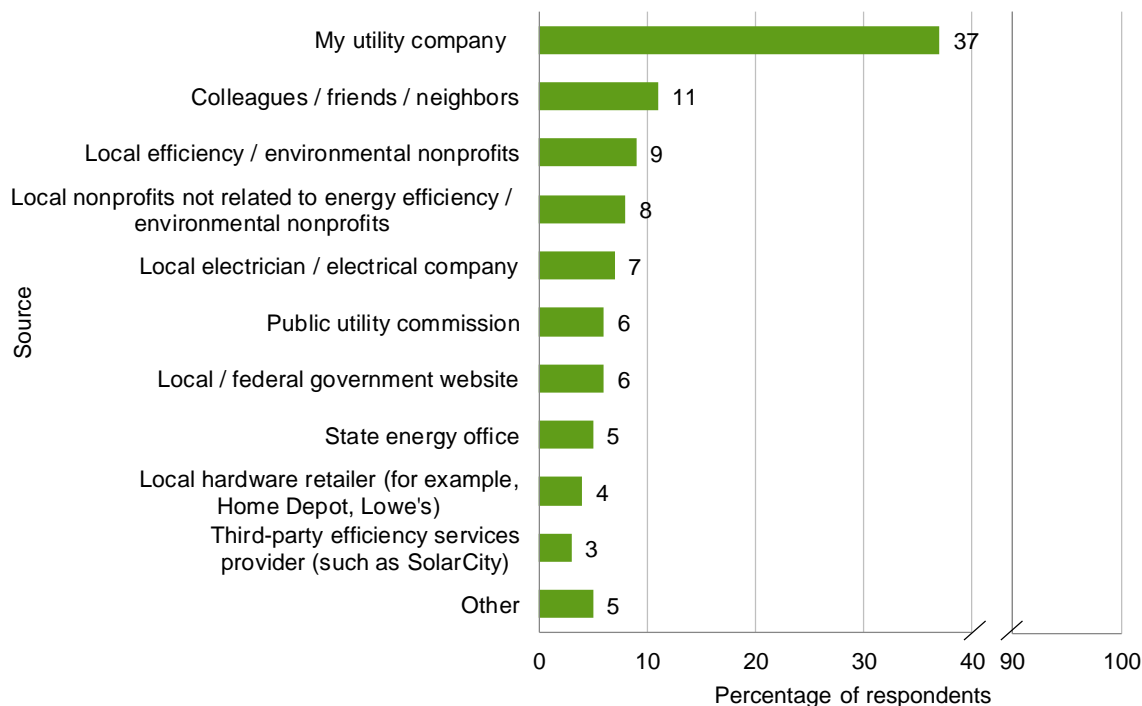
6.0 NHTSaves Residential Programs

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 incentives, education, and training. Our incentives and outreach 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.



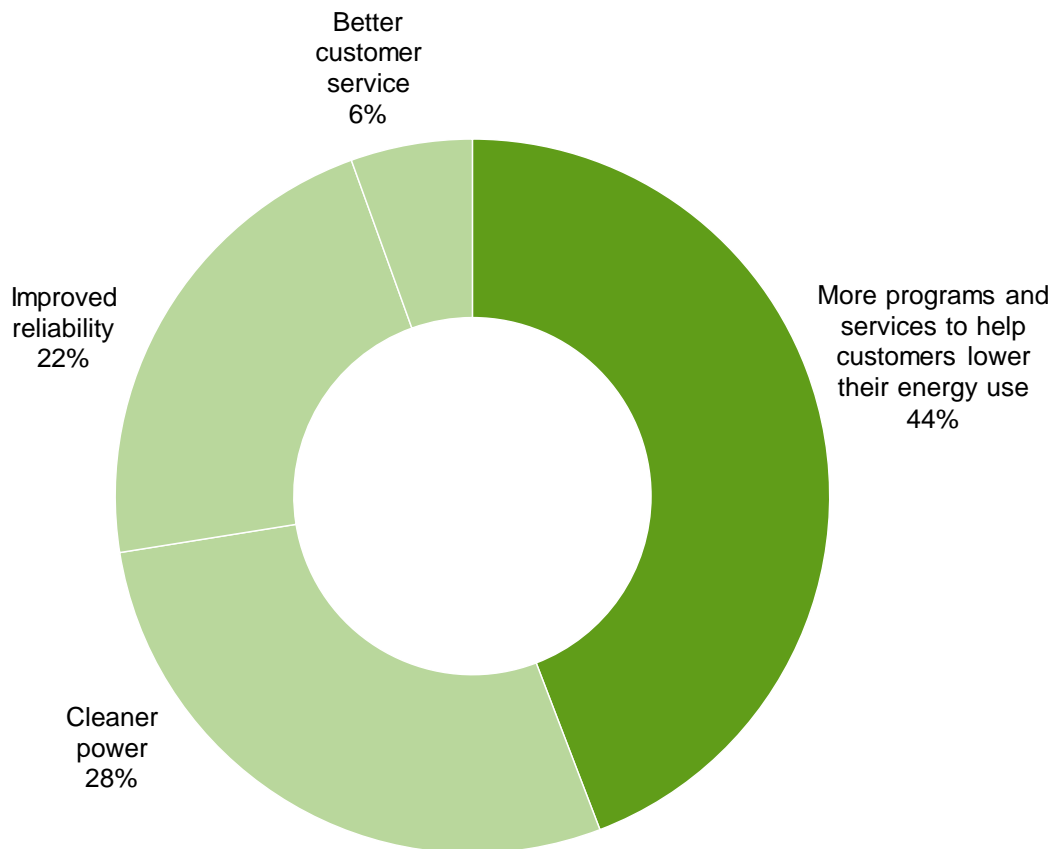
Base: Total sample (n = 1,000). **Question S6_5:** Which of the following do you trust *most* as a source for learning about how to save energy in your home?

© E Source (Residential Utility Customer Survey 2014)

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).

© E Source; data from The Nielsen Company’s 2013 Energy Behavior Track

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.

- **ENERGY STAR Homes** provides certification and incentives to customers who are constructing new highly efficient homes.
- **Home Performance with ENERGY STAR (HPwES)** provides comprehensive improvements for those who are improving the efficiency of an existing home.
- **Home Energy Assistance** provides energy-saving support to income-eligible residents.
- **ENERGY STAR Products** 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.
- **Financing** mitigates first-cost barriers to energy efficiency.
- **Customer Engagement Platform** utilizes self-service tools to help customers learn more about energy efficiency and develop a customized energy savings plan.

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).

FIGURE 6.3: Residential Barriers, Program Interventions, and Outcomes

The NHSaves residential portfolio is designed to overcome a variety of barriers that hinder the adoption of energy efficiency measures or specific behaviors. Through these program interventions, the NH Utilities aim to achieve the outcomes outlined in this table.

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	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 are capable of helping 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

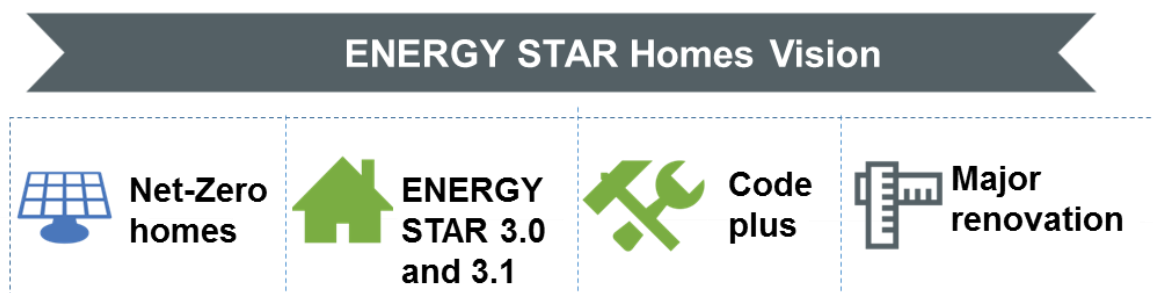
6.1 ENERGY STAR Homes

Program Objective

The NH Utilities are working closely with new-home builders and homebuyers to construct highly energy efficient and comfortable single-family and multifamily homes. The ENERGY STAR Homes program pays incentives directly to contractors or homeowners who build homes to meet or exceed the ENERGY STAR standards and provides the services of home energy raters who ensure quality assurance through certification. This program is a critical market intervention point because many builders wouldn't otherwise take a comprehensive approach to home energy performance, especially in a market where net profit margins are commonly thin.¹⁶

Vision for 2018 -2020

The NH Utilities want to expand program participation and introduce nonparticipating builders to the ENERGY STAR Homes program to capture available energy savings. To enable this shift, ENERGY STAR Homes will remain the premier portion of the program, and the NH Utilities will pursue other elements to provide a wider range of incentive options and entry points.



These adjustments will result in a program with additional participation options, including:

- Increasing awareness of zero-net-energy homes, including the New Hampshire Drive to Net Zero Energy Challenge
- Enhanced incentives for builders who meet the ENERGY STAR Version 3.1 standards
- A Code Plus initiative that will incentivize single-family builders who construct homes above code, yet fall short of ENERGY STAR certification requirements
- Exploration of an option that would provide an incentive for major renovation projects.

The NH Utilities will continue to incentivize customers and contractors to achieve top-tier energy performance, while also ensuring that incentive requirements are not overly

¹⁶ [The Average Profit Margin of Single-Family Builders](#), Professional Builder (2016).

burdensome or restrictive. These efforts allow program administrators to cultivate trust and increase acceptance of technologies and program requirements in order to encourage positive movement in ENERGY STAR and Home Energy Rating System (HERS) home performance ratings.

Program Budget and Goals

Table 6.4: ENERGY STAR Homes Energy Savings and Budget

ENERGY STAR HOMES					
	2018	2019	2020	2018-2020	Lifetime
Electric					
Budget	2,219,099	2,854,055	4,041,274	9,114,428	N/A
kWh savings	906,566	1,254,397	1,803,843	3,964,806	86,772,139
kW reduction	200	278	391	869	N/A
MMBtu savings	9,616	13,222	19,411	42,249	1,000,621
Electric participants	701	965	1,407	3,073	N/A
Natural Gas					
Budget	381,100	434,751	473,878	1,289,729	N/A
MMBtu savings	2,895	3,305	3,586	9,786	242,064
Natural Gas participants	108	122	131	361	N/A

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

Program Design

The ENERGY STAR Homes Program (currently version 3.0) pays incentives to contractors and 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 NH certified homes meet or exceed the minimum criteria. ENERGY STAR has recognized the exemplary performance of this program over the years.

The program also utilizes HERS, which is analogous to a “miles-per-gallon” sticker for houses, giving prospective buyers insight into how the home ranks 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.

Residential Energy Services Network (RESNET) Certified Home Energy Raters are a strong

partner in initiating and completing enrollments in the program. They have solid relationships within the builder community and reach out to encourage their participation. The raters evaluate homes during construction and when they are complete to quantify energy performance. The better the HERS rating, the greater the incentive is for the builder or homebuyer.

The NH Utilities have identified additional program structures to encourage more participation and meet increased targets for energy savings. These new initiatives include Version 3.1, Net Zero Energy Homes, Code Plus Initiative, and a major 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. 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 that have adopted the rigorous 2012 code. The majority of New Hampshire remains under the 2009 Code, 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 additional incentives and support.

Net Zero Homes. A HERS performance rating of 0 represents a zero-net-energy home. To reach net zero, a home must 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.

Builders who participate in the 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.

Code Plus initiative. Code Plus 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 guidelines.

Some builders find the HVAC requirements for ENERGY STAR to be an initial barrier to pursuing the ENERGY STAR certification. By offering a Code Plus initiative, 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're more likely to move forward with certification in future construction.

Major addition/renovation. Over the course of the three-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 Code Plus.

In 2018 NHEC may work with builders on trial projects. Based on the learning from NHEC's exploration, the other utilities may decide to adopt a similar program option.

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 HERS ratings and scaled incentives to reward savings and encourage builders to achieve higher levels of efficiency. Prescriptive rebates on specific appliance and lighting options help to facilitate adoption of new technology. As an additional benefit, the HERS certification serves as an inspection for builders. This advantage allows builders to make the most efficient use of resources in towns that have limited or no inspectors.

Eligibility and Enrollment

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 guidelines as site-built homes. In addition, complete rehabs of existing structures may be eligible to participate if the amount of

rehab work meets ENERGY STAR guidelines, or potentially through the new major renovation/addition option.

Home Energy Raters provide construction and energy consulting to homeowners and home builders. This independent third-party inspection, verification and diagnostic testing helps to maximize energy efficiency. Home Energy Raters must be certified by the Residential Energy Services Network (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 is primarily focused on direct builder contact by program administrators and Home Energy Raters. Program administrators desire to expand trade ally outreach and education with the goal of enlisting new builders who have never participated and deepen existing relationships with current builder-participants. As part of the efforts to expand the program, the NH Utilities will work to increase participation through promotion and partnerships.

Potential initiatives include:

- Participation in trade and home shows
- Outreach to Realtor groups and insulation and HVAC contractors
- Presentations at homebuilder and homebuyer seminars
- ENERGY STAR signs and literature for builders
- In-field training
- Energy code and beyond-code training
- Co-marketing ENERGY STAR developments with builders
- Nominating and promoting program partners for recognition and awards

The ENERGY STAR trademark is well known 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.

Program Success

In the past decade, the more than 6,600 ENERGY STAR homes have been certified through the program. The market share for ENERGY STAR homes has grown from an initial 2 percent to

close to 20 percent.¹⁷

The program partners have also received recognition for outstanding performance. Chinburg Properties, a participating partner, won the ENERGY STAR Partner of the Year award as New Home Builder and Affordable Housing in both 2016 and 2017. And GDS Associates, one of our HERs Rater partners, also won both the 2016 and 2017 ENERGY STAR Partner of the Year award 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 Chinburg and the quality of the build is beyond others.”—*Janine, Londonderry*

Recent or Planned Evaluations

A process and impact evaluation started in 2016 and is expected to be completed during 2017.

6.2 Home Performance with ENERGY STAR (HPwES)

Program Objective

The HPwES program serves existing single-family and multifamily housing customers who desire to reduce their energy bill, improve their home's energy performance, and enhance home comfort. Existing residential buildings present abundant opportunities to improve energy performance, reduce dependence on fossil fuels, and reduce consumer energy costs. Examples of energy-saving projects in this program include air sealing, insulation, appliance replacements, water saving measures, and lighting upgrades. These projects not only reduce energy consumption and save money, but they also improve comfort, health, and other quality-of-life benefits for New Hampshire's residential community.

Vision for 2018 - 2020

The NH Utilities will continue the positive momentum with the current, successful HPwES program structure while expanding opportunities to enroll more customers and extend program benefits through enhanced marketing efforts. As part of the 2018–2020 plan, we will also make updates that streamline participation and improve the customer experience for contractors and homeowners. One initiative is the pursuit of a new software package that simplifies the gathering of information while providing easily understood recommendations to customers.

¹⁷ [New Hampshire Core Energy Efficiency Team](#), Energy Star (2017).

Program Budget and Goals

Table 6.5: Home Performance with ENERGY STAR Energy Savings and Budget

Home Performance with ENERGY STAR					
	2018	2019	2020	2018-2020	Lifetime
Electric					
Budget	3,379,977	5,168,261	7,593,126	16,141,364	N/A
kWh savings	541,590	812,701	1,182,224	2,536,515	39,621,070
kW reduction	93	145	219	457	N/A
MMBtu savings	22,582	37,467	57,904	117,953	2,376,373
Electric participants	770	1,280	1,980	4,030	N/A
Natural Gas					
Budget	950,123	1,020,110	1,150,662	3,120,895	N/A
MMBtu savings	9,573	9,714	10,564	29,851	553,181
Natural Gas participants	619	633	690	1,942	N/A

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

Program Design

HPwES provides consumer incentives and financing options that enable participants to implement comprehensive home energy-efficiency projects. The NH Utilities use a network of more than 20 contractors to raise consumer awareness, recruit participants, conduct home energy audits, recommend improvements, implement projects, and track progress. This program helps develop an expert workforce capable of communicating the benefits of efficiency, and package projects that get customers to think holistically about home energy performance.

The program design makes it easy for customers to participate because, once selected, one contractor can provide all services. The contractor first performs an audit of the home to help identify energy projects, calculate potential savings, and serve as the basis for quality assurance. Participants pay a \$100 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 deducted from 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.

If a heating system is at the end of its life or needs replacement, the contractor can also recommend that the customer bring in an HVAC contractor to replace the unit with an ENERGY STAR certified model.

In addition to contractor partners, the NH Utilities work with lending partners to offer financing options with low interest rates for the HPwES program. The NH Electric Utilities also offer on-bill repayment at 0 percent interest for smaller loans. The Financing section of the energy-efficiency plan addresses these options in greater detail.

The HPwES program remains a strongly fuel-neutral weatherization program. However, the NH Utilities recognize that the program could potentially achieve more electric energy savings. To maximize electric savings, the NH Utilities will explore the following options to determine feasibility, cost-effectiveness, and market response:

Cross-promote the ENERGY STAR Products program with HPwES. Promoting the ENERGY STAR Product program to HPwES participants will better align customers with additional incentives in which they may be interested. The NH Utilities expect to realize a higher conversion rate and a lower cost per customer acquired compared to non-targeted messaging. The NH Utilities may also consider integrating incentives for efficient appliances beyond refrigerators directly within the HPwES program.

Investigate removing electric base load from rebate cap. We are noticing increasing numbers of customers decline the installation of lighting and water savings measures for which they are eligible to receive a 100 percent cost incentive. These customers request that the rebate dollars go toward building shell measures instead. By separating the electric-based load-savings measures from the rebate cap, we could reallocate those funds to allow customers to pursue electric savings as well as significant thermal savings through building shell measures. This could allow the NH Utilities to incentivize for electric savings over the \$4,000 cap.

Explore a high electric usage program offering. There are myriad opportunities for high electric usage that is not tied to heating usage. By training contractors to identify and address areas of opportunity—such as overloaded circuits, or well pumps that are grounding out or stuck in the ‘on’ position—the NH Utilities have the potential to further reduce customer bills. We can also enhance the customer experience to help address home energy consumption issues.

The NH Utilities will include another new element for 2018-2020 which will expand eligibility and provide energy efficiency opportunities to additional customers.

Expand eligibility for natural gas programs. The NH Natural Gas Utilities plan to include a new visual audit and direct install 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 expand the number of participants the natural gas companies can serve. These customers will receive information to better understand the impact of their actions on home energy usage and their home's energy savings potential.

A visual audit of equipment will be a lower-cost option than the standard audit and will still provide useful information for the homeowner. The NH Natural Gas Utilities can directly install measures such as lighting, water savings items, and Wi-Fi thermostats to achieve a cost-effective level of energy savings in these homes. Information gathered during the walk-through audit may indicate opportunity for additional savings, in which case the utilities can use auditing software, to help justify cost-effectiveness and move the project into the full Home Performance program.

The electric companies will learn from the experience of the natural gas companies and consider a similar expansion of eligibility later in the three-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.

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 investment and larger, more comprehensive projects. Qualifying natural gas customers can receive an incentive from both the electric and natural gas companies, provided the customer first reaches the \$4,000 cap from the gas company. This incentive 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 local distribution adjustment charge on their natural gas bill.

Additional incentives 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.

Qualifying measures and the associated incentives may be adjusted periodically based on market conditions.

Eligibility and Enrollment

Determining eligibility is quick. With three pieces of information—ZIP code, conditioned square footage of home, and annual heating fuel usage—single-family 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 energy-savings opportunity.

Once qualified, customers complete a simple 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.

As higher-use customers are served under this program, the qualifying HHI threshold may be adjusted over time. In limited cases, a program administrator can waive the HHI qualification if it is determined that the project is likely to have significant savings and passes the standard benefit/cost test. As discussed in the Program Design section, the natural gas companies will begin to offer a modified option to customers who don't qualify under the current HHI scoring and may move some of those customers back into the full HPwES program based on energy-savings potential. Single-family homes are eligible to participate regardless of space heating fuel or type of system, provided the home is eligible for services. Natural gas customers are first served by their natural gas utility, while non-gas customers are served by their electric utility.

Multifamily homes (more than four units) 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 are eligible for weatherization services through the commercial master metered 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.

Marketing and Outreach

Home retrofit programs like HPwES benefit 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 have been the most effective marketing channels and drive program awareness.

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 Seacoast Energize 360 project can serve as examples for working with additional community-based groups. The NH Utilities have heard from a number of communities around the state that are interested in working jointly to promote energy efficiency opportunities.

In addition to community-based outreach, the NH Utilities may use an integrated approach of general-awareness tactics (print and radio) as well as digital and direct one-to-one tactics (such as email, direct mail, and customer service referrals). These may include:

- Emphasize available 2 percent financing in bill inserts
- Partner with participating lenders to advertise program and 2 percent financing in their marketing
- Promote brand awareness and program offerings through social media
- Leverage email awareness campaigns for e-bill customers who don't receive paper bills
- Publish articles in trade ally newsletters
- Incorporate customer testimonials in social media and bill inserts
- Collaborate with Realtor groups to share program awareness and obtain previous heating-fuel usage history for homebuyers
- Engage with media outlets through press releases and interviews on radio shows
- Host homeowner education workshops in collaboration with local energy committees
- Have a presence at home shows
- Develop new-contractor handout to provide homeowners with relevant information about programs and availability of home energy scores

Program Success



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 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. This led to 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 evaluation on this program June 13, 2011, and a new evaluation will need to be completed over the next three years.

6.3 Home Energy Assistance (HEA)

Program Objective

The NH Utilities are striving to transform New Hampshire's income-eligible housing stock into more efficient, more comfortable, and safer homes. For many income-eligible households,

energy costs may not be affordable, accounting for 8 to 22 percent of their income in 2012.¹⁸ By conventional standards, “energy poverty” is recognized when a household spends about 10 percent or more of their income on energy-related expenses.

Weatherization improvements offered through HEA such as sealing areas with air leakage, adding insulation, and replacing inefficient heating and cooling systems can provide a long-term fix for customers with a high energy burden because they reduce the 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. These projects not only save energy and reduce bills, but they also help improve health, safety, and other quality-of-life benefits for New Hampshire’s income eligible residential community.

Vision for 2018 - 2020

Moving forward, the NH Utilities recognize significant opportunity to expand the reach of the HEA program and reduce customer energy costs. Based on current program eligibility requirements, approximately 20 percent of New Hampshire residents would qualify.¹⁹ In 2016, more than 30,000 customers qualified for the program through fuel assistance alone. Roughly one-third of them specifically asked for weatherization when applying for fuel assistance. To address this need in 2018 and beyond, the NH Utilities desire to reduce the participant waiting lists and expedite the time frame from qualification to participation in the program. The percent of total funding dedicated to the income-eligible program increased from 15.8 percent to 17 percent in 2017 and will continue at the higher level of 17 percent from 2018-2020.

¹⁸ [Energy Costs and Burdens in Vermont: Burdensome for Whom?](#) (PDF), Vermont Low Income Trust for Electricity Inc. (2014)

¹⁹ “Gas and Electric Utilities Energy Efficiency Resource Standard Order Approving Settlement Agreement,” State of New Hampshire Public Utilities Commission (2016).
https://www.puc.nh.gov/Regulatory/Docketbk/2015/15-137/ORDERS/15-137_2016-08-02_ORDER_25932.PDF

Program Budget and Goals

Table 6.6: Home Energy Assistance Energy Savings and Budget

	Home Energy Assistance Program				
	2018	2019	2020	2018-2020	Lifetime
Electric					
Budget	6,252,883	7,999,417	10,680,392	24,932,692	N/A
kWh savings	803,138	1,028,277	1,370,745	3,202,160	43,112,005
kW reduction	110	145	195	450	N/A
MMBtu savings	19,620	25,812	35,236	80,668	1,675,628
Electric participants	765	1,010	1,369	3,144	N/A
Natural Gas					
Budget	1,544,247	1,698,925	1,839,419	5,082,591	N/A
MMBtu savings	9,416	10,075	10,733	30,224	620,887
Natural Gas participants	334	358	379	1,071	N/A

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

In addition to the budget and savings goals, the number of participants are projected per quarter and by county. Tables 6.7 and 6.8 (next page) display the 2018 HEA Quarterly Project Schedule and the 2018 HEA Project Distribution by county.

Table 6.7: 2018 HEA Quarterly Project Schedule

The project schedule reflects the expected throughput of HEA projects by quarter.

Utility	Total Participants	1st. Qtr.	2nd. Qtr.	3rd. Qtr.	4th. Qtr.
		22%	29%	30%	18%
LU-Electric	49	11	15	18	5
NHEC	45	7	16	18	4
Eversource	598	144	174	173	107
Unitil-Electric	73	19	18	19	17
LU-Gas	275	54	83	86	52
Unitil-Gas	59	11	17	19	12
TOTAL Electric	765	181	223	228	133
TOTAL Gas	334	65	100	105	64
Cumulative TOTAL		246	569	902	1,099

Table 6.8: 2018 HEA Project Distribution

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

BY COUNTY	LU-Electric	NHEC	Eversource	Unitil	LU-Gas	Unitil-Gas	Total
Belknap		8	57		27		92
Carroll		5	40				45
Cheshire	2		21				23
Coos		4	47		0		51
Grafton	21	14	22				57
Hillsborough	7		257		214		478
Merrimack		5	47	26	27		105
Rockingham	14	4	57	47	7	38	167
Strafford		0	30			21	51
Sullivan	5	5	20				30
Total	49	45	598	73	275	59	1,099

Program Design

The HEA program emphasizes a community-based approach to facilitate energy-saving projects. The NH Utilities partner with local Community Action Agencies (CAAs) to deliver program benefits and connect with the community. CAAs are excellent partners because they are a primary source of direct support for income-eligible families, have established relationships that help ensure trust and social acceptance, and have access to and utilize many different state and federal funding sources targeted at the same income-eligible customers.

This program is closely coordinated with the NH Electric Assistance Program (EAP) and the federal Fuel Assistance Program (FAP). 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. Customers served by CAAs may also be eligible for Department of Energy Weatherization Assistance Program (WAP) funding. The NH Utilities collaborate with the CAAs and the NH Office of Energy and Planning (OEP) to maximize the number of projects jointly funded by the HEA Program and the federal Department of Energy's (DOE) weatherization program administered by the OEP and the CAAs. The NH Utilities administer the HEA Program to ensure that consistent services are provided across the state. Moreover, this 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 a customer while limiting the number of interactions (and opportunities to drop out) for customers.

While the HEA program remains a strongly fuel-neutral weatherization program, the NH Utilities will explore additional options to help achieve more electric savings within the program. Potential options for additional electric savings may include:

- **Explore a high-electric-usage program offering.** There are myriad opportunities for high electric usage that is not tied to heating usage. By training contractors to identify and address areas of opportunity, such as overloaded circuits, or well pumps that are grounding out or stuck in the 'on' position, the NH Utilities have the potential to further reduce customer bills. We can also enhance the customer experience to help further address home energy consumption issues.
- **Examine cold climate heat pump retrofits for electric resistance heat customers.** The NH Utilities may consider funding conversions to cold climate heat pump technology for customers currently using electric resistance heat.
- **Integrate additional appliances within HEA.** The NH Utilities will evaluate the feasibility to include efficient appliances beyond refrigerators directly within the HEA program. Offerings may include ENERGY STAR dehumidifiers, clothes washers, clothes dryers, and/or room air purifiers.

Incentives

The NH Utilities can cover the total cost of energy-saving projects up to \$8,000 in basic program services for income-qualified customers participating in the HEA program. Natural gas customers who qualify can receive an incentive from both the electric and natural gas companies.

Expenditures above the cap are allowed for the replacement of space heating and/or water

heating equipment under the following conditions:

1. 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 (as in the case of manufactured homes), the equipment must meet the ENERGY STAR annual fuel utilization efficiency (AFUE) minimum requirements.
2. Space and water heating equipment replacements will only be allowed if a home has also been weatherized.
3. 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 program budget to ensure that most funds are used for weatherization services.

The NH Electric Utilities have the option to provide weatherization and natural gas space heating and water heating equipment services to natural gas customers; however, the NH Natural Gas Utilities first provide natural gas customers with weatherization services and natural gas space heating and water heating equipment. Weatherization services for customers using any other fuel to heat their home and all electric base load measures, such as cost-effective lighting and appliances, are provided by the NH Electric Utilities.

The \$8,000 rebate level, with the option of additional funds for heating system and water heating replacement, is designed to provide comprehensive weatherization in income-eligible homes. When possible the CAA’s leverage other funding sources, such as DOE Weatherization funds, so that the expenditure per home from HEA funds is lower and more homes can be served. However, with 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.

Eligibility and Enrollment

The target market for the HEA program includes all customers who meet the eligibility criteria for participation in the FAP, the NH Electric Assistance Program, and anyone residing in subsidized housing or municipal or nonprofit shelters serving those in need.

In addition to customer eligibility, the CAAs also meet specific standards to continue as partners with the NH Utilities. The CAAs will be offered right of first refusal to deliver services under this program provided they meet a set of statewide standards for bidding, pricing, and program delivery.

In cases where a CAA cannot provide income-qualified energy-efficiency services in accordance with the approved weatherization production, or decline to deliver the services, the work will

be assigned to other qualified independent contractors who will be held to the same 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 our message helps ensure that the right 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.

Program Success

Our income-eligible customers have reported significant benefits by participating in the program. The NH Utilities are proud to count their sentiment 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.”
Manchester



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



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*

Recent or Planned Evaluations

The last impact evaluation was completed by Opinion Dynamic Corporation on January 16, 2006. Planning for a new impact evaluation will be needed over the next three years.

6.4 ENERGY STAR Products

Program Objective

The ENERGY STAR Products program encourages customers to recognize and purchase ENERGY STAR–certified lighting, appliances, and space/water heating and cooling products. The program also provides a recycling option for old appliances. New Hampshire has more than 500,000 households, all of which have dozens of energy-consuming devices. Through vendor partnerships and consumer education, the program endeavors to help retailers and consumers distinguish the value associated with purchasing ENERGY STAR goods. Purchasing ENERGY STAR products—which are independently certified to save energy over standard efficient products without sacrificing features or functionality—will help our residents save energy and money.

Vision for 2018 - 2020

The increased savings goals and resources under the EERS will allow the NH Utilities to expand their retail channel partners, deepen relationships with existing partners, and increase their online presence so that customers can buy direct. All of these efforts will facilitate increased sales of qualifying equipment.

Energy efficient products represent a rapidly evolving marketplace. As our program matures, the NH Utilities will continue to keep a careful eye on energy savings opportunities as baselines evolve. In 2018 and beyond, we'll investigate opportunities to reach more customers through expanded partnerships and further leverage online channels where more customers are choosing to buy products. We will also continue to ensure eligible measures and solutions meet our energy savings expectations and stay abreast of market demand.

Program Budget and Goals

Table 6.9: ENERGY STAR Products Energy Savings and Budget

	ENERGY STAR Products				
	2018	2019	2020	2018-2020	Lifetime
Electric					
Budget	4,455,878	4,864,309	5,730,707	15,050,894	N/A
kWh savings	11,964,213	12,940,881	12,462,085	37,367,179	275,020,557
kW reduction	1,491	1,611	1,625	4,727	N/A
MMBtu savings	2,951	3,191	4,091	10,233	148,321
Electric participants	132,343	174,546	206,067	512,956	N/A
Natural Gas					
Budget	1,307,311	1,417,102	1,477,807	4,202,220	N/A
MMBtu savings	16,911	18,136	19,005	54,052	911,613
Natural Gas participants	2,113	2,269	2,392	6,774	N/A

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

Program Design

The ENERGY STAR Products Program provides mail-in incentives, point-of-purchase product markdowns, or online incentives on certain ENERGY STAR–certified appliances and lighting, encouraging consumers to choose more-efficient options than the standard efficiency baseline. The NH Utilities have formed a large network of partners to deliver program incentives, including more than 140 retail locations, equipment suppliers, distributors, and installation contractors to promote the program’s offerings to customers. Through these efforts, the ENERGY STAR Products program supports the state’s economy by working with local hardware merchants in addition to big-box retailers to encourage purchasing products locally.

Providing a mix of point-of-purchase markdowns and simple-to-fill-out rebate coupons for lighting allows the NH Utilities to deliver incentives based on the needs of the retailer. Smaller merchants have lower volumes than big-box retailers and use rebate coupons at checkout so that customers can receive an incentive for their purchase. Larger retailers have the electronic billing systems to support markdowns and feel that this approach is a better fit to move customers through checkout. Markdowns also mean that retailers don’t have to retain coupons containing customer information or wait to receive batches of incentive payments after the

fact. With budget increases, the NH Utilities can expand markdowns with existing participating retailers and offer them to additional retailers, potentially even online retailers.

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 be mailed in or submitted through an online system and customers receive a check for their incentive amount. 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.

Customers can access incentives for heating/cooling equipment through a mail-in form or on-line application and accompanying contractor invoices.

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 will come to the customer's home to take away old refrigerators or freezers and the customer receives an incentive check in the mail. Additionally, recycling events can be planned to encourage customers to drop off smaller appliances for recycling at a convenient central collection location. This program encourages residents to remove old, high usage appliance and ensures they are disposed of properly, with over 90% of the unit being recycled.

To ensure consistent messaging and that adequate services are provided across the state, the NH Utilities employ a circuit rider—an individual (or individuals) who travels to the service territories' 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 kiosks, monitors in-store stocking and display activities, updates point-of-purchase marketing materials, forms and incentive coupons, and helps process incentives or develop cooperative advertising. They also perform periodic training of store staff members.

Incentives

Qualifying products under the program include ENERGY STAR–certified LED lighting fixtures and bulbs, clothes washers, refrigerators, clothes dryers, room air purifiers, room air conditioners, dehumidifiers, and pool pumps. Also included are high-efficiency space/water heating and cooling systems, such as low temperature air-source heat pumps and ductless mini-splits; heat pump water heaters; central cooling systems; and natural gas furnaces, boilers, water heaters, and thermostats.

The NH Utilities will continue to review available energy-efficient products in the marketplace and evaluate their potential savings and incremental costs as well as possible incentive structures for inclusion in the program. Future products may include items such as ventilation



fans, linear lighting, additional Wi-Fi thermostats, or home energy management systems. Qualifying products available, the associated incentives, and delivery strategies may be adjusted periodically based on market conditions. Incentives are based on incremental cost of ENERGY STAR equipment.

Eligibility and Enrollment

All residential customers of the NH Utilities are eligible to participate in the program. Customers will either receive the discounted price at the point of purchase, or they may fill out a form, depending on the measure selected and the retail partner.

Marketing and Outreach

Consumers face a bewildering array of LED options, appliance considerations, and equipment uncertainties, as well as a host of exaggerated manufacturer claims. The NH Utilities seek an integrated marketing and outreach approach to facilitate consumer understanding about equipment and energy usage that will help ensure that customers select the right device for their needs. Additionally, the NH Utilities will collaborate on efforts to increase general ENERGY STAR brand awareness. Examples of marketing efforts may include:

- Collaborative in-store point-of-purchase materials, such as displays that compare costs to operate equipment (for example, halogen versus ENERGY STAR LED bulbs or electric resistance water heater versus heat pump water heater)
- Engagement of a circuit rider to work directly with equipment suppliers and distributors of natural gas equipment.
- Training for retail sales staff and product demonstrations at participating retailers
- Partnering with EPA/ENERGY STAR on national campaigns throughout the year
- In-school education programs to inform students about energy efficiency and encourage them to share information with parents about steps they can take at home
- NHSaves and utility social media posts, email blasts, utility newsletters, and bill inserts

Program Success

The ENERGY STAR Products program contributes to the widespread awareness of the ENERGY STAR label. In 2016, 91 percent of US households reported recognizing the ENERGY STAR label according the Consortium for Energy Efficiency²⁰. The NH Utilities are proud of our contributions to furthering customer understanding and recognition of efficient equipment. And we appreciate the opportunity to help customers be more informed and empowered to influence their own energy consumption and utility bills.

²⁰ www.cee1.org/content/national-awareness-energy-star-surveys

Recent or Planned Evaluations

The last impact evaluation was completed June 22, 2012 and a new evaluation will be conducted in the near future.

6.5 Home Energy Report (HER) Program

Program Objective

Residential behavior-change programs provide stand-alone energy savings through customized and targeted energy usage messaging and comparisons. These programs also encourage customers to participate in existing energy-efficiency incentive programs. HERs offer easy-to-understand energy-use feedback through paper and web-based reports and are a prime customer engagement and empowerment strategy for the NH Utilities.

Vision for 2018 - 2020

The impacts of the HER program have been positive. The utilities who currently offer this program, Liberty Utilities and Eversource, are interested in increasing the program’s customer bases to capture additional cost-effective savings for 2018 and beyond. Unitil is also interested in adding a behavior program to their customer offerings.

Program Budget and Goals

Table 6.10: Home Energy Reports Energy Savings and Budget

	Home Energy Reports				
	2018	2019	2020	2018-2020	Lifetime
Electric					
Budget	795,160	1,215,641	1,973,535	3,984,336	N/A
kWh savings	4,533,025	7,570,850	13,358,050	25,461,925	69,882,550
kW reduction	378	649	1,226	2,253	N/A
MMBtu savings	0	0	0	0	0
Electric participants	79,500	134,500	219,500	433,500	N/A
Natural Gas					
Budget	386,400	347,564	376,795	1,110,759	N/A
MMBtu savings	13,400	11,595	12,560	37,555	127,466
Natural Gas participants	46,000	46,000	46,000	138,000	N/A

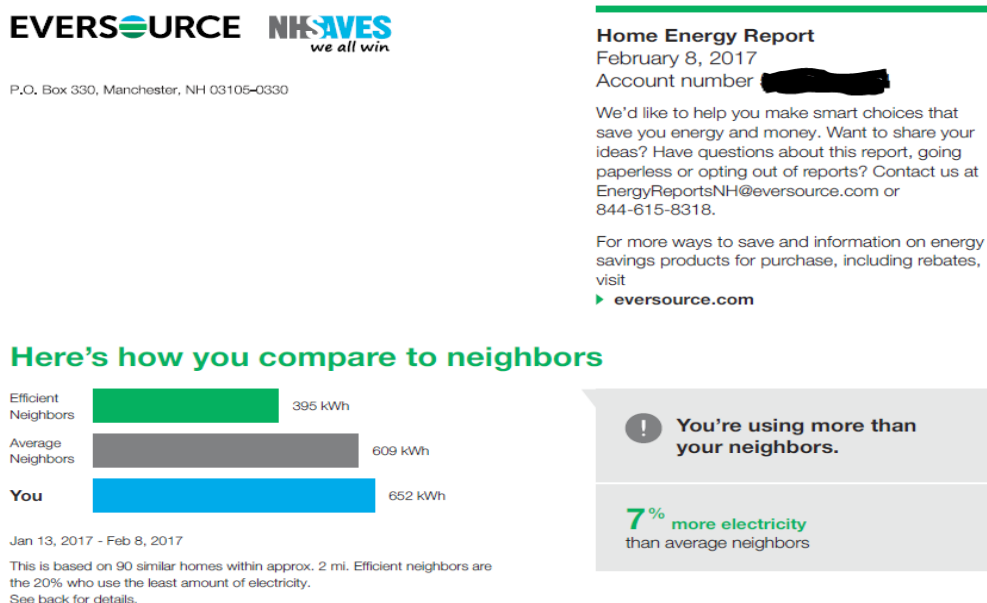
Note: kWh = kilowatt-hours; kW = kilowatt; MMBtu = million British thermal units

Program Design

Eversource and Liberty Utilities provide HERs to select residential customers to reduce energy consumption. The energy usage feedback in HERs provides customers with 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 customized tips to help customers take energy-saving action with their newfound motivation.

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.



The program incorporates a randomized control to ensure unbiased savings estimates. The analytics utilized randomly assigns customers to a treatment group or a control group. The treatment and control groups should have equal customer types. For example, the same percentage of customers in both groups would never take action, always take action, or require a HER to take action.

The only difference between the treatment and control groups is that those who need a HER to take action receive it, and those in the control group don't. Therefore, the difference in energy use between the groups reflects the HERs effect. The randomized control ensures that the HER



is the attribute that leads to differences in energy use between the groups.

Incentives

Eversource's and Liberty's programs encourage customers to take energy-saving action without the use of monetary incentives.

Eligibility and Enrollment

Eversource sends reports to approximately 50,000 customers. This includes a sample of 25,000 customers (the initial pilot 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 increase to 105,000 customers in 2019 and 190,000 customers in 2020.

Liberty Utilities provides reports to 38,000 natural gas customers and is introducing the program for 12,000 electric customers.

Unitil included savings and costs for a behavior program in the Plan. The Company is in the process of issuing an RFP to select a vendor for its 2018-2020 behavior program, which could be HERs. The Company will analyze bids and determine if a program of this type is appropriate for its service territory (natural gas and electric) based on savings, costs, and cost-effectiveness.

Marketing and Outreach

The program serves as a vessel for education and awareness of how behavior impacts energy usage and customers' energy bills. The program doesn't require other marketing or outreach.

Program Success

Achieving the energy-savings goal is a primary metric for this program. On a monthly basis, savings are estimated by comparing the aggregate usage of the treatment group (customers who receive reports) to the control group (customers who don't receive reports).

The program also measures non-energy-savings results to gauge customer experience of the reports. The NH Utilities track a variety of engagement metrics including monthly opt-out rates, email open and click-through rates, and number of calls and emails received in response to reports.

Recent or Planned Evaluations

A 2016 evaluation of Eversource's pilot program demonstrated that the HERs are effective at reducing energy consumption. Normative messaging in the reports was most effective, reducing consumption by 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 spillover into the HPwES program. Because of these impacts, Liberty Utilities Gas is interested in increasing the program's natural gas customer base if possible and adding electric customers in order to capture additional natural gas and electric savings and better position the program in 2018.

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
Budget	\$593,000	\$616,720	\$641,389	\$1,851,109

7.0 NHSaves Commercial Programs

Small businesses, large commercial and industrial (C&I) buildings, and municipal customers are critical segments to reducing energy consumption in New Hampshire, accounting for roughly 78 percent of the portfolio of electricity savings and 69 percent of natural gas savings. These customers, large and small, trust their utility to deliver energy-efficiency advice and information. Nationally, 60 percent of business customers stated that they trust their utility the most for energy-efficiency and energy-saving advice²¹.



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 our associated support network, we raise awareness of the benefits of energy-efficient products and buildings and promote their adoption through design and technical assistance, incentives, education, and training. Our incentives

and outreach facilitate higher-efficiency C&I facilities, reduce energy costs, and support a robust energy-efficiency market 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 and worker health. These enhancements can also lead to greater productivity, and because it costs at least 85 times as much to pay the workers in a typical office as it does to pay the energy bill, boosting productivity by less than 1 percent can be worth as much as cutting the energy bill in half.²²

The NH Utilities provide three statewide programs to ensure that customers receive comprehensive energy-saving solutions to reduce their bills, regardless of business size or segment.

- **Large Business Energy Solutions (Retrofit and New)** provides incentives to large commercial and industrial customers who are retrofitting existing facilities or equipment (“Retrofit”), constructing new facilities, adding equipment, or replacing equipment that is at the end of its useful life (“New”).

²¹ [Large Business Gap and Priority Benchmark 2014](#), E Source (2014); [Small and Midsize Business Gap and Priority Benchmark](#), E Source (2014); respondents were allowed to select more than one answer (n = 5,879).

²² Non-Energy Benefits Can Tip the Scales in Favor of an Energy-Efficiency Project, E Source (2015).

- **Small Business Energy Solutions (Retrofit, New, and Turnkey)** provides incentives and turnkey energy services to small commercial customers who lack the time, resources, or expertise to implement energy-saving solutions.
- **Municipal Energy-Efficiency Program** provides incentives to municipal customers who are constructing new facilities or retrofitting existing facilities.

Though not a statewide offering, Eversource offers the Energy Rewards RFP Program as part of its large commercial and industrial program.

- **Large Business Energy Rewards Program** encourages customers to submit comprehensive projects as part of a competitive bid process and provides the opportunity for multi-year agreements that help implement a broad set of energy saving solutions over time

Multifamily Qualification

Our C&I programs are also available to multifamily customers. Multifamily buildings have multiple program entry points depending on their heating fuel source, energy consumption, and demand. We serve some projects, such as common-area lighting and master-metered natural gas heat, through commercial program funding, and others, such as electric measures in individual apartments, through residential program funding. The commercial and residential program staff will continue coordinating on multifamily projects to minimize the number of different contacts and information points for the customer. The NH Utilities will also explore formalizing a multifamily offering that provides a streamlined entry and service for this sector.



Liberty Utilities energy efficiency experts Rob McLean (l) and Eric Stanley (r) present a check to Forest Ridge property manager Diane Ventresca for over \$224,000.00 in energy efficiency rebates.

Multifamily Case Study

Diane Ventresca, the property manager of Forest Ridge Apartments, a 370-unit rental development located in Nashua, New Hampshire, needed to reduce high energy bills. She said, “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.”

NHSaves Liberty Utility incentives reduced the cost of improvements by 50 percent. Forest Ridge now enjoys \$50,000 in natural gas savings every year and a payback period of just 3.8 years.

Customer Barriers, Program Interventions, and Outcomes

Each of our programs provides a mix of training, incentives, education, and general outreach to deliver energy-savings projects and to bridge the information gap that prevents commercial, industrial, and municipal customers from pursuing energy-efficiency projects (Figure 7.1, next page).

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 identify and target key decision-makers early in the design process	Increased program participation and a deeper level of savings

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 the caps on a case-by-case basis. The incentive cap for commercial and industrial customers who supply a portion of their energy needs through means which by-pass their meter and for which no System Benefits Charge revenues are collected, will be based on the level of kilowatt-hours billed under the System Benefits Charge in the most recent preceding twelve-month period.

7.1 Large Business Energy Solutions (Retrofit and New Construction)

Program Objective

The Large Business Energy Solutions program provides prescriptive and custom incentives to reduce up-front costs of equipment during retrofit and new-construction projects. NH Utilities' Energy Efficiency staff, key account representatives and energy service contractors work closely with our customers to design, build, or retrofit large C&I facilities to achieve elevated energy efficiency, improved productivity, increased comfort, greater operability, and improved building air quality and safety.

Vision for 2018 - 2020

The NH Utilities will further 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. Market segmentation is an opportunity to focus on understanding specific groups of customers, their needs, and the market forces on their businesses. This understanding helps the NH Utilities to work with trade allies on calculating energy-savings potential, and implementing project strategies. Through the use of segmentation, the NH Utilities can strategically target customers by identifying unique opportunities for energy savings within each segment and provide tailored technical assistance and trade ally expertise to target and deliver savings.

The NH Utilities will work to secure longer-term commitments for energy savings from their large businesses. The vision is to institutionalize practices that will help companies sustain long-term savings by establishing multi-year energy efficiency and operational strategies. This approach enables customers to achieve ongoing savings from conservation, streamlined

operations, and increased capital investments.

Program Budget and Goals

TABLE 7.2: Large Business Energy Solutions Energy Savings and Budgets

Large Business Energy Solutions					
	2018	2019	2020	2018-2020	Lifetime
Electric					
Budget	9,572,650	12,326,048	16,593,863	38,492,561	N/A
kWh savings	43,753,223	54,627,820	71,661,090	170,042,133	2,284,914,668
kW reduction	4,832	6,058	7,909	18,799	N/A
Electric participants	515	695	974	2,184	N/A
Natural Gas					
Budget	2,461,626	2,814,724	3,077,607	8,353,957	N/A
MMBtu savings	67,069	73,705	78,877	219,651	2,925,227
Natural Gas participants	131	172	181	484	N/A

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

Program Design

The program targets customer participants during the design stage of a project to promote benefits of selecting premium-efficiency alternatives. To find appropriate projects, the NH Utilities staff leverages multiple channels including:

- Account representatives working directly with existing customers
- Economic development staff working with prospects and customers who are relocating
- Energy-efficiency representatives generating leads in complementary markets such as the building development community and real estate professionals

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. We designed the monetary incentive to offset barriers associated with lack of funding or insufficient payback thresholds, the most significant barrier to project implementation.

The largest energy consumers in New Hampshire are concentrated in manufacturing,

healthcare, schools, ski areas, and large retail facilities. These customers are generally well informed about the opportunities for energy-efficiency improvements and are usually familiar with the NHSaves programs. They're very interested in keeping operating costs low and eliminating waste, and they often have in-house staff that evaluate and propose energy-efficiency improvements.

Despite being generally energy-savvy, savings uncertainty and difficulty identifying, prioritizing, and planning projects continue to be notable barriers to implementation for many large commercial customers. The program also offers technical assistance including project evaluation, measure identification, equipment monitoring, compressed air analysis, and energy audits to address these barriers.

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

Large Commercial Retrofit. Retrofit projects are those where existing equipment or systems are currently functioning, but will be replaced with energy-efficient equipment or improved systems. The project often must have an acceptable return on investment while also providing secondary benefits such as improved work environment or meeting other corporate goals for large business customers to move ahead with these investments. As large companies decide how to invest their capital dollars, the project incentives help to ensure that the efficiency work is competitive with other projects they may be evaluating, and the assistance we provide to identify and quantify energy-efficiency projects and benefits is critical.

New Equipment and Construction (NEC). NEC projects are cases where existing equipment or systems have failed or are at the end of their life, or the customer's business needs have exceeded the output of the existing system. NEC projects can also be the new construction of a facility, a gut rehabilitation project, or a change of business use. The customer needs to purchase equipment or engage in new construction. The NH Utilities incentives and assistance for NEC are intended to influence the customer to shift from standard construction methods and minimum code compliance toward enhanced energy-efficiency options.

The NEC market presents a few significant hurdles; however, the timing of information provided to the design team is critical. For example, the team can make decisions early in the design that will either allow or prevent energy-efficiency enhancements later in the project. Additionally, if a construction project surpasses its initial budget, the initial cost of efficiency measures beyond code compliance can become a target for elimination to keep costs down. It's 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.

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 workshops from 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, streamlined operations, and increased capital investments. In addition to long-term planning, the NH Utilities can help customers implement those plans through multiyear program commitments. One example of such a multiyear commitment is a Memorandum of Understanding that documents mutual commitments between the customer and their utility for investment in energy improvements and achievement of energy savings.

Incentives

The 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 significant percentage of installed cost for Retrofit projects and incremental installed cost for NEC projects. This approach provides a standardized, streamlined option for customers who are installing those technologies where the program has enough data to predict savings and determine the right incentives for measures across a broad set of applications. Prescriptive incentives often serve as a customer's initial exposure to energy efficiency and, after a satisfactory experience, they may choose a more comprehensive or custom approach for subsequent projects.

Turnkey service offers a streamlined approach for prescriptive incentives through skilled trade allies for common measures.

Custom incentives allow customers to evaluate energy efficiency technologies that generally aren't on the prescriptive list. This approach provides a more comprehensive and creative way to address complex projects that the prescriptive program can't fully address. NH Utilities assess project eligibility and incentives on a case-by-case basis and help determine them by a technical study that details energy-savings and project costs.

Performance Based Incentives may encourage even deeper savings and will be utilized as an alternative to prescriptive and custom incentives. Performance based incentives based on, for example, watts saved per square foot or dollars per kWh saved or achieved above code, can provide a path to help the customer focus on the whole system rather than on an incentive for a particular piece of equipment. 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 eligible for the Large Business Energy Solutions program. The program further targets customers planning on new construction, major renovation, and failed equipment replacement as well as customers operating aging, inefficient equipment and systems.

Marketing and Outreach

Utility representatives, vendors, and energy service providers market the program through one-on-one personal outreach, seminars, and training sessions. The NH Utilities also market the program through outreach to property managers, builders, architects and engineers who often have existing relationships or work with our large business customers. The NH Utilities may use direct marketing for specific initiatives or to send specific collateral. They create and deploy marketing materials as needed and plan to explore opportunities to develop sector-specific and technology-specific case studies, additional webinars, and prominent energy-efficiency expos.

Program Success

We measure the success of our Large Commercial Program by customer participation and satisfaction with the cost-effective solutions we work together to implement. Our programs help customers save money and continue operating and expanding 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*

Recent or Planned Evaluations

We completed an impact evaluation of the large C&I program in 2015 and found that participants like the programs (including large C&I retrofit, new equipment, and Eversource's RFP) and are satisfied with services. The NH Utilities incorporated the new realization rates and took action to improve the accuracy of project tracking supporting documentation.

7.2 Small Business Energy Solutions

Program Objective

The Small Business Energy Solutions Program serves New Hampshire’s small and midsize businesses that desire to reduce their energy costs by improving their building’s energy performance. This program offers incentives to encourage businesses to increase equipment efficiency during Retrofits or NEC. Additionally, a turnkey service option is available that is tailored to the unique needs of small businesses—a diverse customer base in terms of technical capabilities and financial resources. The small and midsize business sector makes up approximately 97 percent of New Hampshire’s commercial customer accounts, representing many opportunities to capture significant cost-effective energy savings.

Vision for 2018 - 2020

The NH Utilities are focused on deeper and wider engagement in the Small Business Program. 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. Partnerships with affinity groups and trade allies will allow broader outreach and tailored offerings to achieve energy savings within each segment.

Program Budget and Goals

TABLE 7.3: Small Business Energy Solutions Energy Savings and Budgets

Small Business Energy Solutions					
	2018	2019	2020	2018-2020	Lifetime
Electric					
Budget	5,953,136	7,776,176	10,542,894	24,272,206	N/A
kWh savings	16,305,819	21,017,077	28,537,944	65,860,840	879,983,051
kW reduction	2,273	2,933	3,942	9,148	N/A
Electric participants	746	1,019	1,463	3,228	N/A
Natural Gas					
Budget	1,958,283	2,159,635	2,315,660	6,433,578	N/A
MMBtu savings	44,350	48,255	51,846	144,451	2,075,251
Natural Gas participants	726	825	904	2,455	N/A
Note: kWh = kilowatt-hours; kW = kilowatt; MMBtu = million British thermal units					

Program Design

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, schools, and commercially or master metered multi-tenant facilities, among many others. The small business sector is far less likely to have dedicated staff focused on energy use and efficiency opportunities, and it can be difficult to reach key decision makers. Market barriers include shortage of capital or labor, 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 who are planning on new construction or major retrofits, replacing failed equipment, or have aging, inefficient equipment and systems. Retrofit projects replace functioning equipment with energy efficient options. New equipment and construction projects replace failed or end of life equipment or the construction of a new space. The program uses two primary incentive designs: monetary incentives to offset the barrier associated with upfront costs and a turnkey service option that provides assistance to identify and implement projects.

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 the barriers by delivering full service solutions to our customers.

These vendors perform an initial assessment of the existing equipment, recommend energy-efficient improvements—often targeting lighting and refrigeration upgrades—and install the appropriate measures. Services include, but are not limited to, lighting, programmable thermostats, hot water measures, spray rinse valves, refrigeration measures, and natural gas and electric heat weatherization.

The Small Business Energy Solutions Program provides consumer incentives that enable participants to implement cost effective energy efficiency projects. Utility program coordinators administer the program and work directly with customers and contractors. 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 their business' energy performance.

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 are determined by a technical study 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 vendors generally utilize incentives, energy savings, and improved lighting to promote this program and retrofit opportunities.

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 Saves Small Business Energy Solutions Program.

Marketing and Outreach

Marketing for this program focuses on direct mail and email to customers, leads from trade organizations, direct outreach by trade allies and program coordinators, and referrals from each utility's customer service organization. Beyond traditional channels such as email or the utility website, the NH Utilities may employ alternative channels to reach small business customers, including:

- Key partnerships with affinity groups to engage with their member businesses in order to disseminate targeted information and identify energy efficiency opportunities
- Digital ad placements on popular supply vendor websites
- Direct contact with customers through telemarketing, direct mailers and bill inserts
- Public speaking engagements, tradeshow, seminars and customer events to promote programs and incentives
- Partnerships with trade allies, contractors and builder community to ensure incentives

- are referenced in their proposals, bids, and other customer communications
- Leverage customer testimonials and case studies to highlight achievements

Program Success

We measure the success of our Small Business Program 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



“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

In addition to saving on electricity costs for lighting, SportsZone will enjoy cost savings on maintenance as 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.

Recent or Planned Evaluations

With the approval and engagement of the Commission, 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 TecMarket Works study 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. It is anticipated that the impact evaluation will be complete in advance of planning for the 2019 energy efficiency plan update.

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 gas²³ 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 efficiency.

Vision for 2018 - 2020

Municipal energy use impacts every citizen in New Hampshire. Municipal budgets include the cost of energy use for each town and city, and citizens have the opportunity to directly or indirectly review and approve those costs through town meetings or elections. Discussions at town meetings, approvals of new buildings and upgrades, or the decision to form an Energy Committee or Commission are all opportunities to educate and raise awareness about energy issues as well as opportunities to reduce municipal energy costs and ultimately taxpayer burden.

The NH Utilities seek to deepen our connection with our municipal partners, providing the technical assistance needed to move projects forward and engaging with the municipal employees and local groups that work directly on municipal energy issues. Through the “Leading NH’s Wastewater Facilities to Energy Efficiency” grant and partnership we have found peer to peer sharing to be a useful way to help various municipalities identify good project opportunities and learn about useful next steps and approaches.

There is opportunity to do more 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 municipalities to provide education, identify opportunities, and implement projects that benefit local residents.

²³ Municipal natural gas customers are served via the Small Business and Large Business Energy Solutions programs

Program Budget and Goals

TABLE 7.4: Municipal Energy Solutions Energy Saving and Budgets

	Municipal Energy Solutions				
	2018	2019	2020	2018-2020	Lifetime
	Electric				
Budget	2,000,710	2,000,000	2,000,000	6,000,710	N/A
kWh savings	4,792,039	4,428,684	4,060,638	13,281,361	188,008,049
kW reduction	379	347	317	1,043	N/A
MMBtu savings	3,914	3,834	3,794	11,542	174,401
Electric participants	127	125	123	375	N/A

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

Program Design

The municipal segment has a wide diversity of building types, ranging from warehouses and town clerk’s offices to 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 complete spectrum of commercial and industrial solutions to our municipal customers.

The municipal sector differs from its commercial counterparts in a few ways, including decision-making, financing options and preferences, capacity to accommodate longer payback periods, 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.

Some municipalities have internal expertise that they leverage to work with the utilities in project development. For those that do not, the NH Utilities provide additional technical assistance to help towns understand project options, review proposals, and discuss projects with the community at town meetings or other events. The NH utilities also 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 workforce consists of a growing network of expert energy auditors, energy engineering firms, energy service companies, and equipment distributors, installers, and commissioning resources that leverage our incentives to inspire investment in the latest, most efficient technologies available.

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.

Turnkey service offers a streamlined approach for prescriptive incentives through skilled trade allies for common measures.

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 aren't 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.

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 Energy Efficiency Fund provides priority access to funds for municipal customers²⁴. These funds allow installation of fuel neutral measures such as HVAC systems, boilers, and weatherization in addition to electric saving measures. In 2018 and beyond, per Senate Bill 123 (SB 123), the NH Electric Utilities will ensure municipal customers have priority access to funds; if after four months however, program funding is not fully allocated, the dollars will be offered to other business customers who contribute to the Systems Benefit Charge. 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.

²⁴ RSA 125-O:23 <http://www.gencourt.state.nh.us/rsa/html/X/125-O/125-O-23.htm>

Eligibility and Enrollment

All municipal and local government energy-efficiency projects are eligible, including projects by local governments that have their own municipal utilities²⁵.

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

Program Success

We measure the success of our Municipal Program by town participation and satisfaction, as illustrated by Pelham High School. Pelham High School 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 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 one half years.

Energy Efficient Investments, a firm that specializes in Performance Contracting in New Hampshire has also effectively utilized our program to help municipal customers.



“Energy Efficient Investments has been able to work with our municipal customers to make drastic reductions in their energy consumption. Liberty Utilities takes a hands on approach with our customers to help select improvements that will both reduce building costs and improve thermal comfort. Most importantly Liberty helps customers look at the entire life cycle cost of an improvement. This helps our customers to understand the lowest first cost is not necessarily the best option.” *Mike Davey, business development manager, Energy Efficient Investments*

²⁵ Ashland, Littleton, New Hampton, Wolfeboro, Woodsville

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.

7.4 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.

Vision for 2018 - 2020

Eversource is interested in exploring program options that enable customers to propose multi-year projects. 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 biggest energy users in the state.

A multi-year approach will also enable Eversource to pursue other project types and agreement structures. With multiple years to complete a project, new construction or major retrofits may be viable. It will also enable the utility to develop memorandums of understanding (MOU) with customers. An MOU can establish energy-efficiency goals for large customers and provide performance-based financial incentives for meeting energy-efficiency targets.

Program Budget and Goals

TABLE 7.5: Energy Rewards Energy Savings and Budgets

	Energy Rewards RFP Program				
	2018	2019	2020	2018-2020	Lifetime
Electric					
Budget	803,897	1,274,648	1,848,735	3,927,280	N/A
kWh savings	2,693,943	4,205,420	5,948,560	12,847,923	158,377,698
kW reduction	458	714	1,010	2,182	N/A
Electric participants	26	44	68	138	N/A
Note: kWh = kilowatt-hours; kW = kilowatt					

Program Design

Eversource hosts an annual conference where potential bidders learn how to submit an RFP bid. Customers submit a request for the incentive amount they need to install an energy-efficiency project or series of projects. Eversource awards funds through a competitive process. 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. The 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.

The 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.

The program appeals to a variety of customer types. Most often, interested parties are

customers with in-house technical and engineering staff. This program also has value to customers with proprietary trade information. Competitive bids allow these customers to determine how they can get energy savings without fully disclosing process secrets. 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.

Incentives

The incentive is market-driven by the bidders. 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 generate projects for the Energy Rewards program. This program targets managed accounts (large energy users with the potential to save a lot of energy), and account representatives serve as the marketing arm for Energy Rewards due to their close customer relationships.

Program Success

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. The evaluation found that the programs (including large C&I retrofit, new equipment, and Eversource's RFP) are well liked and participants are satisfied with services. The evaluator made recommendations and the NH Utilities incorporated the new realization rates and took action to improve the accuracy of project tracking supporting documentation.

7.5 Combined Heat & Power (CHP)

Program Objective

Combined heat and power (CHP) systems, also known as cogeneration, generate electricity and useful thermal energy in a single, integrated system. Heat that is normally wasted in conventional power generation is recovered as useful energy, which avoids the losses that would otherwise be incurred from separate generation of heat and power. While the conventional method of producing usable heat and power separately has a typical combined

efficiency of 45 percent, CHP systems can operate at levels as high as 80 percent.²⁶ Typically, a customer must have at least 6,000 hours annually of a thermal requirement (heat and/or hot water) in order for a CHP system to be cost-effective. The input fuel for CHP systems can vary. Most utilize natural gas though propane, oil, and even wood pellets can be used, but these sources of fuel tend to be more expensive than natural gas.

During the three-year Plan period, Unitil Energy Systems, Northern Utilities, Liberty Utilities Electric, and Liberty Utilities Gas (“the Companies”) will investigate the viability of CHP as a custom measure in the electric energy efficiency C&I programs and to what extent the electric and natural gas companies can participate in the installation of the highest efficient units. This investigation will include research of offerings in other states, identification of the appropriate baseline and total resource cost, marketing approaches to encourage adoption of the most efficient systems, and the appropriate incentives to be offered. The Companies will also commit and expend funds for technical support and incentives for the installation of CHP systems should appropriate projects be identified and installed during the three year term. In these cases, savings will be claimed by the Companies as appropriate

²⁶ <http://aceee.org/topics/combined-heat-and-power-chp>

8.0 Evaluation, Measurement and Verification (EM&V)

8.1 Introduction

Evaluation, Measurement and Verification (EM&V) has been an integral component of the efficiency programs in New Hampshire since their inception. EM&V verifies portfolio energy savings, helps calculate the energy savings of specific measures and behaviors, and identifies program enhancements that help improve program delivery and results. Through EM&V efforts stakeholders can better understand the extent to which program activities have successfully addressed market barriers to the adoption of energy efficiency measures. EM&V activities also include program data collection, storage and analysis, as well as the software and staff time needed to ensure high quality information is maintained on all programs.

The 1999 Final Working Group Report of the New Hampshire Energy Efficiency Working Group, which established NH's current energy efficiency programs, now referred to as the NHSaves Programs, identified the need for ongoing evaluation of programs. Since that time, the NH Utilities, in close coordination with or direction of the Commission, have conducted more than 100 studies of the evolving suite of energy efficiency programs. These studies have measured the savings impact of various programs, as well as evaluated their effectiveness over a wide range of issues. http://puc.nh.gov/Electric/Monitoring_Evaluation_Report_List.htm.

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. For reference, the 2016-2018 Massachusetts Statewide Energy Efficiency Strategic Evaluation Plan defines these studies as follows²⁷:

- “Impact Evaluation – The core principles driving impact evaluation planning are Importance and Timing. When determining which end-use(s) to study, the evaluation team considers both the vintage of the most recent study as well as the percent of savings an end-use represents within a program and portfolio.

²⁷ 2016-2018 Massachusetts Statewide Energy Efficiency Strategic Evaluation Plan; <http://ma-eeac.org/wordpress/wp-content/uploads/Exhibit-1-Gas-and-Electric-PAs-Plan-2016-2018-with-App-except-App-U.pdf> ; p. 1,839

Uncertainty is also an important principle as the availability of higher quality data or improved evaluation methodologies offer opportunities to more reliably estimate energy savings. Secondary principles considered in this planning process are Balance and Depth.

- “Market Effects Evaluation – The two core principles for determining if a market effects study is warranted are Timing and Importance. A successful Market Effects study requires both a baseline market measurement prior to program intervention and a follow-up market measurement to assess the program’s impact on the market, ideally 2 or 3 years after the program is introduced. Secondary principles that are also considered are Balance and Differences.
- “Process Evaluation – The core principles driving process evaluation planning are Uncertainty and Timing. When determining the appropriateness of conducting a process evaluation of a specific program or initiative, the evaluation team looks at the maturity of the program as well as whether any changes to program delivery or market conditions have recently occurred. In the event changes have occurred or if a program or initiative is new, a process evaluation is typically warranted. However, prioritizing early feedback on program or market changes must be balanced with appropriate consideration, such as a program or initiative that is still undergoing significant changes and therefore should not be evaluated as the findings may be premature and therefore not likely to be useful. Secondary principles considered in the planning process are Importance, Balance and Depth.
- “Market Characterization or Assessment – Similar to process evaluation, Uncertainty and Timing are the core principles considered in planning market assessments. In addition, History plays a key role as the evaluation team must consider the information already available about a given market prior to commencing new research. When considering the relevance of historical data, the evaluation team will also assess the volatility or changes occurring in the market in question...”

While listed as separate entities, these types of studies and their objectives can be combined within one evaluation. It’s often beneficial to pair studies to ensure a more holistic understanding of root cause and effect, and to determine actionable recommendations that will yield accurate and effective solutions.

To give the public confidence that customer funded programs are producing real and verifiable energy savings, high quality, transparent third-party EM&V efforts are essential. After significant research²⁸, and discussion with stakeholders, the NH Utilities propose that NH is poised to build upon the existing model and enhance our collective ability to efficiently and routinely evaluate the effectiveness of program design and delivery as well as verify the impact of efficiency programs in the field. Impacts in the field include the full spectrum of market effects and reflect the actions taken by participants and by non-participants as a result of program efforts.

8.2 EM&V Framework

For the past several years, the NH Utilities have successfully worked side by side with staff from the Commission to implement an array of program evaluations that measure program impact, assess the design of programs, and identify opportunities for improvement. This approach has adequately addressed the need for program evaluation while meeting the requirements and standards imposed by the Independent System Operator of New England (ISO-NE), which the electric utilities must meet in order to participate in the Forward Capacity Market. As the New Hampshire natural gas and electric utilities embark on more aggressive energy efficiency goals under a statewide EERS, a more formal EM&V Framework will be needed to recommend near and long term priorities and oversee studies.

To identify and prioritize all the possible study opportunities, the NH Utilities propose to establish a new and more formal EM&V Framework, designed to provide a systematic, consistent and transparent way of thinking about the allocation of available EM&V funds and resources. The proposed Framework will be established and overseen by an EM&V Working Group.

The Framework will encompass a variety of EM&V-related considerations, including but not limited to the following:

- EM&V Working Group process

-
- [Six Year Evaluation Plan for Core EE Programs: Final Report, TecMarket Works 9/15/2014](#)
 - [Capturing the Multiple Benefits of Energy Efficiency, International Energy Agency](#)
 - [The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures, NREL March 2013](#)
 - [National Survey of State Policies and Practices for the Evaluation of Ratepayer-Funded EE Programs, ACEEE, February 2012](#)

- Strategic focus for EM&V issues and studies
- Procurement of evaluation vendors
- Consistency and expectations of the evaluation process
- Processes and procedures for the development of a statewide Technical Reference Manual (TRM)

8.3 EM&V Working Group

The EM&V Working Group will be modeled after the one in place in Massachusetts, and composed of relevant staff or designees of the Commission, and staff or designees from each of the NH Utilities. The EM&V Working Group will produce an annual Strategic Evaluation Plan that identifies the existing evaluation work underway, the studies and assessments known at that time that will be undertaken in the coming program year, and the trends in evaluation or market changes that merit review and consideration. This document will be the responsibility of the EM&V Working Group to develop, and will be produced in conjunction with the NH Utilities' annual Energy Efficiency Plan Update.

While the members of the EM&V Working Group will strive to reach a consensus on evaluation issues, where areas of difference cannot be resolved, authority for decision-making will reside with the Commission Staff or its designee. To enable the NH Utilities to fulfill their responsibility to report program savings to the Commission with full confidence, the NH Utilities may bring Commission Staff or designee decisions with which it disagrees to the Commission for review and resolution.

The EM&V Working group will meet regularly 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 or a designee may make regular presentations to the Energy Efficiency and Sustainable Energy (EESSE) Board regarding the progress toward achieving the goals as outlined in the annual Strategic Evaluation Plan, or to share specific findings from a completed evaluation.

For each evaluation, the EM&V Working Group will identify a utility study lead, which will act as the primary point of contact for the evaluator, facilitate meetings, ensure pre-established deadlines are adhered to, facilitate the data request process between the evaluator and the NH

Utilities, and coordinate with all parties before moving on to the next step in the process, when appropriate.

8.4 Strategic EM&V Focus 2018-2020

Given the rapid expansion in program activity under an EERS, and given limited administrative resources on the part of all participants in the EM&V Working Group, it is essential that evaluation priorities be strategic. Using the TecMarket Works multi-year evaluation plan as a starting point, a first priority for limited evaluation resources is for all programs to undergo periodic impact evaluations, not only to verify savings claims but also to meet the requirements of the ISO NE Forward Capacity Market in which each of the NH Electric Utilities participates.

Impact evaluations in New Hampshire have typically incorporated an evaluation of program design effectiveness that, while not the primary focus, identified recommendations for process and design improvements. Evaluating how the program is implemented enables the NH Utilities to correspond quantitative results with actionable improvements. Joint evaluations that address savings impacts and process enhancements are preferred to increase program efficiency, decrease the cost to serve, and maintain high levels of participant satisfaction.

Referencing the TecMarket Six Year Evaluation Plan (page 12), the utilities recommend the EM&V Working Group adhere to the set of criteria for prioritizing evaluations when developing a long range evaluation plan. These criteria are:

1. Size of Savings (relative to overall sector or portfolio savings and benefits)
2. Level of uncertainty about the savings (has the program design changed)
3. Degree of innovation (of the program being evaluated)
4. Frequency (when was it last evaluated)

To the extent that existing evaluation results from other jurisdictions or regional study groups can be used or adapted for use by New Hampshire programs, the NH Utilities will recommend to the EM&V Working Group that this be done, rather than expending limited resources on a New Hampshire specific study. Similarly, the NH Utilities recommend that wherever possible, the EM&V Working Group participate in studies taking place in the region to the extent that such participation reduces expense or administrative burden to New Hampshire without significantly compromising statistical validity of the results.

During the robust review process, stakeholders also communicated a desire for a variety of enhancements to EM&V efforts that will need to be refined and developed through the EM&V

Framework. These recommendations included expanding current evaluation methodologies, disseminating EM&V results more widely, translating results and recommendations into layman’s terms, and expanding the focus of EM&V to explore issues related to energy efficiency programs that have yet to be addressed in depth in New Hampshire. These preferences will be taken into account as the EM&V Working Group identifies and prioritizes EM&V initiatives and study focus.

8.5 Independent Evaluation Contractors

Working collaboratively, the EM&V Working Group will procure one or more independent evaluation contractors to undertake all evaluation activity within a certain research area (e.g., 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.

The Working Group will outline the general work scope for each evaluation in a competitive Request for Proposals. All proposals will be developed with the input and approval of all members of the EM&V Working Group. Responses will be scored based upon the relevant skills, expertise, experience, and cost of each bidder, rather than on the specific approach for any single program evaluation.

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 as part of the proposal writing process. Once an independent third-party evaluation vendor is selected through competitive bid, it will be the designated evaluator for all programs in the designated research area for the duration of the contract term. They will be allowed to supplement their own expertise with that of sub-contractors identified and approved prior to the start of each evaluation.

8.6 Stages of Evaluation

Evaluations will go through a consistent and predictable pathway from proposal to conclusion. Modeled after the process established in Massachusetts, this pathway includes six stages.

Table 8.1. Stages of Evaluation

Stage	Description
Stage 1: Conceptual Framework	A one page summary provides conceptual framework for the project including a very high-level budget and timing, as well as the objective or goal.
Stage 2: Preliminary (High Level) Work Plan	Provides strategies to meet objective including more detail on the potential research design, level of effort (number of surveys, site visits) including additional detail on budget/timing.
Stage 3: Detailed Work Plan	Provides detailed sampling and analysis plans; specific staffing and milestone deliverables.
Stage 4: Evaluation In Progress	Work is conducted consistently with plan and reported in periodic calls and/or status reports.
Stage 5: Reporting	Initial draft report followed by EM&V Working Group review and comment, meetings, and revised drafts based on feedback, all comments tracked and responded to (even if not addressed in final report)
Stage 6: Complete	Report is finalized and published; dissemination and discussion of report with relevant groups, recommendations reviewed with stakeholders and incorporated into program design and/or future plans.

By proceeding through a predictable pathway, the EM&V Working Group will be able to better manage the evaluator 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 at various stages of the evaluation pathway, including the strategic planning process as overarching evaluation plans are developed. Stakeholders may also be engaged as part of active evaluations, through in depth interviews to solicit input. Prior to the development of Stage 1 proposals, stakeholders may suggest topics of interest that will be discussed by members of the EM&V Working Group.

8.7 Technical Resource Manual

As committed to in the EERS Settlement and ordered by the Commission, a priority will be to create a New Hampshire specific Technical Resource Manual (TRM). The work associated with the TRM will be included in the Strategic Evaluation Plan. Activities will include:

1. Comprehensive review of all existing planning assumptions, algorithms and methods of modeling savings for each measure offered in each program based on the benefit cost screening model utilized by all of the electric and natural gas utilities;
2. Identify, describe and document evaluations or other sources of information for all existing or recommended measure assumptions;
3. Compile all savings assumptions the EM&V Working Group agree to in a written and/or online repository that can be referenced by the public.

Once finalized, the TRM will be submitted by the NH Utilities to the Commission as part of its annual plan update . A review and update will be completed on an annual basis in order to incorporate any new measures and updated assumptions as approved for inclusion in the TRM by the EM&V Working Group.

8.8 Budget

The EM&V budget for the 2018-2020 EERS Plan is proposed to be consistent with past budgeting at approximately 5% of the annual program budgets. This includes both internal and external costs of evaluation, including covering the planned retention by the Commission of an evaluation consultant, the preparing of a comprehensive TRM, maintenance and improvements of utility and statewide data tracking databases and program reporting. 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 purposes. The total evaluation budget for the 2018-2020 Plan is \$8.9 million.

8.9 EM&V Priorities

EM&V priorities will be directed by the EM&V Working Group and guided by the TecMarket Works 6-Year Evaluation Plan. The NH Utilities will have to balance limited EM&V budgets to pursue the highest priority third-party evaluations along with other essential EM&V activities as described in Section 8.8 above. In the near-term the NH Utilities will take action to facilitate recommended evaluations of existing programs that have not been evaluated recently. The NH Utilities recognize the following priority areas and programs for near term evaluations and will work with the Working Group to prioritize and move forward with these and other identified projects.

- Residential Lighting
- TRM Development
- Market Research
- Small Business Energy Solutions
 - NH Utilities are currently collaborating with program administrators in MA to undertake an impact evaluation on small business and municipal lighting
- ENERGY STAR Products
- Municipal
- Home Energy Assistance
- Home Performance with ENERGY STAR
- Technical Potential Study

8.10 Routine Program Reporting

The NH Utilities submit Quarterly Reports to the Commission on each program's performance towards achieving goals. These reports are submitted no later than 60 days after the end of a quarter and summarize utility progress towards meeting program energy savings and customer participation goals, as well as budget and spending details. Specifically, the Quarterly Reports highlight:

- **NHSaves Programs performance:** A comparison of program achievements to-do to 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 Reporting covers emissions reductions for the NHSaves programs, loan program statistics, and EM&V activities.

- **Expense by activity:** The NH Utilities summarize expenses by specific tracking activities, including:

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 Program detailed results:** The HEA programs addresses a critical market need in helping lower the energy costs and improve the efficiency of income-limited homes. The NH Utilities provide additional detailed information on this program to share results including, a count of single family and multifamily projects, projects by county, collaboration projects, and the percentage of incentives spent on heating systems. The NH Utilities also include an action plan for a utility if below its quarterly goals by more than 20 percent. The action plan includes revised goals and subsequent reports will include progress toward the revised goals.
- **Forward Capacity Market results:** Summarizes the actual proceed received from ISO-NE and the expenses incurred to-date associated with each NH Electric Utilities' participation in the marketing, including reporting, planning, and evaluation.

9.0 Performance Incentive

9.1 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).

9.2 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:

$$\text{Electric Lifetime Savings \%} = \text{Electric Lifetime Savings} / \text{Total Lifetime Energy Savings}$$

Where:

$$\text{Total Lifetime Energy Savings} = \text{Electric Lifetime Savings (in kWh)} + (\text{Lifetime MMBTU Savings} \times 293)$$

$$\text{Lifetime Electric Savings} = \text{Actual lifetime kilowatt-hour savings achieved by all programs offered under this Plan by each electric utility}$$

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 % \geq 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.

9.3 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

9.4 Smart Start Financing Performance Incentive

Eversource's Smart Start Financing performance incentive is 6% of the loans repaid.

9.5 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.

9.6 Performance Incentive Calculations

Attachments E1, F1, G1, H1, I1, and J1 present each utility's calculations for cost effectiveness, performance incentive, planned benefit-to-cost ratios and planned energy savings for each program.