



New Hampshire Low- and Moderate-Income Electric Opportunities

FINAL REPORT

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SUBMITTED TO: New Hampshire EM&V Working Group

SUBMITTED BY: NMR Group, Inc.

NMR
Group, Inc.





New Hampshire Low- and Moderate-Income Electric Opportunities Study

The purpose of this study was to identify, assess, and recommend opportunities for low- and moderate-income (LMI) residential customers to save electricity from energy efficiency measures other than lighting. The study combined primary and secondary data collection to identify energy-saving measures that could be added to the programs that serve LMI customers, as well as strategies for delivering more electric energy savings from existing measures. The report presents key findings and a set of opportunities and recommendations regarding program design changes and measure offerings the programs can implement to increase electric savings for LMI customers in New Hampshire.

Research Objectives



New Measures: Identify electric savings measures that can be added to the programs.



Existing Program Opportunities: Identify opportunities to save more electricity from measures already in the programs.



Program Enhancements: Identify program design changes that can deliver additional electric savings.

Evaluation Tasks

1

Program Staff Interviews provided in-depth information on current and future program offerings.

2

Measure Performance Review analyzed measures installed through the Home Energy Assistance program in 2021 and 2022.

3

Comprehensive Literature Review identified potential new electric efficiency measures and program offerings. The study team also identified fuel type distribution and end use data from the 2020 Residential Energy Consumption Survey and U.S. DOE LEAD Tool.

4

Market Actor Interviews with program staff offered insight into program designs and measure offerings found in the literature review. Interviews were conducted in October and November 2023 with Consolidated Edison (NY), Efficiency Maine, Efficiency Vermont, FirstEnergy (PA), National Grid (MA), and Xcel Energy (CO) / Energy Outreach Colorado.

Program Opportunities

Program Design Opportunities



Optimizing Program Accessibility



Addressing Financial Barriers



Partnering with Food Banks



Engaging Rural Customers



Building on Multifamily Focus



Targeting Manufactured Homes



Revisiting Non-Energy Benefits

Measure-Level Opportunities



Window Attachments



Energy Saving Kits



Products and Appliances



Review Low-Volume Program Measures

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Acronyms

Acronym	Meaning
AC	Air Conditioning
CAA	Community Action Agency
DHW	Domestic Hot Water
DIY	Do-It-Yourself
DOE	Department of Energy
EM&V	Evaluation, Measurement & Verification
ERV	Energy Recovery Ventilation
ES	Energy Star
HEA	Home Energy Assistance program
HRV	Heat Recovery Ventilation
HUD	U.S. Department of Housing and Urban Development
HVAC	Heating, Ventilation and Air Conditioning
IDI	In-Depth Interview
kWh	Kilowatt-Hour
LEAD	Low-Income Energy Affordability Data
LI	Low-income
LMI	Low and Moderate Income
MF	Multifamily
NEIs	Non-Energy Impacts
SF	Single-family
TSV	Thermostatic Shut-off Valve
WIC	Special Supplemental Nutrition Program for Women, Infants, and Children

Abstract

The purpose of this study was to identify, assess, and recommend opportunities for low- and moderate-income (LMI) residential customers to save electricity from energy efficiency measures other than lighting. The study combined primary and secondary data collection to identify energy-saving measures that are candidates for addition to the programs that serve LMI customers as well as strategies for delivering more electric energy savings from existing measures. This report presents key findings and a set of opportunities and recommendations regarding program design changes and measure offerings the programs can implement to increase electric savings for LMI customers in New Hampshire.

The research determined that the phase-out of lighting measures beginning in 2024 will reduce savings potential from existing measures by approximately one-fifth. Heating and water heating make up the majority of average household energy consumption. Opportunities for electric savings from heating are constrained due to the fairly low prevalence of electric LMI homes that have not already been served by the program as well as a restriction on fuel switching. The main opportunities for savings from heating are replacement of electric-resistance-only systems with heat pumps and additional building envelope improvements for any home with electric heating, largely implemented by the programs already. Existing water heating offerings are also robust, but there are opportunities to increase the delivery of some measures. There are also savings opportunities for products and appliances.

Because a large majority of the suitable measures are already offered by the programs, most of the recommended savings opportunities focus on increasing program participation and providing additional ways for customers to participate. The identified opportunities include:

- [Optimizing Program Accessibility](#)
- [Addressing Financial Barriers](#)
- [Partnering with Food Banks](#)
- [Engaging Rural Customers](#)
- [Building on Multifamily Focus](#)
- [Targeting Manufactured Homes](#)
- [Revisiting Non-Energy Benefits](#)
- [Window Attachments](#)
- [Energy Savings Kits](#)
- [Products and Appliances](#)
- [Reviewing Low-Volume Program Measures](#)

Executive Summary

The purpose of this study, conducted for the New Hampshire Evaluation, Measurement & Verification (EM&V) Working Group, was to identify, assess, and recommend opportunities for low- and moderate-income (LMI) residential customers to save electricity from energy efficiency measures other than lighting. The study combined primary and secondary data collection to identify energy-saving measures that are candidates for addition to the programs that serve LMI customers as well as strategies for delivering more electric energy savings from existing measures. This report presents key findings and a set of opportunities and recommendations regarding program design changes and measure offerings the programs can implement to increase electric savings for LMI customers in New Hampshire.

The primary program serving low-income households in New Hampshire is the fuel-neutral Home Energy Assistance (HEA) program. HEA is a robust, comprehensive program with a long track record of reducing customers' energy bills by improving the efficiency of their homes. The program delivers a full suite of measures including weatherization, lighting, heating systems, air conditioning, water heating, and appliances. A Moderate-Income Pilot program has been offered to customers earning between 60 – 80% of state median income since 2018; this program currently mirrors the offerings of HEA. Both low-income and moderate-income customers also may participate in the full range of residential efficiency programs, including ENERGY STAR Homes, ENERGY STAR Products, and Home Performance with ENERGY STAR.

Research Objectives

The study undertook three key research objectives:

- **New Measures:** Identify electric savings measures that can be added to the programs, with a focus on the HEA program.
- **Existing Program Opportunities:** Identify opportunities to save more electricity from measures already in the programs.
- **Program Enhancements:** Identify program design changes or enhancements that can deliver additional electric savings.

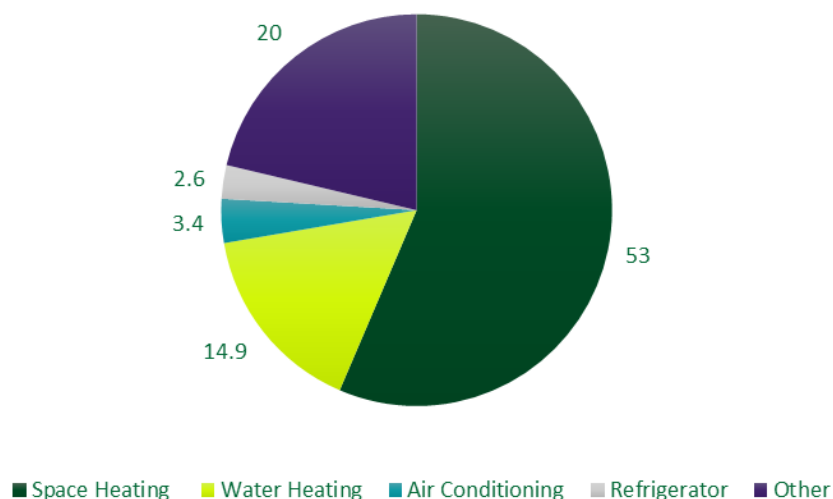
The energy-efficiency portfolios of the New Hampshire Utilities are required to be cost-effective (i.e., having a benefit-cost ratio of 1.0 or higher), inclusive of low-income program offerings. Therefore, this study attempts to focus on opportunities that are likely to have a neutral or positive effect on overall cost-effectiveness.

Key Findings

The phase-out of lighting measures beginning in 2024 will significantly reduce savings potential from existing measures. All lighting measures other than linear LEDs will cease to be offered through the HEA program in 2024. In 2022, approximately 17% of the program's annual kWh savings came from the lighting measures that will be phased out, with about 39% coming from linear LEDs. Most of the opportunity for linear LED installations is found in multifamily buildings.

The largest end uses present the greatest savings potential, though much of the potential has been captured through prior program activity. As shown in Figure 1 below, approximately 56% of the energy consumed by New Hampshire homes is used for space heating and 16% for water heating.¹ Of low-income homes in New Hampshire, approximately 15% use an electric heating system, while nearly half (49%) have an electric water heater.^{2,3} Homes that use electric heating and/or electric water heating therefore present key targets for the programs. However, the HEA program has been targeting low-income customers with electric space heating and water heating for many years, and therefore the future savings potential from these end uses is smaller than it may appear.

Figure 1: Average New Hampshire Residential Energy Consumption by End Use (MMBtu)



Source: U.S. Energy Information Administration, 2020 Residential Energy Consumption Survey, accessed November 29, 2023, [https://experience.arcgis.com/experience/cbf6875974554a74823232f84f563253?src=%E2%80%B9%20Consumption%20%20%20%20%20Residential%20Energy%20Consumption%20Survey%20\(RECS\)-b1](https://experience.arcgis.com/experience/cbf6875974554a74823232f84f563253?src=%E2%80%B9%20Consumption%20%20%20%20%20Residential%20Energy%20Consumption%20Survey%20(RECS)-b1).

Program Opportunities

Based on the findings from the program staff interviews, measure performance review, literature and TRM review, and market actor interviews, the study team identified the following program design changes and measure offerings that have delivered results in other states and can be incorporated into New Hampshire’s HEA program to increase electric savings for LMI customers. A longer list of potential opportunities was shared with study stakeholders and program

¹ U.S. Energy Information Administration, 2020 Residential Energy Consumption Survey, accessed November 29, 2023, [https://experience.arcgis.com/experience/cbf6875974554a74823232f84f563253?src=%E2%80%B9%20Consumption%20%20%20%20%20Residential%20Energy%20Consumption%20Survey%20\(RECS\)-b1](https://experience.arcgis.com/experience/cbf6875974554a74823232f84f563253?src=%E2%80%B9%20Consumption%20%20%20%20%20Residential%20Energy%20Consumption%20Survey%20(RECS)-b1).

² “Low-income Energy Affordability Data Tool,” Energy.gov Office of State and Community Energy Programs, accessed November 13, 2023, <https://www.energy.gov/scep/slsc/lead-tool>.

³ Itron, “New Hampshire Residential Baseline Study,” June 11, 2020, <https://www.puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/20200826-Electric-MER-NHSaves-Res-Baseline-Report-Final.pdf>.

implementation staff during the development of this report; based on staff feedback, some opportunities were removed from consideration because of prior experience, regulatory limitations, and other considerations. The list that follows includes opportunities that are relevant to New Hampshire and feasible, if challenging, to implement.

Program Design Opportunities

- **Optimizing Program Accessibility:** Increasing program accessibility and participation by creating a smoother income verification process and simplifying the application process through a website.
- **Addressing Financial Barriers:** Addressing financial barriers by expanding on-bill financing or online marketplace financing option that could reduce the burden when purchasing larger equipment types for customers who don't follow the traditional HEA pathway.
- **Partnering with Food Banks:** Partnering with food banks and/or pantries to deliver energy-efficiency kits, program marketing materials, and educational brochures and program marketing.
- **Engaging Rural Customers:** Expanding upon current efforts to reach rural communities.
- **Building on Multifamily Focus:** Crafting a dedicated program pathway to provide comprehensive custom and C&I offerings to multifamily properties.
- **Targeting Manufactured Homes:** Increasing participation and access to manufactured homes by partnering with manufactured housing communities and non-profit agencies that work with these communities.
- **Revisiting Non-Energy Benefits:** Exploring the applicability to New Hampshire of recent research findings from other states regarding non-energy benefits for LMI.

Measure-Level Opportunities

- **Window Attachments:** Increasing savings from window improvements for customers with electric heat by adding window coverings as offerings.
- **Energy Savings Kits:** Offering a range of kits, such as a DHW kit or a weatherization kit that includes materials necessary for customers to air-seal their homes, offers cost-effective savings and customer engagement at scale. These kits could be distributed online, via food banks, and/or to new utility customers.
- **Products and Appliances:** Incorporating several appliances that could be offered by the HEA and Moderate-Income Pilot programs such heat pump clothes dryers and showerheads with thermostatic shutoff valves.
- **Reviewing Program Measures:** Identifying underutilized measures already in the HEA program that could undergo program design changes to increase future participation.

Introduction

The purpose of this study is to recommend additional opportunities for low- and moderate-income customers of the New Hampshire (NH) Utilities to save electric energy over the coming years. Lighting measures have comprised the majority of electric savings from the programs in recent years, but in 2024, most lighting measures will cease to be offered due to implementation of federal lighting standards. The NH Utilities are therefore interested in identifying new sources of electric savings for LMI households.

This report presents the findings from three research tasks that were undertaken to identify these opportunities: These included a review of recent measure performance in the Home Energy Assessment program, a comprehensive literature review, and in-depth interviews conducted with representatives of programs that employ the identified opportunities.

Current Program Offerings

The primary program that serves low-income customers in New Hampshire is the Home Energy Assistance (HEA) program. HEA is a long-running and comprehensive program focused on fuel-neutral weatherization of both single-family and multifamily residences. The program serves residential customers of the New Hampshire Utilities that have an annual income of less than 60% of state median income when adjusted for family size. HEA currently employs two main pathways for income qualification. The primary pathway requires working with a county-based community action agency (CAA) to establish qualification based on household income for the New Hampshire Fuel Assistance Program (“FAP”) or the New Hampshire Electric Assistance Program (“EAP”). Other government assistance programs that require income verification at the same income thresholds as EAP or FAP can be used to qualify for HEA. The alternative pathway, used primarily for multifamily properties, is being qualified for subsidized housing by a housing authority or other property management company. The program also coordinates with the federal Weatherization Assistance Program (WAP) to identify eligible customers and to fund projects.

The HEA program offers a robust set of electric, natural gas, and delivered fuel efficiency measures focusing on weatherization; lighting; appliances; water heating; heating, ventilation, and air conditioning (HVAC); and plug-load measures. The measures provide long-term solutions that help households reduce their energy burden (i.e., the percentage of income spent on energy) by reducing energy consumption, thus lowering their bills. The measures also provide significant non-energy-related benefits, including improvements in health, safety, and comfort. The program is delivered to customers primarily via Community Action Agencies (CAAs) that perform income verification, conduct in-home energy assessments, and install measures.

In addition to HEA, low-income customers are also eligible to participate in any residential program offered by the Utilities. The other residential program offerings include the ENERGY STAR Homes Program, which provides energy efficiency services for new construction homes; the ENERGY STAR Products Program, which helps residential customers purchase ENERGY STAR-certified appliances, electronics, HVAC measures, and more; and Home Performance with ENERGY STAR, which provides a range of measures similar to that of HEA but is targeted at

market-rate customers. It is not known to what extent low-income customers participate in programs other than HEA.

Moderate-income customers (i.e., those earning 60 – 80% of state median income) are eligible to participate in the market-rate programs as well as the Moderate-Income Pilot program, which has been offered by the Utilities since 2018.⁴ Customers may enter the Pilot after undergoing the income qualification process with a CAA. This pilot program underwent a redesign in 2023 and now closely mirrors the HEA program in both measure offerings and incentive levels. Participation rates were low in the early years (with additional challenges due to the Covid-19 pandemic), with growth since the redesign. The Pilot is scheduled to conclude at the end of 2024.

Research Tasks and Methodology

Per recent legislation, the New Hampshire Utilities must deliver at least 65% of portfolio MMBtu savings from electric efficiency measures, with the remaining 35% from natural gas or delivered fuels. In the recent program years analyzed in this study (2021–2022), more than half of the energy savings from the HEA program came from lighting measures, with only linear LED fixtures continuing to be offered in the short term. With the amount of claimable savings from lighting significantly decreasing, the objectives of this study were to:

- Identify electric savings measures that can be added to the Home Energy Assistance program
- Identify opportunities to save more electricity from measures already in the program
- Identify program design changes or enhancements that can deliver additional electric savings

The costs and savings of the HEA program are factored into the portfolio average cost-effectiveness, which must be greater than 1.0. Therefore, one important constraint on the opportunities identified through this study is that they be cost-effective or close to cost-effective. Estimating the expected benefit-cost ratio for each opportunity is outside the scope of this study, but the study team did exclude opportunities that would put significant downward pressure on portfolio cost-effectiveness.

To meet the study objectives, the study team carried out three research tasks, as summarized in [Table 2](#). The evaluation team began by reviewing and analyzing the performance of measures offered through the program for 2021 and 2022. This measure performance review was conducted to identify measures that may serve as an opportunity for electric savings.

The study team then conducted a comprehensive review of literature on existing and potential electric program offerings for LMI customers to identify new electric efficiency measures and program offerings. The literature review consisted of program materials and evaluation reports for programs from other jurisdictions, recent baseline studies in the Northeast, and market research

⁴ The Pilot, which uses the NHSaves program infrastructure, is separately funded and approved: It has been funded by the NH Department of Energy out of proceeds from the Regional Greenhouse Gas Initiative and as an award resulting from an RFP won by the New Hampshire Utilities.

and industry reports. The study team also reviewed data from the 2020 Residential Energy Consumption Survey (RECs) to gauge fuel type distributions and end uses.

Based on the findings of the literature review, the study team conducted six market-actor interviews with program staff in October and November 2023 to gain further insight into relevant program designs and measure offerings. The key findings from the literature review and in-depth interviews informed the program and measure recommendations discussed in this report.

Table 1: Relationship Between Evaluation Tasks and Research Objectives

Research Objectives	Evaluation Tasks			
	Measure Performance Review	Literature Review	Market Actor IDIs	Reporting
A) Identify electric savings measures that can be added to the program		✓	✓	
B) Identify opportunities to save more electricity from measures already in the programs	✓	✓	✓	
C) Identify program design changes or enhancements that can deliver additional electric savings	✓	✓	✓	✓

Limitations and Sources of Uncertainty

- Some of the programs included in the secondary research have different regulatory considerations, cost-effectiveness requirements, and/or higher budgets dedicated to their low-income programs, which could affect the feasibility of incorporating similar measures in New Hampshire's HEA program.
- The scope of this work did not include quantitative analysis of the potential savings to be delivered by the identified opportunities. The study team focused on identifying opportunities that are likely to be cost-effective or close to cost-effective, and where possible this report indicates the approximate magnitude of savings for the opportunities.

Report Organization

The [Research Findings](#) section that follows details the results of the three primary and secondary research tasks.

The [Opportunities](#) section synthesizes the results into a catalog of opportunities for driving additional electric savings and offers recommendations for implementing the opportunities. To make the report user-friendly for program staff, the team presents each opportunity as a cohesive section including the relevant results and recommendations.

Research Findings

This section presents the findings of the four research tasks comprising this study:

- Program staff interviews that provided context and direction for the study
- Analysis of recent program activity, including measures installed during program years 2021 and 2022,
- A review of secondary sources to identify strategies and measures applicable to the New Hampshire context
- Interviews of program staff representing peer programs that have implemented strategies and measures that may be applicable for New Hampshire LMI customers.

Program Staff Interviews

The study team interviewed several program implementation staff members from the New Hampshire Utilities during the scoping phase of this study. The interviews were designed to supplement the team's understanding of the program offerings gleaned from written sources and focused on the following topics:

- Needs of low-income and moderate-income customers
- Delineations of "low-income" and "moderate-income" customer classifications
- HEA program administration and recent program changes
- The prevalence of electric heating and associated savings opportunities
- The role of mobile/manufactured housing in the HEA program
- Program measures, including the role of heat pumps in the HEA program
- Known opportunities for additional electric savings
- Research priorities

Interviewees shared some trends that the HEA program has been experiencing and changes that have occurred or are underway:

- Lighting has been a core part of the HEA program and the significant decrease coming in 2024 is a major change for the program.
- Constraints in the capacity of CAAs led to the Utilities bringing on additional contractors to complete projects and doing more resource-efficient multifamily projects.
- The Utilities are working toward adding simplified offerings that allow participants to install measures without going through a comprehensive energy assessment process.

- Some utilities are constrained by workforce capacity, whereas others are starting to have difficulty identifying customers who have not previously participated, especially in homes heated exclusively by electricity.
- A significant amount of program resources go toward necessary pre-weatherization repairs such as knob-and-tube wiring and asbestos removal.
- It can be challenging to identify moderate-income customers who meet the income criteria, and those who do qualify have expressed a need for costs to be covered at 100%.
- The HEA program serves mobile homes and increasing numbers of modular homes, and experiences challenges with identifying enough cost-effective measures suitable for these homes.

Priorities shared by the interviewees included:

- Maintaining cost-effectiveness of the HEA program and the overall portfolio
- Managing coordination with additional federal dollars from the Inflation Reduction Act
- Identifying more ways to help customers in mobile and modular homes
- Exploring behavioral and operational savings opportunities
- Capturing all the energy and non-energy benefits of installed measures

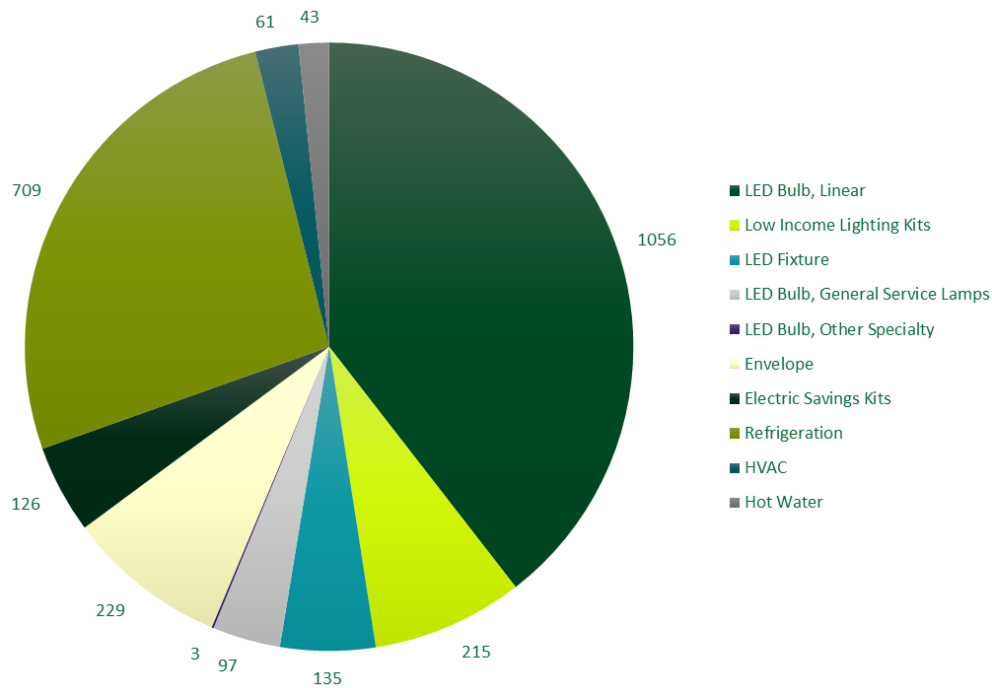
The findings from these interviews were used to inform the scope of work and research objectives for this study.

Installed Measure Analysis

Lighting and refrigeration measures comprise most of the savings reported by HEA in 2022. The measure performance review, which utilized the Utilities' 2021 and 2022 final benefit-cost models and focused only on the HEA program, identified the share of MWh savings measures contributed by each measure and end use.⁵ [Figure 2](#) shows that in 2022, lighting measures contributed the largest amount of annual electric savings (56%), with 70% of that amount coming from linear LEDs. Refrigeration measures (refrigerators and freezers) made up the second-largest share of savings with 27%, and envelope measures were third with 9%.

⁵ Data was obtained from Eversource, Liberty, and Unitil for this analysis.

Figure 2: Annual Electric Savings by End Use in 2022 (MWh)



The most cost-effective measures in 2021 and 2022 were almost exclusively fossil-fueled.

Of the 27 measures that had average benefit-cost ratios greater than 3.0 during 2021 and 2022, all but four were fueled by gas, propane, oil, kerosene, or wood pellets. The four most cost-effective electric measures included electric savings kits, two types of low-flow showerheads, and faucet aerators.

The most cost-effective electric measures included kits, domestic hot water measures, freezers, and air sealing and insulation. Table 2 shows the electric measures installed in 2021 and 2022 ranked by their average benefit-cost ratio. Liberty offered the most cost-effective measure in 2022 with their electric savings kits comprising an advanced power strip, a smart plug, and a nightlight.

Lighting measures had relatively low benefit-cost ratios. Though they contributed to the majority of HEA program savings in 2021 and 2022, lighting measures had average cost-effectiveness ratios less than 1.0.

Table 2: Electric Measures Ranked by Average Benefit-Cost Ratios, 2021-2022

Measure	Quantity	Net Annual MWh Savings	Net Lifetime MWh Savings	Average Benefit-Cost Ratio
Electric Savings Kit	1980	125.66	628.29	54.12
Low Flow Showerhead, Electric	33	4.28	63.79	9.52
Faucet Aerator, Electric	104	7.84	54.86	9.42
Handheld Showerhead, Electric	18	2.40	34.88	8.50
Air Sealing, Electric	57	123.35	899.07	2.14

NH LOW- AND MODERATE-INCOME ELECTRIC OPPORTUNITIES

Measure	Quantity	Net Annual MWh Savings	Net Lifetime MWh Savings	Average Benefit-Cost Ratio
Hot Water Setback, Electric	1	0.17	0.34	1.81
Freezer	123	122.63	1471.61	1.60
Insulation, Electric	63	102.29	2550.56	1.29
Dehumidifier	1	0.37	4.45	1.21
Refrigerator	1301	964.32	11571.90	1.14
Mini Split HP (cooling)	5	17.94	322.85	1.01
Low Income Kits	2720	215.34	1076.71	0.90
Room Air Conditioner / Central AC	3	11.28	101.50	0.80
LED Bulb, Linear	6085	1628.91	16289.13	0.72
LED Bulb, General Service Lamps	3587	305.32	610.64	0.71
Triple Pane Window	1408	24.79	619.86	0.66
Clothes Washer	1	0.80	8.85	0.57
Programmable Thermostat, Electric	18	5.68	85.14	0.51
ES Central AC	1	3.51	63.09	0.51
LED Bulb, Other Specialty	50	2.93	5.86	0.45
DHW Heat Pump Water Heater	26	31.31	407.05	0.43
Central AC	19	8.23	148.09	0.38
Insulated Door, Electric	2	0.00	0.00	0.32
Window Replacement, Electric	73	6.82	170.56	0.27
Mini Split HP (heating)	58	109.56	1972.02	0.26
LED Fixture	3012	687.11	1377.90	0.17

*Electric Savings Kit was recorded as "Wxn Projects" in the Liberty BC model.

Literature and Secondary Data Review

The study team carried out two secondary research activities:

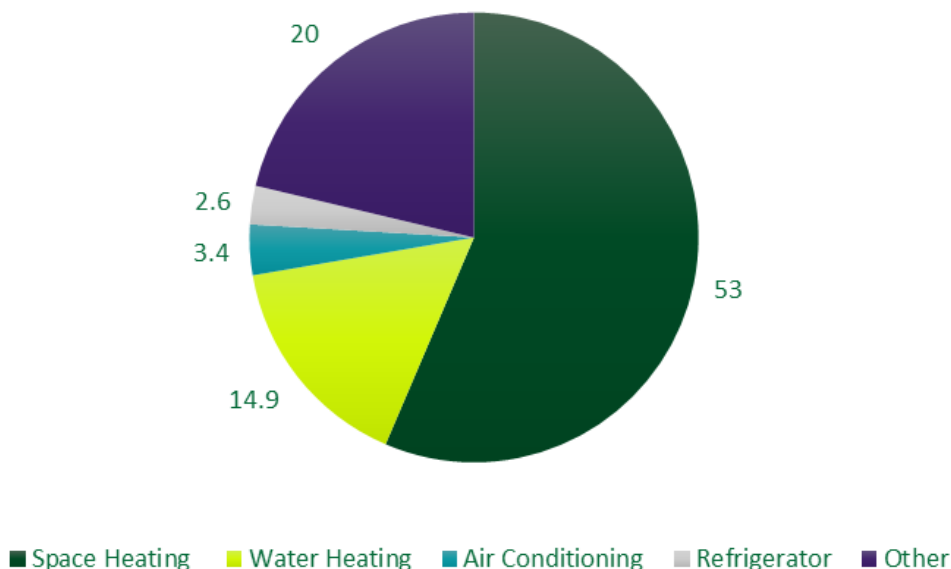
- Analysis of secondary data regarding energy consumption patterns in New Hampshire to better understand the potential for the opportunities to help New Hampshire LMI customers.
- A literature review targeted at identifying existing and potential electric program offerings for low- and moderate-income customers with a focus on states and provinces with a similar climate.

Analysis of Secondary Data

In order to understand energy consumption patterns of low- and moderate-income customers, the team reviewed recent baseline studies for New Hampshire, Massachusetts, and New York. Data from the 2020 Residential Energy Consumption Survey (RECS) and the DOE's Low-Income Energy Affordability Data (LEAD) Tool were also reviewed.

Space heating and water heating are the predominant energy uses in New Hampshire homes. The 2020 RECS survey provides recent data on average household energy consumption in New Hampshire. As shown in Figure 3 below, approximately 53% of the energy consumed by New Hampshire homes is used for space heating and 15% for water heating.⁶

Figure 3: Average New Hampshire Residential Energy Consumption by End Use (MMBtu)



Source: U.S. Energy information Administration, 2020 Residential Energy Consumption Survey, accessed November 29, 2023.

Electric resistance systems are the third most common heating system type in LMI homes. Of low-income homes in New Hampshire, approximately 15% use an electric heating system.^{7,8,9} Multifamily homes are more likely to use electric resistance heating than single-family homes: The New Hampshire baseline study published in 2020 found that 22% of multifamily homes have electric resistance heating, versus 8% of single-family homes.¹⁰ Figure 4 shows the distribution of fuel type by income category as obtained from the U.S. DOE's LEAD tool.¹¹ Low-income households are less likely to use fuel oil, propane, or wood for heating compared to non-low-income households, whereas low-income residents are more likely to use gas or electricity to heat

⁶ U.S. Energy information Administration, 2020 Residential Energy Consumption Survey, accessed November 29, 2023, [https://experience.arcgis.com/experience/cbf6875974554a74823232f84f563253?src=%E2%80%B9%20Consumption%20%20%20%20%20%20%20Residential%20Energy%20Consumption%20Survey%20\(RECS\)-b1](https://experience.arcgis.com/experience/cbf6875974554a74823232f84f563253?src=%E2%80%B9%20Consumption%20%20%20%20%20%20%20Residential%20Energy%20Consumption%20Survey%20(RECS)-b1).

⁷ "Low-income Energy Affordability Data Tool," Energy.gov Office of State and Community Energy Programs, accessed November 13, 2023, <https://www.energy.gov/scep/slsc/lead-tool>.

⁸ Itron, "New Hampshire Residential Baseline Study," June 11, 2020, <https://www.puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/20200826-Electric-MER-NHSaves-Res-Baseline-Report-Final.pdf>.

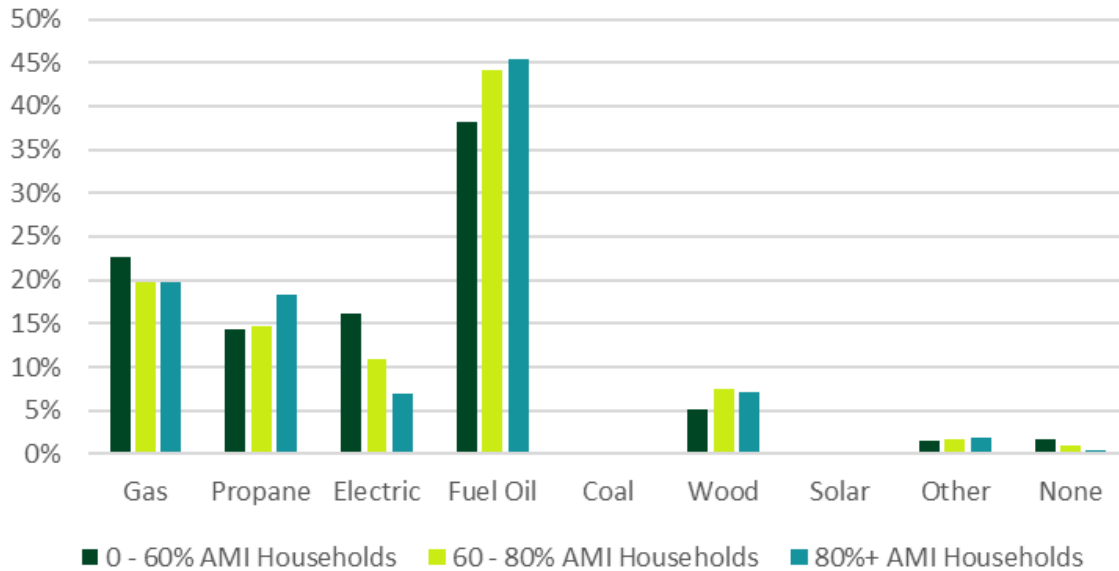
⁹ Note that the electric heating data from the LEAD Tool is a blend of electric resistance and other electrically powered systems such as heat pumps.

¹⁰ Ibid.

¹¹ "Low-income Energy Affordability Data Tool," Energy.gov Office of State and Community Energy Programs, accessed November 13, 2023, <https://www.energy.gov/scep/slsc/lead-tool>.

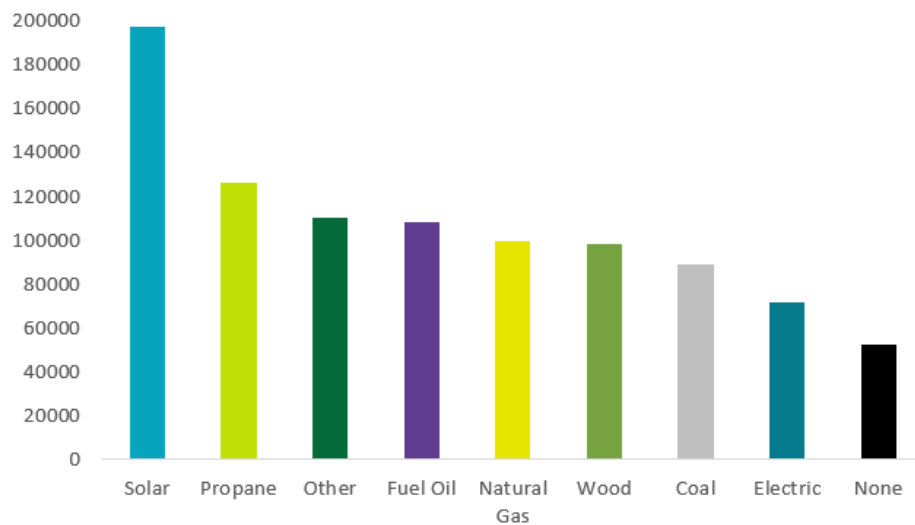
their homes. In addition, Figure 5 shows that New Hampshire residents who use electricity as their primary heating fuel have the lowest average household income of any fuel type (excluding those with no heating) at \$71,087.¹²

Figure 4: Heating Fuel Type by Income in New Hampshire¹³



Source: NMR analysis based on “Low-income Energy Affordability Data Tool,” Energy.gov Office of State and Community Energy Programs, accessed November 13, 2023, <https://www.energy.gov/scep/slsc/lead-tool>.

Figure 5: Heating Fuel Type Distribution by Average Household Income¹⁴



¹² “Low-income Energy Affordability Data Tool,” Energy.gov Office of State and Community Energy Programs, accessed November 13, 2023, <https://www.energy.gov/scep/slsc/lead-tool>.

¹³ Ibid.

¹⁴ Ibid.

Electricity is the predominant water heating fuel in low-income homes in New Hampshire.

Nearly half (49%) of low-income homes have an electric water heater.¹⁵ Similar to space heating, multifamily homes are more likely than single-family homes to use electricity for water heating (56% versus 47%). In low-income multifamily homes, nearly all of the electric water heaters are storage-type systems, whereas single-family homes have a mixture of storage, tankless, and heat pump systems.

Literature Review

The team reviewed programs across 14 states, but six of these states stood out due to their offerings and program design. The programs offered by these six states informed the opportunities identified in this report as well as the market actor interviews.

The six states the team focused on were:

- Efficiency Maine: Low-Income Home Energy Savings Program, Manufactured Homes Heat Pump Pilot
- Efficiency Vermont: Low-Income Weatherization Assistance Program, Mobile Home Weatherization Program, Low-Income Energy Savings Kits Program, Appliance Replacement Voucher Program, Targeted Communities Program
- Mass Save: Income Eligible Single-Family & Multifamily Programs
- Xcel Energy and Energy Outreach Colorado: Income-Qualified Home Energy Savings Program
- Con Edison: Affordable Multifamily Energy Efficiency Program, Multifamily Buildings Neighborhood Program, Bulb Giveaway Program
- First Energy: Low-Income Energy Efficiency Program

The team also reviewed market research and industry reports. The reports that were most informative for identifying opportunities are listed below. Key sources are described in [Table 3](#) below.

- DOE: Energy Efficiency Window Coverings
- ACEEE: Upgrading Manufactured Homes: Model Programs for Retrofits and Replacements
- ACEEE: Reaching Rural Communities with Energy Efficiency Programs
- ACEEE: Toward More Equitable Energy Efficiency Programs for Underserved Households
- ACEEE: ENERVEE Online Shopping Platform

¹⁵ Itron, "New Hampshire Residential Baseline Study," June 11, 2020, <https://www.puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/20200826-Electric-MER-NHSaves-Res-Baseline-Report-Final.pdf>.

Table 3: Summary of Key Sources

Program/Title	Description	Program Offering/Design Opportunity
Efficiency Maine		
Low-Income Home Energy Savings Program, Manufactured Homes Heat Pump Pilot	<p>Manufactured Heat Pump Pilot: A pilot program for participants who are income eligible and live in mobile/manufactured homes. The cost to participants is \$2000 but can be one up-front payment of \$2000 or a lease with 50 monthly payments of \$50.</p> <p>Low- Income Home Energy Savings: This program offers free energy efficiency kits and energy assessments which determine upgrades. Their website includes clear requirements/ details for each measure type, and it is easy to apply for prequalification through QR code.</p>	Optimizing Program Accessibility, Engaging Rural Customers, Targeting Manufactured Homes, Energy Savings Kits, Products & Appliances
Efficiency Vermont		
Low-Income Weatherization Assistance Program, Mobile Home Weatherization Program, Low-Income Energy Savings Kits Program, Appliance Replacement Voucher Program, Targeted Communities Program	<p>Targeted Communities: Program launched with partners and municipal leaders that targeted specific regions in Vermont.</p> <p>Appliance Replacement Voucher: Customers receive a voucher for free EE appliance based on income and energy bills.</p> <p>Low-Income Energy Savings Kits: Weatherization kit is an offering on their Energy Savings Kits Portal; kit includes insulation, air sealing, and water-saving measures.</p> <p>Low-Income/Mobile Home Weatherization Program: Program involves energy assessment that involves upgrades to air sealing, insulation and appliances. Mobile Homes may require replacing it with a Zero Modular home</p>	Optimizing Program Accessibility, Partnering with Food Banks, Engaging Rural Customers, Building on Multi-Family Focus, Targeting Manufactured Homes, Revisiting Non-Energy Benefits, Energy Savings Kits, Ventilation Offerings, Products & Appliances
Mass Save		
Income Eligible Single-Family & Multifamily Programs	<p>Income Eligible SF Program: Performance of an energy assessment that leads to upgrades in HVAC, insulation, air sealing, etc. Triple pane ES windows are a unique offering to this program.</p> <p>Lean Multifamily Program: Multiple incentive pathways are offered, such as an electrification incentive and DER incentive pathways. An IE DER project is a retrofit that meets 40% reduction in site EUI compared to other buildings.</p> <p>NEIs: NEIs savings associated with weatherization upgrades such as air sealing, insulation, and heating system upgrades are claimed for the SF and MF Income Eligible programs.</p>	Optimizing Program Accessibility, Building on Multi-family Focus, Revisiting Non-Energy Benefits, Window Upgrades, Products & Appliances
Xcel Energy		
Income-Qualified Home Energy Savings Program	<p>Income-Qualified Home Energy Savings Program: Xcel Energy partners with Energy Outreach Colorado to help lower energy bills through customized weatherization improvements. Window offerings, as well as the partnership with EOC are unique to this program.</p>	Addressing Financial Barriers, Window Upgrades
Con Edison		

NH LOW- AND MODERATE-INCOME ELECTRIC OPPORTUNITIES

Program/Title	Description	Program Offering/Design Opportunity
Affordable Multifamily Energy Efficiency Program, Low-Income Discount Program, Multifamily Buildings Neighborhood Program, Bulb Giveaway Program	<p>Affordable Multifamily Energy Efficiency Program: A multifamily program that offers a comprehensive and non-comprehensive pathway for whole-building retrofits or projects involving buildings upgrades. Incentive structure is based on kWh savings and project comprehensiveness.</p> <p>Multifamily Buildings Neighborhood Program: Program for Queens and Brooklyn neighborhoods where they can qualify for additional incentives energy-efficient equipment apart from the multifamily program.</p> <p>Bulb Giveaway Program: Partnership between Con Edison and Food Bank of New York to deliver light bulbs to low-income customers</p>	Addressing Financial Barriers, Partnering with Food Banks, Building on Multi-Family Focus, Energy Savings Kits, Ventilation Offerings
Low-Income Energy Efficiency Program	Low-Income Energy Efficiency Program: This program contains seven distinct initiatives under three categories: Direct-Install, Appliance Recycling, and Energy Efficient Kits.	Energy Savings Kits
DOE		
Energy Efficiency Window Coverings	The Department of Energy highlighted the benefits of using window attachments for energy savings and overall performance.	Window Upgrades
ACEEE		
Upgrading Manufactured Homes: Model Programs for Retrofits and Replacements	This topic brief goes over the current barriers faced when improving manufactured homes and what programs can do to overcome them. They point towards model example programs and highlight what energy efficient upgrades should be a point of focus for manufactured homes going forward.	Addressing Financial Barriers, Targeting Manufactured Homes
ACEEE		
Reaching Rural Communities with Energy Efficiency Programs	The report focuses on what current utility programs around the country are doing to reach rural communities. It also notes what policy improvements could be made to facilitate outreach to rural customers.	Engaging Rural Customers
ACEEE		
Toward More Equitable Energy Efficiency Programs for Underserved Households	This report calls attention to the barriers faced by marginalized communities in accessing program resources. It names ways programs can bridge the gap and overcome barriers to serving these communities/customers.	Optimizing Program Accessibility, Addressing Financial Barriers
ACEEE		
The High Cost of Energy in Rural America: Household Energy Burdens and Opportunities for Energy Efficiency	This report underscores the current challenges rural customers face with energy affordability. They also highlight ways to reduce the energy burden for these customers and what utility programs are doing to address it.	Engaging Rural Customers

In addition to the sources mentioned above, the team also reviewed:

- Energy Trust of Oregon: Savings Within Reach
- Energize CT: Home Energy Solutions Income-Eligible
- National Grid: Energy-Wise Multi-Family and Income-Eligible Multi-Family

NH LOW- AND MODERATE-INCOME ELECTRIC OPPORTUNITIES

- ACEEE: Empowering Electrification through Building Envelope Improvements
- NYS: Weatherization Assistance Program
- NYSERDA: Empower+
- NYSEG/RG&E: Income Qualified Market Rate Multi-Family Program
- NY TRM
- PA TRM
- IL TRM
- NEEA: Emerging Technology Quarterly Newsletter
- Entergy Solutions: Manufactured Housing Retrofit Program
- MCE Clean Energy: Energy Savings for Multifamily Properties
- PG&E: Energy Savings Assistance Program
- ACEEE: Closing the Gap in Energy Efficiency Programs for Affordable Multifamily Housing
- District of Columbia Sustainable Energy Utility: Low-Income Multifamily Custom Program
- E Source: Developing comprehensive utility programs for low- and moderate-income customers
- CenterPoint Energy: Low-Income Weatherization, Multi-Family Building Efficiency Program
- E Source: The Energy Equity Framework that Benefits Customers, Utilities, and Underserved Communities
- Com Ed: Income Eligible Kits Program

Market Actor Interviews

Based on the findings of the literature review, the study team identified relevant programs of interest and conducted six interviews with peer organizations offering programs for low- and/or moderate-income customers. The interviews were designed to strengthen the team's understanding of how other energy efficiency programs best engage low- and moderate-income customers and deliver electric savings opportunities. The interview questions focused on the following topics:

- The structure and organization of programs for low- and moderate-income customers
 - Program design, budgets, and metrics
- Strategies for targeting distinct customer demographics, such as rural or mobile/manufactured home customers
- Performance of relevant or unique program measures, including savings patterns, cost effectiveness, and overall successes and challenges experienced by the program
- The role of relationships with external partners in LMI customer engagement
- Future goals or anticipated changes to the program

The interviewees provided insight into overall program design, implementation, and measure performance. Below are some key findings from each interview used to inform the electric savings opportunities and related recommendations in this report.

- **Con Edison:** Con Edison is a utility serving residents living in New York City and Westchester County, New York. The study team was interested to learn more about the utility's Affordable Multifamily Energy Efficiency Program (AMEEP). In the interview with Con Edison, program staff outlined the two program pathways ("comprehensive" and "non-comprehensive") available to affordable housing buildings through AMEEP. This design is a tiered incentive structure that allows customers to either partake in minimal (non-comprehensive) upgrades or large-scale (comprehensive) efficiency projects. Con Edison shared that this structure appeals to customers and has been easy for them to navigate because of the transparent points-based approach used to determine the best fit pathway for participants. Furthermore, staff attributed the program's success to their strong partnerships with their implementation vendor, affordable housing experts, and community-based organizations, all of which promote AMEEP and reach potential participants.

Similar to New Hampshire, Con Edison has also implemented initiatives such as the Smart Kids program to provide energy efficiency kits to LMI students and their families, and food bank collaborations to offer free LEDs to low-income community members.

- **Efficiency Maine:** Efficiency Maine is an agency established to plan and implement energy efficiency programs throughout Maine. The study team was interested in learning more about the structure of their income-eligible options. In the interview, the Efficiency Maine team shared that their low-income programming leans heavily on categorical eligibility to qualify customers. Customers on benefit assistance are eligible for the largest rebate, which covers 80% of project costs up to \$8,000; Efficiency Maine works directly with benefit assistance agencies, like SNAP and TNAF, to bring customers into their low-income programming. The

agency is also working to carve out a more equitable, tiered approach by distinctly offering rebates to moderate-income customers, who qualify based on adjusted gross income and are eligible for enhanced rebates that cover 60% of project costs up to \$6,000.

Efficiency Maine shared that their low-income heat pump water heater program is their most popular offering with customers, with heat pump water heaters delivering the most electric savings out of all program measures. This program offers the installation of new heat pump water heaters to replace operational water heaters free of charge. One challenge mentioned was the bottleneck created by the limited number of installation contractors available. The contractors bear the upfront cost of purchasing a water heater, as the \$3,000 rebate is only delivered to the contractor after installation, and it seems that this incentive structure appeals only to a limited number of contractors. With cost-effectiveness posing a barrier to increasing incentive payments, the program hopes to find new ways to offer larger rebates to contractors in the future in order to expand participation for this measure.

In terms of external collaborations, Efficiency Maine works with MaineHousing, United Way, and Community Action Agencies to support LMI programming. In a continued effort to prioritize energy equity, program staff also described how they work with Native American tribes in Maine to bring energy efficiency programming to LMI customers living on indigenous lands.

- **Efficiency Vermont:** Efficiency Vermont is a statewide energy efficiency utility created to build environmental resiliency and help Vermonters lower energy costs. The study team sought to learn how Efficiency Vermont engages customers and delivers electric savings across the state, especially with their focus on rural and rental customers. In the interview, program staff mentioned that online resources and support staff call centers are crucial for reaching customers, as Vermont is very rural. Online, customers can access the Efficiency Vermont marketplace to easily order energy efficient products and apply for rebates.

The study team learned of Efficiency Vermont's efforts to connect with various customer demographics, such as prioritizing the availability of multilingual program materials and customer service staff to support new Americans and targeting rental customers through the online marketplace and rental property owners. Program staff highlighted the importance of collaborating with municipalities to reach customers, but mentioned the challenge in working with those that may be underfunded, especially in rural areas where collaboration would be the most beneficial. When asked about their work with food banks and schools, program staff shared that while they continue to maintain connections with both, it has been challenging to continue to offer programming because both food banks and schools have tended to have low capacities for new undertakings post-pandemic.

Regarding electric savings measures, Efficiency Vermont shared that their cold climate ductless mini splits are the central measure of their residential portfolio, followed by heat pump water heaters. One new offering they are considering is packaged window heat pumps for renters. Other interesting programming includes Efficiency Vermont's work with manufactured homes. The organization works extensively with affordable housing partners to replace inefficient units and collaborates with manufacturers to bring new zero energy modular homes and advanced manufactured homes to the Vermont market. Finally, the study team also spoke

to Efficiency Vermont about the weatherization kit offered through their Energy Savings Kit portal. While this kit has been part of their programming for a few years, it is not widely popular; customers seem to be deterred by the multi-step installation process and may struggle to understand its role in energy efficiency. The kit costs \$57, but the offering has not been effective due to low savings and engagement.

- **FirstEnergy Pennsylvania:** FirstEnergy Corp is an electric utility comprised of ten distribution companies that span several states, four of which service much of Pennsylvania. The study team was interested to learn more about the organization and delivery of FirstEnergy's Energy Efficiency Kits program and the School Education program, both of which are part of the low-income portfolio. The FirstEnergy program staff shared that energy efficiency kit savings are largely acquired through the new-mover kits initiative, which provides kits to new residential customers. While this initiative has been prioritized recently due to the ease and efficiency of kit delivery, existing customers could previously also apply to receive kits through an opt-in version of the program. There are two types of kits offered: Low-Income Standard and Low-Income Electric, which contains additional water measures for customers with electric water heating. The School Education program also offers kits to K-8 students in collaboration with the delivery vendor AM Conservation; the energy efficiency curriculum is taught by educators from the National Energy Foundation. FirstEnergy shared that the program makes a concerted effort to target schools that are considered low-income by their Title 1 wealth score or qualification for free and reduced lunch.

Kit components are the same across both these LI programs; program staff shared that while the kits are not inexpensive (especially since LI kits contain smart strips), the program has remained cost-effective and successful due to the high volume of kits that are distributed each year. While the high savings can be attributed to the lighting measures in the kits, FirstEnergy shared that the LI electric water measures are also high savers (e.g., showerheads save 92 kWh), as well as advanced power strips (65 kWh savings). Total reported LI Electric kit savings are 271 kWh, whereas the LI Standard kit savings are much smaller. Like New Hampshire, the FirstEnergy team is challenged with finding new measures to drive kit savings now that federal regulation has reduced the role of lighting savings. One potential direction for FirstEnergy is to incorporate weather stripping and weatherization products into kits in the future. Another challenge is ensuring that new-mover customers are made aware of kit deliveries to ensure that kits are properly received and installed, particularly in multifamily buildings.

National Grid (Mass Save): Mass Save is a collaboration between Massachusetts' electric and natural gas utilities to provide energy efficiency service to their customers. The study team met with National Grid to understand the successes and challenges of their programming for low- and moderate-income customers. For Mass Save, moderate-income customers are incorporated into the market-rate program and are offered distinct incentives in comparison to the income-eligible, low-income customers. Income-eligible programs are delivered through the Low-Income Eligibility Affordability Network (LEAN) and National Grid contracts with Action, Inc. as the lead vendor for their programming. For single-family efforts, Action, Inc. relies on community action agencies to deliver services to their respective territories. Multifamily projects are delivered by Action, Inc., in collaboration with other

subgrantees. Program staff shared that while collaboration with community action agencies has been beneficial for connecting with customers throughout the state, it can be challenging to rely on a fragmented network of staff to deliver programming. When asked about income qualification, National Grid noted that customers must receive means-tested benefits (such as fuel assistance, SNAP, etc.) to qualify for participation. Customers who receive these benefits can receive a discount rate on their electric bills and access to other additional energy-efficiency services. In multifamily properties, buildings can be eligible if 50% or more of residents directly qualify for the discount rate. One challenge is that many customers may not choose to receive means tested benefits even if they qualify. Program staff shared that they are looking towards alternate forms of income verification to reach customers through energy-efficiency programming even if customers are not receiving the discount rate. Overall, a main concern is ensuring that low-income customers can take advantage of the entire suite of offerings available to them.

Beyond lighting savings, program staff shared that large electric savings can be attributed to appliances (refrigerators, freezers, clothes washers, dehumidifiers, and window AC units). Windows were recently added to the income-eligible portfolio, and the team has considered new potential measures such as induction stoves and heat pump dryers, although they pose some challenges. National Grid is always considering new additions to the program as well as simplifications to the program design to best meet customer needs. From an equity standpoint, program staff mentioned they foresee increased spending to support barrier mitigation in underserved communities.

Xcel Energy Colorado & Energy Outreach Colorado: The study team conducted a joint interview with staff from Xcel Energy and Energy Outreach Colorado, the primary implementer for Xcel's income-eligible programs. The team was interested to learn more about Xcel's Income Qualified Weatherization Program, as well as other programming for LMI customers. The single-family weatherization program directly targets customers whereas the multifamily weatherization program targets landlords and property managers to deliver weatherization measures through property upgrades for tenants. Customers qualify for programming if their income is below 80% of area median income, and the main goal of the income-qualified programs is to help lower utility bills for customers. One unique point shared was Xcel Energy's allocation of budget towards health and safety measures, which allows the program to help customers address emergency situations in their homes like gas leaks that could be identified upon participation in the program. For the single-family weatherization program, Energy Outreach Colorado works with weatherization agencies to reach customers. The multifamily weatherization program targets customers through the affordable housing network, but there has been a recent shift to incorporate "organically" forming affordable housing into the program, where at least two-thirds of residents in a building are below or at 80% of AMI.

Currently, the most successful electric savings are attributed to lighting, followed by heat pumps; other popular non-lighting measures include insulation, programmable thermostats, and low-flow water fixtures. When asked about current window offerings, Energy Outreach Colorado mentioned that storm windows are available to single-family homes and as custom offerings for multifamily projects; however, the measure is very rarely cost-effective, and

funding is typically only approved if a broken window needs replacement. Observed energy savings for window measures have been low as well. Looking toward the future, program staff shared that they are looking at strengthening measures offered specifically for manufactured homes, including underbelly insulation.

Electric Savings Opportunities

This section summarizes the opportunities for additional electric energy savings for LMI customers based on key findings from the literature review and market actor interviews.

The section is organized by the type of opportunity, i.e., program design opportunities and measure-level opportunities:

Program Design Opportunities:

- Optimizing Program Accessibility
- Addressing Financial Barriers
- Partnering with Food Banks
- Engaging Rural Customers
- Building on Multifamily Focus
- Targeting Manufactured Homes
- Revisiting Non-Energy Benefits

Measure-Level Opportunities:

- Window Attachments
- Energy Savings Kits
- Products and Appliances
- Reviewing Low-Volume Program Measures

The icons for each opportunity indicate whether the opportunity is relevant for multifamily buildings, single-family buildings, or both:



This icon refers to opportunities for electric savings in **multifamily units**.



This icon refers to opportunities for electric savings in **single-family homes**.

Optimizing Program Accessibility

Programs are accessible when:

- they are widely known,
- information about their offerings and enrollment process is readily available, and
- enrollment and participation are as simplified and flexible as possible.



Enhancing program accessibility would increase savings by boosting participation, while also expanding the Utilities' equity and inclusion efforts. A 2023 ACEEE report titled *Toward More Equitable Energy Efficiency Programs for Underserved Households* highlights existing inequities among energy efficiency programs in the U.S.¹⁶ Utility programs often exclude households who shoulder the greatest energy burdens, creating a disconnect between energy efficiency programming and customers who need the most support. Among those underserved are low- and moderate-income households, renters, and households identifying as Black, Latino/a, Indigenous, rural, or non-English speaking.¹⁷ By prioritizing accessibility to energy-efficiency services, programs can reduce these disproportionate impacts on utility customers and expand participation beyond traditionally served households.

Focus on making program information and enrollment accessible online. One approach for increasing program accessibility and boosting participation is to make program information and resources available for customers online. A utility website or the NHSaves website may be the first point of contact for new customers, and existing customers may want and/or expect to find energy-efficiency program details easily online. Effective program websites communicate crucial information such as program benefits, income qualification details, clear application instructions, and an overview of the process of participation. Case studies and other relatable material can encourage reluctant participants to envision how the program might help them. Accessible websites also make information available in multiple languages. The NHSaves and New Hampshire Utilities' websites have varying amounts and types of information about program offerings, and none allow for an online application or other electronic means of contacting the programs.

Provide alternate means of accessing program information for customers lacking reliable internet access. The internet is a necessary way to reach customers, but programs must also address the barrier posed by lack of internet access. Examples of customers that may struggle to access internet-based information and resources include those residing in rural areas that lack broadband access, those who cannot afford internet access, seniors, and individuals with certain disabilities.¹⁸ Programs can connect with these customers by offering physical brochures or flyers and paper applications distributed via a variety of means, such as:

- community locations such as libraries and senior centers

¹⁶ Amann, Jennifer, Carolin Tolentino, and Dan York. "Toward More Equitable Energy Efficiency Programs for Underserved Households." ACEEE, 2023. <https://www.aceee.org/research-report/b2301>.

¹⁷ Ibid.

¹⁸ Information on broadband access in New Hampshire is available at <https://broadbandnh.sr.unh.edu/portal/apps/sites/#/new-hampshire-broadband-mapping/>.

- food banks and pantries
- supplied with an energy savings kit
- printed in a community newsletter.

Additionally, some programs make it possible for customers lacking internet access to call customer support and have the staffer fill out the form on their behalf. In an interview with the study team, Efficiency Vermont emphasized the importance of these strategies for engaging customers with unreliable internet, especially because the state is very rural.

Simplifying and providing multiple pathways to income qualification can bring more customers into income-qualified programs. A key factor for increasing program accessibility for low- and moderate-income customers is to streamline the income verification process. Time-consuming and difficult income qualification processes can deter customers from choosing to pursue electric savings opportunities. Other energy-efficiency programs have addressed this barrier by reaching customers through government assistance programs, simplifying program application steps, and offering informative online materials on both income qualification requirements and program measure offerings.

- **Efficiency Maine:** Efficiency Maine’s website provides exceptionally clear guidelines and information on programs for low- and moderate-income customers. The website features a simple income verification tool that allows customers to easily determine if they qualify for low- or no-cost upgrades.¹⁹ Low-income households are eligible if one member of the household participates in a qualifying government assistance program; moderate-income customers are eligible for elevate rebates based on their federal Adjusted Gross Income (AGI), verified using the applicant’s tax return from the previous year.
- **Mass Save (Massachusetts):** On its website, Mass Save presents an income eligibility table based on number of household members and annual household income.²⁰ Customers who live in single-family or two- to -four-unit apartment buildings can use this table to determine if they qualify for income eligible programming. If eligible, interested customers can dial a number or use the “Find a Community Action Program” tool to connect with a representative and schedule a remote energy assessment. Customers can also apply for fuel assistance through the Home Energy Assistance Program (HEAP) and learn more by calling the toll-free Massachusetts Heat Line provided on the website. Additionally, those who partake in at least one of several listed government assistance programs qualify to receive both fuel assistance and a discount rate applied to their utility bills. All this information is presented online in straightforward steps.

New Hampshire could leverage work to streamline income qualification at the federal and state levels. The Inflation Reduction Act enacted point-of-sale rebates for customers of qualified income levels to receive rebates for certain electrification measures. This statutory requirement necessitates innovation in income qualification to meet the timeliness required for “point-of-sale”

¹⁹ Efficiency Maine. “Income-Based Eligibility Verification.” Accessed November 13, 2023. <https://www.efficiencymaine.com/income-based-eligibility-verification/>.

²⁰ Mass Save. “Mass Save | Income Eligible Programs.” Accessed November 13, 2023. <https://www.masssave.com/en/residential/programs-and-services/income-based-offers/income-eligible-programs>.

implementation. A recent white paper summarizes the landscape of income qualification approaches and ideas for meeting the challenge of simplified, timely income qualification.²¹ The paper provides guidance to State Energy Offices, who will need to implement these processes. Central to the recommended approaches are the concepts of “maximiz[ing] simplicity and accessibility,” “avoid[ing] a ‘one-size-fits-all’ solution,” and “prioritiz[ing] flexibility and innovation.” The paper explores various options for categorical eligibility (i.e., piggybacking on prior qualification for a means-tested program) as well as more modern approaches such as geographic eligibility (e.g., using census tract income information) and technological approaches in the form of records-checking software tools.

Targeted efforts can better engage customers from historically underserved demographics. A key approach for expanding program accessibility is to anticipate the needs of hard-to-reach demographics. In particular, the literature review points to opportunities to better engage renters, moderate-income customers, new Americans or non-English speakers, and Indigenous populations. Other income-eligible programs have used partnerships with local organizations or social services to extend their reach, making it easier for customers from the mentioned demographics to become involved. In collaboration with these groups, programs can host workshops or events to expand energy literacy and attract new customers.

- **Efficiency Vermont:** Efficiency Vermont has made significant strides in support of energy equity. It has long partnered with organizations such as the Women, Infants, & Children (WIC) nutrition program, weatherization assistance programs (WAP), and nonprofit affordable housing organizations to increase its reach within Vermont’s low-income communities. For example, the organization has collaborated with WIC to help low-income families replace old refrigerators with new, efficient units for free. WIC was a suitable partner, in part due to their having their own income verification program, as well as existing relationships with the targeted population, and the focus on refrigerators unified the missions of the two organizations.²² In an interview with Efficiency Vermont, the organization emphasized the importance of these relationships and hosting community events to connect with potential customers.

To address language barriers and support new Americans in the state, Efficiency Vermont ensures that program materials are available in various languages and customer service staff are multilingual. The study team also learned of Efficiency Vermont’s efforts to serve renters. Rental customers are offered online marketplace rebates and appliance vouchers for products used in rental properties.²³ Furthermore, the multifamily portfolio offers a custom retrofit program designed to target rental property owners who can help their tenants save electricity and money.

²¹ Rewiring America, “Frictionless Income Verification Methods for the Electrification Rebates,” December 12, 2022, accessed November 22, 2023, https://assets.ctfassets.net/v4qx5q5o44nj/3cTqhWhFztiUWShtytzwe/10bfe13a145683d7a8f3e913b41ebd0e/Electrification_Rebates_Income_Verification_Memo.pdf.

²² Embedding Energy Efficiency into Low-Income Programs and Services.” Environmental Protection Agency, n.d. https://www.epa.gov/sites/default/files/2017-07/documents/efficiency_vermont_case_study_7-19-17.pdf.

²³ Efficiency Vermont. “Available Rebates,” Accessed November 13, 2023. <https://www.efficiencyvermont.com/rebates/list?cat=&hvacfilter=&type=rental>.

- **Efficiency Maine:** The Efficiency Maine website provides detailed energy efficiency information for measure offerings, such as heat pump rebates, to address knowledge barriers and enhance energy literacy among LMI customers.²⁴ In an interview, the study team learned that Efficiency Maine has more recently attempted to distinctly integrate moderate-income customers into income-eligible programming. Targeting moderate-income customers is an important effort for them to expand equity, since low-income customers are not the only ones who may struggle to afford energy efficiency. The organization also highlighted an ongoing partnership with a Native American tribe in Maine to ensure Indigenous populations have the training and resources available to support energy efficiency amongst their LMI community members. This includes, for example, working with local insulation contractors on building their skills and knowledge to better serve the tribal community with trusted program services.

Increased participation must be coupled with enhanced program delivery capacity. The most recent process evaluation of the HEA program found that a key challenge was meeting customer demand in the face of capacity constraints at the CAAs. The program has since made progress toward addressing this challenge, for example by bringing on additional contractors to handle some of the project work. The program is also investigating ways to offer participation options that would allow customers to receive targeted assistance without going through the full process of a home energy assessment and installation. This approach offers several benefits, including increasing program accessibility, exposing more customers to what the program has to offer, widening the pool of customers who can be helped in a given year, and managing resources, and should be supported.

Recommendations and Considerations

- 1 New Hampshire should analyze HEA participation data to better understand the demographics of participants and non-participants and the remaining potential.**
Analyzing prior participation data would enable the Utilities to target their engagement efforts in areas that need the most assistance in participating.
- 2 New Hampshire should work to streamline the income qualification process and strengthen related communications to increase program accessibility.**
Streamlining the income verification process will reduce barriers to participation and can allow the program to better reach LMI customers who are unfamiliar with or resistant to working with the CAAs. The study team recommends that New Hampshire enhance program communications to clearly outline income eligibility and verification steps, both online and in other materials. This can include additional information on the income qualification process, an online income verification form for customers to pre-qualify, as well as a table with state income-level guidelines to enable customers to quickly assess whether they program may be a fit for them. The pre-qualification step can be used to determine if a customer can follow through with the application process through CAP agencies. Transparent communication will engage qualifying customers who may avoid the effort of applying or otherwise assume they do not qualify.

²⁴ Efficiency Maine. "Heat Pump Incentives for Low and Moderate Income Mainers." Accessed November 13, 2023. <https://www.efficiencymaine.com/income-eligible-heat-pump/>.

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New Hampshire should incorporate additional strategies to target typically underserved demographics such as renters, non-English speakers, and customers with unreliable Internet access.

To increase participation from renters, New Hampshire can use an online rebate marketplace for products or appliances used in rental properties. The marketplace can also offer free, renter-friendly products. To expand this focus, the Utilities should continue to focus on building relationships with LMI property owners. New Hampshire should also review the language demographics of its LMI customers and create multilingual marketing materials to reach non-English speakers. Finally, the Utilities should offer support, such as paper copies of program information and a customer support call center, for customers without reliable Internet access. Overall, New Hampshire should continue to explore ways to expand program accessibility for disadvantaged individuals as one means of increasing participation.

4

New Hampshire should explore additional community partnerships to increase program awareness and support energy literacy.

The Utilities should seek to leverage their relationships with community-based or grassroots organizations in the state to connect with low- and moderate-income customers that have not previously participated. To enhance the work already being done in this area, the Utilities should consider connecting with organizations that target specific demographics. For example, ServiceLink Aging & Disability Resource Centers work to support older adults and people with disabilities in New Hampshire, and Welcoming New Hampshire is a coalition of organizations focused on welcoming immigrants and refugees into New Hampshire.^{25,26} New Hampshire can consider offering workshops on home energy efficiency to help non-participating customers better understand the benefits of programs like HEA. Events hosted in collaboration with local organizations can potentially serve as spaces for customers to apply for HEA and other programs with staff support and fast-track their application for approval.

²⁵ “ServiceLink,” New Hampshire Department of Health and Human Services, accessed December 7, 2023, <https://www.dhhs.nh.gov/programs-services/adult-aging-care/servicelink>.

²⁶ Holt, David. Welcoming New Hampshire, May 25, 2023. <https://welcomingnh.org/>.

Addressing Financial Barriers

The HEA program already offers robust funding for energy efficiency projects for LMI customers, covering up to \$15,000 annually per household with the option to exceed the cap when warranted. Some financial barriers remain, however: For example, other program pathways that may be a better fit for some LMI customers, such as the Energy Star Products program, do not offer a no-cost pathway for LMI customers. Therefore, the study team looked at opportunities for overcoming the remaining financial barriers faced by LMI customers.

Reducing financial and other barriers to entry could increase the number of low-income customers that implement energy efficiency upgrades. Aside from health and safety barriers and necessary repairs, the biggest hurdles LMI customers face when it comes to energy efficient upgrades are lack of money and lack of time to invest in these projects. For low-income households the national average energy burden is three times higher than for non-low-income households.²⁷ Low-income customers can benefit greatly from reductions to their electric bill due to energy efficient upgrades, but the up-front cost of improvements presents a barrier.

While the measures offered through the HEA program are at no cost, other program pathways that may be a better fit for some LMI customers, such as the Energy Star Products program, do not offer a no-cost pathway. Additionally, many customers don't have the time to schedule an energy assessment of their home or cannot take time off from work to receive an assessment or installation. Helping customers acquire products cost-free through the online marketplace can address the barriers of limited funds and time, making the programs more accessible and enhancing savings. The products offered at no cost would be limited to current products the HEA program offers to low-income customers, and savings could count toward either HEA or ENERGY STAR Products.

Program accessibility increases for moderate-income customers when financial barriers are removed, and their needs are directly targeted. Moderate-income customers face similar hurdles of lack of time and money when implementing energy efficiency upgrades. From interviews with Xcel Energy and Con Edison, the study team learned that moderate-income customers are included in their low-income programs: i.e., there is no differentiation between low-income and moderate-income customers.²⁸ Moderate-income customers under this structure benefit from the same incentives, no-cost structure, and participation processes that low-income customers receive. While this approach is not currently possible in New Hampshire due to existing state policy that delineates qualifying income levels for program eligibility, there are other ways to enhance the experience of moderate-income customers.

Another approach to addressing financial barriers for moderate-income customers is to build upon the current on-bill financing program. The following examples demonstrate some ways that utilities have addressed financial barriers.

²⁷ "LEAD Tool," Energy.gov, accessed November 9, 2023, <https://www.energy.gov/scep/slsc/lead-tool>.

²⁸ In-Depth Interview with Con Edison staff, November 1, 2023.; In-Depth Interview with Xcel Energy staff and Energy Outreach Colorado staff, October 24, 2023.

- **NYSERDA & SoCalGas:** NYSERDA and SoCalGas currently have an Eco-Financing option that allows their customers to make fixed monthly payments when purchasing on the program administrator's online marketplace. The online marketplaces also offer the option to apply any utility rebates at checkout.²⁹
- **South Carolina's Help My House Program:** This program offers customers the opportunity to incorporate equipment costs into their utility bills. The costs are financed over a period of ten years and the upgrades have the potential to reduce utility bill costs by a third. On-bill financing is tied to the meter and not the individual resident. Customers qualify for the program if they are in good standing with their utility bills, which precludes the need for income verification.³⁰

Recommendations and Considerations

- 1 New Hampshire should distribute promotional vouchers or codes to LMI customers to order measures free of cost through the online marketplace.** To remove the cost barrier for low- and moderate-income customers to purchase products through the online marketplace, the study team recommends the New Hampshire utilities develop promotional vouchers or codes redeemed while shopping on the online marketplace. These vouchers and codes could be distributed through energy-saving kits, community events, food banks, local and regional agencies, and other means. Using incentives through the online marketplace provides customers the opportunity to install energy-efficient equipment without requiring an energy assessment, helping to address the barrier of limited time. To limit any impacts on cost-effectiveness, no-cost products could be limited to products that are currently offered at no cost to LMI customers. Customers who used a voucher or code at check-out should be issued a survey. The survey will help verify installation rates and the service territories the customers live in. In exchange for taking the survey the customer can be mailed another code or voucher to redeem on the online marketplace as an incentive to take the survey.
- 2 New Hampshire should consider expanding its on-bill financing program.** Offering the option to finance larger equipment costs would reduce the burden on LMI customers having to make a one-time large purchase. The current on-bill financing program offered by the utilities has been used by customers in the past to finance projects through the Home Performance with ENERGY STAR Program.³¹ On-bill financing should be expanded to include appliances that would not be a part of a weatherization project such as refrigerators, clothes washers, and clothes dryers. In addition to the financing option, LMI customers could apply rebates and any other program related discounts to the purchase.

²⁹ Jennifer Amann, Carolin Tolentino, and Dan York, *Toward More Equitable Energy Efficiency Programs for Underserved Households* (ACEEE, May 23, 2023), <https://www.aceee.org/research-report/b2301>.

³⁰ Aimee Bell-Pasht, "Topic Briefs: Upgrading Manufactured Homes" (ACEEE, August 2023), https://www.aceee.org/sites/default/files/pdfs/topic_briefs_-_upgrading_manufactured_homes_-_encrypt.pdf

³¹ 2021-2023 NEW HAMPSHIRE STATEWIDE ENERGY EFFICIENCY PLAN," puc.nh.gov, January 19, 2021, https://www.puc.nh.gov/Regulatory/Docketbk/2020/20-092/LETTERS-MEMOS-TARIFFS/20-092_2021-01-19_EVERSOURCE_REV_PLAN_NARRATIVE_INCORPORATE_SETTLEMENT_TERMS.PDF.

3 **New Hampshire should investigate new approaches for targeting moderate-income customers.** Moderate-income customers are currently able to receive comparable incentives to the HEA by participating in the Moderate-Income Pilot, but the low uptake to date suggests that other aspects of the pilot are not overcoming barriers to participation. Customers that fall into the moderate-income range have been hard to identify and target. Many customers may not be aware they fall into the moderate-income range. One way to address this is by including a moderate-income pathway within the Home Performance with Energy Star Program delivery structure, while maintaining the measure offerings and incentive levels of the HEA program. New Hampshire could add a high-level income screening step to the enrollment process to channel the customer to the moderate-income pathway with higher incentives, the market rate offerings, or the HEA program for customers who qualify. In addition to helping identify and target moderate-income customers, this may help to overcome resistance to participation in a program referred to as an LMI program.

Partnering with Food Banks



Food banks and food pantries serve a similar demographic to the HEA program and have a related mission. Food banks serve primarily as distribution centers that partner with pantries to supply local communities, whereas pantries interact directly with customers utilizing their services.

Food banks have served as an effective way of delivering lighting measures in the past and could be used in the future to deliver other small self-install measures. The study team recognizes the NH Utilities' longstanding relationships with food banks and pantries in the state. The HEA Program has worked with food banks in the past to deliver LED bulbs. The literature review identified several examples of other programs that have also used or continue to use food banks as a mode of delivering measures to their low-income populations. Efficiency Vermont and Con Edison have considerable experience with these offerings, and several other New York utilities have started to engage with food banks and pantries to deliver lighting measures. Some utilities have also begun to deliver Energy Star products and program marketing materials via food banks and pantries.

- **Con Edison:** Starting in 2019, Con Edison partnered with the Food Bank of New York City and Feeding Westchester to deliver close to 65,000 four-packs of bulbs to income eligible residential customers.³² Other New York utilities, including National Grid, Central Hudson, and NYSEG, have also delivered similar programs throughout the state of New York, including suburban and rural populations. A Con Edison representative stated in an interview that food banks continue to be a means for delivering lighting measures. Bulb packages are branded with Con Ed information as well as a link to the website, thus serving as both a measure offering and program marketing material.³³ An evaluation of Con Edison's Food Bank program completed in 2020 used QR codes attached to the distributed bulb packages to deliver a survey to participants, allowing Con Edison to estimate in-service rates and leakage.³⁴
- **New York Utilities:** NYSEG and RG&E collaborate with food banks and pantries, as well as hosting events in their service territories to deliver Energy Star equipment and other energy saving measures. Central Hudson's Community Lighting program has provided LED bulbs through partnerships with United Way and food banks, and National Grid has utilized a network of food banks and local food pantries in upstate New York to distribute products as well as program marketing materials. Finally, Orange & Rockland's Retail Lighting Program works alongside their Food Bank Program to deliver lighting measures to LMI customers.³⁵

³² "Con Edison and Food Banks Brighten Homes With Bulb Giveaway Program," Con Edison and Food Banks Bulb Giveaway Program, August 2, 2019, <https://www.coned.com/en/about-us/media-center/news/2019/08-02/food-banks-brighten-homes-with-bulb-giveaway>.

³³ In-Depth Interview with Con Edison staff, November 1, 2023.

³⁴ Guidehouse, *Residential Retail Lighting 2018 Program Evaluation*, Prepared for Consolidated Edison, September 10, 2020. <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId=%7BF4F8ADEC-6840-4F87-92C3-E335165720AB%7D>

³⁵ "Verified Gross Savings Specification" (The Joint Utilities of New York and NYSERDA, August 29, 2022).

- **Efficiency Vermont:** Efficiency Vermont has collaborated with the Vermont Foodbank for years to deliver energy-efficient lighting to low-income customers. Vermont Foodbank's far-reaching network has allowed products to be moved across 280 partner food pantries throughout the state. They have delivered over 500,000 bulbs since 2009.³⁶ According to Efficiency Vermont, the partnership with Vermont Foodbank has become more challenging since food banks in Vermont were overwhelmed by the COVID-19 pandemic. While Efficiency Vermont continues to maintain connections with food banks, their main goal is to utilize those partnerships for delivering lighting measures while still possible.³⁷

Due to the increasing saturation of the LED lighting market and corresponding decrease in savings, looking to food bank partnerships for bulb distribution is no longer a major opportunity.³⁸ However, food banks and pantries can still effectively deliver other energy saving measures to LMI customers. Partnerships with food banks and pantries are a promising mode for delivering Energy Star equipment, energy-efficiency kits, educational materials, as well as program marketing materials in future program years.

However, there are barriers that could impede this opportunity. For instance, New Hampshire food banks and pantries could have limited capacities to dedicate time and focus to partnerships. Finding ways to make a potential partnership mutually beneficial could help to overcome such a barrier. Additionally, NH Utilities have encountered difficulties confirming New Hampshire residency and quantifying participation rates and install rates; adopting an evaluation approach like Con Edison and as described above could mitigate these challenges. Another barrier to participation is the smaller concentration of food banks and pantries in rural areas.³⁹ Lastly, limited research on the participation levels of food banks across the state may affect opportunities for partnership.

Recommendations and Considerations



New Hampshire should revisit partnerships with food banks and/or local food pantries in New Hampshire to deliver program information and potentially energy kits or Energy Star product-type measures. Food banks have served in the past as a way of targeting the LMI demographic and delivering lighting measures. The NH Utilities should consider expanding the scope of food bank partnerships to deliver program information and small self-install products other than lighting. For example, Energy Star equipment and kits have been delivered through food banks in other jurisdictions and could serve as a replacement to delivering lighting measures. The study team recommends beginning with a demonstration program to test the viability of using food banks and pantries as a delivery mode for other measures. To enable the Utilities to claim savings for the delivered measures, the

³⁶ "Efficiency Vermont: Embedding Energy Efficiency into Low-Income Programs and Services," epa.gov, July 19, 2017, https://www.epa.gov/sites/default/files/2017-07/documents/efficiency_vermont_case_study_7-19-17.pdf.

³⁷ In-Depth Interview with Efficiency Vermont staff, November 8, 2023.

³⁸ "Energy Conservation Program: Energy Conservation Standards for General Service Lamps; Final Rule," Regulations.gov, May 9, 2022, <https://www.regulations.gov/document/EERE-2021-BT-STD-0005-0070>.

³⁹ "New Hampshire Food Access Map," unhcoopext.maps.arcgis.com, accessed November 9, 2023, <https://unhcoopext.maps.arcgis.com/apps/MapSeries/index.html?appid=5caa235e0e024beb8bebbba50a0297d15&entry=2>.

demonstration could be evaluated using an approach like that used by Con Edison to estimate in-service rates, leakage, and lead generation for HEA.



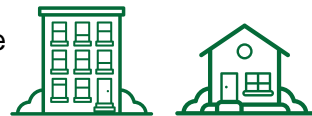
New Hampshire should develop a set of products to deliver via food banks and pantries. Food banks have been a successful avenue for delivering lighting because bulbs are easily stored and transported, and installation is easy for customers. Size and ease of installation should be primary considerations when developing a set of products that can be delivered via a food bank channel. The study team recommends using food banks and pantries to deliver various types of energy-efficiency kits, such as kits focusing on water conserving measures or weatherization measures. Energy-efficiency kits that include water saving measures such as low-flow showerheads and faucets will be easy for customers to install. A weatherization kit could include materials needed to air seal a home as well as instructional materials. (See the section on [Energy Savings Kits](#) for more kit-related ideas.)



New Hampshire should develop instructional videos and flyers to distribute with the products. The study team recommends distributing program materials as well as links to instructional videos along with the products delivered at food banks and pantries. The ease of installation for products is important and to better assist customers, each kit should include links to instructional videos demonstrating how to use each product. Along with instructional videos, the kits can include brochures about New Hampshire's Home Energy Assistance program, enhancing program accessibility and potentially leading to incremental participation.

Engaging Rural Customers

Energy-efficiency programs in rural areas face a set of unique challenges, including establishing and maintaining certified energy efficiency contractor networks or facing additional labor and travel costs, reduced opportunities for community events, communication challenges, and often high concentrations of renters, low-income households, and mobile homes.⁴⁰ Focusing on the barriers inherent to rural program participation offers the potential for multiple benefits, including increasing program accessibility and equity, boosting program savings through additional participation, and supporting local capacity.



Expanding the Utilities' current efforts to reach rural customers would boost savings and participation while also increasing program accessibility. The NHSaves programs already serve many rural customers, though the relative participation rates in rural areas is currently unknown. As part of their ongoing efforts to improve service to New Hampshire customers, the Utilities can focus on the unique challenges of program implementation in rural areas. Rural households across the U.S. tend to carry a greater energy burden when compared to metropolitan households or their region overall. Additionally, rural communities have high concentrations of low-income households, meaning they are less likely to afford energy-efficiency upgrades out of pocket.⁴¹ Increasing participation from rural customers can not only offset their energy burden and dramatically improve their quality of life but also bring in large savings from inefficient homes.

Rural customers can be hard to reach due to geographic location or lack of internet access.

Some income-eligible programs have created targeted approaches to engage large populations of rural customers in their state. A 2018 ACEEE report on reaching rural communities through energy efficiency programs provides examples of successful engagement strategies.⁴² The report highlights the benefit of program collaboration with municipalities and local agencies or non-profit organizations, citing Efficiency Vermont as a strong example. Many programs rely on reaching customers through email marketing campaigns from their utility companies; program staff have also found it effective to use mailers, phone outreach, and community newsletters as additional forms of communication – especially for those without reliable Internet access. Another approach is to implement initiatives in rural stores, such as in-store signage or rebate coupon distribution. A newly issued Toolkit from ACEEE also highlights strategies for supporting rural energy efficiency, including having contractors focus on one geographic area at a time to reduce travel and other costs, expanding broadband access, and offering fuel-neutral services, which NHSaves has done for many years.⁴³

⁴⁰ Ross, Lauren, Ariel Dreihobl, and Brian Stickles. "The High Cost of Energy in Rural America: Household Energy Burdens and Opportunities for Energy Efficiency." ACEEE, July 2018.

<https://www.aceee.org/sites/default/files/publications/researchreports/u1806.pdf>.

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⁴² Shoemaker, Mary, Annie Gilleo, and Jill Ferguson. "Reaching Rural Communities with Energy Efficiency Programs." ACEEE, September 2018.

<https://www.aceee.org/sites/default/files/publications/researchreports/u1807.pdf>.

⁴³ ACEEE, "Toolkit: Adapting Energy Efficiency Programs to Reach Underserved Residents," November 2023, https://www.aceee.org/sites/default/files/pdfs/adapting_energy_efficiency_programs_to_reach_underserved_residents_-_encrypt.pdf.

- **Efficiency Maine:** As part of its retail lighting program, Efficiency Maine printed instant rebate coupons for customers to redeem at the register for a discounted Energy Star LED bulb. They used in-store signs to conveniently advertise the program to shoppers.
- **Efficiency Vermont:** In 2016, Efficiency Vermont launched the Targeted Communities program to support economic revitalization in selected towns and farms.⁴⁴ While this program did not target residential customers, Efficiency Vermont highlighted the importance of building relationships to reach community members who may not have access to traditional marketing channels. In an interview with the study team, Efficiency Vermont emphasized their focus on underserved communities and provided examples of targeted outreach, such as hosting events at local venues like libraries and providing Internet access during events to enable customers to fill out application forms or order products.

Recommendations and Considerations

- 1 **Where not already doing so, New Hampshire should consider collaborating with rural stores and community venues frequented by potential customers to promote energy-efficiency programs.** The New Hampshire Utilities can develop an initiative to engage rural customers at their convenience. Offering program materials or energy savings opportunities in storefronts will help close the gap between the utility companies and rural community members. Offerings could include easy-to-install measures for shoppers to pick up at checkout, rebate coupons to redeem online, or free energy audit applications for income-qualifying customers. In-store signage and flyers will direct shoppers to these offers and spreading general program awareness to those who may not have time to get involved in-store.
- 2 **New Hampshire should build upon relationships with local municipal leaders, agencies, and/or nonprofits to strengthen public support for energy efficiency.** Local entities and organizations have a strong understanding of the constituents or community members they serve. These groups can support new avenues for engaging hard-to-reach customers, such as integrating program marketing into newsletters or requesting feedback from the community on energy-related concerns and needs. Furthermore, local governments can provide insight for the New Hampshire Utilities to learn which neighborhoods or towns have higher energy consumption or face a greater energy burden. By tracking this data, New Hampshire can identify areas where targeted outreach or energy efficiency education may be most beneficial and will generate the greatest electric savings.

⁴⁴ Ibid.

Building on Multifamily Focus



The HEA program currently serves multifamily properties using a similar process to that followed for single-family homes, including an energy assessment and modeling of measure savings, and includes the same measure offerings. Commercial-type measures found in common areas may use the single-family pathway, as is done for lighting measures, or may be served using the commercial program infrastructure.

Building upon the Utilities' current work in multifamily properties to articulate a whole-building multifamily pathway within the existing HEA program would deliver comprehensive savings while continuing to benefit LMI customers. Specifying a set of processes for identifying and installing a comprehensive range of common area and central system measures would ensure that all available electric savings opportunities in multifamily buildings are addressed. Peer organizations such as Mass Save, Efficiency Vermont, and Con Edison have dedicated multi-family retrofit programs that could serve as models for such a pathway for New Hampshire.

LMI Multifamily efficiency programs in nearby states deliver benefits for residents and property owners/managers. These programs include both custom and prescriptive measures with a comprehensive approach to both common area and in-unit improvements. Projects completed through these programs involve working with property owners, affordable housing agencies, and sometimes engineering and evaluation teams to perform technical reviews to determine incentive amounts. Project benefits accrue to both residents and property managers/owners, and the LMI customers living in these buildings experience health and safety improvements, as detailed in the section titled Revisiting Non-Energy Benefits, as well as other non-energy benefits from the upgrades.

- **New York:** The New York State Affordable Multifamily Energy Efficiency Program (AMEEP), offered by Con Edison, NYSEERDA, and other program administrators, offers both comprehensive and non-comprehensive pathways. The comprehensive pathway is designed for whole building retrofits or projects involving upgrades to various building systems, while the non-comprehensive pathway is designed for projects that include fewer upgrades. The incentive structure is based on project comprehensiveness and kWh savings.⁴⁵ This program is tailored for affordable housing, so it directly benefits LMI customers living in these buildings.⁴⁶ In an interview with the study team, Con Edison shared that this structure appeals to customers because it supports varying degrees of participation. They also noted that their partnership with an affordable housing expert facilitates making connections and raising awareness of their program among potential participants.⁴⁷

⁴⁵ New York State Affordable Multifamily Energy Efficiency Program, accessed November 1, 2023, <https://www.coned.com/en/save-money/rebates-incentives-tax-credits/rebates-incentives-for-multifamily-customers/affordable-buildings>.

⁴⁶ Ibid.

⁴⁷ In-Depth Interview with Con Edison staff, November 1, 2023.

Common area LED fixtures are offered as prescriptive measures that fall under both the comprehensive and non-comprehensive pathways, with incentives on a per-fixture basis. In contrast, elevator modernization is offered as a custom measure with incentives of \$0.35 per kWh. For custom measures Con Edison offers unitary controls, packaged terminal air conditioners, variable frequency drives, circulator pumps, chiller replacement, and others. These measure offerings tend to be included as part of larger comprehensive pathway projects.⁴⁸ The Con Edison representative that the study team spoke with stated that common area lighting was their most popular measure, whereas the elevator modernization and ventilation offerings measure saw relatively low uptake. In-unit direct-install measures include LED bulbs, faucet aerators, and showerheads.

- **Efficiency Vermont:** Efficiency Vermont's Income-Based Multi-Family Renovation program offers weatherization, electric efficiency, and HVAC upgrades for multifamily buildings where at least 50% of the residents are eligible based on income. Efficiency Vermont contracts with 3E Thermal to manage these projects and coordinate with weatherization agencies and contractors.⁴⁹ During an interview with Efficiency Vermont, the study team also learned about the program's collaborations with affordable housing agencies, property owners, and mobile home parks with rental units. Some mobile home parks are owned by affordable housing agencies, which allows Efficiency Vermont to treat these units as multifamily to access higher incentives. Through this approach Efficient Vermont has been working with affordable housing partners on mobile home replacements when warranted.⁵⁰
- **Mass Save:** The Sponsors of Mass Save offer an income-eligible multifamily program aimed at working with property owners and landlords on energy efficiency upgrades for buildings with five or more units. Following an energy assessment of the property, a wide range of measures similar to that offered in New York is offered to meet the property's needs. In an interview with one of the Mass Save program administrators, the organization stated they are in the process of developing a deep energy retrofit pathway for properties. These projects would be viewed as overall improvement projects and will require technical reviews to determine incentive amounts.⁵¹

Recommendation

1 New Hampshire should build upon its current multifamily offerings by creating a dedicated pathway within the HEA program for multifamily building projects dedicated to serving LMI residents. The study team recommends New Hampshire articulate its current offerings into a program pathway dedicated to energy efficiency upgrades for buildings with five or more units. A dedicated pathway would place a greater focus on custom solutions and C&I-type measure upgrades for common areas and central systems. The NH

⁴⁸ "New York State Affordable Multifamily Energy Efficiency Program: Downstate Incentives" (Con Edison, October 30, 2023).

⁴⁹ "Multifamily Renovation & New Construction," Multifamily Renovation & New Construction, accessed November 8, 2023, <https://www.efficiencyvermont.com/services/renovation-construction/multifamily-new-construction>.

⁵⁰ In-Depth Interview with Efficiency Vermont staff, November 8, 2023.

⁵¹ In-Depth Interview with Mass Save staff, November 2, 2023.

Utilities should reach out to property owners, landlords and affordable housing agencies they have collaborated with on past projects in order to advertise this pathway and review the viability of returning to these projects for common area lighting projects and larger custom upgrades. In addition, the pathway should be described on the program website.

Targeting Manufactured Homes

Broadening the focus on manufactured homes expands support for low-income customers.



Given the rising cost of home ownership and overall shortage of housing in New Hampshire, a 2023 New Hampshire Housing assessment by Root Policy Research estimates the need for 60,000 more housing units in the state between 2020 and 2030.⁵² To address this need and lack of affordable housing, the report recommends expanding development of manufactured housing, which, as of 2020, makes up 6% of New Hampshire housing units. Manufactured homes reduce the cost burden of both owning and renting a home, with the implication that residents are more likely to have lower incomes. The New Hampshire Utilities can assist in alleviating the energy burden experienced by manufactured home customers through their energy efficiency programming.

Manufactured housing is a key focus for both housing affordability and energy at the federal and state level. A recent series of briefs from the American Council for an Energy Efficient Economy (ACEEE) describes a range of program approaches and measures for manufactured (or mobile) homes.⁵³ The U.S. Department of Housing and Urban Development (HUD) has taken several actions to support mobile home improvements in the past two years, including new energy efficiency standards that take effect in 2024 and 2025 and the creation of a dedicated Office of Manufactured Housing Programs.

Expanding engagement efforts specific to manufactured home communities would boost program participation and deliver more electric savings. The New Hampshire Utilities have existing relationships with manufactured housing community associations and can consider further leveraging those relationships to maximize customers served simultaneously. Serving multiple homes in the same community concurrently can lower program expenses, making the money go further for customers. Program staff can communicate with property owners to engage residents and receive approval for retrofits in multiple units concurrently.

Retrofits in manufactured homes pose unique challenges and the options for additional electric savings measures are limited. The HEA program has been searching for such opportunities for years. Opportunities for electric savings are limited because the roof and walls tend to be thin with no space for additional insulation and heating systems are typically kerosene. The primary opportunities for shell improvements are windows and underbelly insulation, which are already delivered by the program.

Some programs work with manufactured housing developers or affordable housing organizations to stack funding sources and replace mobile homes that are too difficult or expensive to retrofit. Sometimes, replacing an aged mobile home can be a better solution than attempting to retrofit a home that needs many costly repairs and energy improvements. Newly built homes offer significant energy savings and non-energy benefits to residents. While manufactured housing replacement is often too expensive or difficult for utility companies, it is worth noting the successes some utilities have found. ACEEE provided detailed information on

⁵² Root Policy Research. "2023 New Hampshire Statewide Housing Needs Assessment." New Hampshire Housing, n.d. <https://www.nhhfa.org/wp-content/uploads/2023/04/2023-NH-Statewide-Housing-Needs-Assessment.pdf>.

⁵³ Bell-Pasht, Aimee. "Topic Briefs: Upgrading Manufactured Homes," ACEEE, May 2023. https://www.aceee.org/sites/default/files/pdfs/topic_briefs_-_upgrading_manufactured_homes_-_encrypt.pdf.

multiple federal funding sources that can be leveraged to fund repair and replacement projects in a recent presentation.⁵⁴ Not only does home replacement bring energy efficiency to low-income customers, but it can also help utility companies manage peak load by reducing energy use in high consumption areas.⁵⁵

- **Entergy Solutions (Louisiana):** In Louisiana, Entergy Solutions' Manufactured Housing Retrofit program targeted entire manufactured housing communities for upgrades, which expedited approval for each unit.⁵⁶ Within this program, Entergy Solutions offered cool roof coatings, which involves painting the roof of a manufactured home to help reflect light and reduce summer heat. While this measure provides modest energy savings, it can potentially be combined with other measure offerings to maximize savings in manufactured homes that utilize air conditioning. Other measures typically included in this program are direct installation of LED lights and water-saving fixtures, air and duct sealing, and AC tune up.⁵⁷
- **Efficiency Maine:** Efficiency Maine's Whole-Home Heat Pump Solutions for Manufactured Homes Pilot offers heat pump systems in replacement of fossil fuel-fired furnaces. In an interview with the study team, Efficiency Maine described this initiative to be "wildly cost-effective" and successful for homes replacing a kerosene or oil furnace. The program installs heat pumps into the closets of manufactured homes using existing ductwork from the previous fossil fuel system.⁵⁸ The applicability of the heat pump offering is limited in the New Hampshire context where fuel switching is not permitted and electric rates are higher, but other lessons learned from Efficiency Maine's program could inform the New Hampshire Utilities when the in-progress evaluation is finalized. In addition to the heat pump program, Maine also has at least one local production company based in Brunswick, ME, thus providing regionally appropriate supply of efficient new units.
- **Efficiency Vermont:** Efficiency Vermont offers a Mobile and Manufactured Home Replacement program, replacing low-quality mobile homes with energy-efficient modular homes. These homes are zero energy modular homes "designed to eliminate the use of fossil fuels by producing as much electricity as they use."⁵⁹ In an interview with the study team, Efficiency Vermont shared that they also work with affordable housing partners and manufacturers to develop energy-efficient modular homes for new construction in mobile home parks. A unique initiative is their partnership with the Champlain Housing Trust to help ensure farm workers have access to safe housing, usually in mobile homes. Overall, the organization is working to build up their supply chain in order to have dealers market their zero energy modular home models to customers.⁶⁰ This supply chain initiative may

⁵⁴ ACEEE, "Federal Funding Opportunities for State Energy Offices: Manufactured Housing Retrofit & Replacement Programs," Presentation, October 27, 2023.

https://www.naseo.org/Data/Sites/1/documents/taskforces/manufactured-housing/combinedslides_oct272023.pdf.

⁵⁵ Bell-Pasht, Aimee. "Topic Briefs: Upgrading Manufactured Homes," ACEEE, May 2023.

https://www.aceee.org/sites/default/files/pdfs/topic_briefs_-_upgrading_manufactured_homes_-_encrypt.pdf.

⁵⁶ Ibid.

⁵⁷ Ibid.

⁵⁸ In-depth interview with Efficiency Maine on October 30, 2023

⁵⁹ Efficiency Vermont. "Mobile and Manufactured Home Replacement," Accessed November 13, 2023.

<https://www.efficiencyvermont.com/services/income-based-assistance/mobile-home-replacement>.

⁶⁰ In-depth interview with Efficiency Vermont on November 8, 2023

bring benefits for neighboring New Hampshire by making efficient mobile homes more available regionally.

A potential direction for retrofitting manufactured homes in coming years is the Energiesprong approach, a Dutch methodology that combines economies of scale with technologies such as prefabricated facade panels and other system upgrades to deliver rapid and cost-efficient savings.⁶¹ A recent paper investigated the feasibility of applying the Energiesprong approach to manufactured housing in the U.S., concluding that it would be challenging but feasible, particularly as more lessons are learned from applying the approach in the U.S. context.⁶²

Recommendations and Considerations

1 New Hampshire should expand its current efforts for mobile home communities by focusing on relationships with mobile home associations. For example, Unitil has partnered with manufactured home parks in Exeter, New Hampshire to offer energy efficiency weatherization upgrades through the NHSaves Weatherization Program. The study team recommends that New Hampshire continue working with property owners of manufactured home parks to better connect with residents and to expedite the time it takes to perform upgrades across multiple homes. Likewise, partnering with organizations such as ROC USA® could facilitate projects at resident-owned mobile home communities.⁶³ By strengthening these partnerships, the Utilities could streamline the implementation of energy-efficiency programming for existing manufactured homes. Furthermore, the Utilities could leverage more federal funding for manufactured home upgrades in the future, alleviating energy burdens for more low-income households. Heat pump replacement of electric heating may be viable in some situations.

2 New Hampshire should continue to develop additional partnerships with housing programs in the state to investigate the potential for a replacement program and providing energy efficiency services to future manufactured housing developments. The Utilities could work more with housing providers and agencies to assemble funding and support for replacing manufactured homes that are too difficult to retrofit through efficiency upgrades. These partnerships could help the Utilities anticipate the need for energy-efficient mobile and manufactured homes for low-income residents and play a role in energy-efficient new developments. By collaborating on new construction projects, they can potentially leverage the funding provided to affordable housing providers for manufactured home development to drive future savings.

⁶¹ <https://energiesprong.org/>

⁶² Carley, Ed, Rodney Sobin, and Maddie Koewler, "Examining the Feasibility of Applying the Energiesprong Model to Manufactured Housing," National Association of State Energy Officials, No Date, Accessed December 22, 2023. https://www.naseo.org/data/sites/1/documents/publications/5-0376_0549_000097-CARLEY.pdf.

⁶³ <https://www.rocusa.org/>

Revisiting Non-Energy Benefits

Claiming a comprehensive set of non-energy impacts (NEIs) accurately represents the overall benefits recognized from LMI energy efficiency.



Non-energy impacts, also known as non-energy benefits, have been quantified by a variety of research methods, but regulations regarding whether and how these impacts can be claimed vary between states. Several states in the Northeast include NEIs in their cost-effectiveness tests, including Massachusetts, Rhode Island, and Vermont.⁶⁴ Utilities in California include comfort, health, and safety impacts in their cost-effectiveness screening for low-income programs. In an interview with Efficiency Vermont, the organization stated they use societal cost-effectiveness screening, including a 15% adder plus a 15% low-income NEI adder.^{65,66} The New Hampshire utilities currently claim a value of \$406 per weatherization project for all NEIs experienced by HEA participants, based on a study of 2016 – 2017 program activity.⁶⁷

Non-energy impacts are an important factor in evaluating cost-effectiveness. Including comprehensive non-energy impacts in cost-effectiveness screening of measures will allow the New Hampshire Utilities to pursue additional savings by supporting the overall cost-effectiveness of the program, and therefore of the portfolio.

Additional non-energy impacts have been quantified that may pertain to New Hampshire.

New Hampshire should consider incorporating additional NEI research into its next valuation of non-energy impacts. In 2016 and 2021, neighboring Mass Save published rigorous studies of the health and safety impacts of energy-efficiency upgrades in low-income single-family and multifamily homes that considered the applicability of each impact in light of the local climate. These studies quantified several non-energy impacts that occur as a result of weatherization upgrades: reduced fire risk, reduced cold and heat related thermal stress, fewer missed days at work, increased home productivity, reductions in asthma and arthritis, and reduced risk of carbon monoxide poisoning. The measures associated with non-energy impacts include air sealing, duct sealing, insulation, pipe wrap, heating system upgrades, programmable thermostats, and window replacement. Both the single-family and multi-family sectors had the same weatherization measures associated with non-energy impacts. The total annual value of the recommended household NEI values, excluding societal benefits, is \$1,537 per multifamily unit and \$941.87 per single-family unit.^{68,69}

⁶⁴ Samantha Caputo et al., *Non-Energy Impacts Approaches and Values: An Examination of the Northeast, Mid-Atlantic, and Beyond* (NEEP, June 2017), <https://neep.org/sites/default/files/resources/NEI%20Final%20Report%20for%20NH%206.2.17.pdf>.

⁶⁵ Ibid.

⁶⁶ In-Depth Interview with Efficiency Vermont staff, November 8, 2023.

⁶⁷ Opinion Dynamics, *Home Energy Assistance Program Evaluation Report 2016-2017 - FINAL* (New Hampshire Public Utilities Commission, July 29, 2020), <https://www.puc.nh.gov/Electric/Monitoring%20and%20Evaluation%20Reports/20200729-NHSaves-HEA-Evaluation-Report-FINAL.pdf>.

⁶⁸ Beth A. Hawkins et al., *Massachusetts Special and Cross-Cutting Research Area: Low-Income Single-Family Health- and Safety-Related Non-Energy Impacts (NEIs) Study* (Massachusetts Program Administrators, August 5, 2016), <https://ma-eeac.org/wp-content/uploads/Low-Income-Single-Family-Health-and-Safety-Related-Non-Energy-Impacts-Study.pdf>.

⁶⁹ Three³, Inc and NMR Group, Inc., *Low-Income Multifamily Health- and Safety-Related NEIs Study (TXC50)* (Massachusetts Program Administrators, August 31, 2021), https://ma-eeac.org/wp-content/uploads/TXC50_LIMF-HS-NEIs-Final-Report_2021.08.12.pdf.

Recommendation



New Hampshire should conduct a study into quantifying benefits associated with their current LMI program offerings, referencing the research and approaches of other Northeastern states. As the NH Utilities prepare to update their NEIs, they can build upon the research done by states like Massachusetts to incorporate the latest findings without spending too much time and money on new research.

Window Attachments

Window offerings in the New Hampshire HEA Program are currently limited to double-pane replacements of single-pane windows, window inserts, and storm windows. Through the literature review, the study team identified a new type of window upgrade that should be considered for the program: energy-rated window coverings such as insulated cellular shades and drapes.

Window attachments such as shades and drapes can reduce heat loss and gain through windows, saving energy and improving comfort during hot and cold seasons. The recently formed Attachments Energy Rating Council (AERC) is a non-profit organization initiated by the U.S. DOE that rates, labels, and certifies energy-efficient window attachments.⁷⁰ Selecting attachments rated by the AERC assures that window attachments are not merely aesthetic but deliver energy and cost savings. According to the DOE, insulated cellular shades provide the highest R-values out of all the window coverings and when installed properly can deliver up to 10% of heating energy savings.⁷¹ The electric savings to be gained by window attachments is likely to be primarily from electric heating systems (electric resistance baseboard and space heaters, heat pumps, etc.), but there is also some opportunity for cooling savings in homes that use central or window air conditioners.

Dynamic shading is another window covering identified as a potential measure offering for multifamily buildings through the literature review. However, new dynamic shading technology is still being developed, and limited research exists on cost-effectiveness and energy savings.

Recommendation



The HEA program should update its window offerings to include insulating window attachments such as cellular shades and drapes. The study team recommends that the New Hampshire Utilities include insulated cellular shades and drapes for a trial period basis to better understand the cost-effectiveness of these measures in the New Hampshire context. The Utilities could offer insulated cellular shades on the online marketplace and/or as a direct-install measure, along with or as an alternative to inefficient window replacement. Targeting customers whose primary heating fuel is electricity, based on previous participation or usage analysis, would help ensure electric savings.

⁷⁰ "Certified Product Search (Residential)," Attachments Energy Rating Council, accessed November 13, 2023, <https://aercenergyrating.org/product-search/residential-product-search/>.

⁷¹ "Energy Efficient Window Coverings," U.S DOE, accessed November 13, 2023, <https://www.energy.gov/energysaver/energy-efficient-window-coverings>.

Energy Savings Kits

Energy savings kits offer an opportunity to educate customers on energy efficient behaviors while delivering volume-based energy savings. Various energy-efficiency programs use energy savings kits to deliver several self-install measures to customers at once in a cost-effective manner, including some New Hampshire programs. Often, kits are paired with educational materials to help customers use the products provided and understand the purpose of energy efficiency in their home. Based on the literature research and related interviews with staff from other income-eligible programs, the study team identified various energy savings kit types and strategies to add to existing kit programming for additional electric savings opportunities. Below are several other programs that have incorporated energy savings kits into their income-eligible portfolio.

- **First Energy (Pennsylvania):** First Energy has a successful energy savings kit offering that delivers electric savings to low-income customers. The utility introduces customers to their energy efficiency programming by automatically sending free “new mover” kits to customers who have recently moved into a new home. For low-income customers with electric water heating, the kits include LED night lights, LED lamps, energy saving aerators, a furnace whistle, a low-flow showerhead, electric outlet gaskets, and a smart power strip. (Customers with non-electric water heating do not receive a showerhead or aerators.)⁷² Additionally, existing low-income customers may register to receive “opt-in” energy-efficiency kits from the utility.

In addition to this method of kit delivery, First Energy also delivers a School Education offering in collaboration with AM Conservation Group and The National Energy Foundation to cultivate energy literacy at K – 8 Title I schools in Pennsylvania.⁷³ AM Conservation contracts with the National Energy Foundation to bring the energy education curriculum to schools. Alongside the lessons students receive in the classroom, First Energy provides low-income students and their families with energy conservation kits. These kits are comprised of the same measures offered in the opt-in or new mover kits for LI customers.

In an interview with the study team, First Energy shared that the kits delivered to LI customers through these initiatives have been widely successful and have exceeded the program’s participation and savings goals in the past. In particular, the program has received positive feedback from customers regarding night lights and smart power strips.

- **Efficiency Maine:** Efficiency Maine offers free energy-efficiency kits advertised to help LMI customers with electric water heating lower the cost of their electricity bill. Presently, this kit offers a dual spray kitchen aerator with a pause lever, a bathroom faucet aerator, and an energy-saving showerhead.⁷⁴ Customers can order a kit online under Efficiency Maine’s low- and no-cost income-eligible options. They can easily qualify for the program

⁷² ADM Associates, Tetra Tech, and Ecometric Consulting. “Final Annual Report to the Pennsylvania Public Utility Commission,” September 30, 2022.

<https://www.firstenergycorp.com/content/dam/customer/Customer%20Choice/Files/PA/ACT129/Phase-IV-PY13-FINAL-Annual-Report-9-30-22.pdf>.

⁷³ In-depth interview with First Energy on November 2, 2023

⁷⁴ Efficiency Maine. “Free Energy-Efficiency Kit.” Accessed November 13, 2023. <https://www.efficiencymaine.com/free-energy-efficiency-kit/>.

by visiting the Income-Based Eligibility Verification page, which provides eligible LMI customers with a unique ID number.⁷⁵

- **Con Edison:** Con Edison provides energy saving kits to customers enrolled in its Low Income Discount Program. This is an opt-in program; customers can determine eligibility and order a kit in “five easy steps” that are laid out on a user-friendly website.⁷⁶ Upon ordering a kit, Con Edison also advertises energy saving products that customers can add on to their order from the Con Edison Marketplace at a reduced cost. Kits are “tailored to [customers’] needs” and include LED bulbs, low-flow showerheads, and more. In an interview with the study team, Con Edison mentioned that it collects feedback and in-service information on kit offerings via surveys emailed to customers after the kits are received.
- **Efficiency Vermont:** Within the Energy Saving Kits Portal online, customers of selected municipal utilities can order a free DIY Weatherization Kit for their home.⁷⁷ This is not exclusively an income-qualifying offering; rather, it is a unique initiative that attempts to introduce customers to weatherization and non-lighting energy savings. The kit, branded as the *Cool Down with Some Weatherization Kit*, contains a water-saving showerhead, two water-saving bathroom faucet aerators, a water-saving kitchen aerator, an auto on/off LED nightlight, a 15-foot roll of pipe insulation wrap, a self-adhesive door sweep, a tube of all-purpose acrylic latex caulk plus silicone, ten switch and outlet gaskets, and one can of spray foam insulation. The kit items are accompanied by instructional materials to guide customers through the installation process and teach them about the role of weatherization in energy savings.⁷⁸

In an interview with the study team, Efficiency Vermont shared that, while the kit has been a long-standing offering and serves as a good introduction to weatherization, the multi-step process can sometimes be challenging for customers. However, if customers are introduced to the kit by Efficiency Vermont or find it online, they are more likely to inquire about future comprehensive weatherization upgrades for their home.⁷⁹

Recommendations and Considerations

1 New Hampshire should develop kits designed to meet the needs of various customer types and consider enabling customers to select their kit online based on their fuel types and needs. New Hampshire serves a range of LMI electric customers across the state that have different needs. By building kits catering to specific types of customers, such as multifamily renters, heat pump users, or customers with electric water heating, the Utilities can test the cost effectiveness of specifically designed kits. Creating a “Choose Your

⁷⁵ Efficiency Maine. “Free Energy-Efficiency Kit.” Accessed November 13, 2023.

<https://www.efficiencymaine.com/free-energy-efficiency-kit/>.

⁷⁶ “Con Edison | Energy Savings Kit.” Accessed November 13, 2023. <https://savingskit.coned.com>.

⁷⁷ Efficiency Vermont Kits. “Weatherization Kit.” TechniArt, Inc. Accessed November 13, 2023.

<https://efficiencyvermontkits.com/johnson/weatherization-kit.html>.

⁷⁸ In-depth interview with Efficiency Vermont on November 8, 2023

⁷⁹ Ibid.

Kit” website would allow customers to select their fuel type, owner/renter status, and other factors to find the best kit for them. Other types of tailored kits could include:

- **Kits targeted at customers with electric heating or water heating.** If the Utilities choose to offer online ordering for kits, the customer could self-declare their fuel type, simplifying the issue of targeting. Other options for targeting customers with electric heat include sending kits to prior participants whose fuel types are known or analyzing load shapes to detect high winter usage. For water heating, about half of LMI customers using electric systems. It may be possible to use customer account information to identify customers without gas service and/or customers with very low gas usage during the summer, indicating they are not using it for water heating. Additionally, customers with electric systems are likely to be enriched in areas without gas service.
- **“New mover” kits to welcome new LMI customers to energy-efficiency programming.** Like FirstEnergy, New Hampshire can introduce new customers to energy efficiency by supporting attainable electric bill savings via kit delivery upon move-in. This initiative could engage renters if the kits include renter-friendly measures and promote additional rebates that are available for those customers online. The Utilities could also work with multifamily property owners to track renter turnover patterns in low-income buildings, enabling the program to anticipate peak periods for kit delivery and coordinate with property owners to ensure customers are aware of the kit shipment.
- **A weatherization kit to introduce customers to ways to reduce drafts and conserve energy.** To address the barrier of customers becoming overwhelmed by the task, the kit can include a QR code linking the customer to instructional videos, in addition to printed instructions. An additional benefit of using videos is that they can help non-English speakers by visually depicting the process. Providing multiple ways to learn the information also increases program accessibility. New Hampshire also can consider leveraging its school programming to deliver weatherization kits to older students along with educational materials about weatherization in a home. This could address the challenges of marketing weatherization kits to customers who are unfamiliar with the concept or intimidated by the complexity of the kits while tying in with science concepts about heat transfer. The program can track the impact of kits on electric savings by collecting feedback and in-service data from customers with electric heat via surveys, as was done for a Massachusetts school offering.⁸⁰

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New Hampshire can offer electric energy savings kits to specifically promote the use of existing, underutilized measures in the HEA program. In the review of program measures installed in 2021 and 2022, the study team identified several basic electric measures that are included in the HEA program but have low to no participation. Of these measures, several have a benefit-cost ratio over 2.0, suggesting that increased uptake for these measures could yield positive results for the Utilities. The study team

⁸⁰ Opinion Dynamics, CLC and NGRID Education Kits Program Evaluation, September 7, 2018. <https://ma-eeac.org/wp-content/uploads/CLC-NGRID-Education-Kits-Evaluation-Report-FINAL-2018-09-07.pdf>

recommends incorporating some of these measures into a new kit offering to efficiently deliver several measures at once.

For example, New Hampshire could develop a water saving kit containing an electric handheld showerhead or fixed showerhead and an electric faucet aerator. The Utilities could collaborate with a water utility to broaden its reach and expand resources. Along with educational materials for the items in the kit and program promotional flyers, the kit could advertise exclusive discounts to customers who pursue further electric savings through the installation of pipe insulation or air sealing. This could help increase participation rates for cost-effective measures that have been underutilized in the past.

3 **New Hampshire should use kits as a channel to deliver vouchers for marketplace products to LMI customers.** For example, weatherization kits can contain vouchers for customers to order additional quantities of spray foam or outlet gaskets online, free of charge, to treat the rest of the home. Once users are familiarized with the benefits of the kit, they are more likely to pursue further weatherization. Additionally, a weatherization kit could be particularly appealing to New Hampshire families who live in older homes.

Products and Appliances

The literature review identified several types of products and appliances that are potentially valuable offerings for the Home Energy Assistance program. The first measure, heat pumps, is a current offering, while the remainder of the measures would be new to the program.

- **Heat pumps** tend to offer cost-effective savings when replacing an existing electric resistance or delivered fuel heating system. In the New Hampshire context, heat pumps are only fruitful when replacing electric resistance systems because, in other scenarios, they increase electricity consumption. With this in mind, the New Hampshire Utilities could reach out to customers that have weatherized their electrically heated homes through the programs in the past; this approach has the advantage of a home that already has an electrification-ready efficient envelope. Lessons learned from Efficiency Maine's Whole-Home Heat Pump Solutions for Manufactured Homes Pilot may be instructive for the New Hampshire Utilities despite the fact that the Maine program focuses on homes replacing delivered fuel systems.⁸¹ Efficiency Maine's program is currently undergoing evaluation.
- **Cord wood and pellet wood stoves** can be efficient sources of heat that serve as an opportunity to displace electric heating, potentially offering large electric savings in the appropriate context. They can be used for whole-home heating or for heating select spaces.⁸² From 2023 through 2032, federal tax credits are available for the purchase and installation of biomass stoves with an efficiency of at least 75%⁸³, and Efficiency Vermont offers rebates to residential properties for the replacement of older wood stoves.⁸⁴
- **Showerheads with thermostatic shutoff valves** are offered as a commercial measure in New Hampshire and could be added to the HEA and other residential programs. This measure is an offering for Rhode Island's EnergyWise Income Eligible Multifamily program and Mass Save's Income Eligible program. Both states offer the showerheads as a no-cost measure, delivered through direct installation in Rhode Island and offered on the online marketplace in Massachusetts.^{85,86} There is also a valve-only measure that can be used with a customer's existing showerhead. Low-cost measures can be incorporated into energy-efficient kits, such as a kit focused on DHW measures or a new-mover kit. The associated savings are modest, but savings can be maximized when combined with other measures or when delivered in larger volumes through kits or direct installation.

⁸¹ "Whole Home Heat Pump Solutions Pilot," Efficiency Maine, accessed December 6, 2023,

<https://www.efficiencymaine.com/manufactured-home-heat-pump-lease/>

⁸² Energy.gov. "Wood and Pellet Heating." Accessed November 13, 2023.

<https://www.energy.gov/energysaver/wood-and-pellet-heating>.

⁸³ "Biomass Stoves/Boilers Tax Credit," Energy Star, accessed November 13, 2023,

https://www.energystar.gov/about/federal_tax_credits/biomass_stoves.

⁸⁴ Efficiency Vermont. "Wood and Pellet Stoves," Accessed November 13, 2023.

<https://www.efficiencyvermont.com/rebates/list/wood-stoves>.

⁸⁵ Ibid.

⁸⁶ 1. Cadeo and Illume, *Impact & Process Evaluation: EnergyWise Single Family Program National Grid Rhode Island* (National Grid, September 2020), https://rieermc.ri.gov/wp-content/uploads/2020/10/ng-ri-ewsf-impact-and-process-comprehensive-report_final_04sept2020.pdf.

Massachusetts claims savings of 247 kWh for TSV showerheads in single-family homes and 183 kWh per multifamily dwelling unit.⁸⁷

- **Heat pump clothes dryers** are more efficient than standard clothes dryers. According to the DOE, the replacement of a standard clothes dryer with a heat pump clothes dryer could lower consumption by 60%.⁸⁸ Additional benefits include humidity regulation and reduced damage to clothing. New Hampshire offers rebates for these dryers through its ENERGY STAR Products program, and Efficiency Vermont and Burlington Electric offer rebates for heat pump clothes dryers for their single-family and multifamily customers. In an interview with Efficiency Vermont, the study team learned this is a downstream offering with modest traction from customers, with around 200 rebates claimed for this offering annually. Efficiency Vermont's associated savings for this measure are 308 kWh. If this measure were found to be too expensive to include in a cost-effective HEA project, the Utilities could consider offering a larger rebate to income-qualified customers.
- **Electric space heaters** may be attractive to LMI customers due to their low upfront cost but can raise electric bills inordinately. Working with customers to replace or retire electric space heaters in favor of better solutions – weatherization, heating system replacement or repair, etc. – can result in significant energy savings. Currently, where space heaters are encountered during an HEA project, any associated electric savings from weatherization are calculated. An additional way to generate savings from space heater retirement (as well as dehumidifiers and other small equipment) is through community events, such as town-sponsored recycling events.
- **Dehumidifiers** can be important appliances for occupant health, but inefficient dehumidifiers use a large amount of electricity. The HEA program can help occupants save electricity from dehumidifier use in several ways. First, the program could remove the need for a dehumidifier at the source by addressing the moisture problems. This may be warranted as a pre-weatherization health and safety measure, or it may be integral to the weatherization work itself. A second option is to work with the customer to retire the unit if it's not truly needed; Mass Save offers early retirement of dehumidifiers through its income eligible programs, with annual savings of 489 kWh.⁸⁹ Third, the program can replace older units with new Energy Star-rated ones. Fourth, the program could help the occupant conserve energy by educating them on using the dehumidifier settings or a timer to ensure the unit only runs when needed rather than continuously. Finally, installing a heat pump water heater can provide enough dehumidification to eliminate the need for a separate dehumidifier. In this case, savings come from both lower energy use for water heating as well as retirement of the dehumidifier. Note that some of these strategies are already implemented by the HEA program.

⁸⁷ Ibid.

⁸⁸ "Heat Pump Clothes Dryers", U.S.DOE, accessed November 9, 2023, <https://www.energy.gov/eere/buildings/articles/heat-pump-clothes-dryer#:~:text=These%20dryers%20consume%20about%2071,use%20%5BUSDOE%20EIA%202010%5D>.

⁸⁹ "APPLIANCE - DEHUMIDIFIER (IE-PL-ERDH)," Mass Save eTRM, accessed November 13, 2023, <https://etrm.anbetrack.com/#/workarea/trm/MADPU/IE-PL-ERDH/2022-2024%20Three-Year%20Plan%20TRM/version/5>.

Recommendation



New Hampshire should examine the viability of adopting these measures into the HEA program. The study team recommends the New Hampshire Utilities perform cost-effectiveness screening of these potential new measures before implementation.

Many of these measures have modest savings but could help customers with these types of needs.

Reviewing Low-Volume Program Measures

Some currently offered electric measures appear to be underutilized in the HEA program.

As part of the Measure Performance task, the study team identified currently offered electric measures that appear to be underutilized in the HEA program. [Table 3](#) identifies measures with installed quantities of less than three across Eversource, Unitil, and Liberty during 2022, as well as the benefit-cost ratio where there was any installation data.

There are a variety of reasons why a measure may appear to be underutilized. When conducting an HEA project, homes are reviewed for the applicability of all types of measures; some measures, while offered by the program, are rarely applicable. Others may be applicable but would have an unacceptable negative impact on project cost-effectiveness. Sometimes, a customer may decline one or more recommended measures for various reasons. Finally, in the case of showerheads, the customer's existing showerhead may be an equally efficient model or may be clogged such that the existing effective flow rate is less than that of a new, efficient showerhead, thus yielding no energy savings.

This section highlights measures that are rarely installed so their role in the program can be reviewed. In some cases, there may be an opportunity to revise the offerings to increase uptake.

Table 4: Low-Volume Program Measures

Measure	Quantity	Average Benefit-Cost Ratio
Low Flow Showerhead, Electric	33	9.52
DHW Heat Pump Water Heater	26	0.43
Central AC	19	0.38
Handheld Showerhead, Electric	18	8.50
Programmable Thermostat, Electric	18	0.51
Pipe Insulation - Hot Water, Electric	15	3.87
Mini Split HP (cooling)	5	1.01
Stand Alone Water Heater, Electric	4	
Room Air Conditioner / Central AC	3	0.80
Insulated Door, Electric	2	0.32
Hot Water Setback, Electric	1	1.81
Dehumidifier	1	1.21
Clothes Washer	1	0.57
ES Central AC	1	0.51
Clothes Dryer	0	
Window Insert, Electric	0	
Tank Wrap, Electric	0	
Duct Insulation, Electric	0	
Duct Sealing, Electric	0	
Wi-Fi Thermostat, Electric	0	

Recommendation

1

The study team recommends that New Hampshire review the delivery approach for low-volume measures and develop methods to achieve greater participation for electric measures in the HEA program that were underutilized in 2022. New

Hampshire should revisit the delivery pathway for the measures listed in the table above. The study team recommends utilizing program design and delivery strategies mentioned in this report, such as incorporating these measures into energy saving kits, allowing customers to shop for the measures in an online marketplace, or offering rebate coupons to customers as a form of outreach. Offering a wider range of models for measures with aesthetic considerations such as showerheads is another option to increase uptake. The Utilities may also consider delivering some of the underutilized measures as direct-install offerings during initial energy assessments.

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Appendix B Program Staff Interview Guide

1. Which programs serve low-income customers? Do low-income customers tend to participate in programs other than HEA?
2. How is the low-income program administered? Direct install? Rebates? Other?
3. How is “low-income” defined in New Hampshire?
4. Are there planned program changes?
5. How have programs changed in past few years?
6. What are the program results?
7. Which programs serve moderate-income customers?
8. How is “moderate-income” defined?
9. Do you have a sense of how the needs of moderate-income customers differ from those of low-income customers?
10. Is there any low- or moderate-income new construction activity?
11. What is the role of manufactured homes in the program? Are there unique opportunities?
12. Are you interested in measure options for mobile homes and modular homes?
13. Do you have a measure list for mobile homes or would we be able to pull data that would show us what's being put into mobile homes specifically?
14. Which measures make up most of the program savings?
16. When will lighting measures be phased out?
17. What are other significant electric savings measures?
18. Which measures are not installed often?
19. Are you interested in driving more uptake of weatherization? What are the barriers you perceive?
20. Are there other existing measures for which you want to improve uptake and/or savings?
21. Which measures have you considered adding or removing?
22. What are the heat pump offerings? What is the level of uptake?
23. Are you familiar with the potential study? Have you used it to identify measure opportunities?
24. How much electric heating is there in low-income homes?
25. Is there anything else we should know?

Appendix C Market Actor Interview Guide

The Introduction and General Questions were presented to all interviewees.

Introduction

Thank you for taking the time to speak with us about your program. To set the context, we're interested in learning how energy efficiency programs can best engage low- and moderate-income customers and deliver additional electric savings opportunities.

General Questions

1. Please describe the structure of your program(s) for low- and moderate-income customers. How are they organized internally and from the customer's perspective?
2. Can you please clarify for us the following aspects of the program(s): **NMR will track down the following information before the interview and ask any clarifying questions as necessary**
 - a. Savings goals,
 - b. Budgets,
 - c. Participation or customer count targets,
 - d. Reporting metrics,
 - e. Cost-effectiveness test type and requirements, and
 - f. Fuel-switching/climate rules?
3. How are program designs tailored to the needs of the following customer demographics, if applicable?
 - a. Moderate-income customers
 - b. Urban/Suburban/Rural customers
 - c. Owners vs. renters
 - d. Multifamily homes/buildings
 - e. Public or non-profit affordable housing
 - f. Mobile/manufactured home customers
4. I'd like to ask you about the measures offered by your program:
 - a. Which measures currently deliver the most electric savings for the program on a per-unit basis and overall?
 - b. Which measures have the highest participation recently, as the role of lighting savings has declined? Which measures now have the highest volume?
 - c. What new measures or approaches have you added in the past 2-3 years?
 - d. Are you looking at adding additional measures to the program? If so, can you tell me about them?
5. Do you collaborate with any external partners to increase program engagement for low to moderate-income customers, such as municipal leaders, non-profit agencies, community organizations, etc.? If yes, please describe these relationships and how they have impacted program participation.
6. Has your organization implemented or considered strategies to better support energy equity or to better engage environmental justice communities or other communities that have historically had lower participation rates?

Program-Specific Questions

The following questions were asked of the representative for a specific program, as indicated by the header for each section.

C.1.1 Mass Save

In our recent review, our team came across some of your energy efficiency program offerings that are of interest to the New Hampshire Utilities. We have a few questions regarding these findings.

1. What has been Mass Save's experience with **thermostatic shutoff valves (TSV) and TSV showerheads** for income eligible customers?
 - a. In what ways has this measure been successful for the program? What challenges have you experienced with offering this measure, if any?
 - b. How have customers responded to this measure offering? What is the approximate annual participation?
 - c. Can you share the measure's typical energy savings and total resource cost?
 - d.
 - e. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - f. Does this measure tend to be cost-effective?
 - g. Are there any changes you plan to implement in the future for this measure?
2. Can you please talk about any **window-related** measures offered through your Income Eligible Program, such as **inefficient window replacement**, as well as any window measures that you have considered but not added to the program? How did the measure(s) come to be implemented and what is the program's experience with it?
 - a. In what ways has this measure been successful for the program? What challenges have you experienced with offering this measure, if any?
 - b. How have customers responded to this measure offering? What is the approximate annual participation?
 - c. Can you share the measure's typical energy savings and total resource cost?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for this measure?
3. Can you please talk about the **induction stove rebate** offering? How did this measure come to be implemented and what is the program's experience with it?
 - a. In what ways has this measure been successful? What challenges have you experienced with offering this measure, if any?
 - b. How have customers responded to the rebate offering? What is the approximate annual participation?
 - c. Can you share the measure's typical energy savings and total resource cost?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for this measure?
4. Can you please talk about the **engine block heater control** offering? How did this measure come to be implemented and what is the program's experience with it?

- a. In what ways has this measure been successful? What challenges have you experienced with offering this measure, if any?
 - b. How have customers responded to the rebate offering? What is the approximate annual participation?
 - c. Can you share the measure's typical energy savings and total resource cost?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for this measure?
5. New Hampshire's income-eligible program has focused on single-family homes until fairly recently, when they started doing a significant volume of refrigerator replacements. Can you talk about what other measures present the highest-saving electric opportunities for multifamily buildings?

C.1.2 Con Edison

In our recent review, our team came across some of your Affordable Multifamily Energy Efficiency Program (AMEEP) offerings that are of interest to the New Hampshire Utilities. We have a few questions regarding these findings.

1. Can you please talk about the **elevator modernization** measure: Which specific measures are included, how did it come to be implemented, and what is the program's experience with it?
 - a. In what ways has this measure been successful for the program? What challenges have you experienced with offering this measure, if any?
 - b. How have customers responded to this measure offering? What is the approximate annual participation?
 - c. Can you share the measure's typical energy savings and total resource cost?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for this measure?
2. Can you please talk about the **ventilation** offering: Which specific measures are included, how did it come to be implemented, and what is the program's experience with it?
 - a. In what ways has this measure been successful for the program? What challenges have you experienced with offering this measure, if any?
 - b. How have customers responded to this measure offering? What is the approximate annual participation?
 - c. Can you share the measure's typical energy savings and total resource cost?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for this measure?
3. New Hampshire's income-eligible program has focused on single-family homes until fairly recently, when they started doing a significant volume of refrigerator replacements. Can you talk about what other measures present the highest-saving electric opportunities for multifamily buildings?

C.1.3 Efficiency Maine

In our recent review, our team came across some of your energy efficiency program offerings that are of interest to the New Hampshire Utilities. We have a few questions regarding these findings.

1. Can you please talk about the Income Eligible **Heat Pump Water Heaters** measure: How did it come to be implemented and what is the program's experience with it so far?
 - a. In what ways has this measure been successful for the program? What challenges have you experienced with offering this measure, if any?
 - b. How have customers responded to this measure offering? What is the approximate annual participation?
 - c. Can you share the measure's typical energy savings and total resource cost?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for this measure?
2. Can you please talk about the Innovation Program's **Manufactured Homes Heat Pump Pilot**: How did it come to be implemented and what is the program's experience with it so far?
 - a. In what ways has this offering been successful for the program? What challenges have you experienced with this pilot, if any?
 - b. How have mobile home customers responded to this measure offering? How do you anticipate participation to grow in the next phase?
 - c. Can you share the measure's energy savings and total resource cost for Phase 1 and 2?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for this measure?
3. Can you please talk about the **marketing strategy for Efficiency Maine's Income-Eligible offerings**?
 - a. I am curious to learn about how customers engage with your website materials, such as the Energy Efficiency Kit application or the rebates brochure.
 - b. How do you engage with customers who lack internet access?
 - c. How do you engage rural customers?
4. Do you offer any measures for low-income multifamily buildings?
 - a. *[If yes]*: New Hampshire's income-eligible program has focused on single-family homes until fairly recently, when they started doing a significant volume of refrigerator replacements. Can you talk about what other measures present the highest-saving electric opportunities for multifamily buildings?
 - b. *[If no]*: Do you have any plans to expand your programs to include measures or rebates for multifamily buildings? Why or why not?

C.1.4 Xcel Energy Colorado

In our recent review, our team came across some of your energy efficiency program offerings that are of interest to the New Hampshire Utilities. We have a few questions regarding these findings.

1. Can you please talk about the Income Qualified Weatherization Program's **window-related** measure offering: How did it come to be implemented and what is the program's experience with it?
 - a. In what ways has this measure been successful for the program? What challenges have you experienced with offering this measure, if any?
 - b. How have customers responded to this measure offering? What is the approximate annual participation?
 - c. Can you share the measure's typical energy savings and total resource cost?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for this measure?
2. Can you please talk about your **partnership with Energy Outreach Colorado for Income Eligible Programs**? How did this partnership begin and what has been the experience so far?
 - a. In what ways has this partnership been successful for low-income customers? What challenges have you experienced with an external partnership, if any?
 - b. How have customers responded to Energy Outreach Colorado's affordable energy programs?
 - c. Are there any goals you have for this partnership in the future?
3. New Hampshire's income-eligible program has focused on single-family homes until fairly recently, when they started doing a significant volume of refrigerator replacements. Can you talk about what other measures present the highest-saving electric opportunities for multifamily buildings?

C.1.5 Efficiency Vermont

In our recent review, our team came across some of your energy efficiency program offerings that are of interest to the New Hampshire Utilities. We have a few questions regarding these findings.

1. Can you please talk about the **weatherization kit** offered through the Energy Savings Kit portal: How did it come to be implemented and what is the program's experience with it?
 - a. In what ways has this measure been successful for the program? What challenges have you experienced with offering this measure, if any?
 - b. How have customers responded to this measure offering? What is the approximate annual participation?
 - c. Can you share the measure's typical energy savings and total resource cost?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for this measure?
2. Can you please talk about the **heat pump clothes dryer** rebate program: How did it come to be implemented and what is the program's experience with it?
 - a. In what ways has this measure been successful for the program? What challenges have you experienced with offering this measure, if any?
 - b. How have customers responded to this measure offering? What is the approximate annual participation?
 - c. Can you share the measure's typical energy savings and total resource cost?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for this measure?
3. Can you please talk about your existing **Community & Economic Partnerships?** How did these partnerships begin and what has been the experience so far?
 - a. How have these partnerships impacted engagement with low- and moderate-income communities?
 - b. What challenges have you experienced with these partnerships, if any?
 - c. Are there any goals you have for these partnerships in the future?
 - d. Can you speak about any past or ongoing collaborations with: **foodbanks, schools, or municipalities?**

C.1.6 Pennsylvania First Energy

In our recent review, our team came across some of your energy efficiency program offerings that are of interest to the New Hampshire Utilities. We have a few questions regarding these findings.

1. Can you please talk about the **Low-Income Energy Efficiency Kits Initiative**: How did it come to be implemented and what is the program's experience with it? Can you speak about the kits offered through the Low-Income School Education program as well?
 - a. In what ways has this offering been successful for the program? What challenges have you experienced with offering the kits, if any?
 - b. How have customers responded to the measure offerings in the kits? What is the approximate annual participation?
 - c. Can you share the typical energy savings and total resource cost for the kits?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for the kits, such as adding new measures?
2. Can you please talk about your **Low-Income Multifamily Programs**: How did they come to be implemented and what has been the experience so far?
 - a. New Hampshire's income-eligible program has focused on single-family homes until fairly recently, when they started doing a significant volume of refrigerator replacements. Can you talk about what other measures present the highest-saving electric opportunities for multifamily buildings?

C.1.7 Entergy Louisiana: Entergy Solutions

In our recent review, our team came across some of your energy efficiency program offerings that are of interest to the New Hampshire Utilities. We have a few questions regarding these findings.

1. Can you please talk about the **School Kit Program**: How did it come to be implemented and what has been the program's experience so far?
 - a. In what ways has this program been successful? What challenges have you experienced with offering the kits, if any?
 - b. How have customers responded to the measure offerings in the kits? What is the approximate annual participation?
 - c. Can you share the typical energy savings and total resource cost for the kits?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for the kits, such as adding new measures or targeting schools in low-income communities?
2. Can you please talk about the **Income Qualified Weatherization Program**: How did it come to be implemented and what has been the program's experience so far?
 - a. In what ways have the measures been successful for the program? What challenges have you experienced with offering this program, if any?
 - b. How have customers responded to the measure offering? What is the approximate annual participation?
 - c. Can you share the measures' typical energy savings and total resource cost?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this program tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for this program, such as adding more measures?
3. Can you please talk about the **cool roof coating** measure offered through the Manufactured Housing Retrofit Program, if it still exists: How did it come to be implemented and what has been the program's experience with it?
 - a. In what ways has this measure been successful for the program? What challenges have you experienced with offering this measure, if any?
 - b. How have customers responded to this measure offering? What is the approximate annual participation?
 - c. Can you share the measure's typical energy savings and total resource cost?
 - d. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - e. Does this measure tend to be cost-effective?
 - f. Are there any changes you plan to implement in the future for this measure?
 - g. Can you briefly speak about the successes and challenges experienced with the Manufactured Housing Retrofit Program?
4. New Hampshire's income-eligible program has focused on single-family homes until fairly recently, when they started doing a significant volume of refrigerator replacements. Can you talk about what other measures present the highest-saving electric opportunities for multifamily buildings?

Optional Questions (Time Permitting)

1. Can you describe the regulatory and stakeholder environment and how those influence program development? What are the current topics of debate, and/or have there been recent changes at the policy level?
2. What aspects of your program do you feel are most unique and/or most effective?
3. What are the most significant challenges your program has faced throughout development and implementation?
4. Have you observed changes in your customers' needs and wants? If so, how are your programs adapting?

Figure 6: Measures and Program Elements of Interest

Focal Points	Multifamily, Custom, Rural, Manufactured Housing, Partnerships, Targeting, Equity
Program Design Recommendations <ul style="list-style-type: none"> • Partnering with food banks for product delivery • Expanding focus on multifamily • Collaborating with municipal leaders in rural areas • Targeting manufactured homes • Marketplace financing and vouchers • Increasing program accessibility • Considering health and safety benefits 	Measure Recommendations <ul style="list-style-type: none"> • Ventilation offerings • Window upgrades • Enhanced weatherization kits • Showerheads with thermostatic shut-off valve • Induction stoves • Heat pump clothes dryer • Wood and pellet stoves

Conclusion

1. Other measures and program design elements that we're interested in learning about include: [read items from list in Figure 1 that have not been touched on during interview]. Do you have experience with any of these items?
 - a. [If yes, ask the basic set of measure-specific questions:]
 - i. In what ways has this measure been successful for the program? What challenges have you experienced with offering this measure, if any?
 - ii. How have customers responded to this measure offering? What is the approximate annual participation?
 - iii. Can you share the measure's typical energy savings and total resource cost?
 - iv. Have the measure savings been evaluated? If so, could you point us to the evaluation report?
 - v. Does this measure tend to be cost-effective?
 - vi. Are there any changes you plan to implement in the future for this measure?
2. Is there anything else you would like to add?