



**PROPOSED
TRIENNIAL PLAN
FOR FISCAL YEARS 2020–2022**

**BY THE
EFFICIENCY MAINE TRUST**

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Abbreviations/Acronyms

ACEEE	American Council for an Energy Efficient Economy
AEG	Applied Energy Group
AESC	Avoided Energy Supply Component
AMP	Arrearage Management Program
C&I	Commercial and Industrial
CCF	Centum Cubic Feet
CDA	Convergence Data Analytics
CEE	Consortium for Energy Efficiency
CMR	Code of Maine Rules
DEP	Maine Department of Environmental Protection
DOE	U.S. Department of Energy
DOT	Maine Department of Transportation
DSM	Demand Side Management
EISA	Energy Independence and Security Act
EM&V	Evaluation, Measurement, and Verification
EUT	Energy, Utilities and Technology
EVSE	Electric Vehicle Supply Equipment
FCM	Forward Capacity Market
FY	Fiscal Year
GEO	Governor's Energy Office
GHG	Greenhouse Gas
HESP	Home Energy Savings Program
HPWH	Heat Pump Water Heater
HVAC	Heating, Ventilation, and Air Conditioning
ISO-NE	Independent System Operator for New England
kW	Kilowatt(s)
kWh	Kilowatt-Hour(s)
LED	Light-Emitting Diode
MACE	Maximum Achievable Cost-Effective
MMBtu	Million British Thermal Unit(s)
MOU	Memorandum of Understanding
MPRP	Maine Power Reliability Program
MRS	Maine Revised Statutes
MW	Megawatt(s)
MWh	Megawatt-Hour(s)
NEEP	Northeast Energy Efficiency Partnership
NEG-ECP	Conference of New England Governors and Eastern Canadian Premiers
O&M	Operations and Maintenance
OPA	Office of the Public Advocate
PACE	Property Assessed Clean Energy

PV	Photovoltaic
QA	Quality Assurance
QC	Quality Control
R&D	Research and Development
RFP	Request for Proposal
RGGI	Regional Greenhouse Gas Initiative
TRM	Technical Reference Manual
VW	Volkswagen

1. The Efficiency Maine Trust

1.1 Maine’s Independent Administrator for Energy Programs to Reduce Energy Costs and Greenhouse Gas Emissions

The Efficiency Maine Trust (the Trust) is an independent, quasi-state agency established for the purposes of planning, coordinating, and implementing certain energy programs in Maine.

The principal goals of the Trust’s programs are, generally, to help Maine’s homes and businesses reduce their energy costs and to improve the economic security of the State. In pursuing these goals, the Trust’s programs advance the objectives, enumerated in statute, of:

- Reducing the cost of energy in Maine;
- Maximizing the use of weatherization and energy efficiency;
- Reducing economic insecurity from the inefficient use of fossil fuels;
- Increasing new jobs and business development to deliver affordable energy and energy efficiency products and services;
- Enhancing heating improvements for households;
- Facilitating consumer access to technical assistance and financial incentives relating to energy efficiency and alternative energy resources; and
- Reducing greenhouse gas (GHG) emissions.

The Trust’s programs provide financial incentives for the purchase of high-efficiency equipment and the implementation of conservation measures to help Maine customers save electricity, natural gas, and unregulated heating fuels (such as heating oil and propane). In addition to providing financial support, the Trust delivers public information, technical assistance, and quality assurance (QA) related to energy costs, conservation measures, efficient or alternative energy equipment, and installation.

Electric utilities and natural gas utilities are the primary source of Efficiency Maine’s funding. Maine law requires that those utilities procure all energy efficiency resources that satisfy the standard of being cost effective, reliable, and achievable. The utilities fund the Trust to develop and deliver that resource. Additional funding comes from the sale of Maine’s carbon allowances under the Regional Greenhouse Gas Initiative (RGGI), from the Forward Capacity Market (FCM) at the Independent System Operator of New England (ISO-NE), and from the occasional receipt of revenue from grants, voluntary payments, and other agreements.

1.2 Stakeholder Board of Trustees

The Trust is governed by a nine-member Board of Trustees, comprising:

1. The director of the Governor’s Energy Office (*ex officio*);
2. The director of the Maine State Housing Authority (*ex officio*);
3. Seven other members appointed by the Governor, who “adequately represent the interests of commercial energy consumers, industrial energy consumers, small business energy

consumers, residential energy consumers and low-income energy consumers”¹ and among whom there is knowledge of and experience in financial matters, consumer advocacy, management, conservation fund programs, carbon reduction programs, or relevant policy.

Nominations to the Board are reviewed by the Joint Committee on Energy, Utilities and Technology (EUT) and confirmed by the Senate. Appointed trustees serve three-year terms.

The Board generally meets monthly in Augusta, and its meetings are open to the public.

1.3 Staff

Day-to-day operations of the Trust are managed by a staff of approximately 18 full-time employees. The staff handles program design and management, financial accounting and reporting, competitive solicitations and procurement, grant compliance, and various marketing and information sharing tasks. The staff also manages teams of contractors who may assist the Trust in implementing (or “delivering”) elements of programs. Elements of the Trust’s work that may be subcontracted out include market research, marketing, technical training of other contractors and suppliers, technical support, and engineering analysis on specific energy projects. It may also include handling of inbound calls, application processing, calculation and payment of financial incentives, loan underwriting and servicing, program compliance, program evaluation, and financial auditing.

¹ 35-A Maine Revised Statutes (MRS) §10103(2)(A).

2. Regulatory Framework

2.1 Purpose of the Trust

The Efficiency Maine Trust Act (or “the statute”) states that the purposes of the Trust are to:

- Provide uniform, integrated planning, program design, and administration of programs;
- Reduce energy costs and improve security of the state and local economies;
- Administer cost-effective energy and energy efficiency programs to help individuals and businesses meet their energy needs at the lowest cost;
- Ensure that all expenditures of the trust are cost-effective in terms of avoided energy costs; and
- Actively promote investment in cost-effective energy and energy efficiency measures and systems that use energy resources that reduce overall energy costs for consumers in the State.²

As noted previously, the statute further specifies that the Trust’s programs should help lower costs across all fuel types—electric, natural gas, and unregulated fuels—and should extend to weatherizing homes, reducing inefficient use of fossil fuels, enhancing affordable heating systems, increasing jobs and business development, improving consumer access to energy programs, and reducing greenhouse gases.³

2.2 Program Funds—Objectives, Funding, and Implementation Requirements

The Trust is the designated recipient and administrator of several funding streams. As described in more detail below, the Trust is directed by statute to use these funding streams to promote the more efficient and affordable use of energy and customer-sited alternative energy systems.

While some of the Trust’s funding streams are automatically recurring, the statute also contemplates that the Trust may access other funds. It may apply for grants from public or private sources, deposit the proceeds of bonds into program funds, collect revenue from the FCM or other capacity payments, and accept funds from the energy infrastructure benefits fund as well as any “other funds received by or from any entity with which the Trust has an agreement or contract.”⁴

An important feature of the Trust is its fiduciary responsibility. The funds it receives from electric and natural gas ratepayers, and from RGGI, are required to be held in trust for the benefit of the energy consumers who pay for the funds.

² 35-A MRS §10103(1).

³ 35-A MRS §10103(1)(B).

⁴ 35-A MRS §10103(4).

2.2.1 Electric Efficiency and Conservation Fund

The Electric Efficiency and Conservation Fund is dedicated to programs designed to reduce inefficient use of electricity. The main goal of programs supported by this fund is to help reduce energy costs for electricity consumers. The objectives enumerated in statute for the use of this fund are to:

- Increase consumer awareness of cost-effective options for conserving energy;
- Create favorable market conditions for increased use of energy efficiency;
- Promote sustainable economic development and reduce environmental damage;
- Reduce the price of electricity over time for all consumers by reducing demand during peak use periods; and
- Reduce total energy costs for electricity consumers.⁵

The amount of the Electric Efficiency and Conservation Fund is determined by establishing the budgets necessary to capture the maximum achievable cost-effective (MACE) energy efficiency potential. MACE is synonymous with the standard, as articulated in the statute, of all the cost-effective energy efficiency that is achievable and reliable. The principal revenue stream for this fund comes from payments that the utilities make directly to the Trust for the procurement of cost-effective energy efficiency (the “Electric Efficiency Procurement”). The payments are deemed by statute to be a just and reasonable element of utility rates. The amount of the procurement payments may be reduced by netting out amounts committed by the Trust Board for this purpose from certain other funding streams, including settlements such as the Maine Power Reliability Program (MPRP), proceeds from the FCM, or payments from RGGI.

The Electric Efficiency Procurement is statutorily capped at 4% of total revenues from retail electricity supply sales and transmission and distribution sales.⁶ Maine’s largest electric customers, who take service at the transmission and sub-transmission level, do not contribute to and are ineligible for funding from the Electric Efficiency Procurement. They are, however, eligible for other components of the Electric Efficiency and Conservation Fund, including FCM and MPRP funds.

While pursuing the listed objectives, the Trust allocates budgets and deploys strategies for the Electric Efficiency and Conservation Fund to give all customers a reasonable opportunity to participate. The statute expressly directs the programs paid for through this fund to:

- Target at least 10% of the Electric Efficiency and Conservation Fund or \$2.6 million, whichever is greater, to low-income residential customers;
- Target at least 10% of the Electric Efficiency and Conservation Fund or \$2.6 million, whichever is greater, to small business customers; and

⁵ 35-A MRS §10110(2)(A).

⁶ 35-A MRS §10110(4)(A).

- Apportion the remaining funds among customer groups and geographic areas in a manner that allows all other customers to have a reasonable opportunity to participate in one or more conservation programs.⁷

2.2.2 Natural Gas Conservation Fund

The Natural Gas Conservation Fund is established in statute to promote the efficient use of natural gas. Objectives for the use of the fund are to:

- Increase consumer awareness of cost-effective options for conserving natural gas;
- Create more favorable market conditions for the increased use of efficient natural gas products and services; and
- Promote sustainable economic development and reduce environmental damage through the more efficient use of natural gas.⁸

Revenues to the Natural Gas Conservation Fund derive from assessments on natural gas utilities that are statutorily deemed to be just and reasonable costs to be included in rates (the “Natural Gas Efficiency Procurement”). The amount of the assessments is directed by statute to be the amount necessary to capture all cost-effective energy efficiency that is achievable and reliable.⁹ In past years, the law that limited application of the natural gas assessments to the largest gas utility in the State, Northern Utilities (doing business as Unitil). In 2013, the Legislature changed the law by expanding the Natural Gas Efficiency Procurement’s applicability to all local distribution companies providing natural gas in Maine, including Bangor Natural Gas, Maine Natural Gas, and Summit Natural Gas of Maine. Until recently, Maine’s largest natural gas customers, whose usage exceeded 1 million centum cubic feet (CCF) of natural gas annually, were exempt from contributing to the Natural Gas Efficiency Procurement; as such, they were not eligible for the Trust’s natural gas efficiency programs. However, in the spring of 2017, the Legislature amended the law once again, codifying the inclusion of large, non-generator, users. It maintained a limited exclusion for large manufacturers, agricultural, and aquaculture businesses; from FY2018 forward, these customers pay the natural gas assessment on their first 1 million CCF of usage and are eligible for the Trust’s natural gas efficiency programs.¹⁰

Consistent with the statute, the Trust targets the funds of the Natural Gas Conservation Fund so that a reasonable percentage will go to low-income residential customers and to small business customers, and so that remaining funds allow “all other [natural gas utility] consumers to have a reasonable opportunity to participate” in the programs.¹¹

⁷ 35-A MRS §10110(2)(B).

⁸ 35-A MRS §10111(1).

⁹ 35-A MRS §10111(2).

¹⁰ 35-A MRS §10111(2).

¹¹ 35-A MRS §10111(1)(B)(3).

2.2.3 Regional Greenhouse Gas Initiative Trust Fund

RGGI is a nine-state regional program to limit carbon emissions from electricity generators. Maine joined RGGI in 2009 when the program was established. Under the program, large generators are required to purchase “carbon allowances” in an amount equal to their carbon emissions. Allowances are sold at quarterly auctions for this purpose. In Maine, proceeds from the auctions are transferred to the RGGI Trust Fund managed by the Trust.¹² The statute emphasizes that the Trustees have a fiduciary duty to the customers of the electric utilities and that the RGGI funds are to be held in trust for the purposes of benefiting those customers.

The RGGI Trust Fund is to be used for energy conservation programs that reliably reduce electricity consumption or GHG emissions, giving priority to measures with the highest benefit-to-cost ratio. In the spring of 2016, the Legislature amended the Efficiency Maine Trust Act to provide new direction on the allocation of RGGI investments. Beginning in FY2017, the amended law required the Trust to allocate \$3 million annually to the Public Utilities Commission (the Commission) to be disbursed to a select group of energy-intensive manufacturers, known as “affected customers.” In accordance with the statutory directive, the Trust allocated 50% of the remaining funds to the residential sector and 50% to the commercial and industrial (C&I) sector. Later, in light of declining RGGI revenues over a period of several quarters, the Legislature instituted further amendments to the statute in the spring of 2017. First, it reduced the \$3 million annual affected customer transfer to \$2.5 million in FY2018 and \$2.5 million in FY2019, and added a \$1.0 million payment in FY2020. Second, it eliminated for the same period the requirement that the Trust split the remaining RGGI revenues evenly between residential and C&I programs.¹³

The price per ton of carbon allowance, and the total number of tons of carbon allowances sold, has varied considerably over the last eight years. Early on, annual auction revenues to Maine’s RGGI Trust Fund were more than \$11 million per year. In the period around FY2012, the combination of reduced electricity consumption during the economic recession and a major switch by generators from oil to natural gas led to a drop in carbon emissions and a glut of carbon allowances. During that time, revenues from RGGI auctions fell to approximately \$4 million per year. When the regional carbon emissions cap was adjusted, the market rebounded; annual revenues between FY2014 and FY2016 ranged from \$12 million to \$14 million. Then, as alluded to above, the revenues began to decline rapidly in FY2017, falling to \$7 million for that year. This was largely due to uncertainty regarding the future of RGGI, as participating states had not come to an agreement regarding whether to continue the arrangement beyond 2020. When the states officially decided to extend RGGI to 2030, market confidence returned, causing an uptick in market confidence and a subsequent increase in revenues. Annual revenues in FY2018 were \$9.4 million, and the Trust expects \$9.7 million for FY2019. In the period governed by Triennial Plan IV, the Trust is projecting revenues to the RGGI Trust Fund at approximately \$10.7 million for FY2020, \$11.8 million for FY2021, and \$13 million for FY2022. The Trust assumes there will be less market volatility during this period; the new program rule governing RGGI

¹² 35-A MRS §10109.

¹³ 35-A MRS §10109.

from 2020 to 2030 includes an automatic emissions cap readjustment mechanism to avoid the oversupply of allowances when actual emissions fall below the established threshold.

2.2.4 Energy Efficiency and Renewable Resource Fund

The Renewable Resource Fund was originally established to support research and development (R&D) and demonstration projects for renewable energy.¹⁴ In 2011, the law was modified to further authorize use of the fund to provide rebates for customer-sited, commercialized renewable energy equipment meeting a cost-effectiveness test.¹⁵ In 2012, a bill from the Governor modified the law again, allowing voluntary contributions made to the fund to be used for energy efficiency projects (in addition to renewable energy projects) and changing the name of the fund to the Energy Efficiency and Renewable Resource Fund.¹⁶

During the period covered by Triennial Plans I, II, and III, this fund periodically received revenues from the following sources: voluntary contributions made by electricity ratepayers; alternative compliance payments made by electricity suppliers (to comply with their requirements to supply renewable energy); federal grants; and a dedicated system benefit charge. This charge amounted to 0.005 cents/kWh for every unit of electricity consumed in Maine. In 2010, statutory authorization for this dedicated charge expired and was not reauthorized, ending this source of funds. In recent years, all funds carried forward from federal grants and the system benefit charge were fully expended. Also, revenues to the fund from alternative compliance payments dropped to zero, and revenues from voluntary ratepayer contributions fell to approximately \$50,000 per year. For the Triennial Plan IV period, the Trust assumes that revenues for this fund will be limited to voluntary contributions at a level of \$50,000 per year. Per the statute, the Trust must direct 35% of annual to the Maine Technology Institute to support the development and commercialization of energy efficiency and renewable energy technologies.

2.2.5 Federal and Miscellaneous Funds

The statute provides that the Trust shall oversee and administer:

- A. The U.S. Department of Energy (DOE) State Energy Program; and
- B. Other federally funded programs and projects related to Trust programs.¹⁷

During the first Triennial Plan period, the Trust administered programs funded by six separate federal grants totaling more than \$93 million. Nearly all of this amount came through one-time grants from the American Recovery and Reinvestment Act of 2009, which, except for certain revolving loan funds, was not available for programs during the period of Triennial Plans II or III. A notable exception was revenues received from the recurring State Energy Program formula grant, which in recent years occasionally provided between \$20,000 and \$50,000 per year for the Trust to invest in energy programs. The Trust

¹⁴ 35-A MRS §10121 and §3210(9)(B).

¹⁵ 125th Maine Legislature, First Regular Session, LD 761 – An Act to Provide Rebates for Renewable Energy Technologies.

¹⁶ 125th Maine Legislature, Second Regular Session, LD 1864 – An Act to Improve Efficiency Maine Trust Programs To Reduce Heating Costs and Provide Energy Efficient Heating Options for Maine’s Consumers.

¹⁷ 35-A MRS §10115(1).

intends to apply for federal grants through competitive requests for proposals (RFPs) when they present a good fit with the Trust’s mission and Triennial Plan. However, at this time and for purposes of budgeting and planning, the Trust is not forecasting receipt of any federal grants during Triennial Plan IV.

As mentioned above, the statute authorizes the trust to accept “other funds received by or from any entity with which the Trust has an agreement or contract....”¹⁸ The Board of Trustees must vote to accept funds and may do so where the receipt of those funds is consistent with the purposes laid out for the Trust in the statute.¹⁹ As of the writing of this Triennial Plan, the Trust has only one such funding source that will be active during FY2020 and FY2021: the Volkswagen (VW) settlement funds. In 2016 and 2017, VW agreed to settle allegations that it violated the federal Clean Air Act by installing “defeat devices” on certain diesel vehicles. Under consent decrees reflecting the settlement agreement, Maine (through the Maine Department of Transportation) received settlement funds from VW. Through a Memorandum of Understanding, the State contracted with the Trust to administer approximately \$3.15 million to promote electric vehicle charging infrastructure to help reduce greenhouse gases and improve the energy efficiency of transportation in Maine. The Trust Board voted unanimously in December 2017 to accept the funds for this purpose.

As with any outside grants or funding streams, the allowable uses are typically set by the granting entity and memorialized in contract terms.

2.3 Long-Term Targets

The Maine statute provides that an objective of the Trust’s Triennial Plan is to design, coordinate, and integrate programs that advance six long-term goals.²⁰ These goals, as revised through the Omnibus Energy Bill in 2013, are listed below. (Appendix A details historical results as they relate to the Trust’s progress in advancing these goals.)

1. Reducing energy costs, including residential heating costs;
2. Weatherizing substantially all homes whose owners or occupants are willing to participate in and share the costs of cost-effective home weatherization by 2030;
3. Reducing peak-load demand for electricity by 300 MW by 2020;
4. By 2020, achieving electricity and natural gas program savings of at least 20% and heating fuel savings of at least 20%;
5. Creating stable private sector jobs providing alternative energy and energy efficiency products and services in the State by 2020; and
6. Reducing greenhouse gas emissions from the heating and cooling of buildings in the State by 10% below 1990 levels by January 1, 2020.²¹

¹⁸ 35-A MRS §10103(4).

¹⁹ 35-A MRS §10103(4).

²⁰ 35-A MRS §10104(4)(F).

²¹ 38 MRS §576.

2.4 Principles of Administration

Leading up to the legislative decision to shift responsibility for administering programs to the new, independent Trust, there was robust policy debate about what principles should guide the implementation of programs. A consensus emerged to increase the focus on customers' energy needs; promote independent and objective planning and decision making; enhance nimbleness and flexibility in program management in order to adjust quickly to changes in energy prices and the emergence of new technologies or program strategies; and promote efficient administration, transparency, and accountability.

These industry best practices were later codified in the Efficiency Maine Trust Act, which directs the Trust to ensure that program design and implementation conform to enumerated "Principles of Administration," in order to be:

- *Consumer-oriented*: Programs are consumer-oriented such that the processes for participation and program design are targeted to serve the multiple needs of energy consumers in this State;
- *Independent, objective, nimble*: The effectiveness of programs is maximized by building up and centralizing expertise, addressing conflicts of interest, mitigating the influence of politics, promoting flexible, timely program management, and providing a champion for funding cost-effective energy and energy efficiency programs;
- *Efficient*: The efficiency with which programs are planned, designed, overseen, and delivered is maximized; and
- *Sustainable*: Sufficient checks and balances are provided to ensure consistency with public policy and accountability so that energy efficiency programs in the State are sustainable for the long term.²²

The model of using an independent, third-party administrator such as the Trust to help achieve these principles in the administration of efficiency programs and alternative energy programs is becoming more common across the United States. This model is also employed in Delaware, the District of Columbia, Hawaii, New Jersey, New York, Oregon, Wisconsin, and Vermont.

2.5 Other Statutory Directives

2.5.1 PACE Act

The Property Assessed Clean Energy (PACE) Act was enacted in Maine in 2010 to facilitate financing of energy-saving improvements in Maine buildings.²³ The PACE Act establishes underwriting standards for small loans (up to \$15,000) and authorizes the Trust to administer a program of marketing, financing, and servicing loans for energy upgrades.

²² 35-A MRS §10104(2).

²³ 35-A MRS §10151 et seq.

2.5.2 Capacity Resource Adequacy

In recent years, the Maine Legislature enacted a provision authorizing the Commission to approve long-term contracts for capacity and energy under specific circumstances.²⁴ The purposes of this provision include:

- To reduce electric prices and price volatility for the State's electricity consumers and to reduce GHG emissions from the electricity generation sector; and
- To develop new capacity resources to reduce demand or increase capacity so as to mitigate the effects of any regional or federal capacity resource mandates.²⁵

Among other things, the Commission may contract with the Trust to deliver energy efficiency capacity resources and the available energy that is associated with such resources.²⁶

2.5.3 Potential Energy Infrastructure Revenues

In 2009, the Maine Legislature established a process for permitting electricity transmission lines or gas pipelines to use the existing rights-of-way along certain State-owned corridors: I-95, I-295, and the Searsport-Loring pipeline easement. The law provides that until July 31, 2017, for a transmission line or pipeline that was permitted to use one of these corridors, a portion of the payments from the project due to the State would be deposited in the Energy Infrastructure Benefits Fund managed by the Trust.²⁷ The statute further directs that the Trust is to use any such proceeds from the Energy Infrastructure Benefits Fund for grants, loans, programs, and incentives "[t]o improve the State's economy by pursuing lower energy costs for people, communities and businesses in a manner that will enhance the environment of the State in accordance with the triennial plan."²⁸ To date, no payments have been made to the Fund, and no qualifying projects have been permitted that would require payments to the Fund.

2.6 Program Guidelines

The regulatory framework in which the Trust operates starts with the statutory provisions outlined above. This framework is detailed in a series of rules that the Trust has adopted and through program guidelines. The Trust's rules, codified at Section 95-648 of the Code of Maine Rules, and individual program guidelines are all available on the Efficiency Maine website at www.energymaine.com.

²⁴ 35-A MRS §3210(C).

²⁵ 35-A MRS §3210(C)(2)(B) and (2)(C).

²⁶ 35-A MRS §3210-C(6)(A).

²⁷ 35-A MRS §122(6-A) and (6-B); see also, 5 MRS §282(9).

²⁸ 35-A MRS §10103(4-A).

2.7 Oversight from the Public Utilities Commission

The Commission has oversight of the Trust's program planning and administration,²⁹ and must approve the Triennial Plan. The Commission will approve the Plan if it reasonably explains how the programs will achieve the requirements of the statute and the performance metrics contained in the Plan.

The Commission's oversight includes evaluating performance of the programs and ratifying the performance metrics if the metrics conform with the statute's principles of program administration and are in the public interest. The Commission may open an investigation and issue appropriate orders to address concerns of non-compliance. The Commission is empowered to establish a fund to cover the costs of its oversight responsibilities.

2.8 Legislature

The Trust's committee of jurisdiction in the Maine Legislature is the Energy, Utilities and Technology Committee. On December 1 of each year, the Trust presents to the EUT Committee the annual report of the prior year's activities, results, and financials. On January 30 and July 30 of each year, the Trust also submits to the EUT Committee year-to-date financial updates and the operating budget. By practice, the Trust typically also provides a briefing on the annual report and plans for the year ahead to the EUT Committee early in the year for each legislative session. Periodically throughout a session, the Trust provides briefings, written information, analysis, and testimony about energy issues. Occasionally, when relevant, the Trust offers similar input in other legislative committees, such as the Environment and Natural Resources Committee or the Appropriations Committee. When a Triennial Plan is under development, the Trust provides an opportunity for the members of the EUT Committee to ask questions and give input.

²⁹ See, generally, 35-A MRS §10104(4) and §10120.

3. The Triennial Plan

3.1 Purposes and Requirements

The main purposes of the strategic plan for the Trust's programs are to:

- Serve as a guide for staff working to implement the programs;
- Help Trustees track the progress of staff's program implementation;
- Indicate the direction the Trust's programs are taking to customers, vendors, and contractors in the marketplace, and also to advocates and policymakers; and
- Satisfy the statutory requirement to present a document containing targets, objectives, performance metrics, strategies, and budget allocations for the Board and the Public Utilities Commission to review.

The Efficiency Maine Trust Act specifies that, every three years, the Trust should prepare a strategic plan and that the Trust's programs should be administered by the Trust consistent with that plan. Pursuant to the statute, this plan, referred to as the "Triennial Plan," must:

- Be a detailed, triennial, energy efficiency, alternative energy resources and conservation plan;
- Identify all achievable cost-effective energy efficiency savings and related programs that could be implemented, the costs and benefits of such programs, and the basis and support for such identified costs and benefits;
- Include efficiency and conservation program budget allocations, objectives, targets, measures of performance, program designs, program implementation strategies, timelines and other relevant information;
- Provide integrated planning, program design and implementation strategies for all energy efficiency, alternative energy resources and conservation programs administered by the Trust;
- Include provisions for the application of appropriate program funds to support workforce development efforts; and
- Be consistent with the comprehensive state energy plan.³⁰

3.2 Process and Timeline

The Triennial Plan development process culminates with approval or rejection by the Commission through an adjudicatory proceeding. The statute provides that the standard for Commission approval is whether the Triennial Plan reasonably explains how its proposed use of funds would achieve the:

³⁰ 35-A MRS §10104(4).

- Objectives and implementation requirements of the programs established under Chapter 35-A, Sections 3210-C, 10110, 10111, or 10119, of the Maine Revised Statutes; and
- Measures of performance (or “metrics”) for each program funded by the statutory funds described in those sections.³¹

According to the statute, the Commission is to approve all elements of the Triennial Plan that it determines to be cost-effective, reliable, and achievable. The Commission also incorporates into gas and electricity utility rates sufficient revenue to provide for the procurement of energy conservation resources that are identified in the plan as being cost-effective, reliable, and achievable, within a statutorily established cap.

Before the Plan is submitted to the Commission, however, it undergoes several steps. The staff began developing Triennial Plan IV by reviewing recent past performance, working on a basic outline of priorities, identifying issues needing further analysis, and laying out a process and timeline. Trustees provided input during periodic program updates, budget discussions, and presentations on Triennial Plan issues. The staff obtained data from the utilities and market research from outside experts to help formulate program targets and strategies. The staff also commissioned several studies, which helped the staff estimate the budgets necessary to capture all efficiency resources that are reliable and achievable, and meet the standard for cost-effectiveness.

In addition, the staff launched a stakeholder engagement process. This process involved publishing a formal request for information before drafting this document, holding individual meetings, and holding a public hearing. It further involved soliciting and considering written comments on a draft version of the plan. All materials were made publicly available on a dedicated webpage that provided an ongoing means for stakeholders to submit questions, comments and recommendations, and supporting materials for the Trust’s consideration. The Trust also offered a detailed briefing on the Plan to the Legislature’s Committee of jurisdiction to provide an opportunity for input. All written comments received by the Trust may be found at <https://www.energymaine.com/triennial-plan-iv/>.

After considering input from stakeholders and policymakers, the staff presents a final draft of the Triennial Plan at a meeting of the Board of Trustees. Once satisfied that the document comports with the objectives, targets, and requirements of the statute and provides a suitable explanation of the program strategies, the Board may approve the Plan by a two-thirds vote.

Finally, the process prescribes that the Trust staff will submit to the Board of Trustees an update to the Triennial Plan when significant changes are contemplated. Significant changes require approval by the Board before they may be put into effect. In the event these changes relate to the use of funds “generated by assessments” on utility ratepayers, the changes also require approval by the Commission “using the same standard as for the triennial plan.”³²

³¹ 35-A MRS §10104(4)(D); 35-A MRS §10104(3).

³² 35-A MRS §10104(6).

3.3 Program Implementation Priorities

In addition to best practices of administration and implementation, the plan reflects a balancing of the following priorities in its allocation of the budget and design of programs: acquiring resources, transforming the market, maintaining fairness, leveraging the private sector, and reducing environmental impacts of energy.

3.3.1 Acquiring Resources

A strong selling point for the Trust's programs is that they deliver energy resources that cost less than conventional energy resources and, therefore, reduce total energy costs. In the case of electricity, the acquisition of low-cost energy resources also suppresses the rise of energy and capacity charges, and improves grid reliability. These benefits are essential if the Maine economy is to remain competitive with neighboring states. By investing in energy conservation projects that satisfy the Trust's stringent cost-effectiveness test, the programs are acquiring energy resources for the benefit of the participating customers and the ratepayers on the system. As a general rule, the budget allocations and program designs in this Triennial Plan reflect the Trust's top priority, which is reducing energy costs in Maine by the "maximum amount possible" through acquisition of demand-side energy resources that are cost-effective, achievable, and reliable.

3.3.2 Transforming the Market

Another priority of the Trust, as reflected in the Triennial Plan, is to help transform the marketplace with regard to energy conservation and cost-effective renewable energy resources. Market transformation in the Trust's programs takes several forms.

One example is building economies of scale for newer, high-efficiency products such that they are stocked on store shelves, salespeople and technicians are familiar with and promote the products, and the retail price is driven down. Recent energy-efficient technologies going through this transformation in Maine include ductless heat pumps and heat pump water heaters (HPWHs): these products are now available across the State due in significant part to the Trust's incentives, training for contractors and distributors, and informational materials.

Another means of market transformation is through workforce development. Triennial Plan IV continues the past success of promoting training for key players in the energy conservation supply chain. The Trust emphasizes the certification and licensing requirements for trade allies affiliated with Efficiency Maine programs. It also considers online and in-store training opportunities, scholarships, and other support for existing programs run by community colleges. In past years, Trust programs paid for and organized training for:

- Home energy auditors to learn sales skills when pitching their services to homeowners;
- Contractors to learn about new mini-split heat pumps;
- Sales staff at large retail chains who are responsible for promoting ENERGY STAR® lights and appliances;

- Large commercial contractors to learn about advances in variable frequency drives (VFDs); and
- Facility managers to become certified in best practices of operation and maintenance for the energy systems in their buildings.

A third area of activity that advances the priority of market transformation is the Trust's promotion of general energy education and awareness. The Trust maintains a website that helps both residential and business customers access information about available programs (including technical support and financial incentives), and has expanded the offerings to include more generic information about energy efficiency and the options available to consumers considering a purchase of new lighting, heating or cooling systems, water heaters, electronics, appliances, motors, or controls. Recently, this activity has included providing information to customers who may be unfamiliar with operating their new efficient equipment: the Trust's Ductless Heat Pumps web hub provides both pre- and post-installation information for customers (<https://www.energymaine.com/about-heat-pumps/>). Triennial Plan IV continues to leverage these increasingly important website resources and expands the Trust's use of social media and digital advertising to effectively reach more customers.

Finally, market transformation includes activities to encourage the entry of new high-efficiency products and alternative energy products into the marketplace. The cost-effectiveness of new products or practices can be hard to demonstrate or predict. Meanwhile, making such products or practices available on a broad scale, while maintaining quality control (QC), can be challenging. To address these issues, the Trust often seeks to start on a smaller scale by supporting innovative pilot initiatives. In this Triennial Plan, the Trust will continue to use the Innovation Program (see Section 6.2) to pilot new products, or new applications of established products, as well as new approaches to running programs. The Trust will also continue its practice of funding custom projects in commercial and industrial settings, where appropriate. The funding of custom projects (see Section 5.1) enables contractors and their customers to take advantage of energy-saving opportunities even if the product has not yet achieved sufficiently wide use to appear on a "prescriptive incentives list" of the most commonly used efficient products. Funding custom projects also enables the Trust to support best practices in building design, industrial processes, and building operation so that, over time, these will become standard industry practice.

3.3.3 Maintaining Fairness

The Triennial Plan also reflects the priority of maintaining fairness in the way that budgets are allocated and programs are designed and implemented. At a minimum, a degree of fairness is achieved by ensuring that statutory minimum funding levels are allocated to low-income customers (the greater of \$2.6 million or 10% of the Electric Efficiency Procurement and an appropriate percentage from the Natural Gas Conservation Fund) and to small business customers. Beyond these statutory directives for budget allocations, the Trust seeks to promote broad participation among customers and a reasonable distribution of project benefits throughout the State.

Before Triennial Plan III, the Trust allocated funds from electric customers (from the system benefit charge and RGGI) and gas utility customers according to the percentage of total load represented by

each customer class (e.g., approximately 40% for residential customers and 60% for business/institutional/industrial customers of electric utilities). Starting in Triennial Plan III and continuing with Triennial Plan IV, the Trust allocates funds on the basis of opportunity for cost-effective energy savings. This approach will continue to entail administering a blend of programs targeted to the needs of different customer types and the channels through which they access energy conservation. Some programs will result in a small number of very large projects acquiring extensive energy savings; others will result in tens of thousands of small, low-cost product upgrades that make small energy savings accessible to homeowners and businesses everywhere, even in more remote areas of the State. By contrast, other initiatives, such as the Small Business Initiative (see Section 5.3), will yield lower energy savings and incur greater cost. While these undertakings may run counter to the principle of maximizing resource acquisition, the Trust pursues them nonetheless because they are cost-effective, achievable, and reliable, and because it is important that customers from every sub-sector and every region of Maine have a reasonable opportunity to access the benefits of cost-effective energy conservation programs.

3.3.4 Leveraging the Private Sector

As noted above, an overarching purpose of the Trust is to reduce the energy costs of Maine's residential and non-residential customers to the maximum extent, consistent with the requirements of cost-effectiveness. A core priority of the Trust is to leverage private sector funding and activities in the free market. This means that, as much as possible, the Trust designs its programs so that marketing and installation of efficiency, conservation, and alternative energy measures are incorporated into the normal, day-to-day activities of the existing supply chain, which comprises manufacturers; suppliers; vendors; architects and engineers; contractors (electricians, plumbers, heating technicians, builders); and retail stores. Leveraging the private sector entails taking advantage of competition in the marketplace to push down prices of equipment and services. This approach has the added benefit of avoiding "picking winners" in technology, fuel type, or service providers, leaving the outcome to the efforts of market players and the choices made by customers.

This market-based approach also means that in most cases, the homeowner or business owner bears ultimate responsibility for deciding what upgrades to install and which contractor to use, and for executing and paying for the transaction. Except for the case of improvements made in certain low-income homes, the Trust's financial contribution takes the form of an incentive designed to move the customer from the status quo, or from purchasing the standard-efficiency model, to upgrading to a high-efficiency model. The incentive is designed to cover a portion of the cost of the energy upgrade, and the customer must bear the balance of the project cost. The Trust also offers loans for many upgrades to help customers reduce initial investment costs. Without this significant financial investment from the customers, the Trust's costs for procuring cost-effective energy resources would be greatly increased, the overall cost of delivering energy through utility systems would be considerably higher, and emissions of carbon and other air pollutants would rise.

3.3.5 Reducing the Environmental Impacts of Energy

Traditionally, the production and consumption of energy have been among the largest contributors to air pollution, including GHGs that cause climate change. Energy is also closely associated with other environmental and land use issues, such as water quality, solid and hazardous waste, wildlife impacts, scenic impacts, and sustainable use of finite resources. Energy conservation and clean alternative energy resources have the potential to not only reduce or mitigate harmful environmental impacts, but to do so more cost-effectively than other ways to mitigate such impacts.

Throughout the design and implementation of this Triennial Plan, the Trust's top priority, as noted above, is to ensure that energy conservation and alternative energy resources maximize cost-effective energy savings and economic benefits to ratepayers and the local economy. In addition, consistent with statute, the Trust seeks to deploy these energy resources in a way that also advances State environmental policies.

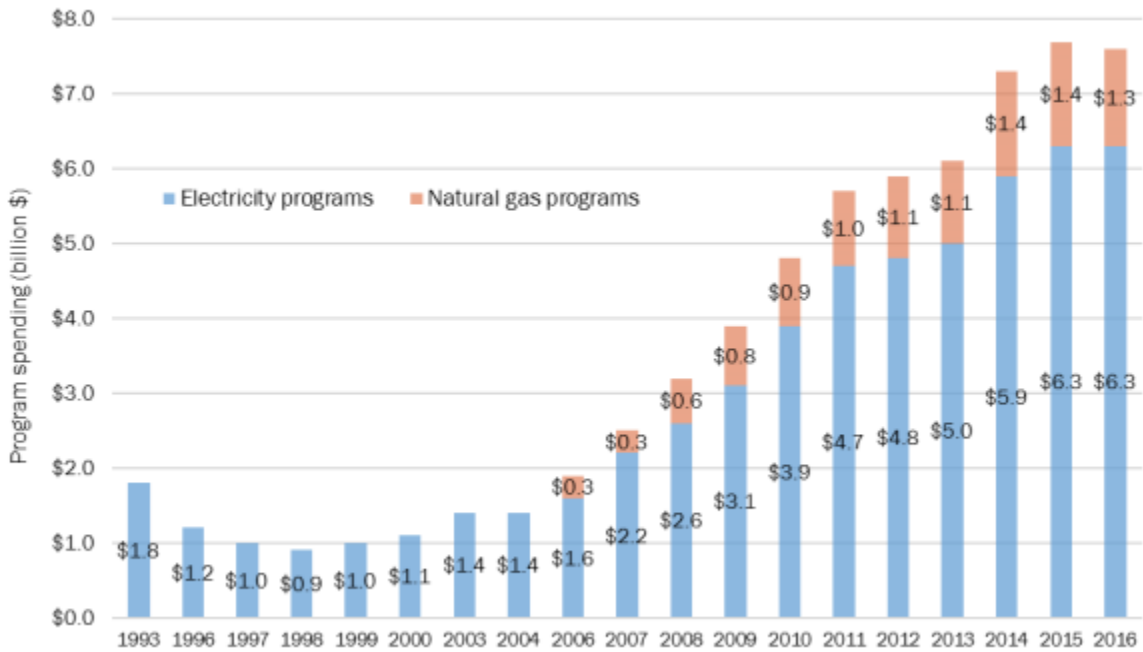
3.4 Results

3.4.1 Recent History of Energy Conservation Programs

Nationally, energy conservation programs are well-established as a means for cost-effectively lowering energy bills and reducing carbon dioxide and other air pollutants. Efficiency programs also have successfully promoted business profitability, local economic development, and jobs. It should be no surprise then to learn that across the United States, \$7.6 billion was invested in 2016 through programs to promote the more efficient use of electricity, heating fuels, and industrial process fuels.³³ Figure 1 shows that nationwide funding for energy conservation programs increased 443% between 2003 and 2016, reflecting a growing commitment to efficiency as a low-cost, low-carbon, and highly reliable energy resource.

³³ American Council for an Energy Efficient Economy, "ACEEE: The 2017 State Energy Efficiency Scorecard," September 2017, page vi.

Figure 1: National Spending on Energy Efficiency Programs



Note: Annual spending on electric and natural gas energy conservation. Natural gas spending is not available for the years 1993–2004. Sources: Nadel, Kubo, and Geller 2000; York and Kushler 2002, 2005; Eldridge et al. 2007, 2008, 2009; Consortium for Energy Efficiency (CEE) 2012, 2013, 2014, 2015, 2016; Gilileo et al. 2015; Berg et al. 2016. As reprinted in American Council for an Energy Efficient Economy, “ACEEE: The 2017 State Energy Efficiency Scorecard,” September 2017.

Energy conservation programs have been delivering cost savings in Maine for decades. Before the restructuring of Maine’s electric utilities in 2000, the investor-owned utilities—Bangor Hydro Electric and Maine Public Service (now merged and renamed Emera Maine) and Central Maine Power—were vertically integrated, owning and managing generation stations as well as the transmission and distribution lines. They also offered energy conservation programs to their customers. Among the first energy conservation programs in the country, these initiatives were referred to as Demand Side Management (DSM) programs. Showing their commitment to providing Maine ratepayers with low-cost energy conservation, Central Maine Power proposed, and the Commission approved, DSM budgets above \$20 million per year in the early and mid-1990s.

Starting in 2002, the Commission assumed responsibility for administering statewide energy conservation programs funded with a system benefit charge. Over eight years, the programs grew from a handful of small educational and training initiatives to a full-fledged conservation unit, branded as “Efficiency Maine.” The unit offered energy-saving measures from the smallest low-income residential setting to the largest paper mills. Under Commission management, the Efficiency Maine programs adopted a market-based approach that relied on developing a network of trade allies (e.g., electrical and plumbing contractors, equipment suppliers, architects, and engineers) who are referred to as Qualified

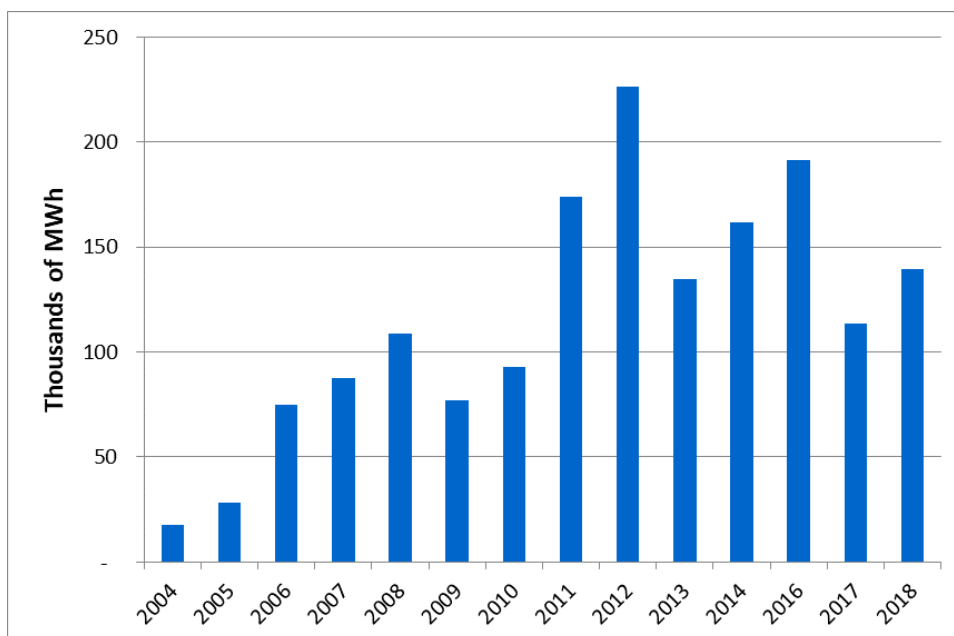
Partners. Efficiency Maine also targeted residential and business lighting as among the most cost-effective opportunities for energy savings, and helped transform the lighting market to high-efficiency compact fluorescent bulbs and high-performance T8 linear fluorescent tubes. During this period in the middle of the decade, the Efficiency Maine programs were funded at about \$9 million per year. As certain pre-existing program commitments (from the so-called Power Partners Program) reached their end and made more funds available for Efficiency Maine, the annual budget for electricity savings programs grew to \$14-15 million by 2009.

In 2009, the State enacted legislation to shift responsibility for administering Efficiency Maine programs to a new independent trust—the Efficiency Maine Trust. Starting on July 1, 2010, the Trust consolidated responsibility for administering multiple revenue streams, including the Electric Efficiency and Conservation Fund, the Natural Gas Conservation Fund, the newly created RGGI Trust Fund, the Energy Efficiency and Renewable Resource Fund, and the federally funded State Energy Program. The mission given to the new Trust by the Legislature was to coordinate and, where appropriate, to integrate the administration of electric and thermal conservation programs and programs to promote alternative energy.

3.4.2 Energy Savings in Maine

Efficiency Maine has been steadily delivering energy savings to and lowering energy costs for Maine’s electricity, natural gas, heating oil, and propane customers. By way of illustration, Figure 2 shows the annual savings from Efficiency Maine electricity conservation programs—the longest running and most comprehensive Efficiency Maine programs—from FY2004 to FY2017. Note that this figure shows only the savings from new program activity completed in each year. It does not reflect the cumulative savings from programs completed in prior years even though the savings from a conservation measure commonly persist throughout the lifetime of the equipment, usually more than a decade.

Figure 2: Annual Savings from Efficiency Maine Programs in Thousands of MWh (2004–2018)



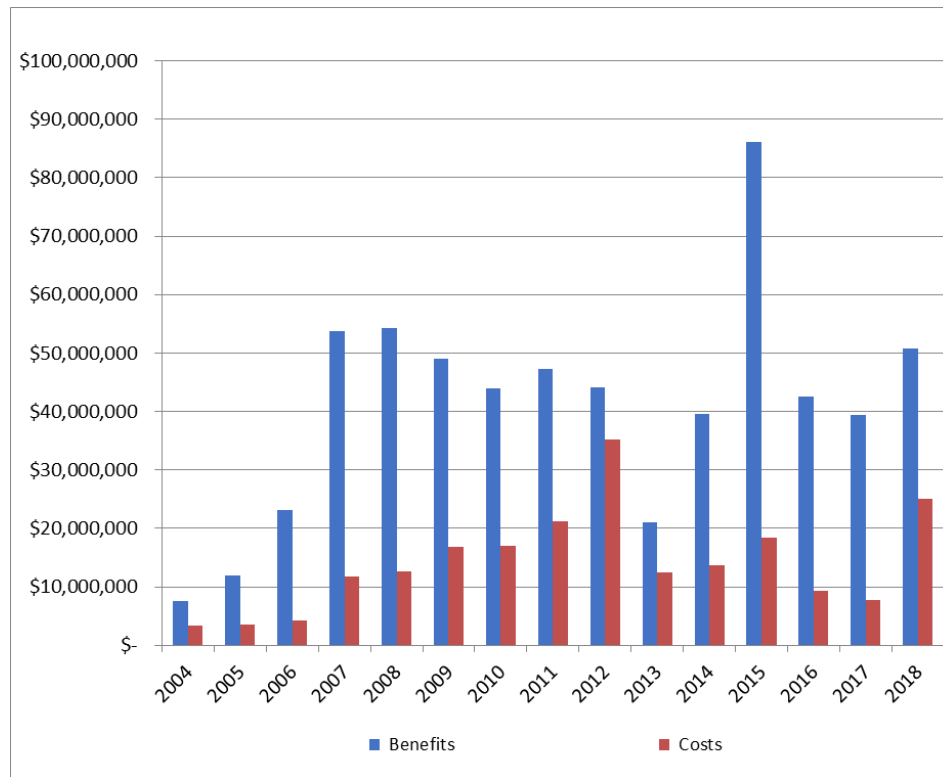
Source: Efficiency Maine data.

3.4.3 Financial Savings (Benefits)

Energy and capacity savings from efficiency projects are the chief contributors to financial savings, which are referred to in the Trust’s calculus of cost-effectiveness as “benefits.” The financial savings represent the net cost that is avoided, or not paid, by the customer and other ratepayers as a result of the efficiency upgrade. Over the past decade Efficiency Maine programs have delivered significant benefits that outweigh the total costs.³⁴

Figure 3 and Figure 4 highlight the financial savings, over the full lifetime that efficiency upgrades remain operational, for two of Efficiency Maine’s most popular and longest-running programs—the Commercial and Industrial Prescriptive Program and Retail Initiatives.³⁵ Because the financial benefits are a function of the price of the energy use avoided, if energy prices drop they may decrease even as budgets or energy savings are increasing.

Figure 3: Benefits (Lifetime) vs. Costs of the Commercial and Industrial Prescriptive Program



Note: Reflects electric, natural gas, and unregulated fuel savings.

³⁴ “Total costs” reflect the sum of the Trust’s costs for administration and financial incentives plus the incremental capital and operating costs paid by the customer.

³⁵ The Business Incentive Program is now named the Commercial and Industrial Prescriptive Program.

Figure 4: Benefits (Lifetime) vs. Costs of the Retail Initiatives Program

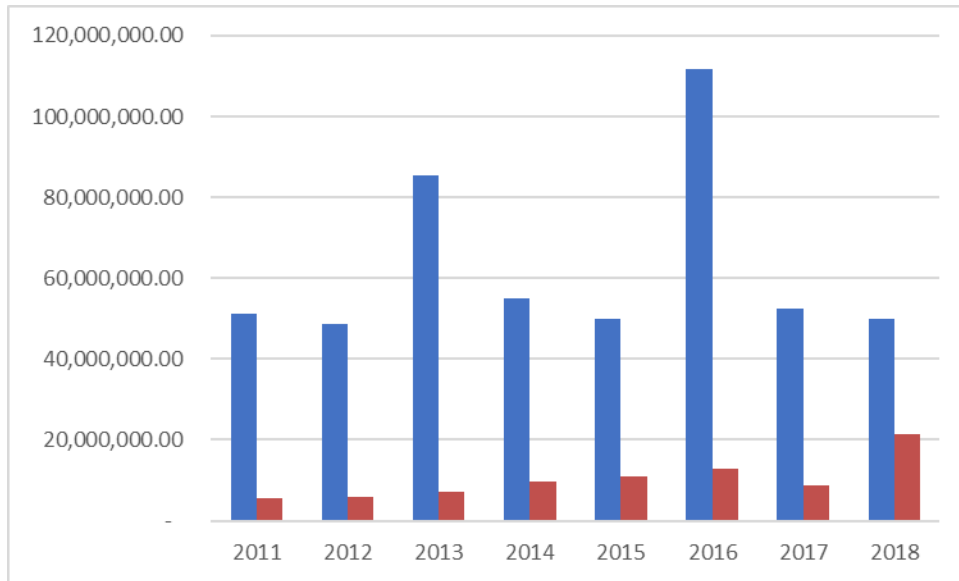
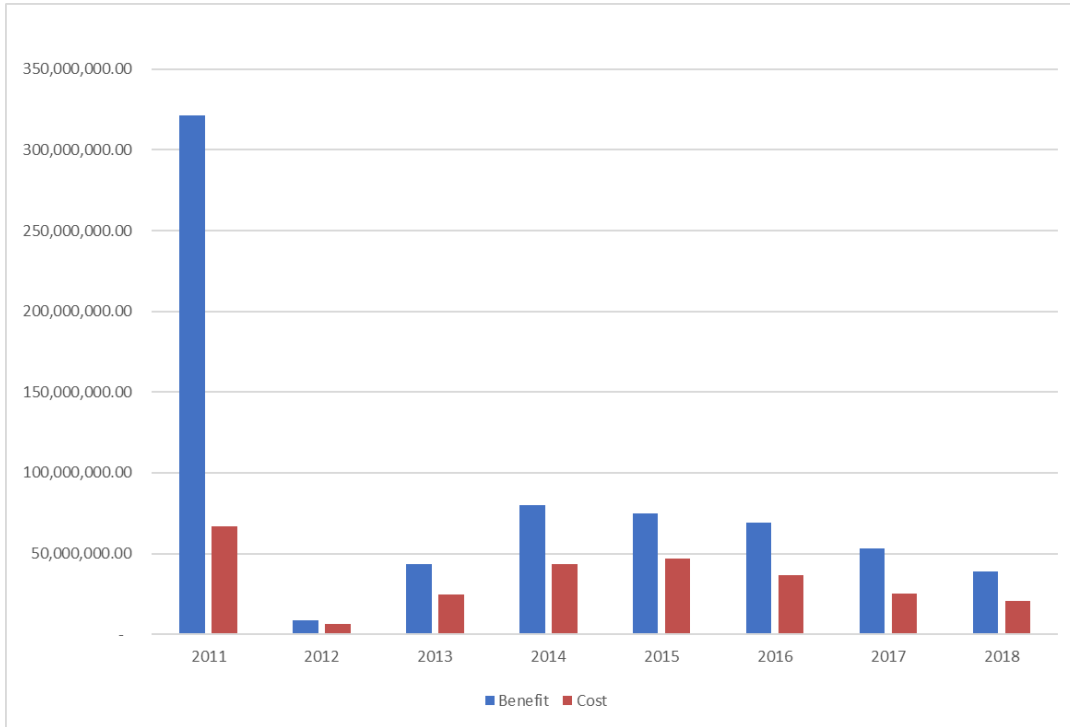


Figure 5 highlights the program benefits from Trust programs targeting natural gas and unregulated fuel savings. For purposes of allocating budgets and tracking savings, the term unregulated fuels refers to fuels such as oil, propane, kerosene, or wood. Note that activity in 2011 was considerably higher due to the influx of American Recovery and Reinvestment Act (ARRA) funds.

Figure 5: Benefits (Lifetime) vs. Costs of Natural Gas and Unregulated Fuels Programs



3.4.4 Efficient Administration of Programs

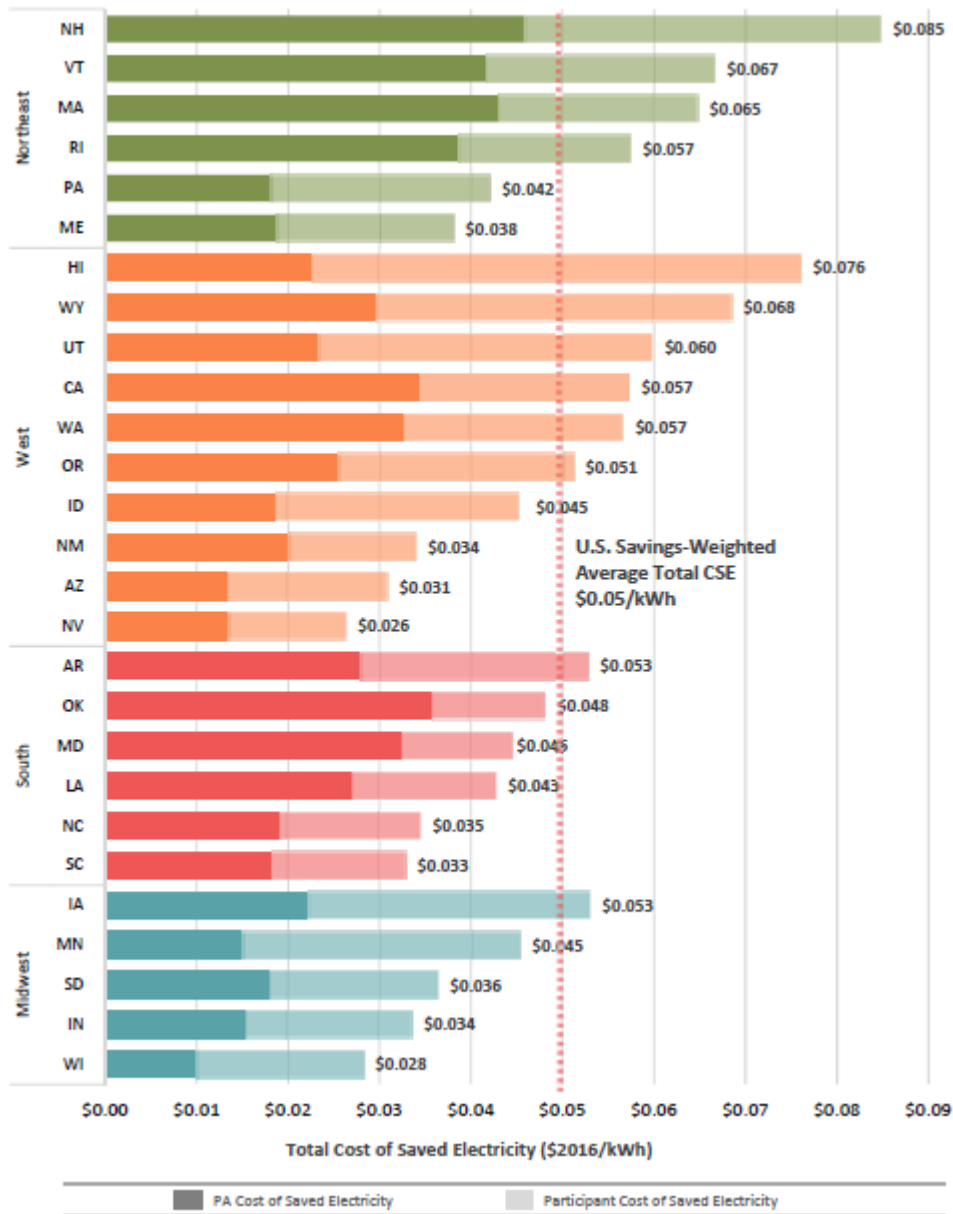
Maine statute identifies several best practices in program administration that the Trust is directed to pursue. Among these is the principle of maximizing “the efficiency with which programs are planned, designed, overseen and delivered.”³⁶ This principle is complemented by statutory guidance regarding the efficient deployment of RGGI funds to “minimize administrative costs and maximize program participation and effectiveness.”³⁷

The Trust has achieved reasonable success in delivering energy savings at a low cost of production during the previous Triennial Plan periods. This success is reflected in Figure 7.

³⁶ 35-A MRS §10104(2)(C).

³⁷ 35-A MRS §10109(4)(G) states, “In order to minimize administrative costs and maximize program participation and effectiveness, the trustees shall, to the greatest extent feasible, coordinate the delivery of and make complementary the energy efficiency programs under this section and other programs....”

Figure 7: State Rankings for Costs of Saving Energy



Note: PA = Program Administrator.

Source: Lawrence Berkeley National Lab, "The Cost of Saving Electricity Through Energy Efficiency Programs Funded by Utility Customers: 2009–2015," June 2018, page xvii.

The Trust regularly commissions independent, third-party evaluations and is committing more resources to measurement, verification, and analysis of program performance (see Section 6.1). By accelerating its collection of information on market prices, how measures are performing in the field, and what is driving customer participation in the programs, the Trust aims to continuously improve the effectiveness of its energy-saving strategies and maximize the efficiency of program delivery.

4. Identification of Cost-Effective Opportunity

4.1 FY2020-FY2022 Program Budgets

Table 1: Electric Program Budgets

Program	FY 2020	FY2021	FY2022
C&I Custom Program	\$3,920,000	\$3,920,000	\$3,920,000
C&I Prescriptive Program	\$12,706,000	\$12,817,000	\$12,928,000
Small Business Initiative	\$2,682,000	\$2,682,000	\$2,682,000
Distributor Initiatives	\$9,046,000	\$9,046,000	\$9,046,000
Retail Initiatives	\$6,674,000	\$6,097,000	\$5,599,000
Home Energy Savings Program	\$4,934,000	\$5,461,000	\$5,989,000
Low-Income Initiatives	\$6,048,000	\$6,048,000	\$6,048,000
Total	\$46,010,000	\$46,071,000	\$46,212,000

Table 2: Natural Gas Program Budgets

Program	FY 2020	FY2021	FY2022
C&I Custom Program	\$116,000	\$116,000	\$116,000
C&I Prescriptive Program	\$570,000	\$570,000	\$570,000
Small Business Initiative	\$0	\$0	\$0
Distributor Initiatives	\$122,000	\$122,000	\$122,000
Retail Initiatives	\$9,000	\$9,000	\$9,000
Home Energy Savings Program	\$131,000	\$129,000	\$126,000
Low-Income Initiatives	\$95,000	\$95,000	\$94,000
Total	\$1,043,000	\$1,041,000	\$1,037,000

Table 3: Unregulated Fuel Program Budgets

Program	FY 2020	FY2021	FY2022
C&I Custom Program	\$205,000	\$1,004,000	\$1,016,000
C&I Prescriptive Program	\$630,000	\$630,000	\$630,000
Small Business Initiative	\$-	\$2,480,000	\$2,480,000
Distributor Initiatives	\$1,258,000	\$1,258,000	\$1,258,000
Retail Initiatives	\$884,000	\$398,000	\$398,000
Home Energy Savings Program	\$1,881,000	\$1,852,000	\$1,840,000
Low-Income Initiatives	\$2,957,000	\$1,147,000	\$997,000
Total	\$7,815,000	\$8,769,000	\$8,619,000

For detailed FY2020-FY2022 financial information, see Appendix B: Budget and Performance Metrics.

4.2 MACE Quantification Methodology

4.2.1 MACE Definition

The Efficiency Maine Trust Act includes a mandate for the Trust to capture all cost-effective energy efficiency opportunity that is reliable and achievable.³⁸ The Commission refers to this concept as “MACE”—“maximum achievable cost-effective” energy efficiency:

In the Commission’s dockets relating to the Trust, it has become colloquial to refer to the acronym MACE, which arises from how the Trust’s studies have evaluated all cost-effective potential for energy efficiency savings. These studies refer to maximum achievable cost-effective energy efficiency, or MACE. Title 35-A directs the Commission to approve all cost-effective, reliable, and achievable energy efficiency savings. 35-A M.R.S. § 10104(4). The Commission treats and refers to MACE as synonymous with the standard set by Title 35-A. Efficiency Maine Trust, Request for Approval of Second Triennial Plan, Docket No. 2012-00449, Order at 12 (March 6, 2013).³⁹

MACE potential is the amount of cost-effective energy that can realistically be saved, taking into account the following considerations:

- Real-world barriers to end users’ adoption of efficiency measures (e.g., upfront costs, supply chain limitations, lack of customer awareness, unwillingness (or reluctance) to participate in programs, technical constraints);
- Non-measure costs of delivering programs (for administration; marketing; analysis; and evaluation, measurement, and verification (EM&V));
- Ability and capacity of programs and administrators to boost program activity over time;
- Policy or regulatory constraints;
- Other market-specific barriers that the “program intervention” is modeled to overcome; and
- Future market trends.

4.2.2 Benefits and Costs Calculations

The Trust follows the standard practice of energy efficiency programs by estimating benefits and costs based on the difference between two scenarios: (1) the baseline (i.e., what would have happened if not for the program), and (2) an efficient alternative that ultimately happens as a result of the program. The Trust uses the same benefits and costs in calculating MACE as it does in program implementation. All the relevant benefit and cost values are captured in the Trust’s Technical Reference Manuals (TRMs). The TRMs serve as a central repository and common point of reference for the methods, formulas, assumptions, and sources that are used to estimate benefits from energy-efficiency measures, and provide a common platform for analyzing energy savings across measures and programs. These TRMs are described in further detail in Section 6.1. This section provides a high-level overview of some related considerations and assumptions that go into the Trust’s assessment of cost-effective opportunity.

³⁸ 35-A MRS §10110(4-A), 35-A MRS §10111(2).

³⁹ State of Maine Public Utilities Commission, *Efficiency Maine Trust, Request for Approval of Third Triennial Plan*, Docket No. 2015-00175, Order at 3, n.3 (July 6, 2016).

Establishing the Baseline

The baseline represents the starting conditions, or what would have happened if not for the energy efficiency program. Establishing the baseline allows for comparison between energy use with and without an energy efficiency upgrade. Considerations include assumptions about whether the average customer would have installed less efficient equipment or if they would have continued to use existing equipment.

Several sources of information support the Trust's baseline analysis. First, the Trust considers what customers are *required* to do or have done based on regulatory codes and standards. For example, in establishing the baseline for residential boilers, the Trust looks at the federal minimum efficiency standards for residential heating systems. Second, the Trust conducts market research to gain a better understanding of what types of equipment are being sold at Maine's retailers and distributors, and of how customers respond to different promotional conditions. For example, the light-emitting diode (LED) Lighting Pricing Trial Results (Appendix C) characterized the universe of lighting products for sale at several different stores and analyzed changes in customer behavior in response to price and marketing shifts. Third, the Trust assesses the current universe of installed equipment. For example, as part of Triennial Plan IV, the Trust commissioned a baseline study on the state of commercial and industrial lighting in Maine (see Appendix D). This study inventoried lighting in use at 76 facilities to document the existing baseline and assess the potential opportunity for lighting efficiency upgrades.

Assigning the relevant decision type that characterizes a customer's decision to undertake an energy upgrade is an important consideration in establishing the baseline (see Table 4). Decisions fall into one of two categories: (1) lost opportunity or (2) retrofit.

Lost opportunities cover measures such as those undertaken during new construction projects and planned equipment purchases. Planned equipment purchases include adding new equipment to an existing facility, whether in connection with remodeling, expansion, or otherwise, as well as "replacement on burnout" when equipment fails beyond repair or nears the end of its useful life. In all these cases, if the customer does not choose an efficiency upgrade, there will not be another economical opportunity to upgrade the equipment for many years. The opportunity to influence the adoption of high-efficiency equipment in new construction or expansion scenarios occurs at the point when new equipment is being specified and installed. The potential for upgrades in a given year is determined by the rate of new construction and consumer facility upgrade plans. For "replacement-on-burnout" scenarios, the potential for upgrades in a given year is determined by equipment failure rates and the age of equipment stock.

Retrofits occur when customers are motivated to take action due to Efficiency Maine incentives and outreach. In these cases, the equipment replacement or upgrade occurs before the end of its useful life. In this scenario, savings can theoretically be captured at any time; however, in practice, it takes many years to address an entire stock of buildings, even with the most aggressive energy efficiency programs. Example barriers to retrofits include competing business or contractor priorities, lack of knowledge or expertise, limited pool of qualified vendors, and long decision-making or budget process, among others.

Table 4: Assessment of Measure Cost for Different Decision and Project Types

Decision Type	Project Type	Scenario	Baseline	Measure Cost
Lost Opportunity	New Construction	Customer is in the market to purchase new equipment for a new construction project	Federal standards or standard market practice for new equipment	Incremental cost: difference between the cost of the baseline and high-efficiency equipment
	Addition of New Equipment	Customer is in the market to add new capacity to an existing facility/renovation or to add controls to improve the performance of new equipment	Federal standards or standard market practice for new equipment	Incremental cost: difference between the cost of the baseline and high-efficiency equipment
	Replacement on Burnout	Customer is in the market to purchase new equipment to replace existing units that have worn out or otherwise need replacing	Federal standards or standard market practice for new equipment	Incremental cost: difference between the cost of the baseline and high-efficiency equipment
Retrofit	Early Replacement	Customer's existing equipment is in working order and has remaining useful life, or customer is adding controls to improve the performance of operating equipment in an existing facility	Existing equipment or conditions	Full measure cost: cost of the high-efficiency equipment (including installation)

Load Shape

How a piece of equipment is used over the course of a day and year has implications for the energy and demand costs that the customer will incur when that equipment operates. Generally, electricity used during on-peak, or high-demand, periods is more expensive; certain customers are obligated to pay demand charges that increase during these timeframes. The Trust must therefore understand the coincidence factor, or the degree to which a given measure is likely to be operational during peak hours, as defined by ISO-NE. The higher a measure's coincidence factor, the higher the potential financial savings associated with demand (i.e., kilowatts). The Trust also applies energy period factors to allocate the annual energy (i.e., kilowatt-hour) savings into one of the four energy periods, each with its own specific costs: (1) Winter Peak, (2) Winter Off Peak, (3) Summer Peak, and (4) Summer Off Peak. This allocation is performed in order to apply the appropriate avoided cost values in the calculation of program benefits.

Impact Factors

A series of other factors account for verified measure performance in a cost-effectiveness calculation. These include the following:

- *In-service rate*: The percentage of efficient units distributed through an energy efficiency program that are actually implemented, rather than left uninstalled for some reason.
- *Realization rate*: The comparison between predicted and actual energy savings, as determined by a program evaluation.

Program Attribution

Program attribution involves isolating savings achieved as a direct or indirect result of the program. The Trust considers the following factors:

- *Free-ridership rate*: The percentage of energy savings achieved by participants who would have implemented the measure or practice in the absence of the program. These savings are not attributable to the program influence. The Trust sets free-ridership rates at the level determined in a given program's most recent evaluation. It uses a default free-ridership rate of 25% for unevaluated measures where comparable evaluated measures do not exist.⁴⁰
- *Spillover rate*: An estimate of energy savings attributable to spillover effects expressed as a percentage of savings from equipment that participants install through an energy efficiency program. Spillover refers to the installation of efficiency measures or adoption of efficiency practices by customers who did not directly participate in an efficiency program, but were nonetheless influenced by the program to make the efficiency improvement.⁴¹

Secondary Impacts and Interactive Effects

Some energy efficiency measures have impacts beyond the targeted energy savings. For example, a high-efficiency clothes washer saves electricity and also reduces hot water usage. The Trust calculates the additional energy savings associated with this reduction, taking into account the specific fuel type used for water heating.

In some cases, an efficiency measure interacts with other equipment. An example of this interactive effect is the impact that efficient lighting has on a building's heating, ventilation, and air conditioning (HVAC) equipment. When efficient lighting is installed, the amount of waste heat produced by the lights is reduced. This results in additional electricity savings due to lower cooling loads but also leads to increased fuel usage during the heating season to offset the heat lost from the new lighting. While the impact of a single light bulb is negligible on HVAC systems, the Trust includes both the cooling benefit and the heating penalty in its cost-effectiveness calculation of efficient lighting.

⁴⁰ This value is consistent with the Triennial Plan III Settlement (see State of Maine Public Utilities Commission, Order Approving Stipulation, Docket No. 2015-00175, July 6, 2016).

⁴¹ National Efficiency Screening Project, *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*, Edition 1 Spring 2017, p. 100.

Other Quantified Impacts

Occasionally, an energy efficiency project has additional benefits and costs beyond the direct energy savings and costs associated with the new measure(s). Though there are a number of non-energy impacts associated with energy efficiency upgrades, Triennial Plan IV incorporates only the following factors:

- Savings associated with reduced water usage (i.e., water supply and wastewater charges);
- Savings and costs associated with reduced or increased operations and maintenance (O&M) requirements; and
- Savings associated with reduced bad debt (for Low-Income Initiatives only).

Achievable Program Participation

The Trust analyzes additional information on program participation to further refine its calculations of what constitutes achievable cost-effective opportunity. Historical performance offers some insight into future performance. For example, if the Trust was able to incentivize 5.7 million LED light bulbs through the Consumer Products Program (now called Retail Initiatives) in the Triennial Plan III period, it is fair to suggest that it could achieve a similar level of program activity in the Triennial Plan IV period (adjusting for the declining participation in the program driven by the longer life of the efficient LEDs installed each year). The number of bulbs that burn out each year is predictable, and the cost of inefficient bulbs has remained fairly stable. If the cost of efficient LEDs holds constant, through the application of incentives reassessed every quarter, then it is reasonable to assume that participation in the program will remain at similar levels.

In some cases, a comparison of historical program participants and eligible non-participants can also be helpful. The potential analysis for the C&I Custom Program, for example, cross-referenced the list of Maine's larger energy users with the list of past program participants to identify the untapped market.

The Trust may also consider capacity within the contractor community. If there is a considerable opportunity for a particular measure, but only a limited number of contractors with the appropriate expertise to install it, that measure's potential figure must be limited accordingly. This also applies to the supply chain; the market may not have the immediate capacity to meet new demand resulting from a measure incentive.

4.2.3 Setting Incentives

A measure's incentive level affects the quantity of that measure the Trust is able to incentivize. The Trust uses several strategies in setting appropriate incentive levels. The goal is to find a threshold that is just high enough to motivate participation. Finding this balance can be challenging; while the Trust does not want to pay more incentives than needed, setting them too low will result in a high free-ridership

rate. It is important to note that the pool of free-riders is fixed; the only way to drive the free-ridership rate down is to incentivize broader participation, thereby reducing the proportion of free-riders.⁴²

Determining the decision type is a key part of setting incentives. For retrofit measures, the incentive is applied to the full project cost, including labor costs for installation. It is meant to encourage the customer to replace a piece of equipment that is otherwise functioning properly. For lost-opportunity measures, however, the incentive is set based on the incremental cost between the efficient equipment and the standard, baseline equivalent. In this case, the incentive is designed to encourage the customer to upgrade to the more efficient choice; the incentive can account for the amount that the customer was already expecting to pay for the equipment and installation.

Beyond this basic consideration, the Trust looks to other sources of information to gather insight into appropriate incentive levels. Price elasticity studies can prove extremely helpful; these studies change incentive levels over a specific period and monitor the impact on program activity. In some cases, the Trust also considers the typical return on investment threshold for a particular customer sector. For example, homeowners might have less aggressive return on investment criteria than a corporate business. Finally, the Trust also looks to energy efficiency programs in other states for insight. This is particularly valuable for new measures, where the Trust can leverage the program administrator experiences in other jurisdictions.

Over the course of a Triennial Plan period, the Trust constantly monitors program activity and changes incentive levels accordingly.

4.2.4 Monetization of Benefits and Costs

Once the Trust establishes the types of relevant benefits and costs for a given measure, it then monetizes (calculates the dollar values associated with) those savings and costs.

Avoided Costs

The Trust uses the avoided costs laid out in the most recent version of the Avoided Energy Supply Component (AESC) Study. Synapse and a team of subcontractors developed this study on behalf of a group of regional stakeholders including the Trust, other program administrators, utilities, regulators, and advocates. It is updated periodically; AESC reported new results in 2013, 2015, 2016, and 2018. A copy of the 2018 AESC Study can be found in Appendix E.

To determine the values of energy efficiency, the AESC Study calculates and provides hourly avoided costs for each New England state in a hypothetical future in which no new energy efficiency measures are installed. The study examines avoided costs of energy, capacity, natural gas, fuel oil, other fuels, other environmental costs, and demand reduction-induced price effects. It relies on a combination of models to estimate each of these costs for each future year.

⁴² This statement does not apply to Low-Income Initiatives, where the customer's income status means that he or she is unlikely to take action without assistance.

Useful Measure Life

Useful measure life is another key consideration in monetizing savings and costs. How long will the measure be in place and active? The Trust uses product specifications, program evaluations, and measure life studies to determine these values for the TRMs.

Discount Rate

As set forth in its rules, the Trust calculates the present value of a measure over its expected useful life by taking into account the time value of money. According to Chapter 3 and Chapter 4, the discount rate used for electric and natural gas utility procurement-funded measures is the current yield of 10-year U.S. Treasury securities, plus two hundred basis points, adjusted for inflation.⁴³ The Trust uses the same discount rate for measures funded with other, non-utility procurement funds.

Other Quantified Impacts

In monetizing the savings associated with other quantified impacts, the Trust applies the useful measure life and discount rate as defined above.

Reduced water usage is monetized using an average cost of supply water and wastewater utility rates multiplied by the percentage of homes that are connected to the public water supply, plus an assumed avoided cost for homes served by wells.⁴⁴

In Triennial Plan IV, the MACE potential reflects O&M economic impacts, where they can be quantified, for each year over the life of the measure. In addition, the MACE potential accounts for avoided bad debt resulting from the Low-Income Initiatives, following the practice begun in the last Triennial Plan. Specifically, in the last plan the Trust was authorized to “apply default value, representing the benefit of avoided bad debt to electric utility ratepayers, to the lifetime savings of any electricity-saving measure by multiplying 3.8 percent times the statewide retail cost of electricity (as reported by the Governor’s Energy Office or Public Utilities Commission), and discounting that amount by applying the real discount rate, and adding the resulting value to the total benefits of the measure.”⁴⁵ The Trust applies the same monetization methodology in Triennial Plan IV.

Program Delivery

In setting program budgets, the Trust must account not only for incentive costs, but also the costs of delivering (or running) a program. Elements of program delivery include, but are not limited to, rebate processing, program marketing, training and outreach for businesses in the supply chain, customer outreach, and field inspections. Each program has different considerations, depending on the target customer type or program design. Developing a delivery plan entails considering what is required to get

⁴³ 95-648 Code of Maine Rules (CMR) ch. 3, §4(3), 95-648 CMR ch. 4, §4(3).

⁴⁴ The avoided cost of water for homes with wells is based on the electricity consumption of the well pump and does not include water treatment costs.

⁴⁵ State of Maine Public Utilities Commission, Revised Stipulation, Docket No. 2016-00159, August 14, 2017, page 9.

achievable cost-effective energy savings. Generally, the more significant the target customers' barriers and the more involved the program design, the higher the delivery costs.

The Small Business Initiative (see Section 5.3) serves as a helpful example in illustrating this process. The State of Commercial and Industrial Lighting in Maine Study (Appendix D) finds a significant opportunity for lighting retrofit projects in Maine's small business sector. At the same time, however, these customers are generally less likely than larger businesses to be aware of energy efficiency options and are more likely to face financial and time barriers to undertaking a retrofit. A program delivery mechanism to overcome these obstacles involves direct outreach, a free initial consultation, and considerable ongoing communication between the customers and the Trust. The combination of the technical potential and these program design considerations determines what is achievable for this sector and how much it will cost to deliver.

4.2.5 Benefit-to-Cost Ratio Calculation

The Trust calculates the benefit-to-cost ratio according to Chapter 3 and Chapter 4 of its rules,⁴⁶ long-standing practice, and past directives from the Commission. As such, the costs and benefits include those experienced by the participant, the program administrator, and the utilities, as defined above. The formulas for the benefit-to-cost ratio are as follows:

$$\text{Portfolio} \sum_{\text{measure life}} \frac{NTGR \times PV(\text{Energy\&Demand Benefits} + \text{Water Benefits} + \text{O\&M Benefits} + \text{Bad Debt Benefits})}{\text{Administration} + \text{Program Delivery} + NTGR \times PV(\text{Fuel Costs} + \text{Measure Cost} + \text{O\&M Costs}) + (1 - NTGR) \times \text{Incentives}}$$

$$\text{Program} \sum_{\text{measure life}} \frac{NTGR \times PV(\text{Energy\&Demand Benefits} + \text{Water Benefits} + \text{O\&M Benefits} + \text{Bad Debt Benefits})}{\text{Program Delivery} + NTGR \times PV(\text{Fuel Costs} + \text{Measure Cost} + \text{O\&M Costs}) + (1 - NTGR) \times \text{Incentives}}$$

$$\text{Measure/Project} \sum_{\text{measure life}} \frac{NTGR \times PV(\text{Energy\&Demand Benefits} + \text{Water Benefits} + \text{O\&M Benefits} + \text{Bad Debt Benefits})}{NTGR \times PV(\text{Fuel Costs} + \text{Measure Cost} + \text{O\&M Costs}) + (1 - NTGR) \times \text{Incentives}}$$

Where:

- NTGR = Net to Gross Ratio;
- PV = Present Value; and
- O&M = Operations and Maintenance.

The Trust screens for eligibility at the project level, rather than the program level. A project is defined as a bundle of related measures installed concurrently. Any project that has a benefit-to-cost ratio greater than or equal to one is eligible for inclusion in the Trust's programs. This screening is conducted at the net level, as opposed to the gross level. This means that the calculation is adjusted for the impact factors

⁴⁶ 95-648 CMR ch. 3, 95-648 CMR ch. 4.

and program attribution described in Section 4.2.2. See Appendix L for the cost-effectiveness screening of measures that informed the opportunity assessment for the Triennial Plan IV period.

5. Program Descriptions

5.1 Commercial and Industrial Custom Program

5.1.1 Overview

The C&I Custom Program incentivizes tailored energy efficiency and distributed generation projects that require unique engineering analyses and projects entailing energy conservation measures that are not covered by prescriptive incentives.

Customer Segments

The C&I Custom Program is open to all C&I customers in Maine. This group consists of all non-residential customers, including businesses, institutions, and multifamily (or apartment) property owners. Despite its broad customer eligibility criteria, the program typically targets larger energy users with relatively complex facilities.

Channels

The C&I Custom Program targets eligible customers by making direct contact with facility managers and corporate officials, as well as with vendors and installers.

5.1.2 Objectives

- Help C&I customers overcome the barriers to implementing complex, custom energy efficiency and distributed generation projects;
- Reduce energy costs at C&I customer facilities;
- Reduce the price of electricity over time for all consumers by achieving reductions in demand for electricity during peak use periods;
- Reduce total energy costs for electricity consumers in the State by increasing the efficiency with which electricity is consumed; and
- Create more favorable market conditions for the increased use of energy-efficient products and services.

5.1.3 Market Barriers

- *Upfront cost and long payback periods:* Businesses commonly require that investments achieve no more than a 1.5- to 3-year payback; custom projects typically have a 4- to 7-year payback before accounting for incentives. Businesses and institutions have many competing demands for capital, and most conservation projects are weighed against other capital investments in internal decision-making processes.
- *Lack of in-house capacity/expertise:* Businesses and institutions often lack a full-time staff dedicated to energy or facility management. Without in-house expertise, they rely on outside contractors and vendors to identify conservation opportunities. Most custom projects require site-specific engineering; this can be capital-intensive and often extends beyond what most energy contractors or vendors are willing to explore on speculation. The

Trust has found that relying on market-based contractors and vendors alone leaves the potential for many custom conservation projects untapped.

- *Unfamiliarity with new technology or processes:* In some cases, a custom conservation project involves technology or processes that are new to or uncommon in the marketplace. Such measures are not well-suited to promotion as part of a prescriptive list of highly standardized measures. The unfamiliarity of contractors and customers with uncommon measures represents a hurdle for custom projects.

5.1.4 Opportunity Analysis

Methodology

The Trust's opportunity analysis for the C&I Custom Program draws on the Applied Energy Group (AEG) Custom, Refrigeration and Compressed Air Potential Study (Appendix F). First, this study segmented utility data by location, business type, annual usage, and demand. This process helped to characterize the marketplace by facility type and business type and to determine the size of the efficiency opportunity in each eligible business segment. AEG then reviewed past program performance. It analyzed program tracking data to determine average project size by year, end-use, and customer, then linked the program database with the utility dataset using a combination of unique identifiers. This approach allowed AEG to compare the two datasets by segment, identifying participants and non-participants.

Based on the results of the market characterization and the evaluation of past program performance, AEG interviewed a group of contractors to shed some light on program and market gaps. These tasks provided the quantitative and qualitative data to shape AEG's projection of future program opportunity.

Findings

For the most part, the AEG study found that recent participation levels in the C&I Custom Program can be replicated in the Triennial Plan IV period. The majority of measures remain cost-effective, and there remains ample unrealized opportunity among medium and large customers.

The study acknowledged that activity in the C&I Custom Program has diminished when compared to three and four years ago. It attributes this change to several key drivers. First, the State's paper manufacturing sector is smaller than it once was, and the remaining paper mills have not participated in the program at the same rate as they did in the past. Second, large lighting retrofit projects that once represented a significant portion of the program have since transitioned to a prescriptive pathway through the C&I Prescriptive Program. Third, lower avoided costs in the Triennial Plan III period rendered certain large HVAC projects non-cost-effective. Finally, small combined heat and power projects are no longer cost-effective in the Triennial Plan IV period when O&M costs are factored into the Total Resource Cost test.

5.1.5 Program Design

Addressing Market Barriers

The C&I Custom Program's incentive structure is designed to overcome barriers associated with large upfront costs and insufficiently attractive payback periods; at 50% of project cost for retrofits and 75% of incremental cost for lost-opportunity projects, the program's incentives are designed to have a meaningful impact on investment decisions. Additionally, program staff reviews project proposals on a rolling basis pursuant to a Program Opportunity Notice. This approach helps to ensure that project investments can sync with customers' internal budgeting processes.

The program overcomes barriers associated with lack of in-house expertise by providing several levels of technical support. First, as appropriate, the program offers free scoping audits to customers where there is a reasonable likelihood of cost-effective energy efficiency and distributed generation project opportunity. The audits themselves are meant to be a starting point in the program, with a goal of identifying at least one project for which the customer could develop an application. In addition, many projects identified during scoping audits result in referrals to the C&I Prescriptive Program.

In cases where a specific project has been identified but requires more in-depth evaluation, the program cost-shares an investment-grade analysis, or "Technical Assistance Study." The Trust has found that these studies result in well-designed and successful efficiency and distributed generation projects, reducing the need for costly review or redesign at later stages in the installation process.

In addition, the program has found that the Trust's impartial expertise in providing technical assistance and reviewing project applications helps improve the accuracy of projections of the amount of energy savings that can reasonably be expected from the energy upgrade. The Trust thus plays an important role in ensuring that program participants feel confident in moving forward with significant investments and helps secure necessary approval from corporate decision makers.

Measures Promoted

The C&I Custom Program is designed to be flexible enough to invite a broad array of potential projects and participation from customers of varying sizes. During the Triennial Plan IV period, the Trust anticipates following the same practice of offering competitive incentives for relatively large, custom electric and thermal energy efficiency projects.

The C&I Custom Program will also continue to offer incentives for cost-effective distributed generation projects, as it has since 2009 when the program was initiated. In addition to the standard criteria, the program will also apply the following extra criteria to distributed generation projects:

- The program will only consider the avoided electricity (including capacity) from the output of a generation unit that coincidentally offsets grid-supplied electricity. The program will examine hourly data to ensure that proposed projects' output will be used on site, behind the customer's meter.
- Projects that involve the combustion of fossil fuels will need to meet an overall annual threshold for operational efficiency.

Incentives and Financial Considerations

The C&I Custom Program will invest in custom efficiency and distributed generation projects consistent with the following program design elements:

- *Minimum project size:* The program will set a minimum project threshold in order to improve the likelihood that the project savings will exceed investment costs in custom engineering. In FY2019, the minimum electric project size was 36,000 kWh annual savings, and the minimum thermal project size was 4,000 MMBtu annual savings.
- *Simple payback:* The program will set a minimum simple payback threshold that will apply to all applicants. This floor helps ensure that the program incentive is instrumental in moving a project forward, helping avoid free-ridership. Because most customers in the program have unique usage and costs of energy, program staff will perform an individualized simple payback assessment for each project. This involves estimating the financial value of site-specific energy savings through a billing analysis and comparing these savings to the total cost of the project as supported by specific bids from contractors and vendors.
- *A ceiling on the cost of first-year energy savings:* The program will apply a cost ceiling, expressed as dollars per unit of savings, to ensure that it does not overpay for savings.
- *Customer cost-sharing:* The program will continue to require that customers pay a percentage of the project's cost. This requirement may differ between retrofit and lost-opportunity projects.
- *Maximum incentive size:* The program will apply annual incentive caps in order to avoid overspending the budget, causing program interruptions or suspensions. The balances within the relevant funding sources will dictate the appropriate threshold levels for different project types (i.e., electric, natural gas, all-fuels). If an electric or natural gas project shows potential for significant, cost-effective electricity savings but exceeds the program's incentive limit, the Trust may work with customers to bring a specific funding request to the Public Utilities Commission to be considered for funding through a budget adjustment.⁴⁷

The program will also continue to provide incentives for Technical Assistance Studies. The cost share will be set at a meaningful percentage of the overall study cost, and capped at a reasonable threshold. For example, the current program offers 50% up to \$20,000.

Marketing and Outreach

The unique, site-specific nature of custom projects and the barriers they face means the C&I Custom Program uses an individualized, customer-focused outreach strategy. Program outreach starts with raising awareness of the program among the leadership of targeted businesses and institutions and reaching out directly to facility or energy managers. After making contact, the program staff offers free scoping audits and encourages customers with promising projects to pursue Technical Assistance Studies.

⁴⁷ This option does not extend to all-fuels projects, which are funded using RGGI funds.

In addition to targeting potential customers, the program markets custom energy efficiency opportunities to the major vendors and contractors, as well as architectural and engineering firms working in Maine. These energy professionals are able to “pitch” program participation to potential clients. Similarly, partnerships with trade associations or industry groups help spread the word about program offerings.

Quality Assurance/Quality Control

Because each custom project is unique, each requires site-specific oversight by program staff. The Trust independently verifies energy-saving calculations in project proposals and equipment specifications. By evaluating proposals in collaboration with the customer, the Trust provides added security to customers installing projects that may have been proposed by outside contractors or employ new technologies. The Trust also analyzes how the paybacks of the proposed projects relate to the customers’ internal investment hurdles.

The C&I Custom Program staff reviews projects from their earliest stages through to their completion. This includes conducting site visits, reviewing design plans, and reviewing invoices to ensure that each project is completed according to initial design specifications. If projects run over budget, the customer is responsible for the overrun, placing the onus on private sector project managers to exert budget oversight. Upon project completion, the program staff conducts a site visit to verify project installation details. All projects are inspected. Savings estimates (and incentives) are adjusted for “as-built” conditions. The Trust meters all distributed generation projects and logs their ongoing performance in the Trust’s customer tracking database.

The Trust employs several strategies to prevent stranded investments. These strategies include requiring program participants to fund at least 50% of project costs; requiring projects to achieve minimum thresholds of cost-effectiveness; setting minimum and maximum simple payback parameters; reviewing the financial and technical capacity of the proponents to execute and maintain the project; and setting a cap on the maximum incentive from the Trust.

5.2 Commercial and Industrial Prescriptive Program

5.2.1 Overview

The C&I Prescriptive Program provides C&I customers access to financial incentives and technical support for the installation of energy-efficient equipment. The program prioritizes equipment that has predictable operating characteristics and practical applications across the commercial and industrial sector. This program complements the offerings of the Distributor Initiatives program and solutions offered through the C&I *Custom* Program.

Customer Segments

This program serves all non-residential customers, including businesses, industrial customers, manufacturers, municipalities, non-profit building owners, and multifamily buildings of five or more units.

Channels

The C&I Prescriptive Program is delivered through a network of trade allies, or Qualified Partners. Qualified Partners are familiar with efficient technologies, product installations, available Efficiency Maine incentives, and the incentive application process. Most Qualified Partners are installation contractors, such as electricians, plumbers, and heating technicians. However, equipment distributors also serve as Qualified Partners and participate in this program.

5.2.2 Objectives

- Reduce energy costs for electricity consumers in the State by increasing the efficiency with which electricity is consumed;
- Reduce energy costs for electricity consumers in the State by increasing the efficiency with which natural gas and unregulated heating fuels (including oil and propane) are consumed;
- Motivate C&I customers to improve energy consumption through early retirement of inefficient equipment;
- Promote highest-efficiency equipment options when customers are replacing existing equipment or adding new equipment; and
- Create more favorable market conditions for the increased use of energy-efficient products and services, including training trade allies on efficiency measures and incentives.

5.2.3 Market Barriers

- *Upfront costs*: The increased price of energy-efficient options is a barrier for many customers. This program offers incentives to reduce the initial price difference between conventional and high-efficiency options.
- *Competing priorities*: Businesses have many competing demands for capital. It can be difficult for them to prioritize replacing inefficient, but functional, equipment with an efficient model. Efficiency incentives help move retrofit projects higher on the list of capital investments.
- *Lack of information*: Many customers are not familiar with high-efficiency choices: incentives help guide both customers and installation contractors to the efficient option.
- *Lack of in-house capacity*: Few Maine businesses have full-time facility managers or other staff who identify, manage, and install efficiency projects. A prescriptive list of incentivized measures removes uncertainty about incentive amounts and program criteria: this list enables contractors to confidently sell efficient projects to potential customers and enables customers to budget for an equipment upgrade.

5.2.4 Opportunity Analysis

Due to the diversity of measures offered through the C&I Prescriptive Program, the opportunity assessment draws upon four separate analyses:

- The opportunity assessment for lighting measures was based on the *State of Commercial and Industrial Lighting in Maine Study* found in Appendix D.

- For compressed air and refrigeration measures, the Trust relied on the *Custom, Refrigeration and Compressed Air Potential Study* found in Appendix F.
- For ductless heat pumps, the Trust compiled its own analysis of the market for high-efficiency supplemental heating. This analysis may be found in Appendix G.
- The energy-saving opportunities for other measure categories were determined by a staff review and relied principally on past program history.

These efforts looked to answer key questions:

- Are measures that are currently incentivized by the program still cost effective?
- Should other measures be added to the program?
- What size is the retrofit lighting opportunity in the State?

Methodology

Lighting

There was a significant shift in the lighting market during the Triennial Plan III period; LED lamps and fixtures are becoming the top choice of many potential customers, contractors, and distributors, where high-efficiency fluorescent fixtures had been the default choice at the beginning of the period. With this market shift, the program has increasingly focused on retrofit installations of existing buildings: in general, the program seeks to incentivize LEDs where they are replacing inefficient fixtures. A new construction project is unlikely to need an incentive to install high-efficiency LEDs, whereas a business with functional fluorescent lighting still needs an incentive to proactively upgrade to LEDs.

Efficiency Maine commissioned a lighting study to assess the retrofit opportunity to improve lighting efficiency in Maine's C&I sector. The authors of the *State of Commercial and Industrial Lighting in Maine Study* began by developing a statistically significant sample of commercial and industrial lighting in the State of Maine. They then conducted on-site surveys noting fixture type, wattage, and square footage to determine the current baseline characteristics of C&I lighting in the State. This opportunity assessment also took into account price trends, technology updates, and changes in the market.

The study's authors defined two types of hypothetical retrofit projects for each location, looking at lamp replacements for one project and fixture replacements for the other. Each replacement was screened for cost-effectiveness, creating a list of eligible measures for each project scope. The results of the site-specific findings were extrapolated by facility type and square footage to a statewide opportunity. The final step was to assess contractor capacity and other program adoption limitations to forecast expected program participation during the Triennial Plan IV period upon which program budgets were based.

The assessment also found that for certain halogen and tubular replacement products, there continues to be a lost-opportunity market. This lost-opportunity lighting market is reflected in the Distributor Initiatives and Retail Initiatives sections (see Sections 5.4 and 5.5).

Compressed Air and Refrigeration

The opportunity assessment also included a targeted study of refrigeration and compressed air measures (see Appendix F). This study is summarized in the C&I Custom Program description (see Section 5.1). However, the Trust attributed a portion of the opportunity identified through this study to the C&I Prescriptive Program: that opportunity includes low-cost measures and measures for which the savings and cost could be quantified without site-specific analysis.

Ductless Heat Pumps

The Trust's assessment of the commercial opportunity for ductless heat pumps relied on its *Analysis of the Opportunity for High-Efficiency, Cold Climate Ductless Heat Pumps in Maine in Fiscal Years 2020-2022* (Appendix G). This analysis synthesizes the collected experience of program managers and delivery staff, recent and ongoing evaluations, and experiences from other program managers around New England. It explains the Trust's cost-benefit calculation and how the Trust works to ensure that the most efficient and effective equipment is installed and used to the maximum benefit. The report estimates future program activity by analyzing contractor availability, customer interest, payback requirements, and past program activity.

All Other Measures

For the remaining measures the Trust reviewed the level of past program activity and used that activity to extrapolate budgets and goals for the next program period.

Findings

Based on its opportunity analysis, the Trust determined that it should continue to offer many of the same Triennial Plan III measures for Triennial Plan IV, as many remain cost effective. These measures include ductless heat pumps, compressed air systems, ventilation systems, and retrofit lighting projects. The assessment found that the market for agricultural, compressed air, ventilation, and large heating systems will remain consistent with the previous period. Ductless heat pump installations are projected to grow a modest amount as the technology becomes more familiar to potential customers.

The significant opportunity for retrofit lighting savings is reflected in the C&I Prescriptive Program and Small Business Initiative budgets. The C&I Prescriptive Program budget reflects the opportunity that can be captured through a market program driven mainly by contractors and end users (lost-opportunity lighting is reflected in the Distributor Initiative and Retail Initiative budgets). For ductless heat pumps the report found that the Trust's programs can significantly influence both the number and quality of heat pumps installed in the State.

The study found that inefficient lighting makes up a majority of the lighting systems in Maine businesses and that only 28% of lighting fixtures in the businesses surveyed were LEDs. A significant portion of the remaining lighting reflects cost-effective retrofit projects.

For the C&I Prescriptive Program's Triennial Plan IV budget, see Appendix B.

5.2.5 Program Design

Addressing Market Barriers

The program's market-based approach addresses the upfront-cost barrier by providing incentives that encourage customers to take action and retrofit to the high-efficiency option. These incentives may be paid to the customer or to the contractor, making it possible for contractors to sell efficiency projects with lower up-front costs paid by the customer. In addition to the incentives, the Qualified Partners have an important role in persuading customers to invest in upgrading equipment. Marketing campaigns focus on ways that efficiency projects improve a business's bottom line and the strategic advantages of proactive replacement of inefficient equipment.

In addition, the established network of efficiency contractors helps overcome a lack of customer knowledge about efficiency options and lack of in-house capacity by ensuring that contractors are familiar with efficient technologies and available incentives. The program provides a search tool on the Efficiency Maine website (<https://www.energymaine.com/at-work/qualified-partners/>) to connect prospective customers with Qualified Partners in their area; this is coupled with online information about efficiency solutions by energy use and sector.

Measures Promoted

The program will incentivize proven energy-saving measures that are widely available and represent a significant opportunity for Maine's C&I sector. It will prioritize measures that have practical applications across the State. Whenever possible, the program will take advantage of third-party systems for verifying and vetting the performance of eligible measures. For example, measures incentivized through the program may be listed and verified by the Consortium for Energy Efficiency; the Air-Conditioning, Heating & Refrigeration Institute; or the DesignLights Consortium.

The program invests funds from multiple sources to incentivize a diverse group of measures to reduce consumption of electricity, natural gas, and unregulated heating fuels. Measures in the program range from lighting retrofits to ductless heat pumps to compressed air systems to ventilation equipment. What these measures have in common is that they represent a significant efficiency opportunity across the State and are readily available, but are not an ideal fit for instant discounts at distributors. These measures may require site-specific information or installer expertise, or are planned retrofit projects, making them a better fit for this program than for Distributor Initiatives.⁴⁸

Incentivized measures will be continuously monitored and adjusted. The program will remove incentives for measures that become "industry standard" and may add new, proven technologies and strategies as they become commercially available and demonstrate cost-effectiveness.

Incentives and Financial Considerations

For retrofit projects that replace existing, operational equipment, incentives are established based on the full installed costs of the efficiency measures. For upgrades made at the time of planned investment

⁴⁸ The exceptions to this are certain screw-in and tubular replacement LEDs that are offered through instant discounts at distributors.

in equipment and systems (also referred to as lost-opportunity projects), incentives are set to reflect the incremental cost of efficient measures relative to standard measures. Incentives are monitored quarterly and may be adjusted to reflect market activity and market prices.

In addition to basing incentives on costs, the program sometimes implements alternative ways to calculate incentives beyond per-unit fixed values that can drive higher savings for lower costs. For example, high-efficiency lighting and lighting control projects do not always need one-for-one replacements. By incentivizing a project based on savings rather than number of fixtures, fewer LED fixtures may be installed in a space. This approach will result in more energy savings at a lower total project cost.

Marketing and Outreach

The program frequently relies on the Qualified Partner network to reach potential customers. The Qualified Partner network comprises more than 1,000 contractors, vendors, suppliers, and energy professionals that provide support to businesses interested in saving energy. These independent businesses are the primary marketers of the program—working with their existing customers and identifying new customers for energy-efficient equipment. The Trust has found that all but the smallest businesses in Maine work with contractors for electrical, heating, and mechanical solutions. For businesses that do not currently work with a contractor or a Qualified Partner, the Efficiency Maine website features a Qualified Partner locator tool to easily put potential customers in touch with a Qualified Partner in their area.

The Trust communicates with Qualified Partners through a dedicated website as well as a monthly electronic newsletter. The Trust also convenes a Lighting Advisory Group (which comprises lighting installers, distributors, and manufacturers) quarterly; this group consults with program staff on program opportunities, changes to the marketplace, and customer outreach. In addition, the program participates in supplier open houses and meets with professional associations and groups (e.g., the American Society of Heating, Refrigerating and Air-Conditioning Engineers; Illuminating Engineering Society; and International Brotherhood of Electrical Workers) to share information about energy efficiency opportunities and encourage more industry professionals to become Qualified Partners.

The Trust also markets directly to potential customers. This activity may include advertisements in trade or business publications, participation in targeted trade shows, presentations to relevant business groups, direct mail, social media advertising, and more. The Trust also collaborates with industry and professional associations to reach customers in key sectors. During the last Triennial Plan period, this included working with and exhibiting at conferences hosted by Maine Public School Facility Managers, the Maine Real Estate and Development Association, Maine Municipal Association, Maine Health Care Association, Maine Rural Water Association, Maine Restaurant Association, Rotary groups, economic development groups, local chambers of commerce, and more.

The program provides information to potential customers through the Trust's website and sector-based resources (e.g., a brochure on energy solutions and incentives for restaurants), as well as over the phone. On the website, the Trust provides information about product eligibility, shares case studies of

Maine businesses and the efficiency solutions they implemented, and provides a starting point for Maine businesses organized by sector. Most importantly, the Trust connects potential customers with Qualified Partners working in their area through an online contractor locator tool.

Quality Assurance/Quality Control

The program staff screens incentive applications for completeness, including a review of equipment cut sheets and contractor invoices. In addition, all applications are signed by the customer to ensure that both the customer and the contractor have reviewed and agree to applicable terms and conditions.

Applications above a certain cost threshold receive a technical review before project pre-approval is granted. At project completion, the program staff reviews these larger projects again before issuing incentive payment. In addition, the program staff inspects a random sample of projects on-site; currently, 10% of all projects are inspected on-site. Any significant issues identified while on-site are addressed with the installation contractor.

In addition to these random inspections, the program provides technical assistance to participating contractors. The program makes program information and equipment information available on the Qualified Partner website. The Trust also sends Qualified Partners general information on the industry, the program, and incentivized measures via the newsletter. Technology-specific information may also be addressed through training on new technologies or advanced installation techniques. All Qualified Partners must go through an annual recertification process to ensure that they have the most up-to-date information about incentivized measures and that they are compliant with program eligibility criteria.

5.3 Small Business Initiative

5.3.1 Overview

Small businesses are served through multiple Trust programs – the C&I Custom Program, C&I Prescriptive Program, Distributor Initiatives, Retail Initiatives, and this initiative, the Small Business Initiative. The Small Business Initiative provides turnkey efficiency services and financial incentives that cater to the needs of small businesses with peak demand of 25 kW or less. The program is designed to overcome the barriers experienced by small businesses, including the lack of capital for improvements and lack of time and expertise to analyze energy options in-house. Due to their relatively small size and lower energy use, these businesses tend to receive less attention from contractors and vendors seeking to develop new projects. This program brings information and technical support to the customer's doorstep to schedule and execute energy upgrades using a direct-install approach.

Customer Segments

During the Triennial Plan II period, this program targeted commercial and industrial customers having a peak demand of 100 kW or less. Starting with the Triennial Plan III period, the Trust focused the program on a smaller subset of businesses having a peak demand of 25 kW or less; these businesses are typically defined as Small General Service or General Service customers. That peak-demand limit will remain the same during the Triennial Plan IV period. More than 75,000 small business accounts are in this target

market statewide; there are approximately 90,000 C&I electric customers in the State.⁴⁹ Through case-by-case utility bill assessment, the Trust will continue to make exceptions for businesses with annual energy profiles similar to those of other program participants. The Trust will consider expanding the program to customers with demand in excess of 25kW where such customers are not well served by other Trust programs.

Eligible customers include non-residential customers in selected geographical areas. The program has historically targeted rural and more remote areas of the State; the Trust anticipates expanding the program to more densely populated areas during the Triennial Plan IV period. The program may accelerate inclusion of an area served to meet Non-Transmission Alternative needs or reduce grid constraints. In those cases, the Trust may apply additional measures or larger business-size criteria.

Channels

This initiative is delivered through a “direct-install” approach: “direct-install” describes delivery of efficiency measures that are brought directly to the attention of the property owner at the property site, and where the equipment procurement, scheduling, and installation (with the consent of the customer) are arranged by the program delivery team and installation contractor. This differs from the prescriptive and custom program delivery approaches in which the customers (or their contractor) initiate and manage purchases and project installation.

5.3.2 Objectives

- Contribute to a target of at least 10% of the Electric Efficiency Procurement or \$2.6 million, whichever is greater, to programs for small business customers;⁵⁰
- Contribute to a target of allocating a reasonable percentage of Natural Gas Efficiency Procurement to programs for small business customers considering these consumers’ share of gas load and the cost-effective conservation opportunity available at their businesses;⁵¹
- Increase consumer awareness of cost-effective options;
- Create favorable market conditions for increased use of energy conservation;
- Reduce total energy costs for electricity consumers in the State by increasing the efficiency with which electricity or other fuels are consumed; and
- Maintain a cost-effective, strategic approach to deliver efficiency and conservation resources to Maine’s small businesses.

5.3.3 Market Barriers

- *Upfront costs*: Small businesses typically have limited access to capital, making it hard to invest in energy efficiency improvements that require a large, upfront payment. The increased price of the energy-efficient option is also a barrier.

⁴⁹ Maine Public Utilities Commission, “Electricity: Delivery Rates,” December 31, 2015, https://www.maine.gov/mpuc/electricity/delivery_rates.shtml

⁵⁰ 35-A MRS §10110(2)(B) and 95-648 CMR ch. 3, §3(A)(2).

⁵¹ 95-648 CMR ch. 4, §3(A)(2).

- *Lack of information:* Few customers are familiar with high-efficiency choices: the program educates customers and takes the guesswork out of efficiency upgrades.
- *Lack of in-house capacity:* Few small businesses have the capacity to identify, manage, and install efficiency projects.
- *Small project size:* A small business may not have a large enough efficiency project to be viewed by a contractor as worth the time and expense of a sales call. This program incentivizes contractors to visit and market efficiency upgrades to small commercial customers by bundling the opportunity to do multiple projects at small businesses in targeted geographic areas.
- *Split incentives:* Sometimes the entity making decisions on energy conservation investments does not pay the energy bills, and therefore has little incentive to reduce them. For example, tenants in commercial rental properties may pay their own electric utility bills, but the building owner is in the position to purchase and install equipment. In cases where energy costs are included in rent, the renter does not always see the benefit from energy conservation.

5.3.4 Opportunity Analysis

For Triennial Plan IV, the Trust examined the retrofit lighting opportunity in Maine’s smallest businesses. The assessment also explored whether the direct-install method would be a good strategy for promoting non-lighting efficiency measures in this customer group.

Methodology

As described in the C&I Prescriptive Program section (see Section 5.2), Efficiency Maine commissioned a study to assess the retrofit opportunity to improve lighting efficiency in Maine (Appendix D). The study provided an estimate of the cost-effective statewide opportunity and projections of program uptake during the Triennial Plan IV period. This statewide projection includes small, medium, and large businesses; this section and program focus only on the study findings that pertain to small businesses.

In addition to lighting savings opportunities, site assessments conducted at small businesses visited over the Triennial Plan III period indicate that there are also refrigeration and HVAC efficiency opportunities in Maine small businesses. Those findings, as well as the studies conducted on the entire C&I sector, are reflected in the C&I Prescriptive Program and Distributor Initiatives sections (see Sections 5.2 and 5.4).

Findings

The lighting study found a significant lighting efficiency opportunity in the State. Much of this opportunity resides in the numerous small businesses across Maine. This opportunity and the budget associated with it can be found in Appendix D. Because the Small Business Initiative is a direct-install program, the budget allocations are driven by the planned program outreach and the geographic locations to be targeted during the Triennial Plan IV period.

Refrigeration and HVAC measures face numerous challenges to be included in the Small Business Initiative. First, in the context of this initiative these would be retrofit measures, which carry a

significantly higher burden in terms of program cost. Second, their design and installation would require different trade professionals from those involved in lighting, and are not as good a fit for the turnkey, direct-install approach. With the possible exception of ductless heat pumps, the economies of scale achieved through the lighting options installed in Maine businesses would be more difficult to achieve with refrigeration and HVAC measures. Providing discounted HVAC measures through distributors is, at the moment, a more cost-effective approach. That said, the Trust will continue to assess non-lighting efficiency opportunities and consider direct installation or other approaches to provide enhanced incentives for small businesses with peak demand of 25 kW or less. These non-lighting efficiency opportunities are included in the budgets for the C&I Prescriptive Program and Distributor Initiatives (see Appendix B).

5.3.5 Program Design

Addressing Market Barriers

The Small Business Initiative is designed to overcome the primary barriers preventing Maine's very small businesses from implementing efficiency upgrades. The program addresses the upfront cost barrier by paying a larger percentage of the project cost than the incentive offered in other programs. In addition, the customer is only required to pay its portion of the project costs; the Trust pays the balance to the installing contractor. This arrangement means the customer does not need to "float" the full cost of the project upon completion and then wait for the incentive payment. In some areas, for smaller projects, customers may be able to pay their portion on their electric bill through on-bill financing.

The Small Business Initiative approach to incentives and delivery helps overcome split incentives between the landlord and small business tenant: many landlords and tenants are able to share the customer portion of the project costs. Limiting the program to a given region for a limited time (typically six months) helps spur action for participating businesses, and the limited-time offer may be all the more critical to spur action in situations where the tenant and the landlord are splitting the benefits.

The program addresses a lack of information about efficiency options and a lack of in-house capacity by providing turnkey assessment and installation services. Potential customers receive a free site assessment that details costs and benefits of lighting upgrades; if the customer is interested in upgrading, a qualified Small Business Initiative contractor will complete the installation. Customers are not required to identify opportunities or identify contractors, simplifying the process and allowing customers without in-house project management capacity to participate.

Customers with peak demand of 25kW or less are the focus of this program because these small businesses' efficiency projects may not be large enough to be viewed by a contractor as worth a sales call. This program incentivizes contractors to visit these small commercial customers by bundling a number of small businesses together in one targeted geographic area and negotiating attractive pricing for lighting products. The program will continue to use procurement mechanisms to ensure the lowest costs possible for the direct installation of efficiency measures.

Measures Promoted

Eligible measures will continue to include LED lamps and fixtures and lighting controls for both interior and exterior applications. In addition, the Trust will continue to collect site-specific data regarding refrigeration, compressed air, and HVAC equipment to inform consideration of expanding future eligibility of program measures. The Trust will also explore the possibility of offering retrofit ductless heat pump incentives through the Small Business Initiative using RGGI funds.

Incentives and Financial Considerations

This program model offers the small business owner a free initial, on-site assessment of select efficiency opportunities, a proposal with recommended energy-efficient upgrades, and the installation of chosen measures. This turnkey approach is paired with efficiency incentives that are higher than those offered through the C&I Prescriptive Program. The combination of direct installation and higher incentives helps overcome the greater number of barriers experienced by small businesses upgrading to efficient equipment. In some regions, the program also offers on-bill financing in cooperation with the electric utility.

To support the program, the Trust will choose an equipment distributor through a competitive bid process, and contractors who commit to a timely direct installation of select measures. Equipment distributors will be invited to participate in periodic, competitive bids for equipment; those bids will set the price for a given equipment list, for a specified region, for a limited period of time.

Marketing and Outreach

Geographic targeting is a significant component of the marketing campaign: the Trust attempts to create a local “buzz” in a given region to interest potential customers. In the past, the program has mailed information to eligible customers in a given region, advertised in local papers, and worked with local business leaders to announce the opportunity to the small business community. These strategies will continue to be a focus of the Small Business Initiative’s marketing and outreach. Other marketing tactics have included working with iconic local businesses to participate in the program; these local businesses then host business-to-business events and act as case studies in targeted mailings or advertisements.

Through customer lists provided by the local electric utility, the Trust also conducts direct outreach to eligible customers. This includes phone calls, on-site sales calls, and targeted mailings. Participating contractors and distributors also identify potential customers and conduct outreach and sales calls.

Quality Assurance/Quality Control

Potential participants must present a utility bill to verify load and eligibility for participation in the program. A customized calculator tool is used to evaluate the cost-effectiveness of every measure proposed in each project; measures that are not cost-effective on their own will be screened out of the project. A random number of projects will be inspected on-site to verify the work of each participating contractor. In addition, participants will be asked about their experience through a customer satisfaction survey.

5.4 Distributor Initiatives

5.4.1 Overview

The Distributor Initiatives Program offers incentives for efficient products, including lighting and heating systems, acquired through distributors. Distributors are supply houses where contractors and larger customers go to purchase plumbing, heating, refrigeration and electrical supplies. Distributors stand in contrast to retail stores where homeowners and smaller commercial customers typically shop.

The distributor channel is an important complement to the retail channel as well as planned or customer-driven efficiency projects. In general, the measures discounted at distributors include:

- Products sold at significant volumes (e.g., typical residential boilers);
- Products that are not typically offered for sale at retailers, due to their size or specialized applications, such as a boiler or furnace; and/or
- Products that are not typically chosen or specified by the customer, such as a circulator pump.

Over the Triennial Plan III period, the Trust discounted a number of space heating systems, water heating systems, and LED products at distributors to capture more equipment purchased by contractors on behalf of customers. In the period covered by Triennial Plan IV, all distributor initiatives will be grouped under a single program to consolidate delivery and administration.

Customer Segments

The Distributor Initiatives Program serves all sectors of the Maine economy including residential, low-income, commercial, and industrial customers. This program includes measures that reduce natural gas, unregulated heating fuels, and electricity consumption.

Channels

The Distributor Initiatives Program encompasses a network of suppliers serving contractors purchasing lighting, space heating, water heating, and commercial kitchen equipment. The discounts offered through this program enable the Trust to capture more of the emergency replacement market. In addition, the markdowns offered at the distributor make it easier for contractors to choose the efficient option when working on a project where the product model is not specified. These instant discounts also encourage distributors to stock efficient product models, ensuring availability for interested contractors and customers.

5.4.2 Objectives

- Incentivize measures to reduce electricity, natural gas, and heating fuel consumption;
- Reduce total energy costs;
- Reduce peak load demand for electricity;
- Help contractors and customers overcome barriers to implementing efficiency projects;

- Promote high-efficiency equipment options when customers and contractors are replacing inefficient or burned-out equipment or adding new equipment; and
- Create more favorable market conditions for the increased use of energy-efficient products and services.

5.4.3 Market Barriers

- *Upfront cost*: The increased cost of the energy-efficient option is a barrier for many customers. This program relies on markdowns (also referred to as instant discounts) to overcome the price differential between conventional and high-efficiency options. For many purchases, the price differential is key because the contractor is making the purchasing decision and will likely purchase the lowest-cost option.
- *Short replacement decision cycle/emergency replacement*: Many replace-on-burnout situations have a short decision cycle for replacement. Capturing these emergency replacements is a challenge, especially if it requires the adoption of a new or unfamiliar technology; there may not be time to educate decision makers before the purchase. Upfront cost is the primary driver in these situations.
- *Lack of information*: Many customers are not familiar with high-efficiency choices: markdowns at distributors provide an added incentive for contractors to educate customers about efficient options, or make the education *less* necessary because the contractor has connected the customer with the lowest-cost option. Discounted high-efficiency models can be sold as “free product upgrades.”
- *Paperwork*: Many contractors, even long-time participants in Trust programs, consider the incentive application process burdensome and frustrating for some installations or projects. By discounting equipment at the distributor, the reporting requirement and any liability from rebate errors shift to the distributor. In turn, the Trust can ensure data integrity through participating distributors (a smaller pool than participating contractors) as well as underwrite some of the costs associated with reporting. This program design can remove the paperwork barrier for contractors, as well as invite contractors that are not trade allies to pass along the benefits of the program to their customers.
- *Installation*: Installing high-efficiency equipment may require more time and materials because the new system may, for example, require new piping or site preparation. Equipment markdowns can keep total project costs commensurate with those of a conventional system, allowing a customer to spend more on labor while spending less on equipment.

5.4.4 Opportunity Analysis

The opportunity analysis for Distributor Initiatives set out to assess which measures offered through Trust programs were best suited for instant discounts, if more measures would be purchased through this channel than through another program, and if new technologies or measures should be offered through the program during the Triennial Plan IV period.

Methodology

The opportunity for efficiency savings procured through Distributor Initiatives was determined by a market study that examined the cost-effectiveness of measures typically marketed through distributors, and projected rates of turnover for equipment that could be replaced, cost-effectively, with a more efficient model. The study also reviewed past program performance for some measures currently discounted at distributors. The Trust assumed that most purchases through the program were made because existing systems had reached the end of their useful lives or had otherwise failed. These purchasing decisions are categorized as replace-on-burnout; the baseline for these measures is a less expensive and less efficient system that meets minimum codes and standards.

The opportunity assessment included an in-depth study of HVAC measures, as the Trust anticipated moving more measures into the distributor channel during the Triennial Plan IV period (see Appendix H). The study also reviewed distributor or midstream initiatives administered by other efficiency programs, including in nearby states, and identified additional measures to include. For example, Vermont has had success in capturing energy savings in the circulator pump market through its distributor program. The data from other markets and efficiency programs also demonstrated that the Trust could expect an increase in both the kinds of measures incentivized and the quantity of measures sold, if a measure were shifted from downstream or customer rebates to markdowns.

The study also determined that the cost of delivering instant discounts through the distributor channel could be expected to be lower than the delivery costs for downstream rebate programs.

The Trust complemented this assessment of new HVAC opportunity with a review of the lighting, water heating, and commercial kitchen measures currently discounted at distributors through Trust programs. This assessment projected participation levels based on historic performance. As will be described elsewhere in the Retail Initiatives section, LED sales are highly sensitive to incentive levels. The opportunity for energy savings from lamps marked down through Distributor Initiatives takes into account the general findings from the Trust's 2017 study on LED price sensitivity (see Appendix C) as well as the potential impact of the enforcement of the Energy Independence and Security Act (EISA) standards regulating the energy efficiency of the lighting industry. For more on EISA and its impact on lighting savings opportunity, please see Section 5.5, Retail Initiatives.

The opportunity assessment also found that sales of heat pump water heaters through distributors were highly price sensitive. At smaller instant markdowns, contractors swapped HPWHs for less efficient models at a modest rate. When the instant discount was bigger, resulting in an end price of HPWHs that was the same as, or lower than, the price of inefficient models, many more contractors purchased the efficient model on behalf of their customers. Moreover, distributors and manufacturers responded to higher discount levels by adding promotions or discounts of their own, further incentivizing the purchase of the efficient model.

Findings

The Trust's analysis determined that the program should continue to mark down many of the Triennial Plan III measures for Triennial Plan IV, as they remain cost-effective. These include HPWHs, boilers,

furnaces, commercial kitchen equipment, and screw-in LEDs. The assessment of the savings opportunity afforded through LED instant discounts found that the energy-saving potential for screw-in LEDs is consistent with the energy savings of the last Triennial Plan period. The Trust's market assessment found that the size of the water heating market is projected to grow over that of the Triennial Plan III period with more aggressive incentive levels. The Trust will split this opportunity between Distributor Initiatives and Retail Initiatives based on historical performance. Because the Trust has never experienced high levels of uptake of commercial kitchen equipment, the assessment did not project a significant change to levels of measure adoption. The Trust will closely monitor the adoption rate for commercial kitchen equipment during the Triennial Plan IV period.

In addition, the opportunity analysis determined that the Trust should expect more HVAC measures to be purchased through the distributor channel than through the downstream programs that the Trust offered during the Triennial Plan III period. This projected increase in sales is due to many factors, including a maturing relationship with distributors, contractor familiarity with instant discounts, the movement of many residential HVAC measures to the distributor channel, and an increase in discounted measures offered. For example, the analysis suggests that the Trust could expect to incentivize a greater number of electronically commutated motor (ECM) smart pumps. These pumps have integrated variable frequency drives and software that allows them to ramp up and down based on demand. Pumps fit several of the criteria for what makes for a good measure for midstream discounts: (1) they are rarely specified by the customer, (2) they are chosen by the contractor on the basis of price, (3) they are not typically sold at retail, and (4) they are sold in high volumes.

ECM smart pumps had been incentivized through the C&I Prescriptive Program but not in the residential sector. The study found that these pumps have an extremely low penetration in Maine's residential market, but that other northeastern states have captured half the market with their midstream programs. The study estimates that the Trust could capture approximately three-quarters of replacements in the residential sector through a midstream discount.

For the Distributor Initiatives budget under the Triennial Plan IV, see Appendix B. This includes investment potential for multiple fuels and program funds, including electric procurement, natural gas procurement, and RGGI funds.

5.4.5 Program Design

The program relies on Memoranda of Understanding (MOUs) with distributors to promote and incentivize efficient heating, plumbing, commercial kitchen, and lighting equipment. The MOUs also require participating distributors to report on key data points including measure characteristics, fuel type (for HVAC and plumbing measures), and installation location. The Trust will frequently visit participating distributors to ensure the availability of informational materials, and answer distributor staff questions about data collection, eligible models, and more.

Addressing Market Barriers

The program addresses the upfront-cost market barrier by discounting the cost of the high-efficiency option to make it cost-competitive with the conventional option; this amount is set high enough to

guide contractor or customer choice to the high-efficiency model. The markdowns also address the barrier presented by emergency replacements by having efficient options readily available at a competitive price compared to the conventional replacement model. This helps to overcome barriers presented by lack of information about efficient options or lack of time to research efficient options and available incentives. The reduction in upfront costs also helps mitigate additional installation costs that may be required for the efficient option. Finally, discounts offered at distributors help to overcome any barriers presented by rebate paperwork or processing—installing contractors simply have to present installation information to the distributor. In many cases, the Trust reimburses distributors for some of the costs associated with collecting and reporting this information.

Measures Promoted

Determining if a measure is a good candidate for this program involves consideration of several questions. First, is the equipment traditionally purchased at distributors? Second, is the market for the measure large enough that participating distributors will stock it? Extremely large boilers, for example, are not discounted through the program because they are installed infrequently, and many are purchased directly from product manufacturers. The program instead focuses on the models of space and water heating systems that are commonly installed in Maine buildings.

Third, are the market barriers associated with selecting efficient equipment overcome by the program design? As described above, the program focuses on replace-on-burnout or emergency replacement measures. Trust incentive programs have traditionally captured only a small fraction of the heating and water heating replacement market because the short window for replacement made it difficult for customers to apply for rebates or investigate efficient alternatives. The Distributor Initiatives Program is designed to capture more emergency replacement situations by reducing first costs and making the efficient measure the default replacement model. Providing instant discounts on efficient options assists contractors that may select the measure without customer guidance and therefore default to the least expensive option.

The program design also helps overcome other market barriers. For some measures in this program, there is energy-saving potential that was not being fully captured through other program delivery mechanisms, or potential participating contractors or customers deemed the rebate application process “not worthwhile.” An example of this situation is commercial kitchen equipment. A restaurant would realize significant energy savings by upgrading to high-efficiency equipment, but there has not been a proactive retrofit market in Maine. Very few commercial kitchen measures have been incentivized through Trust programs in the past. By offering incentives for these measures to commercial kitchen equipment distributors rather than directly to contractors or customers, the program will attempt to capture some of the replace-on-burnout market. Market research indicates that most commercial kitchen equipment sold is refurbished, used equipment. In this case, Trust discounts offered on new, efficient models compete not only with standard models, but also with less expensive, used equipment.

Whenever possible, eligible measures will be verified and vetted by a third party. For example, measures incentivized through the program may be listed and verified by the Consortium for Energy Efficiency; Air

Conditioning, Heating, and Refrigeration Institute; and DesignLights Consortium. These organizations also provide technical information on high-efficiency equipment and installation best practices.

Incentives and Financial Considerations

The program will discount efficient heating systems, light bulbs, and other equipment by the percentage of the incremental price difference between conventional and high-efficiency models required to motivate the sale. These incentives will be delivered as a markdown, administered pursuant to individual MOUs between the Trust and participating distributors. In some cases, the Trust may also incentivize distributors to collect and report data as that burden shifts from contractors to distributors in this program model. Furthermore, depending on the measure and level of activity, the Trust will provide distributors per-unit payments to offset administrative and marketing costs and to encourage sales.

To preserve the efficiency and simplicity required to maintain contractor and distributor participation, the Trust offers incentives based on technology and not fuel type. For instance, a condensing gas boiler for small commercial and residential applications may be fueled by either propane or natural gas. To offer an instant discount on this measure, the Trust attempts, to the greatest extent practical, to incentivize the boiler at the same amount, regardless of what fuel type is used, and then account for the incentive from the appropriate funding source. Fuel-specific measures and discounts are projected to significantly impact participation and adoption rates.

Marketing and Outreach

The primary goal of this program is to capture replace-on-burnout or emergency replacement purchases rather than proactive replacements. These transactions are largely between distributor staff and installation contractors. With that in mind, the marketing and outreach for the program focuses primarily on distributors. This includes educating distributor staff, posting signage about instant discounts at the distributor, and making contractor- and customer-facing materials available at the distributor's location. These materials are meant to equip the contractor with everything he or she may need to communicate with customers about efficient options and instant discounts.

In addition, the Trust may market efficient options directly to customers in the hopes that they will ask their contractor about a "discounted equipment upgrade" or instant discounts. For example, the Trust has undertaken digital ad campaigns about emergency replacements. The Trust has also undertaken marketing campaigns about aging heating systems to prompt customers to ask contractors about efficient options.

Quality Assurance/Quality Control

Program field representatives will visit distributors to ensure that data collection processes are in place and that distributor staff is familiar with eligible equipment; in addition, program representatives will verify that informational materials are available for contractors. Program staff will review instant discounts processed by distributors to ensure that the product and participant are eligible. The Trust will carefully monitor product pricing and program participation to assess appropriate discount amounts.

5.5 Retail Initiatives

5.5.1 Overview

This program offers incentives for consumer products through retail channels. These products sell in relatively high volumes and achieve predictable savings when installed. High-efficiency products promoted through the program typically include LEDs, appliances, thermostats, and other consumer goods. The Trust provides incentives through the Retail Initiatives Program in the form of markdowns and mail-in rebates; this program supplements other Trust programs that engage the expertise of trade allies or incentivize products through markdowns at distributors.

Customer Segments

The Trust's Retail Initiatives offer incentives to multiple customer groups including residential, low-income, and commercial customers.⁵²

Channels

This program leverages purchases made through retail and online stores. The rebates and markdowns offered through this channel complement the discounts offered by the Trust through Distributor Initiatives. Some measures, including LED bulbs and HPWHs, have been successful at reaching both homeowners and contractors. For example, a homeowner may purchase an LED bulb at a retail store, and an electrician may purchase LED bulbs at a distributor.

5.5.2 Objectives

- Reduce total energy costs;
- Offer all customers, regardless of geographic location or income level, a reasonable opportunity to participate in a conservation program;
- Increase consumer awareness and use of high-efficiency products;
- Reduce peak load demand for electricity; and
- Create more favorable market conditions for the increased use of energy-efficient products and services.

5.5.3 Market Barriers

- *Upfront cost*: The increased price of the energy-efficient option is a barrier for many customers. This program relies on in-store markdowns or mail-in rebates to overcome the price differential between conventional and high-efficiency options.
- *Short decision cycle or emergency replacement*: Many replace-on-burnout situations have a short decision cycle for replacement. Broken water heaters may be replaced even within one day of their failure. Capturing the opportunity to select an efficient option in these emergency replacements can be a challenge, especially if it requires the adoption of a new

⁵² NMR Group, Inc. and Nexant, Inc. *Efficiency Maine Appliance Rebate Program Evaluation Overall Report*. Augusta, ME: Efficiency Maine Trust, 2014. Accessed June 8, 2018. <https://www.energymaine.com/docs/Efficiency-Maine-Appliance-Rebate-Program-Evaluation-Report-2014.pdf>

technology. Few customers are interested in thinking about their water heating systems until their current system fails. For such emergency situations, as well as for routine bulb purchases, a customer's decision is most often based primarily on price.

- *Lack of information:* Many customers are not familiar with high-efficiency choices: heat pump water heaters, for example, are still an unfamiliar technology for many Maine households and even some plumbers.
- *Diversity of choices:* The number and diversity of consumer products and inefficient product options available on the market can make it difficult for customers to pick out the efficient option. Having so many choices can be overwhelming.

5.5.4 Opportunity Analysis

The opportunity analysis for Retail Initiatives set out to determine if the current measures offered through the program would be cost-effective during the Triennial Plan IV period, if additional measures should be offered through this channel, and how sensitive market adoption of LED bulbs is to bulb price.

Methodology

The opportunity for efficiency savings through Retail Initiatives was determined by assessing the results of multiple studies and past program performance. This assessment assumed that most purchases made through the program occur because existing bulbs and appliances have reached the end of their useful lives or have otherwise failed. Since these purchasing decisions take place due to equipment failure, they are categorized as replace-on-burnout. The baseline for these measures is a less expensive and less efficient bulb or appliance that meets minimum codes and standards. If the standard practice is to purchase a less expensive and less efficient model, then there is an opportunity to incentivize the efficient bulb or appliance.

The opportunity analysis also considered retrofit measures. These measures replace standard equipment that is still operational; customers are motivated by rebates to take early action to upgrade with an efficient alternative. Retrofit measures achieve savings equal to the difference between the energy consumption of the efficient technology and energy consumption of the previously existing product. An example of a retrofit measure captured in the opportunity analysis for this program is smart thermostats.

The Trust assessed historic performance of the program, including the rate of measure adoption. This review also took into account price trends, technology updates, and changes in the market, and the technology adoption curve. For example, in assessing the size of the opportunity for efficient water heaters, the Trust considered the number of water heaters in Maine, the number of water heaters likely to fail in any one year, the number of efficient models incentivized through the program in the past, and projected changes to the water heater market and adoption of efficient measures. Heat pump water heaters are a measure that has shifted along the technology adoption curve since the last Triennial Plan period. While the technology has become somewhat more familiar to plumbers, contractors, and some homeowners since the last Triennial Plan period, it is still unfamiliar to most consumers. The Trust incentivized only 281 heat pump water heaters in FY2013, the first year the measure was offered. The

following year, 2,035 HPWH rebates were issued. In FY2017, more than 4,000 HPWHs were incentivized, and in FY2018 the number will be above 5,000 through retailers and distributors. As a new technology becomes more familiar, end users and plumbers become more receptive to considering it when their existing water heater needs replacement. However, the cost differential between an electric resistance water heater and an HPWH is still a barrier. Program history shows that higher incentive levels lead to higher adoption rates.

The opportunity analysis for this program also considered a 2017 Trust study on LED pricing (see Appendix C). The study evaluated LED sales and customer behavior numbers at different incentive levels and product placement locations to determine free-ridership rates. The study's findings suggest a clear relationship between incentive levels and customer demand for LEDs. Sales volume increased for all products as the incentive level increased and the customer-facing price dropped. The study found that increased incentive levels also led to lower levels of free-ridership. Furthermore, special "off-shelf" product placement further increased sales and reduced free-ridership. The Trust is using these findings to determine free-ridership levels and to inform decisions on preferred product placement and incentives.

The Trust also examined historic program performance data, the number of sockets in Maine homes, and the socket burnout rate to estimate the number of bulbs likely to be purchased through the program during the Triennial Plan period. This examination informed the Trust's assessment of the size of the market, in particular for specialty bulbs. The budget in Appendix B includes incentivizing more specialty LEDs than in years past.

Lighting savings will be impacted by the U.S. Department of Energy's implementation of the EISA standards regulating the energy efficiency of the lighting industry. At the time of writing this plan, there is considerable uncertainty regarding the implementation of EISA. There is not yet enough information to assume that standards targeting luminous efficacy (a measure of efficiency in lumens produced per watt consumed), projected to be in place by 2020, will occur. It is uncertain whether halogen bulbs will meet this standard by 2020, but in either case, incentivizing LEDs will be cost-effective. Another possibility is that the DOE will place a mandatory minimum requirement on all general service (or traditional bulb) lamps of 45 lumens per watt; this standard would effectively ban all existing regulated incandescent and halogen light sources from the market. In this scenario, it would no longer be cost-effective to offer incentives on LED general service lamps. The DOE rulemaking process started in the fall of 2017 to finalize standards on general service lamps and is still underway. This process is expected to be finalized by the first half of 2019; the Trust will update the Triennial Plan when that rulemaking process is complete.

For the purposes of the current plan, the Trust modeled the program opportunity without EISA 2020 enforcement. This assumption of a less efficient baseline is informed by market assessments, a lack of EISA enforcement to date by the federal government, and the current availability of incandescent bulbs in Maine stores despite some earlier EISA milestones that should have eliminated their availability. Please see Appendix I for more information on EISA regulations.

If EISA is enforced, it would reduce but not eliminate the number of cost-effective measures through Retail Initiatives. The Trust will adjust eligible measures and budget accordingly. Enforcement would reduce the energy savings claimed per affected bulb. Cost-effective energy efficiency lighting opportunities would remain depending on the eventual date of implementation and scope of the bulbs affected. The provision does not eliminate savings for general service, or traditional, screw-in bulbs because there will still be higher efficiency options. Even within LEDs, the luminous efficacy can vary from less than 70 lumens per watt to more than 100 lumens per watt. If the 2020 provision takes effect, the incremental savings opportunities will be measured against the revised baseline. The Trust will carefully monitor the lighting market, how the national standards impact local markets over time, and the implications for the cost-effectiveness of lighting investments. Some markets have seen a negative outcome by eliminating LED incentives based on projected standards rather than based on products stocked in stores: inefficient products quickly gained a significant market share in these cases.

Findings

Based on the opportunity analysis, the Trust determined that it should continue to offer many of the same retail consumer products from Triennial Plan III in Triennial Plan IV, as they all remain cost-effective. These include heat pump water heaters, room air purifiers, clothes washers, smart thermostats, and LEDs. The assessment found that with the help of incentives the market for HPWHs will grow compared to the last Triennial Plan period as customers and installers continue to become more familiar with the technology. HPWHs will continue to be offered through Retail Initiatives and Distributor Initiatives to reach all potential participants.

The Trust's analysis of LED instant discounts found that the energy-saving potential is consistent with the energy savings of the last Triennial Plan period. The Trust's analysis did not add any new measures to this delivery channel, but will continue to monitor the market and other efficiency programs for efficient products sold through the retail channel.

For the Retail Initiatives budget under Triennial Plan IV, see Appendix B.

5.5.5 Program Design

This program leverages relationships with retailers of energy-efficient products to discount products on the shelf or distribute rebate information to customers at the point of purchase. The program relies on extensive use of MOUs with the major vendors of energy-efficient products. The Trust uses these MOUs to negotiate discounted prices for Maine customers, product placement, and availability of high-efficiency appliance models and informational materials. The Trust maintains point-of-purchase materials and verifies in-store pricing through frequent visits to all participating retailers.

Addressing Market Barriers

The Retail Initiatives Program addresses the upfront-cost market barrier in several ways. For some items, including LEDs, the program marks down the price of the high-efficiency option to a level that brings it close to the price of the standard option. The program also provides mail-in rebates; these rebate amounts attempt to make energy-efficient products more attractive than inefficient ones.

The program addresses short decision cycles by marketing to customers in replacement situations and, perhaps more importantly, lowering the price of the high-efficiency option to compete with the baseline products. Marketing activities include targeted online digital advertising for emergency replacement search terms, education of installers and retail store personnel about high-efficiency options and rebates, and in-store information and signage. In-store information, signage, and personnel training are also the key strategies for addressing the barriers presented by lack of information and diversity of choices. Because bulb and water heater purchases are typically based on price, the Trust may set incentives to make efficient products the same or lower price than the standard products as well as work with retailers to position discounted units for high visibility.

Measures Promoted

The Trust evaluates products for inclusion in Retail Initiatives based on cost-effectiveness, demand, and availability. The program often relies on third-party standards (e.g., ENERGY STAR-certified HPWHs) to establish which energy-efficient products are eligible for incentives. That said, the appliance market has seen increasing efficiency across many products, meaning that the difference in baseline products versus efficient models can be more modest than in the past; this positive market transformation has resulted in some consumer products being removed or excluded from the program. By way of example, the energy savings between an ENERGY STAR television and the baseline model is now so small that the Trust has found it better to invest in incentives for other high-efficiency products.

Incentives and Financial Considerations

Retail Initiatives incentivize the purchase of energy-efficient lighting by providing the minimum discount necessary to drive consumer action. The Trust bases incentives for appliances and other consumer products on the incremental price difference between conventional and high-efficiency models. Incentives generally are set at a percentage of this incremental difference in order to guide customer choice to the high-efficiency model.

This program delivers financial incentives to participating Maine residents and businesses through two mechanisms:

- *Markdowns:* The Trust will enter into MOUs with retailers and manufacturers; MOUs typically specify that the Trust will reimburse stores if they sell high-efficiency products at agreed, discounted prices according to program guidelines.
- *Mail-in rebates:* For larger items, such as water heaters or appliances, consumers will make the purchase, pay full price, and then submit a rebate claim form to the Trust.

Marketing and Outreach

The purchasing decision for many energy-efficient consumer products is made at the store. In order to influence the customer to make an energy-efficient choice, the Trust focuses marketing efforts for this program on point-of-purchase materials including in-store displays, customer demonstrations, and training for store personnel. This has included working with stores on, and paying marketing fees for, promotional placements including end caps and aisle pallets; sales records demonstrate that these placements significantly impact sales volume, although only in conjunction with incentives. In-store

personnel can also influence the number of energy-efficient models sold. In other cases, customers are motivated to purchase higher efficiency products based on low prices.

For situations where customers conduct research on consumer products prior to purchase, the Trust focuses its efforts on keyword marketing, website information, and education of the installer community. For example, if a Maine customer searches “broken water heater” online, they may see an ad describing water heater rebates and Trust resources. The Trust also works to educate plumbers and other contractors about heat pump water heaters and other technology to help vendors convince customers to purchase energy-efficient water heaters at the time of replacement. Because the replacement window is so short, installer familiarity with efficient options is important; if the efficient option is less expensive than the standard unit, familiarity may be less important.

Quality Assurance/Quality Control

Field representatives will visit stores to ensure that agreed upon markdown prices and discounted products match MOU terms, that point-of-purchase materials are being used properly, and that store employees are aware of the available measures. For example, the Trust will verify payments to participating retailers against MOU agreements to ensure that only program-approved LEDs are being incentivized. Retailers will be required to receive a waiver for any purchases exceeding quantity limits as described in the MOU; a Maine address is required as verification for larger purchases.

The Trust will review all rebate claims to ensure that the product and participant are eligible. In addition, contractors who want to appear on the Efficiency Maine Registered Vendor List as an installer must meet program requirements. For example, plumbers on the list are currently required to demonstrate a State plumbing license and proof of insurance, and sign a code of conduct.

The Trust will carefully monitor product pricing and incentive amounts to motivate customers and installers to purchase high-efficiency models.

5.6 Home Energy Savings Program

5.6.1 Overview

HESP is the program through which the Trust pursues savings from upgrades to a home’s building envelope or certain heating systems. In a departure from prior plans, Triennial Plan IV will promote some home heating measures in other programs. Specifically, most central heating system upgrades (fossil-fired furnaces and boilers) will be handled through the Distributor Initiatives Program (Section 5.4), and wood and pellet stoves will be addressed through the Retail Initiatives (Section 5.5).

Customer Segments

HESP serves residential customers of all income levels who live in 1- to 4-unit residential buildings.

Channel

HESP is a market-based initiative that enlists the help of a network of independent trade allies to drive program participation.

5.6.2 Objectives

- Invest in measures that lower residential heating energy demand and reduce GHG emissions;
- Significantly advance the statutory goal of substantially weatherizing by 2030 all homes whose owners or occupants are willing to participate in and share the costs of cost-effective home weatherization;
- Increase consumer awareness of cost-effective options for conserving heating fuels; and
- Promote sustainable economic development and reduce environmental damage through the more efficient use of all fuel types.

5.6.3 Market Barriers

- *Lack of technical expertise/familiarity with energy efficiency technologies:* Many customers are unfamiliar with energy efficiency options, are not confident in their knowledge of equipment performance, or feel overwhelmed by installation considerations.
- *Lack of upfront capital:* Weatherization and heating system replacements routinely cost several thousand dollars, with comprehensive projects costing more than \$10,000. These high upfront costs can pose a significant impediment to implementing home energy upgrades. Some residents also have difficulty accessing traditional financing.
- *Uncertainty:* Because every home and building is different and because energy prices fluctuate, customers are uncertain about the amount and timing of energy savings from any improvements. Energy efficiency is not a concrete concept for most people; it cannot be seen, it can be difficult to measure, and future energy prices are uncertain.
- *No contractor relationship:* Homeowners tend to find it intimidating to identify, schedule, and work with contractors.
- *Split incentive in rental situations:* In many rental situations where tenants pay for their own utilities, they have an incentive to save energy, but may not be able to invest in efficient equipment or weatherization. Landlords, who are able to invest in energy efficiency, will not directly benefit from energy saved where the tenants pay the heating bill.

5.6.4 Opportunity Analysis

Methodology

Over the course of Triennial Plan III, the Trust found that program participation in HESP relied more on the capacity of the contractor network than on the size of the opportunity for cost-effective conservation measures. Because of this, the Trust's methodology in Triennial Plan IV used a bottom-up approach. This approach looked at contractor capacity and prior program participation rates. It also took into account the different funding sources available to fund measures offered through HESP. Some funding, such as the Electric Efficiency Procurement and the Natural Gas Efficiency Procurement, are modeled and administratively set at a level to capture the MACE energy efficiency. By contrast, revenues from the Regional Greenhouse Gas Initiative fluctuate based on the supply and demand for carbon allowances. Because most of the envelope and biomass measures in HESP are funded through

RGGI revenues, the budget for the opportunity must be adjusted to reflect the available funds forecasted from RGGI. Thus, contractor capacity and past program participation rates are considered in the context of forecasts of RGGI revenues to calculate the size of cost-effective opportunity for HESP in Triennial Plan IV.

The Trust's assessment of the residential opportunity for ductless heat pumps relies on its *Analysis of the Opportunity for High-Efficiency, Cold Climate Ductless Heat Pumps in Maine in Fiscal Years 2020-2022* (Appendix G). This analysis:

- Synthesizes the collective experience of program managers and delivery sub-contractors, recent and ongoing evaluations, and experiences from other program managers around New England;
- Explains the Trust's cost-benefit calculation and how the Trust works to ensure that the most efficient and effective equipment is installed and used to the maximum benefit; and
- Estimates future program activity by analyzing contractor availability, customer interest, payback requirements, and past program activity.

Findings

For building envelope improvements measures, the Trust forecasted program activity based on the size of the contractor network and historical project totals. To develop budgets for weatherization measures, the Trust looked at the fuel mix of past program participants to assign percentages of the opportunity that would be funded with sources for unregulated fuels, natural gas procurement, and electric procurement respectively. In addition, the Trust recognizes that weatherization building envelope improvements measures can save electricity by reducing a building's heating load and the associated operating hours of heating systems and ancillary equipment.

For ductless heat pumps, the opportunity analysis found that the Trust's programs will continue to significantly influence the efficiency level of heat pumps installed in the State.

5.6.5 Program Design

The Trust will continue operating HESP using a market-based approach to promote home energy upgrades. Elements of this approach include rebates, financing, information, and a network of Registered Vendors. A market-based approach, leveraging HESP program incentives to achieve significant private investment in home energy improvements, is essential for advancing participation and savings goals.

Addressing Marketing Barriers

- *Lack of technical expertise/familiarity with energy efficiency technologies:* The program will continue to offer a variety of educational resources through printed materials and online. This information will cover the benefits of, considerations for, and proper use of energy efficiency projects, and will provide tools such as guides and calculators that help customers make informed decisions.

- *Lack of upfront capital:* The program will offer mail-in rebates and loans to overcome the initial cost barrier. In addition, loans will allow customers to spread the cost of energy improvements over time.
- *Uncertainty:* The program will offer a variety of materials and online calculators to help customers estimate the impact of efficiency projects on their homes.
- *No contractor relationship:* To help homeowners identify qualified contractors, the program will continue to offer a network of licensed and insured professional contractors who are qualified to complete projects eligible for Efficiency Maine rebates. To help protect customers, contractors in the network must sign a code of conduct.
- *Split incentive in rental situations:* The program conducts outreach to landlords who have properties eligible for the program (buildings with four or fewer units).

Measures Promoted

The measures promoted through HESP fall into two general categories:

- *Building envelope improvements* refer to the improvement of a home's thermal envelope, which may include activities such as insulating or air sealing, along with energy assessments to verify improvement in the home's thermal envelope. In addition, building envelope improvements may cover the insulation and sealing of a home's heating distribution system (ducts or pipes).
- *Heating systems*, where the customer is the decision maker and works with the contractor to select an appropriate model. These systems include ductless heat pumps, geothermal systems, and biomass boiler and furnaces. In addition, the program will consider controls that balance multiple heating systems to maximize the use of the most efficient units.

Incentives and Financial Considerations

Incentives offered through HESP will include both (1) rebates to entice and lower costs associated with the uptake of envelope upgrades and equipment; and (2) financing options to help homeowners reduce upfront costs and spread out the cost of energy improvements over time.

During Triennial Plans II and III, the program offered incentives for a wide range of heating and envelope measures. The Trust moderated its promotion of the program to maintain contractor activity levels and participation without overextending the budget or experiencing gaps in availability of rebates. The Trust will continue this strategy through the Triennial Plan IV period to support participation while seeking to avoid disruption to the contractor community, which occurs when significant changes are made to measure eligibility or program incentives. In situations where additional funding is made available to HESP, the Trust will make incremental changes to marketing and incentives to advance long-term objectives and energy savings goals.

Marketing and Outreach

To complement marketing performed by the contractor community, HESP will continue to use digital marketing as the primary approach for cost-effective outreach for the program. Digital marketing

typically includes web ads, search engine optimization, video ad spots, and use of social media platforms for high-volume viewing or to engage potential participants directly. Marketing efforts are also likely to include print advertising, presentations at local events, and brochures in property tax bill mailings with participating municipalities. A less frequently used option, due to its cost and less targeted audience, is to pay for conventional radio or television ad campaigns.

The program will supplement its media outreach initiatives by engaging the Trust's network of residential Registered Vendors. This community of trade allies has grown to more than 700 residential contractors, vendors, and energy professionals who provide services to homeowners that qualify for Efficiency Maine rebates. When warranted, the Trust will sometimes offer training opportunities for vendors on topics related to program offerings. For example, the Trust has offered panels and workshops at its Annual Symposium that cover program initiatives, emerging technologies, and best practices for effective installations or sales. The Trust communicates with this network to keep contractors up to date with the latest incentive levels and rebate eligibility criteria. Efficiency Maine has built, has maintained, and will continue to offer an online locator tool to enable homeowners to easily locate energy service professionals.

Finally, the Trust will continue to curate a variety of informational materials on energy efficiency technology, options, and incentives. These will take the form of printed brochures, web pages, videos, and online calculators. These resources will give consumers the information they need to move forward with their energy efficiency projects.

Quality Assurance/Quality Control

The program has an established QA/QC process that includes in-home inspections conducted by highly experienced and certified building analysts. Program staff inspect a percentage off all program participants. Historically, that percentage has been between 10 and 15%. The focus of site inspections is to ensure that projects are completed as reported and to verify compliance with program rules including equipment specifications and configuration, satisfactory workmanship, and customer experience. Any discrepancies are recorded and brought to the attention of the participating contractor to remedy and to improve future work. The Trust will continue to employ the following mechanisms, where appropriate, to help promote and ensure quality work:

- Registered Vendor Code of Conduct;
- Building Performance Institute certification;
- Requirement for proper licensing by the Maine Fuel Board;
- Requirement of comprehensive general liability insurance;
- Completion of forms submitted to the Trust establishing eligibility of the home and the measures;
- Signatures by the customer and the contractor attesting to the information represented in the eligibility forms;
- Reminders in communications with Registered Vendors; and

- Possible removal of vendors from the Registered Vendor list for failure to comply with the Code of Conduct or program guidelines.

5.7 Low-Income Initiatives

5.7.1 Overview

Efficiency Maine Trust delivers energy-saving opportunities to low-income customers through a portfolio of initiatives, including market-based, direct installation, and direct-mail approaches.

Customer Segment

The target market for the Trust's low-income initiatives is all residential dwellings in Maine occupied by low-income households.⁵³

Channels

The Trust's low-income initiatives target energy conservation funding to eligible households through three channels:

- *Market-based initiatives*, where low-income customers participate in the same programs the Trust offers to other residential customers. In some cases, the Trust may offer enhanced incentives to eligible low-income customers;
- *Direct installation* of conservation measures, where the Trust covers up to 100% of the cost of equipment and installation and oversees contractor support; and
- *Direct-mail campaigns*, where customers receive an offer for free, small energy-saving devices, along with a postage-paid order form.

The resulting blend of approaches is designed to overcome obstacles to cost-effective energy conservation for low-income Mainers.

5.7.2 Objectives

- Target at least 10% of the Electric Efficiency Procurement collected under §10110(4-A) or \$2,600,000, whichever is greater, to programs for low-income residential consumers,⁵⁴

⁵³ Under the Trust's rules, eligibility for low-income initiatives funded by the Electric Efficiency and Conservation Fund is limited to a customer of a transmission and distribution utility receiving benefits under the utility's program to assist low-income customers, or a household that has qualified at any time in the prior 12-month period to receive assistance through any state or federal program in which low income and/or limited assets are criteria for eligibility. See 95-648 CMR ch. 3, §2(D). Eligibility for low-income initiatives funded by the Natural Gas Conservation Fund is limited to a customer of gas utility receiving any special utility rates or programs designated for low-income customers, or a household that is heated with natural gas from any utility and has qualified at any time in the prior 12-month period to receive assistance through any state or federal program in which low income and/or limited assets are criteria for eligibility. See 95-648 CMR ch. 4, §2(C). Low-income initiatives funded by RGGI funds expand upon these criteria, extending eligibility to owners of mobile homes and properties having low assessed property values.

⁵⁴ 35-A MRS §10110(2)(B); 95-648 CMR ch. 3, §3(A)(2).

- Direct a reasonable percentage of funds from the Natural Gas Efficiency Procurement to programs for low-income residential consumers, considering these consumers’ share of gas load and cost-effective opportunity available at their homes;⁵⁵
- Direct \$300,000 in Maine Power Reliability Program settlement funds (MPRP funds) to the weatherization of low-income homes each year, through FY2022;
- Weatherize substantially all low-income homes whose owners or occupants are willing to participate in and share the costs of cost-effective home weatherization;⁵⁶
- Increase consumer awareness of cost-effective options;
- Reduce total energy costs; and
- Help reduce arrearages and “bad debt” associated with customers who fail to pay their utility bills.

5.7.3 Market Barriers

- *First cost*: Low-income customers typically have limited access to disposable funds, making it hard to invest in energy improvements that require an incremental, upfront payment.
- *Limited access to capital*: Poor credit or lack of collateral can restrict access to financing options.
- *Split incentives*: Sometimes the entity making decisions on energy efficiency investments does not pay the energy bills, and therefore has little incentive to reduce them. This is typical of rental properties; for example, the tenant may pay the utility bills, but the landlord is in the position to purchase and install equipment or improvements to the building envelope. Similarly, in cases where energy costs are subsidized or included in rent, the end user may not experience the benefit from energy conservation.
- *Lack of information*: Energy conservation is not an intuitive or easily understandable concept for most people; it cannot be seen, it is difficult to measure, and future prices are uncertain. Some customers are also unfamiliar with energy conservation options, are not confident in their knowledge of equipment performance, or feel overwhelmed by installation considerations.

5.7.4 Opportunity Analysis

Methodology

The Trust’s opportunity analysis for low-income initiatives in the Triennial Plan IV period centered around two general questions: (1) to what extent can the Trust continue to offer the same measures as it has in the past, and (2) is there new information about the low-income baseline conditions that might inform a change in measure offerings or delivery approach?

⁵⁵ 95-648 CMR ch. 4, §3(2).

⁵⁶ This is consistent with one of the Trust’s long-term statutory goals (35-A MRS §10104(4)(F).)

The first question is one that the Trust asked of all its programs. If certain program designs and measure offerings currently generate cost-effective energy savings,⁵⁷ the Trust sought to determine whether they would continue to do so into the Triennial Plan IV period. Furthermore, it attempted to quantify the remaining opportunity based on historical activity and experience.

With respect to the second question, the Trust focused on one specific line of inquiry: what portion of the average low-income home's water and space heating load is attributable to electricity usage? This question arose out of the Trust's internal analysis of utility interval data for a small subset of low-income customers⁵⁸ and a series of low-income home site visits. The data, though not statistically significant, suggested that low-income Mainers might rely more heavily on electric resistance water heating and supplemental electric space heating than other residential customers.

The Trust subsequently commissioned a formal, statistically significant analysis to test this theory, hiring Convergence Data Analytics (CDA). The Trust also drew upon the Office of the Public Advocate's (OPA's) 2018 Maine Low-Income Household Energy Efficiency Baseline Study (see Appendix J).

The OPA study performed in-depth surveys of energy end uses for a representative sample of low-income homes. CDA's 2018 Low Income Electric Heating and Cooling Analysis (see Appendix K) analyzed utility interval data and primary heating system information from 775 participants in the utilities' Arrearage Management Program (AMP) and 67 homes sampled in the OPA study. CDA examined the correlation between outside temperature and electrical usage. CDA used the results of this analysis to make estimates about the percentage of an average low-income home's heating and cooling load that is attributable to electricity.

Findings

The Trust's analysis determined that several measures offered during FY2018 continue to be cost-effective (see the measure list in Appendix L). These include both lost opportunity and retrofit HPWHs, air-sealing and insulation measures, certain heating systems, and the suite of small energy-saving measures relying on do-it-yourself or volunteer installation (such as LEDs, low-flow showerheads, and low-flow aerators). The Trust will continue to offer these measures through the market-based, direct-install, or direct-mail channels, as it did in FY2018. It will reassess the cost-effectiveness of measures as new information becomes available over the course of Triennial Plan IV, and will add or remove measures as appropriate.

The OPA study indicated that the State's low-income households rely more heavily on electric water heating than the average residential customer; 48% of low-income households use electric resistance water heaters, compared to 14% of non-low-income households. The study suggests that the majority of the approximately 137,700⁵⁹ electric resistance water heaters in the state exist in low-income homes.

⁵⁷ This assessment was made as of the writing of Triennial Plan IV (Summer 2018).

⁵⁸ The Trust performed a basic analysis of interval data for a subset of AMP participants. For more detail on this program, refer to Section 5.7.5 – Marketing and Outreach.

⁵⁹ NMR's 2015 Residential Baseline Study noted that 25% of the State's 551,109 homes have electric resistance tank water heaters.

With approximately 175,000⁶⁰ eligible low-income households, the Trust calculates that 84,000 inefficient electric resistance water heaters exist within this customer sector alone. Given a measure life of 10 years, the Trust assumes that 8,400 of these inefficient water heaters burn out every year and need to be replaced. Like all residential customers, low-income customers are highly likely to make their emergency replacement purchasing decisions at a retailer or distributor. The Trust will therefore allocate an appropriate portion of low-income funding to account for this customer sector's share of program participation in Retail Initiatives and Distributor Initiatives.

CDA's analysis found that 3,527 kWh annually can be attributed to heating across the sample of low-income customers in its study. For low-income homes that specifically indicated that they use electric heat, the analysis found that 7,609 kWh per year can be attributed to heating. These findings suggest that there could be cost-effective conservation project opportunities at low-income homes having high electrical heating demand.

As in the Triennial Plan III period, natural gas measures are opportunity-constrained. In typical single-family homes heated with natural gas, certain building envelope measures and heating system measures have the potential to be cost-effective. However, the universe of single-family homes heated by natural gas, inhabited by eligible low-income households that have authority to make decisions about building insulation or heating system upgrades, remains extremely small. The universe of low-income apartments heated by natural gas is considerably larger, but the opportunities for cost-effective building envelope measures and heating system measures in those buildings are very limited.

Unregulated-fuel measures, on the other hand, are funding-constrained, as they were during the Triennial Plan III period. The Trust's RGGI budget dedicated to low-income initiatives remains small relative to the unregulated-fuel measure opportunity in this sector.

For the low-income initiatives budget under Triennial Plan IV, see Appendix B.

5.7.5 Program Design

Addressing Market Barriers

In the Trust's experience, employing a variety of channels helps overcome obstacles to low-income program participation and implementation.

Market-based initiatives help ensure competitive project costs and broad accessibility. The Trust's HPWH incentives through the retail and distributor channels are set at or near 100% of the incremental measure cost. In addition to minimizing free-ridership and maximizing cost-effective savings, this program design approach makes upgrading to the efficient alternative an affordable option for all customers. It overcomes upfront-cost barriers, putting the inefficient replacement model and the efficient alternative on equal footing. By targeting emergency replacements where a low-income

⁶⁰ This is the number of low-income households that have qualified at any time in the prior 12-month period to receive assistance through any State or federal program in which low income and/or limited assets are criteria for eligibility. Figure from the Maine Department of Health and Human Services.

customer is required to make a purchasing decision, the Trust minimizes costs and administrative burdens associated with customer acquisition.

In some cases, market-based initiatives also leverage a customer co-pay, motivating customers to take an interest in quality work and pay ongoing attention to proper maintenance and operation. Nevertheless, not all customers are able to overcome upfront-cost barriers, even with enhanced incentives and attractive financing opportunities. Accordingly, in cases where the Trust seeks a cost-share for eligible low-income customers, it will, where practical, keep the co-pay levels low to promote access to the programs. The Trust also plans to continue offering small, unsecured loans through this channel to overcome barriers associated with lack of access to capital. In light of the characteristics of the market-based approach, it is best suited to homes that are owner-occupied.

Direct-install initiatives, which fund up to 100% of the equipment and installation cost, overcome the customer's upfront-cost and financing barriers. Additionally, the turnkey direct-install approach, in which the Trust initiates contact with eligible households, selects product models, and coordinates qualified vendors, removes barriers associated with lack of information and subject-matter expertise. At the same time, however, the direct-install approach incurs higher costs per project than other channels and is thus budget intensive. Another consideration is that the higher costs of a direct-install approach sometimes face a greater challenge in meeting cost-effectiveness requirements. Therefore, direct-install projects must yield significant energy savings in order to be cost-effective. The Trust will continue to provide direct-install offerings through the AMP initiative and to reach eligible households heated with natural gas.

As with direct-install initiatives, direct-mail initiatives target eligible customers and rely on Efficiency Maine or a third party (someone other than the customer) to initiate contact. Delivery costs for direct-mail initiatives, unlike those for direct-install initiatives, are extremely low. In relying on the end user to perform the installation, many of the applicable measures easily surpass the cost-effectiveness requirement.

Measures Promoted

As with all of the Trust's programs, the measure offerings through the low-income initiatives may be subject to different limitations based on the funding sources. As evidenced by the HPWH example, measures incentivized for residential customers through market-based programs are generally good candidates for inclusion in low-income initiatives. (An exception to this general rule sometimes applies when the low-income dwelling is in an apartment building, where the characteristics of the building and heating system may differ significantly from those of a single-family home). Across the various low-income initiatives, the Trust's budget assumes promotion of the following measures during the Triennial Plan IV period: HPWHs, ductless heat pumps, air-sealing and insulation measures, some heating systems, and the suite of small, do-it-yourself energy-saving measures. As discussed, the Trust will continue to reassess measures' cost-effectiveness as new information becomes available over the course of Triennial Plan IV, and will add or remove measures as appropriate.

Incentives and Financial Considerations

Low-income initiatives may offer different financial incentive types and sizes depending on the delivery channel. Market-based initiatives may pay close to 100% of the incremental cost of a measure or require a co-pay from participating households. Where a co-pay is required, it will be lower than the cost-share requirements for non-low-income residential customers. Additionally, the Trust will couple its incentives with access to financing in the form of small, unsecured loans for qualifying customers. Through the turnkey direct-install approach, the Trust covers up to 100% of all costs of the upgrade, including opportunity assessment, project management, project materials, and installation costs. Direct-mail initiatives involve no financial contribution from the participant.

Marketing and Outreach

Driving demand for energy conservation services and participation in the Trust's low-income initiatives generally requires targeted messaging to eligible homeowners. Because of the sensitive nature of personal income information, identifying potential participants remains challenging for the Trust. Direct mailing and outreach through traditional low-income program delivery agencies remain the most affordable and targeted strategies. The Trust will continue to market low-income initiatives to eligible households through partner organizations including the Maine Department of Health and Human Services, the Maine State Housing Authority, Community Action Agencies, General Assistance Program Officers, non-profit organizations, and the utilities.

The Trust's licensed contractor network will also continue to serve as an active sales force for this sector. In addition to providing continued technical information and program guidance to the vendor community to support this effort, program staff will explore opportunities to enhance contractor interest in, and commitment to, project opportunities through this channel.

The Trust will also drive participation in low-income initiatives through the statewide marketing of other Trust programs. This is particularly relevant to HPWH incentive offerings through Retail Initiatives and Distributor Initiatives, where marketing and outreach materials in stores will effectively target all customer sectors. Furthermore, the Trust will leverage the various educational resources on its website to help low-income Mainers reduce their energy costs, including no- and low-cost energy tips, home energy calculators, case studies, and vendor locators. In addition, the Trust will continue to make Kill-a-Watt meters available at most public libraries in Maine.

The Trust will increase its efforts to market directly to customers enrolled in AMP. The Maine Public Utilities Commission Rule Chapter 317, Statewide Arrearage Management Program, describes generally the objective of AMP:

This Chapter establishes a process and regulations by which each electric transmission and distribution utility shall implement an Arrearage Management Program (AMP) to assist eligible low-income residential customers who are in arrears with their electricity bills. An AMP implemented pursuant to this section is a plan under which a transmission and distribution utility works with eligible low-income residential

customers to establish an affordable payment plan and provide credit towards a customer's accumulated arrears as long as that customer remains in compliance with the terms of the program.⁶¹

AMP is intended in part to help reduce the number of low-income customers in arrears on their electric bills or, alternatively, to reduce the amount of these customers' arrearage, and, therefore, lower the "bad debt" burden to ratepayers that is associated with customers who fail to pay their utility bills. In the spring of 2018, the 128th Maine Legislature voted to extend AMP through 2021; the Trust will therefore continue to leverage this program channel through at least the second year of Triennial Plan IV, or until such time as AMP is discontinued.

Moving forward, the Trust will work with AMP stakeholders and the Low Income Advisory Group to consider ways to expand offerings for AMP participants. An initial focus will be placed on the new information emerging from the baseline study by the OPA and the CDA analysis of utility interval data showing high-levels of electric heating (see Appendix J and Appendix K). Given the uncertainty surrounding realization rates for these types of measure offerings, the Trust will work directly with AMP customers in good standing to pilot the applicability and effectiveness of high-efficiency heating systems and building envelope measures. If the pilot project reveals that these measures demonstrate predictable and persistent cost-effective savings, the Trust will scale up the initiative to reach out to more low-income homes outside of AMP.

Quality Assurance/Quality Control

The Trust will conduct QA inspections of approximately 15% of all direct-install projects and market-based projects. The Trust requires that all installations be completed by contractors on the Trust's Residential Registered Vendor list, ensuring that all participating installers abide by a specific code of conduct and adhere to certain licensing requirements. The Trust also provides installers with material and installation specifications for energy-efficient technologies installed through its direct-install initiatives.

5.8 Renewables

5.8.1 Overview

Maine statute establishes that the Trust shall administer the Energy Efficiency and Renewable Resource Fund.⁶² The statute authorizes the Trust to use this fund for the purpose of funding renewable resource R&D, community demonstration projects of renewable energy technologies, and rebates for cost-effective renewable energy technologies.⁶³ This fund receives annual revenues from voluntary ratepayer

⁶¹ 65-407 Maine Public Utilities Commission Rule Chapter 317.

⁶² 35-A MRS §10121(1).

⁶³ Section 10121(1) of the statute authorizes the Trust to use these voluntary contributions to promote R&D, demonstration projects, and rebates for "energy efficiency" measures. The Trust finds that funding from other sources that is used for promotion of energy efficiency is reasonably likely to be adequate for the duration of this Triennial Plan. By contrast, initiatives to help increase the market penetration and use of renewable energy lack significant funding in Maine. For this reason, the Trust intends to reserve funds received by the Energy Efficiency and Renewable Resource Fund for use in researching, demonstrating, and deploying renewable energy technologies.

contributions and alternative compliance payments made through the Renewable Portfolio System. The Trust is also authorized to “seek and accept funding for the [Renewables] program ... from other sources, public or private.”⁶⁴ This section of the Triennial Plan describes how the Trust will deploy funds that are received by the Energy Efficiency and Renewable Resource Fund.⁶⁵

Customer Segments

Following are the eligible customer segments by potential project type for this fund:⁶⁶

- *R&D Projects*: Customers in the University of Maine System, the Maine Maritime Academy, or the Maine Community College System.
- *Community Demonstration Projects*: Maine-based non-profit organizations, consumer-owned transmission and distribution utilities, community-based non-profit organizations, community action programs, municipalities, quasi-municipal corporations or districts, community-based renewable energy projects, and school administrative units.
- *Rebates*: There is no statutory limitation or prescription as to what customer segments are eligible for rebates through the Renewable Fund.

Channel

When available funds in the Energy Efficiency and Renewable Resource Fund are too low to support a broadly available, prescriptive rebate initiative, the Trust focuses on supporting a smaller number of custom projects to advance the R&D or demonstration goals of the fund. The R&D and demonstration initiatives, when offered, are delivered primarily through competitive procurements. When applicable, rebates are delivered through the Trust’s contractor-based programs for residential and commercial customers.

5.8.2 Objectives

- Simplify and enhance consumer access to technical assistance and financial incentives relating to the use of alternative energy resources;
- Promote community demonstration projects and support the development and commercialization of renewable energy technologies; and
- Increase public information and awareness of alternative energy technologies and their benefits.

5.8.3 Market Barriers

Market barriers for renewable energy technologies include the upfront cost of the improvement, access to financing, lack of information, and lack of technical expertise in broader trades.

⁶⁴ 35-A MRS §10121(2).

⁶⁵ This section of the Triennial Plan does not address ways that the Trust might help promote customer-sited renewables using other funding streams or in conjunction with other programs. For example, the Trust supports installation of certain renewable energy resources with its suite of home energy loans and HESP. Details of how that program supports renewable energy resources are addressed in those sections.

⁶⁶ 95-648 CMR ch. 103, §3, 4.

5.8.4 Opportunity Analysis

Funding constraints represent the primary factor shaping opportunity for the Renewable Resource Program. Absent new legislation or bonding to generate a new revenue stream, the Trust forecasts that the revenues in the Energy Efficiency and Renewable Resource Fund will be approximately \$50,000 annually. This level of funding is consistent with revenues received during each year of Triennial Plan III. Thirty-five percent of the revenues are directed by statute to the Maine Technology Institute to help promote R&D of renewables.⁶⁷ The forecasted level of funding that will remain for the Trust after remitting the R&D funds to the Maine Technology Institute is insufficient to support a rebate program. With the limited revenue, the Trust will target projects that have the greatest impact on demonstrating low-cost renewable energy options with the greatest end-user payback in community facilities.

The market for demonstration grants consists of Maine-based projects submitted by eligible applicants. The projects must produce energy or heat from renewable sources, including solar photovoltaic (PV), solar thermal, biomass, landfill gas-to-energy, geothermal, wind, and wood pellet systems. Homes and businesses with rooflines or other areas that have an unobstructed orientation to the sun and the opportunity to displace expensive heating fuels for water or space heating are good candidates for PV systems, and also solar hot water or hot air. Per the Trust's rules, these projects must also be cost-effective, provide value to a community, and demonstrate broad community support.⁶⁸ Additionally, the Trust will focus on distributed resources on the customer side of the meter, as it does with its other programs. The Trust has not modeled this market potential for Triennial Plan IV, as opportunity will depend entirely on funding availability.

If a utility or the Commission determines that a specific area of the electricity grid is facing a potential reliability issue, and further that the high cost of solving that reliability issue through upgrades to the transmission or distribution system is more costly than "non-wires alternatives," there may be an initiative to procure alternatives such as distributed generation, demand response, energy storage, and incremental energy efficiency. In this situation, the value of new renewables could grow to be among the most cost-effective resources to serve the reliability needs of the targeted area. Should this occur, the Trust would be able to use its authority in the Energy Efficiency and Renewable Resource Fund to rapidly and efficiently acquire suitable renewable non-wires alternatives through a targeted rebate initiative.

5.8.5 Program Design

Given forecasted funding levels, the program will focus on community demonstration grants during the Triennial Plan IV period. As discussed above, these grants are most likely to have the strongest demonstration impact and greatest direct end-user payback for public facilities.

Addressing Market Barriers

The primary purpose of the demonstration grant initiative is to illustrate the potential value of a renewable energy technology or application. The grants help offset the large upfront cost often

⁶⁷ 35-A MRS §10121

⁶⁸ 95-648 CMR ch. 103, §3(2).

associated with renewable energy projects. By focusing on community demonstration projects, the program also works to increase public awareness and overcome barriers associated with lack of information. Additionally, by spurring additional activity in the renewable energy marketplace, the grants help build technical experience among Maine's local contractors and installers.

Measures Promoted

Eligible projects will include installations of renewable energy equipment where the project demonstrates a simple payback determined by comparing the net installation costs with the value of energy generated over the life of the equipment. This program area focuses on customer-sited, renewable energy measures. Recipients of past grants have proposed projects involving solar electric PV, solar hot water, solar hot air panels, and biomass resources.

Incentives and Financial Considerations

Contingent upon available funding, the Trust will continue to offer grants to stimulate best practices and projects that demonstrate novel or niche applications. As it did during the Triennial Plan III period, the Trust may defer grant offerings in a given fiscal year to allow revenues in the fund to accumulate. Once the pool of available funds reaches a sufficient level, the Trust will issue a request for proposals.

An increase in revenues to this fund would allow the Trust to offer more frequent rounds of competitive solicitations and to include demonstration of a broader array of technologies or applications. If the increase were significant, it could also enable the Trust to promote R&D of technologies or processes shown to fill a particular need or opportunity in the Maine economy and having good potential to be incorporated into the Trust's regular incentive programs.

Marketing and Outreach

The Trust notifies those on its interested parties list by email when there are new RFPs for demonstration projects, and circulates information to relevant trade associations, community groups, and media outlets. These opportunities are also posted on the Trust's website.

Efficiency Maine's Renewable Energy Solutions webpage also provides relevant information and links pertaining to renewable energy technology. Program information may also be distributed through the HESP marketing initiatives (see Section 5.6), which may include television and radio campaigns, print advertising, local informational forums, and brochure insertion into property tax bill mailings in participating municipalities.

Finally, statute requires that, to the extent that resources allow, the Trust establish training programs for solar equipment installers.⁶⁹ Absent a significant change in the funding constraints of the Energy Efficiency and Renewable Resource Fund, the Trust currently does not expect to offer such training during the Triennial Plan IV period. There are several reasons. First, there is no clear need for subsidized training for solar installers in Maine. Second, providing training would not be cost-effective on its own.

⁶⁹ 35-A MRS §10113.

Third, since the Trust's prior funding stream for solar rebates expired and was not reauthorized by the Legislature, it would not serve any program offered by the Trust to train solar installers.

Quality Assurance/Quality Control

The program will continue to apply its established QA/QC process. As part of the bid selection process, the RFP Review Team will evaluate all project documentation prior to accepting an application. Trust staff will monitor progress during the construction phase by reviewing invoices and conducting site visits to ensure that each project is completed according to initial design specifications. Upon project completion, staff will conduct an inspection to verify project installation details.

The Trust will continue to analyze situations in which renewable energy technology is able to meet the same cost-benefit screening test that the Trust uses to gauge cost-effectiveness for traditional energy efficiency measures. In cases where renewables can meet that test, they can be eligible for promotion through the Trust's other programs. This has been the case with biomass boilers and stoves, as well as geothermal heat pumps in HESP (see Section 5.6). In particular, as the price of PV technology continues to drop, the Trust will closely track the potential cost-effectiveness of PV and other solar energy resources to determine if they can be promoted through more traditional resource acquisition programs.

6. Strategic Initiatives

6.1 Evaluation, Measurement, and Verification

6.1.1 Overview

EM&V activities encompass systematic data collection and analysis related to the Trust's programs. Trust staff and by independent third-party contractors conduct EM&V activities using industry-standard practices and the Trust's EM&V systems and protocols. Specifically, the Trust relies on program data that it maintains in the Efficiency Maine Reporting and Tracking (effRT) 2.0 database, the Technical Reference Manuals that document energy-saving assumptions and methodologies, and primary and secondary data collected through research efforts.

EM&V activities produce key data to inform the Trust's short- and long-term program planning and delivery decisions, and to meet reporting requirements. Key EM&V activities include reviews of Technical Reference Manuals; effRT database maintenance; independent third-party evaluations; commissioned research and analysis; general research; Forward Capacity Market analysis; data reporting; and QA, QC, and process improvement.

6.1.2 Objectives

- To provide data-driven research, analysis, and reports to inform program design and delivery strategies, verify program results, and ensure ongoing program and organizational improvement;
- To meet statutory requirements for independent evaluations;
- To satisfy the ISO-NE market rules for the sale of capacity resources; and
- To continuously improve the Trust's capacity to accurately track the status of efficiency projects, measure energy savings, generate reports, and maintain confidential treatment of customer information in a timely manner.

6.1.3 Technical Reference Manuals

TRMs document the methods and assumptions used to calculate energy and demand savings. The Retail/Residential TRM contains all the relevant references for savings measures promoted through the Home Energy Savings Program, Retail Initiatives, and Low-Income Initiatives; the Commercial/Industrial and Multifamily TRM does the same for measures promoted through programs serving non-residential customers and multifamily buildings with five or more units. Each TRM serves as a central repository and a common point of reference for the methods, formulas, assumptions, and sources that are used to estimate savings from energy efficiency measures. The TRMs provide a common platform for analyzing energy savings across measures and programs. For each measure, the TRM provides the following:

- An overview description of the measure and documentation of algorithms used to calculate gross energy savings and demand savings;
- Efficiency assumptions for the baseline and the efficient measure;
- Deemed parameter values or instructions for inputs to savings algorithms;

- Measure life and cost;
- Impact factors for calculating adjusted gross savings and net savings; and
- Notes and citations on the sources of information used to develop the TRM.

The Trust plans to continue issuing updated versions of its TRMs at least once a year. These updates will incorporate new measures as well as new results from program evaluations and other relevant research. For measures that experience more dynamic changes (such as the cost of LED bulbs), the Trust will typically reassess the TRM entries quarterly.

6.1.4 effRT Database

Historically, the Trust maintained separate databases to track progress for each of its programs. In large part, these databases evolved independently and varied in format and sophistication. During the first Triennial Plan period, the Trust initiated a significant effort to upgrade and transform its databases into a unified system supporting multiple programs with standardized internal processes, features, and quality. This initiative built on the foundation of the successful effRT database system that historically supported Commercial and Industrial programs to create a new, multi-program database referred to as effRT 2.0. During the second Triennial Plan period, the Trust integrated all active programs into effRT 2.0.

The effRT 2.0 platform supports the Trust's reporting and project activity tracking. The Trust will continue to build upon effRT 2.0 to take advantages of cost savings from streamlining administrative functions and automating processes. The platform will continue to support the Trust's reporting and project activity tracking. In addition, it will continue to support the Trust's participation in the FCM by accurately reporting incremental capacity savings monthly and forecasting FCM bids.

6.1.5 Independent Third-Party Evaluations

Chapter 35-A, Section 10104, of the Maine Revised Statutes describes that the Trust shall arrange for an independent evaluation of each major program at least once every five years. The law directs that the evaluation must analyze a program's effectiveness in meeting goals and be conducted by a competent professional with expertise in energy efficiency matters. In fulfillment of statutory requirements, at least once every five years, the Trust commissions an evaluation of any program having an annual budget greater than \$500,000. The analysis is conducted by independent third parties who specialize in the evaluation of energy efficiency programs. Program evaluations conducted by these third parties are designed to:

- Document and verify the program impacts on energy and demand savings;
- Assess program cost-effectiveness;
- Provide recommendations for improving the accuracy of claimed savings; and
- Inform adjustments in program strategies and allocation of resources.

Each program evaluation typically includes collection and analysis of both qualitative and quantitative data and methods, through steps such as:

- TRM review;
- Program staff interviews;
- Customer telephone surveys;
- Interviews with trade allies (participating installers, distributors, retailers, and manufacturers);
- On-site data logging and equipment verification;
- Billing analysis;
- Assessments of impact factors (in-service rate, realization rates);
- Net impact assessment;
- Cost-effectiveness assessment;
- Findings review and presentation to the Executive Director and the Board;
- Reassessment of TRM measures based on evaluation results for:
 - Savings algorithms,
 - Deemed parameters,
 - Realization rates, and
 - Free-ridership and spillover rates; and
- Prioritization of future evaluation topics and studies.

During FY2020-2022, the Trust will conduct independent evaluations of its major programs. The Trust expects to begin issuing RFPs in FY2020 to select evaluators for independent third-party program evaluations.

6.1.6 Commissioned Research and Analysis

During Triennial Plan III, the Trust established a group of pre-qualified research and evaluation contractors to perform targeted research and analysis of discrete issues and questions on an as-needed and ongoing basis. This research and analysis capacity complements formal program evaluations and informs the Trust's real-time program planning.

Baseline Studies

The Trust periodically conducts studies on the current age and efficiency of equipment installed in Maine homes and businesses. These studies help quantify savings opportunities and "ground-truth" deemed values in the TRM. Baseline studies typically involve the end users of equipment.

Market Research

Market research allows the Trust to better understand current market conditions and trends. This research can involve interviewing distributors and installers on stocking practices, the types of equipment being offered and the reasons why, and supply chain considerations. Market research can

also involve gaining access to external datasets that look at equipment sales and efficiencies at statewide, regional, and national levels.

Modeling and Analysis

The Trust engages consultants and contractors to perform various modeling and analysis activities that address specific topics. For example, the Trust has worked with contractors to better understand how incentive levels affect the cost-effectiveness of measures using price elasticity analysis. These studies compare the customer-facing price of equipment with levels of program uptake to determine free-ridership at different incentive levels, and help the Trust maximize the cost-effectiveness of its programs. The Trust also participates in forecasting studies such as the Avoided Energy Supply Component studies that help determine the avoided costs used in screening for cost-effectiveness. Finally, the Trust also engages contractors to perform metering and analysis on installed measures to gain insights into their usage and achieved savings in real-world applications.

Measure Development

The Trust occasionally engages consultants and contractors to help with the definition of new measures. These efforts can include characterization of the market and opportunity for efficient measure adoption (through primary market research or secondary research), surveys of existing programs in other jurisdictions, establishment of existing and future baselines (through primary baseline studies or secondary research), modeling and estimation of energy and demand savings and measure costs, definition of measure eligibility criteria, and development of TRM entries.

Customer Surveys

The Trust will also continue to implement near real-time surveys of customers in order to reduce the length of time between purchase and program feedback. These surveys allow the Trust to act on results more quickly and pursue more focused analysis of customer decision making.

6.1.7 General Research

Research Forums

The Trust participates in selected regional and national forums by contributing to data collection, participating in joint research studies, and attending informational webinars. The Trust plans to continue its participation in the Evaluation Committee of the Consortium for Energy Efficiency and will review other opportunities on a case-by-case basis.

Standards and Codes

Standards and codes at the federal, state, and local levels can have a large impact on energy efficiency programs by shifting the baseline. Examples include changes to ENERGY STAR® eligibility criteria, EISA lighting standards, and local building codes. Trust staff keep up to date with these developments to ensure that the EM&V systems and the program designs accurately reflect applicable regulations and standards.

Literature Review

The Trust stays abreast of the energy efficiency market by reviewing research, evaluations, and TRMs from other energy efficiency program administrators and stakeholders.

6.1.8 Forward Capacity Market Analysis

ISO-NE's FCM is a market into which electricity generators, efficiency program administrators, and others may bid to supply qualifying "capacity" to serve the New England grid. The Trust is a participant in this market, aggregating the summer-peak electricity savings from the many conservation measures supported through its programs and bidding those savings resources into the FCM auction. In order to do so, the Trust must comply with the ISO-NE Manual for Measurement and Verification of Demand Resources. To comply, the Trust completes specific analyses and reports, including demand resource qualification packages, measurement and verification plans, monthly performance reports, and annual certifications of compliance with measurement and verification plans. Throughout the Triennial Plan IV period, the Trust will continue to complete the various analyses, documentation, and reports required for its demand resources in the FCM. The Trust will enter into a contract with an independent third party to complete the required annual verification of compliance with the measurement and verification plan.

6.1.9 Data Reporting

The Trust reports on a variety of program and portfolio metrics through an annual report and through information submitted to the Legislature as part of work sessions and hearings. In addition, the Trust responds to external data requests from organizations such as the Consortium for Energy Efficiency, the DOE, the Energy Information Administration, RGGI, and the American Council for an Energy Efficient Economy (ACEEE).

6.1.10 Quality Assurance, Quality Control, and Process Improvement

The Trust's EM&V staff will oversee QA/QC standards across all programs. QA/QC activities will focus on verification of methodology and savings estimates consistent with the TRMs, and verification that eligibility criteria are applied according to program manuals and consistent with statute and Trust rules. Trust staff implement continuous process improvement in the establishment of tools, processes, and procedures designed to improve accuracy, timeliness, and efficiency of data gathering and reporting.

6.2 Innovation

6.2.1 Overview

The Trust's Innovation Program provides funding to conduct pilot projects that demonstrate new types of energy efficiency, conservation, or alternative energy measures, or new strategies for promoting such measures. The program focuses on measures that show significant potential to be cost-effective and to provide energy savings or GHG savings but are not yet well understood or established in the marketplace. The measures piloted may or may not prove to be cost-effective or popular in the Maine marketplace. The Innovation Program thus uses smaller pilot projects to generate findings about cost-effectiveness and market demand before making larger investments in incentives and program delivery.

The Innovation Program facilitates the early stages of market transformation. It is not intended to target a specific segment of the market. By its nature, this program is a tool or an avenue for testing new technologies and strategies' potential for advancing the Trust's purpose and goals, regardless of which customer sector is served. In doing so, the Innovation Program attempts to advance unfamiliar, untested products and strategies to the point that they can be incorporated into the Trust's resource acquisition, market transformation, or carbon reduction initiatives.

The Trust will allocate approximately 0.5% of its total program budgets to the Innovation Program. It will issue one or more competitive solicitations annually to target the specific opportunities and needs for demonstrating new program measures or designs. The Trust may, at its discretion, complement this approach by self-administering certain discrete initiatives to advance the Innovation Program objectives where to do so would be more cost-effective than outsourcing the activity.

6.2.2 Objectives

- Conduct pilot projects testing new technologies or strategies to determine their potential for advancing the Trust's purpose and goals;
- Increase consumer awareness of cost-effective options for conserving energy or reducing GHG emissions; and
- Create more favorable market conditions for the increased use of energy-efficient products and services.

6.2.3 Market Barriers

The Innovation Program is targeted at the barriers facing newly commercialized efficiency products and conservation applications or operations that are not widely understood or employed in the Maine marketplace. First costs tend to be even higher for newcomers that have not generated any economies of scale. Familiarity and acceptance among vendors and their customers are lower for new technologies. In many cases, a technology or process that is new to a marketplace has difficulty demonstrating that its participation in an energy conservation program will meet the cost-effectiveness test.

6.2.4 Program Design

Addressing Market Barriers

In providing financial support during the early stages of commercialization, the Innovation Program provides new market participants and Maine contractors with an opportunity to test performance, raise product or process awareness, and build experience, thereby advancing the development of the product or process.

Measures Promoted

Eligible measures include any commercially available energy efficiency, conservation, or alternative energy measure that meets the targeted criteria specified in the Trust's request for proposals and is consistent with any limitations or requirements of the revenue source that funds this program. Eligible measures must typically show that they have the potential to meet the Trust's cost-effectiveness test and that if the pilot project is successful, the measure has a reasonable likelihood of graduating to the

Trust's regular program offerings. In the case of pilot projects that are awarded funding through the RGGI Fund, it may alternatively be necessary to demonstrate that the measure can, in theory, quantifiably and cost-effectively achieve GHG reductions.

The program may, on occasion, promote limited demonstration projects for near-commercial technologies that show substantial energy-saving opportunities for the State. The program may also promote demonstration and analysis of varying program designs to help shape the ultimate design of a full-fledged program in the Trust's portfolio.

Incentives and Financial Considerations

The Innovation Program will use competitive solicitations to screen and select pilot programs for commercialized products or new ways of delivering cost-effective measures. The proposals will dictate the level of financial assistance for a given pilot project. Certain projects may offer financial incentives to customers to promote uptake of a product or process, while other projects may simply seek the Trust's investment of a portion of the costs to install the product or implement the process and then measure and report on the results.

Marketing and Outreach

The Trust notifies those on its interested parties list by email when there are new RFPs, and circulates information to relevant trade associations, community groups, and media outlets. These opportunities are also posted on the Trust's website.

Throughout the Triennial Plan IV period, the Trust will conduct outreach and networking efforts with existing public and private organizations. The Innovation Program will seek to leverage the efforts of other agencies and organizations where appropriate.

When the Trust does not have a fully formed, concrete direction for an Innovation Program RFP, it may issue a formal request for information. This process allows the Trust to solicit ideas from knowledgeable members of the energy conservation community.

Quality Assurance/Quality Control

QA/QC features will be determined through the competitive solicitation process. If a pilot project is seeking to demonstrate a particular program design for future consideration by the Trust, QA/QC features will generally be used and tested as part of that demonstration. If a pilot is testing a particular product or process, the steps by which the results will be measured, analyzed, verified, and shared should be provided in the bidder's proposal and memorialized in the contract deliverables. The Trust will maximize the use of utility interval data to help measure, verify, and analyze the results of pilot projects.

6.3 Public Information and Outreach

6.3.1 Overview

The Trust reaches potential customers through tailored marketing and outreach campaigns across its various programs. These efforts are complemented by the Trust's work to provide general energy information and education through its website, events, and other activities to help consumers

considering the installation of energy conservation measures. The Trust seeks to boost energy savings by increasing awareness of the benefits of cost-effective, customer-sited energy resources and operating practices and behaviors, and by providing basic guidance in how to access Efficiency Maine programs. In addition, the Trust occasionally provides training opportunities to promote workforce development relevant to energy conservation.

6.3.2 Objectives

- Increase consumer awareness of cost-effective options for conserving energy, using energy more efficiently, or using more alternative or renewable energy, as well as for financing related projects;
- Create more favorable market conditions for the increased use of energy-efficient products and services;
- Provide general information about the benefits of energy conservation and distributed renewable or alternative energy;
- Provide tools and resources to support decision making related to energy conservation, including best practices, usage tips, calculators, purchasing guides, and vendor locators; and
- Promote access to technical training on best practices in marketing, installing, and maintaining energy upgrades to maximize energy savings, cost-effectiveness, and customer satisfaction.

6.3.3 Market Barriers

- *Lack of information:* Many customers are not familiar with energy conservation choices; public information resources help guide both customers and contractors to efficient options, as well as strategies to conserve energy.
- *Diversity of choices and information:* The number and diversity of products and contractors available in the market can be overwhelming for customers who are planning upgrades or replacing burned-out products. The Trust's website is a trusted, accessible resource for information and can act as support for customers choosing among efficient equipment options and contractors.
- *Lack of familiarity with efficient technologies:* The Trust provides resources for Maine's efficiency contractors to increase their familiarity with efficient technologies and best practices for installation.

6.3.4 Program Design

Addressing Market Barriers

The Trust shares information on energy conservation issues through several channels. The Trust's website is a significant resource for consumers, providing web tools including a lighting savings calculator, vendor locator, heating system comparison tool, and virtual tour of energy-saving household technologies. Additional web resources focus on the installation and operation of high-efficiency

equipment; for example, the ductless heat pump web hub shares installation considerations, user tips, case studies, and more.

The Trust attempts to drive interested Maine consumers to the website via targeted digital ads and search engine (or web) optimization strategies. At this time, the website has about 16,000 visitors a month. The Trust has increased its presence on social media and has found Facebook and Twitter to be effective communication channels. While the Trust continues to share information at workshops, fairs, conferences, and trade shows, educational efforts have increasingly focused on digital resources that reach out directly to potential customers.

To complement these digital resources, the Trust invests in its own customer service representatives, who are available for customers preferring over-the-phone support. The Trust staffs a toll-free number to answer customer questions about efficiency options and incentives. Staffed from 8:00 AM to 5:00 PM Monday through Friday, this call center receives approximately 1,100 calls a month. When customers visit a store that sells efficient products, they often see information provided at the point of purchase, such as signs and brochures in the water heater aisle at a major retailer or in front of an off-shelf display of LED bulbs. Efficiency contractors frequently educate their customers as they provide their specific services.

The Trust periodically provides trainings and scholarships to overcome market barriers to workforce development. For example, the Trust has offered scholarships for advanced heat pump training to support the contractor community in adopting best practices for installing this relatively new technology. The Trust has also sponsored trainings in commercial building energy management and lighting. Specific trainings for installers will be offered as needed during the Triennial Plan IV period when new technologies come on the market or as the Trust identifies issues through the program QA reviews.

Measures Promoted

The Public Information and Outreach initiative funds educational resources, workshops, or courses that present and discuss the benefits of energy conservation and the options for pursuing energy conservation or distributed renewable and alternative energy systems. The activities funded range from organizing or participating in workshops and conferences, to creation and delivery of written materials, to developing web tools or digital resources.

Incentives and Financial Considerations

Financial incentives are typically not a feature of the Trust's Public Information and Outreach efforts. However, the Trust has offered scholarships and training discounts to energy conservation contractors and facility managers participating in training programs. The Trust will consider the use of scholarships to promote its objectives where appropriate and as budgets allow during the Triennial Plan IV period.

In prior years, the Trust brought "in-house" the production of several Public Information and Outreach efforts including some web design and production. If in-house resources are insufficient, the Trust may

use a competitive bidding or selection process to execute some of the Trust's Public Information and Outreach efforts.

Marketing and Outreach

The Trust will continue to build on the growing awareness of energy conservation, management of energy costs through energy conservation, and Efficiency Maine programs. The Trust will communicate with various Maine audiences through digital, print, and video case studies; website and digital technologies; social media; seminars, symposia, and forums; workshops and trainings; print and television media; and other vehicles that make the Trust's programs and information accessible to Mainers statewide.

The Trust will evaluate how Public Information and Outreach efforts may support more targeted customer communication needed by other Trust initiatives. For example, a general public information campaign may accompany a Non-Transmission Alternative initiative in a specific geographic area. Similarly, customers who receive a rebate for a programmable thermostat may also be invited to receive energy-saving tips or demand response alerts.

The Trust's marketing efforts are largely focused on educating potential customers about a specific energy-efficient technology or energy-saving solution promoted through a specific program. However, the Trust may from time to time undertake general energy conservation marketing campaigns or educational initiatives the scope of which extends beyond any one of the channel-specific programs.

Quality Assurance/Quality Control

The Trust will consider the following measurement tools when gauging the success of Public Information and Outreach efforts:

- Web metrics (number of unique visitors, time, bounce rate);
- Social media followers and participation;
- Survey instruments;
- Frequently asked questions and inquiries directed toward the Trust's website and toll-free number;
- Course and workshop participation rates and participant assessments;
- Program participation rates; and
- Frequency of energy conservation and customer success stories in the media.

6.4 Other Initiatives

During the period of Triennial Plan IV, the Trust plans to engage in various state, regional and national forums and initiatives that advance the purposes for which the Trust was established. A brief description of these forums and initiatives follows.

6.4.1 Track and Participate in State Energy Initiatives

Within Maine, there are a multitude of forums and initiatives that have the potential to impact the Trust's programs. The Trust makes a practice of engaging in these forums and initiatives with an eye to maximizing the installation and use of measures that deliver cost-effective energy conservation or greenhouse gas reductions, consistent with the purposes given to the Trust in the Efficiency Maine Trust Act.

Legislature

The Trust plans to remain engaged at public hearings and work sessions of the Maine Legislature to fulfill its duty as "a champion for funding cost-effective energy and energy efficiency programs."⁷⁰ The Trust staff will provide information, analysis and testimony on all matters directly relating to the Trust and the Trust's programs. The staff may also engage in legislative discussions where they touch on the issues of energy conservation, customer-sited alternative energy systems, and reducing greenhouse gas emissions as well as on the administration of publicly funded programs.

Governor's Energy Office

The Trust will work collaboratively with the Governor's Energy Office (GEO), as directed by statute, to develop a comprehensive state energy plan. This plan is due to be submitted to the Legislature every two years to identify opportunities and recommend actions to lower the total cost of energy to consumers. The plan is required to include a section that specifies the State's progress in meeting the Oil Dependence Reduction Targets and recommendations, if needed, for actions to meet the reduction targets to:

- a. Reduce the use of oil across the state economy to achieve the targets of reducing oil consumption in Maine from 2007 levels by at least 30% by 2030 and by at least 50% by 2050;
- b. Focus on near-term policies and infrastructure changes that set the State on a reasonable trajectory to meet the targets; and
- c. Prioritize the improvement of energy efficiency and the transition to the use of alternative energy sources for heating and transportation.⁷¹

The Trust will continue to provide GEO with information about Trust programs for reporting to DOE and other national and regional information systems.

MaineHousing

The Trust also will also collaborate with the Maine State Housing Authority (MaineHousing) on developing updates to MaineHousing's annual plan for the DOE Weatherization Assistance Program, the Low-Income Home Energy Assistance Program, and the Central Heating Improvement Program. Each year, MaineHousing briefs the Trust's Board, at a public meeting, on the elements of the next year's weatherization plans. The Trust is given the opportunity to ask questions and provide input regarding

⁷⁰ 35-A MRS §10104(2)(B).

⁷¹ 2 MRS §9(5)(A).

lessons learned, best practices, and opportunities to ensure that similar initiatives are complementary and not duplicative.

Maine Public Utilities Commission

The Trust staff is very active in proceedings at the Maine Public Utilities Commission (PUC). The Trust staff files and presents all necessary testimony, evidence, comments, briefs and exceptions related to the development, review and approval of the Trust's Triennial Plan, Annual Updates (to the Triennial Plan), and related dockets.

In addition to the Triennial Plan dockets, the Trust staff also engages at the PUC in other proceedings that have a direct or indirect impact on the Trust's programs. For example, the Trust has been an active party in dockets involving "non-wires alternatives" (also called non-transmission alternatives, or NTAs). An early pilot project around Boothbay has led to inquiries about the feasibility of using more energy efficiency and distributed energy resources (DERs) to cost-effectively ensure grid reliability in other locations. In these inquiries, the Trust intends to remain engaged in developing and providing data, analysis, and testimony about the opportunity for DERs to serve as lower-cost alternatives to proposed transmission or distribution system upgrades. This engagement may include developing cost-effective NTA resources, where approved by the PUC, that are additional to what is identified in the Triennial Plan or are implemented on an accelerated schedule compared to what appears in the Triennial Plan. Any such departures from the Triennial Plan will be proposed as amendments to the Plan and will not be pursued until properly authorized.

Certain other matters pending before the PUC may prompt the Trust to get engaged where these matters relate to the Trust's programs and purposes. Cases that involve the establishment and use of "avoided costs" and other values used in the calculations of "benefits" and "costs" that determine "cost-effectiveness" are of direct interest to the Trust. Similarly, rulemakings that may impact the programs or procedures of the Trust will be monitored by the Trust and may prompt the Trust's engagement. Finally, various reporting initiatives are likely to continue to require collaboration between the Trust and the PUC. As one example, the Trust works with the PUC to develop reports on the uses of funding from the Regional Greenhouse Gas Initiative.

Department of Environmental Protection

The Trust works with the Maine Department of Environmental Protection (DEP) where there is an intersection of environmental objectives and the kinds of programming and conservation measures or "clean tech" promoted by the Trust. DEP is Maine's administrative liaison to RGGI Inc., the non-profit entity that manages RGGI. For example, in the past the Trust has talked with DEP about how the Trust's program designs could be used to reduce emissions from biomass combustion and mitigate the risk of leaking fuel tanks.

While no specific initiatives have been identified for collaboration during the next Triennial Plan period, the Trust expects to continue working with DEP where the Trust's programs, data, or analysis may be of assistance in helping the DEP advance its mission. For example, the Trust will assist DEP, if asked, in its preparation of a biannual status report to the Legislature on progress toward meeting Maine's statutory

carbon reduction goals.⁷² Additionally, the Trust and DEP, together with the PUC, will continue their practice of preparing an annual report for the Legislature on the activities and results of RGGI in Maine.

Workforce Development

The Trust monitors workforce capacity and skillsets as part of its planning and implementation of conservation programs. Where the Trust identifies specific skills needed for designing, installing, and maintaining high-efficiency equipment, it may support targeted training and other means of promoting quality assurance. By way of example, during the Triennial Plan III, the Trust offered a scholarship to support heat pump installers receiving training through a program at a community college. The Trust has historically sponsored classes for facility managers, hosted webinars for contractors to learn about the latest technology developments, and facilitated continuing education credits for realtors or other trade professionals on issues related to energy conservation.

Codes and Standards

State and local building codes and equipment standards are occasionally the subject of policy change. When this happens, it can impact energy conservation programs in a variety of ways. In the event that proposals emerge during the Triennial Plan period to change codes or standards, the Trust will stand ready to assist with the analysis and consideration of policies impacting the use of cost-effective products, operations and building practices.

6.4.2 Track and Participate in Regional and National Initiatives

The Efficiency Maine Trust Act provides that: “The trust shall monitor conservation planning and program development activities in the region and around the country ...” and also that “The trust may coordinate its efforts under this section with similar efforts in other states in the northeast region...”⁷³

ISO-New England

The Independent System Operator for New England (ISO-NE) operates wholesale markets that serve New England’s electricity customers. Among these is the Forward Capacity Market (FCM) into which electricity generators, efficiency program administrators, and others may bid to supply qualifying “capacity” to serve the New England grid. The Trust is a participant in this market, aggregating the

⁷² See, 38 MRS §576, “The State’s goals for reduction of greenhouse gas emissions within the State are as follows: 1. Reduction by 2010. In the short term, reduction to 1990 levels by January 1, 2010; 2. Reduction by 2020. In the medium term, reduction to 10% below 1990 levels by January 1, 2020; and 3. Long-term reduction. In the long term, reduction sufficient to eliminate any dangerous threat to the climate. To accomplish this goal, reduction to 75% to 80% below 2003 levels may be required.” See also, 38 MRS, §578, “... every 2 years ... the department shall evaluate the State's progress toward meeting the reduction goals specified in section 576, review the cost-effectiveness of the actions taken toward meeting the reduction goals and shall amend the action plan as necessary to ensure that the State can meet the reduction goals. The department shall submit a report of its evaluation to the joint standing committee of the Legislature having jurisdiction over natural resources matters and the joint standing committee of the Legislature having jurisdiction over utilities and energy matters by January 1, 2016 and by that date every 2 years thereafter.”

⁷³ 35-A MRS §10110(2)(D) and (I).

summer-peak electricity savings from the many conservation measures supported through its programs and bidding those savings resources into the FCM auction.

The Trust's participation in the FCM entails collecting and provide data, making forecasts of future capacity savings, delivering certification of measurement and verification protocols, providing financial assurance, and reporting to ISO-NE as required in the FCM rules. The Trust also occasionally participates in planning and policymaking discussions at ISO-NE. The Trust will continue these activities during Triennial Plan IV.

Energy Conservation Forums

From time to time, the Trust will engage in regional and national forums related to energy conservation. Illustrative organizers of such forums include DOE conferences, gatherings of the American Council for an Energy-Efficient Economy, the Northeast Energy Efficiency Partnership, and the Consortium for Energy Efficiency. The Trust's participation is typically limited to sharing data and analysis about efficiency programs by means of conference calls and online webinars. On occasion, where there are potential opportunities for the Trust to raise grant funds for Trust programs or to gain concrete insights into specific technical or administrative matters of direct relevance to Trust programs, a member of the staff will travel to a workshop or conference.

Grid Modernization

States such as New York and Rhode Island are developing processes to compare costs and benefits of future grid upgrades with the costs and benefits of non-wires alternatives. With the accelerating evolution in the Internet of Things makes it technically and economically possible to communicate with and control end-use energy equipment, new possibilities are emerging. Grid operators and grid customers are developing the ability to monitor and manage electricity usage (load) in real time. Energy conservation programs, such as those run by the Trust, are increasingly engaged in promoting the installation and use of end-use equipment and systems that can take advantage of the emerging capacity to cost-effectively provide real-time monitoring and management. During Triennial Plan IV, the Trust will continue to monitor developments on "grid modernization" in other states and will engage in policy discussions and PUC proceedings on the topic when the opportunity presents itself.

Climate Change Plans, Reports, and Greenhouse Gas Reductions

The Trust provides data, analysis and program recommendations Maine-based efforts to reduce greenhouse gas (GHG) emissions to various state, regional and national initiatives. As noted above, the Trust offers feedback and input on various state agency studies or reports about carbon reductions in Maine and plans for meeting longer-range carbon reduction targets. On occasion, the Trust will also share its perspective with regional initiatives where Maine's policies and programs play a contributing role in addressing climate change.

Although it has not been involved previously in the initiatives of the Conference of New England Governors and Eastern Canadian Premiers (NEG-ECP), the Trust recognizes that this is a forum in which the constituent jurisdictions, including Maine, collaborate to develop plans and policies on energy and transportation to promote economic development and to help meet carbon reduction targets.

In recent years, the NEG-ECP Climate Change Action Plan set regional targets for 2030 to reduce GHG emissions by 35-45% below 1990 levels and for 2050 to reduce GHG emissions by 75-85% below 2001 levels.⁷⁴ The resolution passed by NEG-ECP in 2015 further resolved that:

- a. The [Governors and Premiers] recognize the importance of all efforts being made at the state, provincial and federal levels to address climate change; and
- b. The [Governors and Premiers] ask the Committee on the Environment to identify strategies, policies and measures through which the region can achieve the 2030 reduction marker and the 2050 target.

Given the interconnections of power grid, gas pipelines, and roads in this region, the NEG-ECP is likely to remain an important forum for discussion of climate change strategies, including the role of energy conservation and low-carbon DERs. Where the Trust is able to contribute data, analysis, or successful case studies of measures and programs that may assist the NEG-ECP in studying or developing “strategies, policies and measures” to lower carbon emissions, it will do so.

A specific area of interest to the Trust in the coming Triennial Plan period is referred to as “Strategic Electrification.” This term generally describes strategies, policies and measures that promote use of electricity for useful work that would otherwise be performed using a higher-carbon energy source. The best models of heat pumps, heat pump water heaters, and electric vehicles (EVs) convert energy to perform useful work at extremely high levels of efficiency. Moreover, in the context of the New England power grid and generation fleet, these end uses have extremely low carbon profiles. For these reasons, discussions about Strategic Electrification commonly focus on the use of electric heat pump technology for space and water heating and the electric vehicles for transportation.

By way of example, the NEEP recently launched a Strategic Electrification Initiative. Among other deliverables, this initiative prepared an Action Plan that analyzed the amount of heating and transportation needed in 2050 in order for the northeast states to meet certain carbon reduction goals. It further modeled the impact on the electric grid of various scenarios of increased electrification of the heating and mobility sectors. Drawing from its experience administering nationally recognized heat pump programs, the Trust provided data and analysis to the authors of the plan.

As another example, in 2018 the Trust began work with the Maine Department of Transportation (DOT), the DEP, and the GEO to develop a strategic plan to develop electric vehicle infrastructure in Maine. The resulting Electric Vehicle Supply Equipment (EVSE) Initiative uses funds from the settlement of legal claims against the car manufacturer, Volkswagen, to reduce nitrogen oxide and carbon emissions from light-duty vehicles. During Triennial Plan IV, the Trust will continue to administer the implementation of this Initiative pursuant to the terms of its Memorandum of Agreement with DOT. At the urging of its Board, the Trust staff will continue to pursue additional funding opportunities to complement and/or expand on the EVSE Initiative to promote greater market penetration and use of electric vehicles.

⁷⁴ NEG-ECP, “Resolution 39-1: Resolution Concerning Climate Change,” August 31, 2015.