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November 30, 2021

Senator Mark Lawrence
Representative Seth Berry
Co-Chairs, Joint Committee on Energy, Utilities and Technology
Maine State Legislature
100 State House Station
Augusta, ME 04333-0100

Dear Chairman Lawrence and Chairman Berry:

I am pleased to present you this year's Annual Report on the programs of the Efficiency Maine Trust (the Trust). The Annual Report, enclosed with this letter, describes the activity of the Trust in Fiscal Year 2021, which spanned from July 1, 2020 through June 30, 2021.

As you will read in the report, the Trust succeeded in reaching significant milestones in FY2021. For example, we continued to help Maine lead the nation in adoption of high-performance heat pumps, and have now promoted more than 88,000 installations in the past nine years. Over the course of the year, the Trust invested approximately $65 million in energy efficiency. We estimate that the resulting energy upgrades will save more than 2.2 billion kWh and 3.3 million MMBtu in cost-effective energy savings over the life of the measures installed, avoiding over $315 million in unnecessary energy costs.

As always, we welcome the opportunity to brief you on last year's results and the current program activity in FY2022. I would appreciate it if you would share this with the rest of your Committee.

Best,

Michael D. Stoddard
Executive Director

FY2021 ANNUAL REPORT

The Trust is the administrator for programs to improve the efficiency of energy use and reduce greenhouse gases in Maine. The Trust does this primarily by delivering financing and financial incentives on the purchase of high-efficiency equipment or changes to operations that help customers save electricity, natural gas, and other fuels throughout the Maine economy. The Trust is an independent, quasi-state agency governed by a Board of Trustees with oversight from the Maine Public Utilities Commission.

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Abbreviations/Acronyms

ACEEE	American Council for an Energy-Efficient Economy
AMP	Arrearage Management Program
BEV	Battery Electric Vehicle
BTM	Behind the Meter
BTU	British Thermal Unit
C&I	Commercial and Industrial
CAA	Community Action Agency
CCF	Centum Cubic Feet
CEO	Chief Executive Officer
CHIP	Central Heating Improvement Program
CHP	Combined Heat and Power
CIP	Commercial and Industrial Prescriptive
CLIC	Cost-effective Lighting Investment Calculator
CMP	Central Maine Power
CSO	Capacity Supply Obligation
CTO	Chief Technology Officer
DC	Direct Current
DEP	Maine Department of Environmental Protection
DER	Distributed Energy Resource
DHHS	Department of Health and Human Services
DIY	Do-It-Yourself
DOE	U.S. Department of Energy
ECM	Electronically Commutated Motor
EERRF	Energy Efficiency and Renewable Resource Fund
EM&V	Evaluation, Measurement, and Verification
EV	Electric Vehicle
EVSE	Electric Vehicle Supply Equipment
FCA	Forward Capacity Auction
FCM	Forward Capacity Market
FON	Funding Opportunity Notice
FR	Free-Ridership
FY	Fiscal Year
GEO	Governor's Energy Office
GHG	Greenhouse Gas
HESP	Home Energy Savings Program
HVAC	Heating, Ventilation, and Air Conditioning
ISO-NE	Independent System Operator for New England
kW	Kilowatt(s)
kWh	Kilowatt-Hour(s)

LD	Legislative Document
LED	Light-Emitting Diode
LIHEAP	Low-Income Home Energy Assistance Program
M&V	Measurement and Verification
MACE	Maximum Achievable Cost-Effective
MaineHousing	Maine State Housing Authority
MMBtu	Million British Thermal Unit(s)
MTI	Maine Technology Institute
MPCT	Modified Participant Cost Test
MPRP	Maine Power Reliability Program
MRS	Maine Revised Statutes
MW	Megawatt(s)
NEEP	Northeast Energy Efficiency Partnerships
NOx	Nitrogen oxide
NTA	Non-Transmission Alternative
NTG	Net-to-Gross
NWA	Non-Wires Alternative
O&M	Operations and Maintenance
OPA	Office of the Public Advocate
PACE	Property Assessed Clean Energy
PACT	Program Administrator Cost Test
PHEV	Plug-in Hybrid Electric Vehicle
PTHP	Packaged Terminal Heat Pump
PUC	Public Utilities Commission
QP	Qualified Partner
RFP	Request for Proposals
RGGI	Regional Greenhouse Gas Initiative
RRV	Residential Registered Vendor
RTU	Rooftop Unit
SBI	Small Business Initiative
SLIC	Small Business Cost-effective Lighting Investment Calculator
SO	Spillover
T&D	Transmission and Distribution
T&ST	Transmission and Sub-Transmission
TA	Technical Assistance
TRC	Total Resource Cost
TRM	Technical Reference Manual
VRF	Variable Refrigerant Flow
VW	Volkswagen
WAP	Weatherization Assistance Program

Message from the Executive Director

The Year of COVID etched an indelible mark on all things—people and organizations. During Efficiency Maine's Fiscal Year 2021 (FY2021), the impact of the pandemic on our operations was remarkable in several ways. To our astonishment, the rate of heat pump installations across the state more than doubled, setting a new record for this high-efficiency, clean heating technology and firmly establishing Maine's leadership in the national march towards beneficial electrification. Maine's schools also showed their resourcefulness during unprecedented challenges, taking advantage of their temporarily vacant buildings to install heat pumps and many hundreds of efficient LED light fixtures with help from Efficiency Maine rebates. As these examples show, Efficiency Maine's programs helped keep businesses in business, and workers working, to help the state's energy customers integrate more efficient equipment into their homes and businesses.

Our results tell the story.

In FY2021, we provided incentives on 27,326 heat pump units,[1] representing a 114% increase compared to FY2020. Several factors fed the increase in program participation, including larger rebates, more marketing, and the launch of a new training module for vendors designed to help drive heat pump activity and ensure quality installations in a fast-growing market. As the pandemic became more entrenched, other factors weighed in: many Mainers found themselves spending more time at home due to COVID-19 restrictions and sought better year-round comfort; the summer of 2020 (the beginning of FY2021) was the third warmest in the state's history; and many Mainers received stimulus money from the federal government that increased their disposable income. Together, these influences led to a significant jump in the move to heat pumps in Maine homes.

This market growth caught on in the non-residential sector too. By including new heat pump incentives in our Small Business Initiative and adding Variable Refrigerant Flow (VRF) systems to our incentives for schools, we logged record-breaking distribution of heat pump technology, across geographic regions and sectors.

The Maine Climate Council's Climate Action Plan also helped shape our year's undertakings. This Plan identified cars and trucks as the state's largest source of carbon pollution and recommended shifting to electric vehicles (EVs) as one of the best ways to achieve Maine's carbon reduction targets. In FY2021, we saw the transition to EVs pick up speed as we issued 1,127 rebates fueled by the introduction of new EV models with longer ranges, increased availability of public charging, and growing consumer acceptance of EV technology. A promotion targeting government entities helped 33 towns, agencies and school districts combine our incentives with manufacturers' rebates to add 85 EVs to their public fleets, leading by example and lowering their operating costs. By May 2021, the Trust's rebate numbers had

[1] The Trust bases its count of units on a "heat pump equivalent" to accommodate the diversity of systems installed across the residential and commercial sectors. The Trust assumes that one "heat pump equivalent" is counted for every 25.1 MMBtu/year of heat provided. This metric is based on the modeled performance of a single residential heat pump in with an Air Conditioning, Heating and Refrigeration Institute (AHRI)-rated Heating Seasonal Performance Factor (HSPF) between 10 and 12.5.

increased to more than 250% of pre-pandemic levels. We're pleased to report that we recently extended our EV rebate program for another year with sufficient funds to help defray the cost of approximately 2,500 more EV purchases.

Efficiency Maine also administers the statewide initiative to build out a network of publicly accessible EV chargers across Maine. A first phase of this initiative was achieved in FY2021 with the installation of high-speed EV chargers (also called "DC fast chargers") on the Maine Turnpike at the Kennebunk plazas (northbound and southbound) and the West Gardiner plaza, as well as in Jackman, Skowhegan, Farmington and North Windham. A subsequent competitive solicitation awarded grants to extend the public high-speed EV charger network in Lewiston-Auburn, Fairfield, Newport, Bangor, Ellsworth, and Belfast to be installed in 2022.

In addition to installing these publicly accessible fast chargers, Efficiency Maine continues to support the expansion of lower-cost, public Level 2 (240 volt) chargers serving local community use at shopping centers, restaurants, convenience stores, workplaces, apartment complexes, and municipal parking lots across the state. To date, the Trust has helped fund 200 new public plugs in Maine's public EV charging network, which has now grown to a total of 130 DC high-speed charging plugs and 410 Level 2 plugs.

In FY2021, our commercial programs increased their emphasis on the needs of small businesses, municipalities, and schools. For instance, we introduced financing options to qualified small business owners that upgraded to high-performance heat pumps and VRF systems. Another initiative saw 83 municipalities take advantage of a promotion specially designed to assist Maine municipalities of 4,000 residents or fewer. Combining Efficiency Maine's incentives with a bonus rebate from The Nature Conservancy, the participating municipalities installed 207 heat pumps and 47 lighting projects. We also supported more than 50 projects in public and outdoor spaces through a Parking and Pole Lighting Retrofit Initiative. The initiative was inspired by a desire to provide job opportunities for electrical contractors and supply houses during the restrictions imposed by COVID-19 since many outdoor lighting projects could be completed with limited physical interaction between customers and contractors.

Our support for workforce development deepened in April when we partnered with the Maine Office of State Fire Marshal to offer free webinars to introduce the energy provisions of Maine's new building energy codes, which took effect in July and apply to all new building construction in Maine. The webinars focused on the newly adopted 2015 version of the International Energy Conservation Code (IECC) and explained how it differs from the 2009 IECC, which was previously in effect. We hope that a robust training program will help make the transition to implementing the new energy codes quicker and easier for code officials, builders, trades, and other professionals who build our homes and commercial structures. We were pleased to partner with the Fire Marshal's staff to plan and deliver these trainings.

As we look to the future, we see exciting opportunities ahead. For example, as Maine's grid modernizes, Efficiency Maine has an important role to play helping consumers maximize value while helping maintain grid resilience and reliability. We will build on the pilot projects begun in FY2021 to test the use of emergency batteries, EV batteries, water heaters and freezers to store energy and/or shift load away

from periods of peak demand. Where the test results look promising, we hope to incorporate these applications, as well as a traditional demand response initiative, into a full-scale Demand Management Program. Employing these strategies will deliver benefits in the form of reductions in peak energy use, peak demand charges, wholesale electricity prices, and power plant pollution. It will also increase grid reliability and help balance of intermittent renewable energy generation.

Also, Efficiency Maine is proud to help administer programs funded through federal appropriations and grants. Through an allocation by the Maine Jobs and Recovery Plan, Efficiency Maine will use $25 million in federal funding to help low- and moderate-income Mainers improve the comfort of their homes and reduce their heating bills with an aggressive new weatherization program. An additional $25 million in federal funds will also be used to improve energy efficiency at the many public schools, town offices, small businesses and major manufacturers that experienced detrimental economic impacts due to the COVID-19 pandemic.

Fortunately, Efficiency Maine will have some new tools in the toolbox to help get the job done. Thanks to two pieces of legislation passed in 2021, Efficiency Maine has been endowed with expanded authority – in the form of the Clean Energy and Sustainability Accelerator and the Commercial Property Assessed Clean Energy (PACE) program -- to provide financing and investment for select energy projects.

With big goals and expanded resources, we're looking forward to another busy and productive year. We are grateful to all the customers and contractors who took the time and effort to make energy efficiency projects happen, and to our Board of Trustees, and the policymakers, regulators and stakeholders that have continued to guide and support Efficiency Maine's programs.

Thank you.

/s/ Michael D. Stoddard

Introduction

This Annual Report of the Efficiency Maine Trust ("the Trust" or "Efficiency Maine") describes activities during Fiscal Year 2021 (FY2021), which covered the period from July 1, 2020, to June 30, 2021. The report includes the budgets, activities, and results for all programs and related activities administered by the Trust. In total, these programs will generate more than 2.2 billion kWh, and more than 2.8 million MMBtu, in cost-effective lifetime energy savings for Maine ratepayers. Some noteworthy highlights of the Trust's FY2021 programs include:

- Avoiding more than $315 million in unnecessary lifetime energy costs;
- Prompting approximately $92 million of incremental private investment using $65 million of program investment;
- Reaching a milestone of promoting nearly 88,000 high-performance heat pumps[2] over the past nine years;
- Supporting a record number of heat pump water heater installations in a single year – 10,783 units;
- Supporting weatherization projects in more than 1,800 homes through the Home Energy Savings Program (HESP) and Low-Income Initiatives;
- Adding more than 19.6 MW of new peak summer demand reductions to the grid; and
- Avoiding an estimated 71,666 short tons of annual greenhouse gas (GHG) emissions.

The Trust was created by state statute in 2009.[3] The purposes of the Trust include:

- Consolidating under one roof the funds for Maine's consumer-focused efficiency and alternative energy programs for all fuel types, including electric, natural gas, and unregulated fuels;
- Procuring distributed energy resources (such as efficiency and alternative energy) that cost less than traditional energy to help individuals and businesses meet their energy needs at the lowest cost; and
- Helping transform the energy market in Maine so that energy-efficient products, alternative energy equipment, and related energy services are more accessible and affordable to end-use customers.

The Trust is governed by a nine-member Board of Trustees. Suzanne MacDonald (Chief Community Development Officer at the Island Institute) and Joan Welsh (former member of the Maine House of Representatives) served as Chair and Vice-Chair, respectively. Glenn Poole (former Energy Manager at Verso Corporation) served as Treasurer, and James Boyle (owner of Boyle Associates Environmental Consultants) served as Secretary. Ex officio positions were filled by Dan Burgess (Director of the GEO)

[2] The Trust bases its count of units on a "heat pump equivalent" to accommodate the diversity of systems installed across the residential and commercial sectors. The Trust assumes that one "heat pump equivalent" is counted for every 25.1 MMBtu/year of heat provided. This metric is based on the modeled performance of a single residential heat pump in with an AHRI-rated HSPF between 10 and 12.5.

[3] 35-A MRS Chapter 97.

and by Dan Brennan (Director of the Maine State Housing Authority). Kenneth Colburn (Principal at Symbiotic Strategies LLC), Heather Furth (Owner of Orono Brewing Company), and Mark Isaacson (Manager at Competitive Energy Services, retired) also served.

Sectors Served

The Trust's programs and initiatives serve multiple sectors. Table 1 illustrates the sectors served by each Trust program.

Table 1: Sectors Served by Efficiency Maine Programs

Program	Commercial and Industrial	Small Businesses	Multifamily	Residential	Low-Income Households	Institutions
Commercial and Industrial Custom Program	✓					✓
Commercial and Industrial Prescriptive Program	✓	✓	✓			✓
Small Business Initiative		✓				
Distributor Initiatives	✓	✓	✓	✓	✓	✓
Retail Initiatives	✓	✓	✓	✓	✓	✓
Home Energy Savings Program			✓	✓		
Low-Income Initiatives			✓		✓	
Renewable Energy Demonstration Grants						✓
Electric Vehicle Initiatives	✓	✓	✓	✓	✓	✓

Funding

The Trust received and/or expended funds in FY2021 from a variety of sources, including Maine's electricity and natural gas utility ratepayers, the Regional Greenhouse Gas Initiative (RGGI), the Maine Power Reliability Program (MPRP) Settlement, the Forward Capacity Market (FCM) from the New England grid, Volkswagen (VW) Settlements, and the New England Clean Energy Connect (NECEC) Settlement. The Trust is directed by Maine statute to invest these funds to promote more efficient and affordable use of energy and customer-sited alternative energy systems. Table 2 depicts the FY2021 funding sources for each major program. The table is followed by brief descriptions of the Trust's funding sources and how they are invested through Efficiency Maine programs and other initiatives.

Table 2: Program Funding Sources

Program	Electric Efficiency Procurement	Natural Gas Efficiency Procurement	Regional Greenhouse Gas Initiative	Maine Power Reliability Program Settlement	Forward Capacity Market	New England Clean Energy Connect Settlement	Federal/Other	Energy Efficiency and Renewable Resource Fund	Volkswagen Settlement Funds
Commercial and Industrial Custom Program	✓	✓	✓	✓	✓				
Commercial and Industrial Prescriptive Program	✓	✓	✓	✓	✓				
Small Business Initiative	✓		✓	✓					
Distributor Initiatives	✓	✓	✓	✓					
Retail Initiatives	✓			✓					
Home Energy Savings Program	✓		✓	✓	✓		✓		
Low-Income Initiatives	✓		✓	✓	✓	✓			
Renewable Energy Demonstration Grants								✓	
Electric Vehicle Initiatives	✓[4]								✓

Electric Efficiency Procurement

Electric Efficiency Procurement funds come from payments that electric utilities make directly to the Trust for the procurement of cost-effective electrical energy efficiency. The amount of funding the Trust receives is determined by the budget needed to capture the maximum achievable cost-effective (MACE) energy efficiency potential approved by the Maine Public Utilities Commission (PUC). Where available, the Trust allocates a portion of other funding sources to offset some of the utility procurement necessary to capture MACE potential.

Maine's electricity customers who take service at the transmission and sub-transmission (T&ST) level do not contribute to and are ineligible for funding from the Electric Efficiency Procurement.

Natural Gas Efficiency Procurement

Natural Gas Efficiency Procurement funds come from natural gas distribution utilities. Similar to the standard used to establish the appropriate level of funding for electric efficiency, the amount of the procurement set for natural gas efficiency programs is based on the amount needed to capture the maximum achievable cost-effective natural gas savings through energy efficiency and conservation.

Maine's very large manufacturers and very large agricultural and aquaculture businesses, whose usage exceeds 1 million centum cubic feet (CCF) of natural gas annually, are limited to paying the assessment for the Natural Gas Efficiency Procurement on their first 1 million CCF of usage. This limitation does not impact their eligibility for the Trust's natural gas efficiency programs.

[4] Reflects $97,302 in funding from a Maine Public Utilities Commission pilot grant.

Regional Greenhouse Gas Initiative

RGGI is an eleven-state regional initiative to limit carbon emissions from electricity generators. Maine joined RGGI in 2009 when it was established. Under RGGI, large generators are required to purchase "carbon allowances" in an amount equal to their annual carbon emissions. Allowances are sold at quarterly auctions for this purpose.

Maine law requires that 100% of the annual carbon dioxide emissions allowances be allocated for public benefit to produce funds for carbon reduction and energy conservation, and that the revenue resulting from the sale of allowances must be deposited in the Regional Greenhouse Gas Initiative Trust Fund managed by the Trust.[5]

The Trust must use RGGI funds for measures, investments, loans, technical assistance and arrangements that reduce electricity consumption, increase energy efficiency or reduce greenhouse gas emissions and lower energy costs at commercial or industrial facilities and for investment in measures that lower residential heating energy demand and reduce greenhouse gas emissions.

Maine Power Reliability Program Settlement

The funds that the Trust received from the MPRP Settlement are governed by a May 7, 2010, stipulation approved by the PUC. In FY2021, the Trust received through the MPRP Settlement $300,000 for the weatherization of low-income homes, $500,000 for efficiency projects for T&ST customers, and $700,000 to be allocated for other electrical efficiency programs at the Trust's discretion.

Forward Capacity Market

FCM funds are proceeds from the Trust's capacity resources, which are bid into the Independent System Operator for New England (ISO-NE) markets. The compensation that the Trust receives from the FCM is for the reduction of demand delivered through qualifying efficiency projects that are tracked and reported by the Trust.

In late FY2019, the Maine Legislature enacted a Governor's bill – LD 1766 - *An Act To Transform Maine's Heat Pump Market To Advance Economic Security and Climate Objectives* – establishing a goal of installing 100,000 high-performance heat pumps in the state during the next five fiscal years. The new law directed the Trust to allocate all of the next five years of FCM revenue to promoting high-efficiency heat pumps. It required that these funds be used to "supplement but not supplant" the existing incentives funded by the Electric Efficiency Procurement, and provided that the Trust's FCM revenues must be excluded from consideration when the PUC determines the amount of cost-effective electric energy efficiency resources to be procured to capture MACE potential. The new law went into effect in September 2019.[6]

[5] 38 MRS §580-B(7).

[6] Public Law, Chapter 308, LD 1766, 129th Maine State Legislature – *An Act To Transform Maine's Heat Pump Market To Advance Economic Security and Climate Objectives.*

New England Clean Energy Connect Settlement Funds

In 2019, the PUC approved Central Maine Power's request to build the NECEC—a 1,200 MW transmission line traversing Maine from the Quebec border to Lewiston.[7] As part of the settlement agreement approving the project, the project sponsors agreed to establish multiple funds to deliver benefits to Maine. Three of the funds will be fully administered by the Trust: (1) a $15 million Heat Pump Fund to support the installation of heat pumps; (2) the $10 million Hydro-Quebec EV Fund to support public EV charging infrastructure; and (3) the $5 million Dirigo EV Fund to provide marketing and financial incentives promoting EVs. The Dirigo EV Fund has been paid out in a lump sum, while the other two will be paid out over multiple years.

A fourth fund, the $50 million Low-Income Customer Benefits Fund, was also established to support programs that reduce energy expenditures for low-income Mainers. For calendar years 2021 and 2022, annual payments of $1.25 million from the Low-Income Customer Benefits Fund will be administered by the Trust to promote more heat pumps, heat pump water heaters, and weatherization in low- and moderate-income homes.

Federal/Other

The Trust received federal funds through the American Recovery and Reinvestment Act in 2009 and 2010. These funds were disbursed through grants and also through a revolving loan fund. The revolving loan fund continued to operate in FY2021.

Energy Efficiency and Renewable Resource Fund

The Energy Efficiency and Renewable Resource Fund (EERRF) is composed of voluntary contributions from ratepayers, as well as alternative compliance payments from entities that do not meet Maine's renewable portfolio standard requirement. Maine law stipulates that 35% of these revenues be directed to the Maine Technology Institute (MTI) to help promote research and development of renewables. The Trust may use the remainder of these revenues to fund demonstration projects or to provide rebates for customer-sited, commercialized renewable energy equipment, as funds allow.

Volkswagen 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 one settlement agreement, Maine (through the Maine Department of Transportation) received settlement funds from VW. Through a Memorandum of Understanding, the Department contracted with the Trust to administer approximately $3.15 million of these funds to promote electric vehicle (EV) charging infrastructure with the goal of reducing GHG emissions and improving the energy efficiency of transportation in the state. Separately, VW settlement funds were also awarded to the Office of the Attorney General for the State of Maine. Of these funds, $5.1 million were transferred to the Trust for the purpose of running a program to reduce carbon and nitrogen oxide (NOx) emissions through the promotion and increased use

[7] Maine PUC, Orders Approving Transmission Line, Dkt. No. 2017-00232 as supplemented by Dkt. No. 2019-00179, May 3, 2019, and October 20, 2020, respectively.

of EVs. Another approximately $3 million were transferred to the Trust to help state government facilities reduce their carbon footprint through energy efficiency improvements as part of the Governor's "Lead by Example" initiative.[8]

Agricultural Fair Assistance Program Fund

In late FY2019, the Maine Legislature enacted a bill, LD 1186 – *An Act To Address Electricity Costs of Agricultural Fairs,* requiring the Trust to administer a new program to help agricultural fairs reduce their electricity demand charges. The new law established the Agricultural Fair Assistance Program Fund to support this program. The PUC assesses each electric utility an amount necessary to collect the total value of demand charges paid by agricultural fairs in the state during the prior year. The Trust collected revenues for this fund in FY2021. The first round of expenditures on new measures to reduce demand at fairs is expected in FY2022.

Results

In FY2021, the programs administered by the Trust played a critical role in helping Maine businesses and homes take advantage of energy efficiency, educating consumers about products that save energy, and helping them connect with vendors and contractors. The Trust's programs provided financial incentives that spurred consumers to choose energy-efficient options over lower-priced, less-efficient options—a choice that will reduce energy bills over the long term and put the Maine economy on a stronger footing.

Table 3 and Table 4 illustrate the total energy savings and lifetime avoided energy costs associated with each program administered by the Trust in FY2021. Savings values reported in the program summary tables here, and in the individual program tables throughout this report, are "adjusted gross savings" unless otherwise indicated. Adjusted gross savings reflect the change in energy consumption and/or demand that results directly from program-related actions taken by participants in an Efficiency Maine program, regardless of why they participated, adjusted by factors developed through program evaluations.[9]

In addition to energy savings, the tables show the sum of Efficiency Maine's costs. These costs reflect the financial incentives paid by the program, as well as the costs to manage the programs, provide public information and outreach, hold training sessions, provide technical support, and conduct quality assurance for each program. The tables also show the program participants' (customers') incremental

[8] Maine Executive Order No. 13, FY 19/20, An Order for State Agencies to Lead by Example Through Energy Efficiency, Renewable Energy and Sustainability Measures, November 26, 2019.

[9] Periodically, the Trust enlists independent third-party contractors to evaluate the savings impacts of major programs. The evaluations help the Trust develop factors to improve the accuracy of gross savings calculations based on installation rates and actual, site-verified savings rates. The evaluations are also used to analyze program attribution, including identifying program participants who would have installed the same or equivalent efficiency measures on their own even if the program had not been offered ("free-ridership" [FR]) and the percentage of efficient equipment installed due to program influences even though no incentive or technical assistance was received ("spillover" [SO]). Factoring in free-ridership and spillover delivers "net savings," which quantifies the savings directly (adjusted gross minus FR) and indirectly (SO) attributable to the program. The Trust publishes the FR and SO factors in the Technical Reference Manuals (TRMs).

costs invested in the energy upgrades, including those associated with both the upfront cost and operational costs. The benefit-to-cost ratio indicates the ratio of the financial benefits (from the lifetime avoided energy costs[10]) to the combination of Efficiency Maine costs and participants' incremental cost.

[10] The lifetime energy benefit shown in the summary tables, and in the individual program tables throughout this report, is calculated using methodologies and assumptions approved by the PUC as part of the approval process for the Trust's Triennial Plan IV.

Table 3: Costs and Savings for Electric Programs

Program	Annual kWh Savings	Lifetime kWh Savings	Efficiency Maine Costs	Participant Cost	Lifetime Energy Benefit	Cost/kWh (Lifetime)	Benefit-to-Cost Ratio
Commercial and Industrial Custom Program – Electric	7,043,743	102,547,310	$2,207,603	$2,415,261	$10,575,335	$0.045	2.29
Commercial and Industrial Prescriptive Program – Electric	39,961,358	514,756,912	$9,263,812	$11,762,204	$55,627,462	$0.041	2.65
Small Business Initiative - Electric	2,263,944	29,431,165	$1,777,859	$998,939	$5,145,108	$0.094	1.85
Distributor Initiatives – Electric	22,474,617	286,191,294	$7,445,951	$2,188,923	$28,383,858	$0.034	2.95
Retail Initiatives – Electric	39,109,578	226,218,840	$7,344,323	$4,157,977	$37,282,824	$0.051	3.24
Home Energy Savings Program – Electric	53,489,129	962,804,321	$15,481,618	$34,926,865	$93,453,680	$0.052	1.85
Low-Income Initiatives – Electric[11]	10,509,982	119,996,942	$3,269,356	$454,789	$14,850,406	$0.031	3.99
Strategic Initiatives – Electric	-	-	$1,753,703	-	-	-	-
Administration – Electric	-	-	$1,987,837	-	-	-	-
Total	**174,852,350**	**2,241,946,785**	**$50,532,061**	**$56,904,958**	**$245,318,673**	**$0.048**	**2.28**

[11] In Triennial Plan IV, the Trust directed a portion of the Low-Income Initiatives electric budget for investment through the Retail Initiatives and Distributor Initiatives to fund heat pump water heater sales to low-income customers through these channels. The costs and savings associated with these investments are reflected in the Low-Income Initiatives electric results and not in the Distributor Initiatives or Retail Initiatives electric results.

Table 4: Costs and Savings for Thermal Programs

Program	Annual MMBtu Savings	Lifetime MMBtu Savings	Efficiency Maine Costs	Participant Cost	Lifetime Energy Benefit	Cost/ MMBtu (Lifetime)	Benefit-to-Cost Ratio
Commercial and Industrial Custom Program – Natural Gas	9,456	144,658	$292,421	$341,284	$1,004,938	$4.38	1.59
Commercial and Industrial Custom Program – Unregulated Fuels	6,044	88,131	$384,137	$405,980	$1,502,670	$8.97	1.90
Commercial and Industrial Prescriptive Program – Natural Gas	13,565	320,780	$179,975	$47,882	$2,030,495	$0.71	8.91
Commercial and Industrial Prescriptive Program – Unregulated Fuels	20,105	404,202	$443,131	$722,784	$6,332,393	$2.88	5.43
Small Business Initiative – Unregulated Fuels	11,264	168,954	$1,011,850	$2,549,471	$4,415,923	$21.08	1.24
Distributor Initiatives – Natural Gas	5,468	71,869	$124,999	$127,590	$554,333	$3.51	2.19
Distributor Initiatives – Unregulated Fuels	11,586	289,661	$896,699	$299,150	$5,241,724	$4.13	4.38
Home Energy Savings Program – Unregulated Fuels	35,006	814,879	$3,202,948	$10,388,773	$18,576,716	$16.68	1.37
Low-Income Initiatives – Unregulated Fuels	30,630	551,242	$3,355,459	$7,660,046	$15,134,197	$19.98	1.37
Renewable Energy Demonstration Grants Program	-	-	$0	-	-	-	-
Electric Vehicle Initiatives[12]	52,182	510,484	$2,701,687	$13,044,262	$15,736,324	$30.85	1.01
Strategic Initiatives – Thermal	-	-	$490,140	-	-	-	-
Administration – Thermal	-	-	$1,372,153	-	-	-	-
Total	**195,307**	**3,364,858**	**$14,455,600**	**$35,587,221**	**$70,529,713**	**$14.87**	**1.41**

[12] For the Electric Vehicles Initiatives, the Trust reports on energy savings associated with rebates for electric vehicles (EVs), but does not claim savings for EV chargers (also referred to as "EV Supply Equipment" or "EVSE"). Lifetime energy savings reflect gasoline savings associated with rebated EVs, net of the increased electricity use associated with charging those EVs (converted to MMBtu). Efficiency Maine Costs include those associated with both EV rebates *and* EVSE ($2,477,241 and $224,446, respectively). Participant Costs reflect those associated with EV rebates only (not EVSE); they reflect both the customers' share of the incremental costs to purchase the vehicle and new electricity costs associated with charging those EVs. But they do not reflect avoided maintenance costs, which can be significant. The Benefit-to-Cost ratio reported for Electric Vehicle Initiatives reflects cost and savings associated with EV rebates only (not EVSE).

As discussed in the "Finance and Administration" section of this report, the Trust invested more than $65 million in FY2021 to fund the programs and cost savings described above. Table 5 provides a summary of the Trust's payments during FY2021.

Table 5: FY2021 Payments Made[13]

Use of Funds	Amount
Programs	**$ 59,989,151**
Commercial and Industrial Custom Program	$ 2,863,770
Commercial and Industrial Prescriptive Program	$ 9,886,919
Small Business Initiative	$ 2,794,708
Distributor Initiatives	$ 8,467,516
Retail Initiatives	$ 7,344,746
Home Energy Savings Program[14]	$ 19,305,282
Low-Income Initiatives	$ 6,624,524
Renewable Energy Demonstration Grants Program	$0
Electric Vehicle Initiatives	$ 2,695,311
Other Initiatives[15]	**$6,375**
Agricultural Fair Assistance Program	$0
Lead by Example Initiative	$6,375
Strategic Initiatives, Public Information, and Administration	**$3,988,572**
Strategic Initiatives	$ 2,243,846
Administration	$ 3,359,992
Other Payments[16]	**$ 72,256**
Total Use of Funds – Efficiency Maine Trust	**$ 65,665,245**

The following sections of the Annual Report provide short descriptions of each program referenced in Table 3 and Table 4. The descriptions generally include a statement of the main purpose of the program, a brief explanation of the activities undertaken to implement the program, and a summary of quantifiable results.

[13] Table 3 and Table 4 reflect savings, costs, and benefits based on project completion dates, while Table 5 reflects accrual-basis accounting. This results in some variance in the Program payments made due to timing differences. Specific differences driven by factors other than timing are detailed in footnotes 14-16.
[14] Home Energy Savings Program payments include $620,718 of loan support not reflected in the program tables.
[15] Other Initiatives are discrete initiatives not reflected among the Trust's major programs summarized in Table 3 and Table 4. For more information, refer to the "Other Initiatives" section of this report.
[16] Includes payments to MTI for its share of the EERRF, payments to the Maine Department of Environmental Protection (DEP) for its RGGI-related administration costs, payments to RGGI Inc. for administration costs, and payments to GEO for its staff time. These payments are not reflected in the program tables above.

Efficiency Maine Programs

Commercial and Industrial Custom Program

The Commercial and Industrial (C&I) Custom Program incentivizes tailored energy efficiency projects that require site-specific engineering analyses and/or projects with energy conservation measures that are not otherwise covered by prescriptive incentives. The C&I Custom Program is primarily designed to overcome the barriers confronting Maine's larger businesses and institutions when making investments in complex energy efficiency and distributed generation projects. These projects represent important facility improvements that reduce the inefficient use of energy and keep operating costs down for Maine's largest energy users.

Commercial and Industrial Custom Program

Sectors Served

- Commercial and Industrial
- Small Businesses

Funds Invested

- Electric Efficiency Procurement
- Natural Gas Efficiency Procurement
- Regional Greenhouse Gas Initiative
- Maine Power Reliability Program
- Forward Capacity Market

FY2021 Activities

Following are some program activity highlights for FY2021:

- Continued to employ an incremental approach to developing projects; staff focused on encouraging customers to complete one or more individual projects that fit with their current priorities and/or budget, building a positive foundation for additional program participation and energy efficiency investment in the future.
- Awarded incentives to 28 new customers and 12 past program participants (vs. three new customers and 14 past program participants in FY2020).
- Completed one scoping audit and one technical assistance (TA) study, representing a continued decline from previous years' activity.
- Observed considerable program interest from cannabis cultivation facilities; cannabis projects constituted 22 of 40 awards made and accounted for 36% of incentive funds awarded.

FY2021 Results[17]

Table 6: C&I Custom Program – Electric Results

Metric	Value
Total Participants	23
Total Projects	25
Annual kWh Savings	7,043,743
Lifetime kWh Savings	102,547,310
Efficiency Maine Costs	$2,207,603
Participant Costs	$2,415,261
Lifetime Energy Benefit	$10,575,335
Benefit-to-Cost Ratio	2.29

Table 7: C&I Custom Program – Thermal Results[18]

Metric	Value	
	Natural Gas	Unregulated Fuels
Total Participants	3	4
Total Projects	3	5
Annual MMBtu Savings	9,456	6,044
Lifetime MMBtu Savings	144,658	88,131
Efficiency Maine Costs	$292,421	$384,137
Participant Costs	$341,284	$405,980
Lifetime Energy Benefit	$1,004,938	$1,502,670
Benefit-to-Cost Ratio	1.59	1.90

FY2021 Analysis

Projects at cannabis cultivation facilities dominated the C&I Custom Program activity in FY2021 due to a combination of two factors. First, though the medical cannabis market has been active in Maine since the late 1990s, the recent legalization of recreational adult use[19] led to considerable sector expansion. Second, in October 2020, the Efficiency Maine Board of Trustees adopted a new policy to allow program eligibility for any project located at a cannabis-related business.[20] Maine's cannabis growers – some

[17] Several custom projects achieved a blend of electric and thermal savings in FY2021. The results associated with each fuel type are reported in the corresponding tables. Participant figures are therefore repeated; overall, the C&I Custom Program closed projects with 25 distinct participants in FY2021.

[18] Because the program expended all available Maine Natural Gas funds before the end of FY2021, it used $73,266 in RGGI funds to supplement two natural gas project incentives. The costs and savings associated with these two projects are therefore split between the Natural Gas and Unregulated Fuels columns based on the pro-rata share of MNG and RGGI incentive funds, respectively.

[19] In November 2016, Maine voters approved the recreational use, retail sale and taxation of cannabis. During the 128th Legislature, a 17-member legislative committee was convened to overhaul the Marijuana Legalization Act (MLA) passed by voters. After a lengthy process, An Act To Implement a Regulatory Structure for Adult Use Marijuana became law on May 2, 2018. LD 719—An Act To Amend the Adult Use Marijuana Law was enacted in June 2019, and authorized the newly formed Office of Marijuana Policy to proceed with final adoption of adult use rules. The first active adult use establishment licenses — including the first cultivation licenses — were issued on September 8, 2020.

[20] Efficiency Maine Trust Board Meeting, Minutes, October 7, 2020.

new, some existing, but all newly eligible for incentives – turned to the program for assistance in opting for higher-efficiency lighting and HVAC solutions than they would otherwise have chosen to pursue. As noted above, cannabis projects constituted 22 of 40 awards made and accounted for 36% of incentive funds awarded.

Initially, the Trust decided that all energy efficiency projects funded by the Trust at cannabis facilities would be administered through the C&I Custom Program. Over the course of FY2021, it became apparent to program staff that an in-depth custom analysis would not be required at a subset of these projects: horticultural lighting projects for indoor cannabis flower and vegetative rooms at facilities that do not have central HVAC systems (i.e., they have no potential for a reheat penalty associated with dehumidification loads.) Staff determined that these projects yield consistent, predictable savings across different cannabis growing facilities, and involve relatively simple and easily accessible equipment. As such, they are more efficiently administered through the C&I Prescriptive Program. The Trust will make this transition in early FY2022, freeing up considerable time for the C&I Custom Program team to focus on other priorities. Unless and until staff identifies additional prescriptive opportunities, all other cannabis projects will continue to fall under the C&I Custom Program in FY2022.

Over the past few years, the C&I Custom Program witnessed a slight downturn in participation from large, energy-intensive manufacturers while the statutory set-aside of RGGI funds for "affected customers" was in place. This legislative mandate resulted in complex program requirements for "affected customers" seeking to participate in the program, and also reduced available funding to the programs, both of which discouraged participation from some of the state's largest consumers in RGGI-funded projects.[21] Since the budget set-aside expired in FY2021, Staff has been working hard to rebuild connections and renew interest, and expects this effort to bear fruit in FY2022.

Participants in the C&I Custom Program relied primarily on outside contractors and vendors to identify energy efficiency opportunities in FY2021. In some cases, however, more complex projects required site-specific engineering beyond what most energy contractors or vendors were willing to explore on speculation. Accordingly, the program continued to offer support to overcome the lack of site-specific assessment and in-house expertise at customer facilities by providing free scoping audits to identify viable projects. The program also administered TA grants to support further development of complex projects.

As in FY2020, the scoping audit offering saw relatively limited uptake in FY2021 compared to prior years; the program completed one scoping audit (versus nine in FY2019 and 12 in FY2018). Staff attributes this decline largely to the COVID-19-related shutdowns that prohibited outside parties from gaining physical access to facilities. TA studies also saw modest uptake, continuing a trend that began several years ago. As in FY2019 and FY2020, the program completed one TA study in FY2021. These figures have declined steadily from a high of nine completed TA studies in FY2015. This trend reflects the proliferation of

[21] See Public Law, Chapter 498. 127th Maine Legislature, Second Regular Session. LD 1398 – An Act To Reduce Electric Rates for Maine Businesses. April 29, 2016.

smaller, less complex projects (most of which do not require advanced analysis through a specialized third party) participating in the program over the same time period.

While scoping audits and TA studies may not currently be in high demand, they remain an important element of the program for those who choose to take advantage of them. Activity from FY2015 through FY2020 suggests that, on average, 38% of scoping audits lead directly to project implementation in subsequent fiscal years. The data also show an average TA-to-project conversion rate of 75% for the same period. In addition to empowering and encouraging customers to move forward with meaningful energy efficiency projects, scoping audits and TA studies can help customers reduce costs. Moreover, the program scrutinizes the work of engineering firms and contractors, reducing the risk that customers will pay for inflated costs or unnecessary add-ons.

FY2022 Plans

- Transition a subset of cannabis projects to the C&I Prescriptive Program.
- Monitor the evolving federal policy landscape, assessing opportunities for targeted outreach to customers planning significant renovations, expansions, or development with the help of federal recovery and/or infrastructure funds.
- Focus on rebuilding connections and renewing program interest among the state's largest energy users.
- Develop and execute a targeted outreach campaign for R-22 chiller replacement projects. (Manufacturing R-22 refrigerant or importing it to the United States was banned effective January 1, 2020, and supplies of recycled R-22 are expected to diminish and become prohibitively expensive. As facilities with R-22 chillers make plans to replace equipment, the program is eager to influence purchasing decisions in favor of more efficient chiller options.)
- Work to accommodate the potential for a small number of custom project proposals from larger industrial customers. In the event that a project shows potential for significant, cost-effective electricity savings but exceeds the program's $1 million incentive limit, the Trust may work with customers to bring a specific funding request to the Public Utilities Commission (PUC) to be considered for funding through a long-term capacity contract.

Commercial and Industrial Prescriptive Program

The Commercial and Industrial Prescriptive (CIP) Program offers fixed-price financial incentives for a predefined list of "off-the-shelf," widely available efficiency measures. Typical measures promoted through this program include lighting fixtures; heating and cooling systems; and sector-specific solutions, such as compressed air equipment and agricultural equipment. These measures have practical applications across the state in commercial, industrial, non-profit, government, and other institutional settings.

Commercial and Industrial Prescriptive Program

Sectors Served

- Commercial and Industrial
- Small Businesses
- Multifamily (≥5 units)
- Institutions

Funds Invested

- Electric Efficiency Procurement
- Natural Gas Efficiency Procurement
- Regional Greenhouse Gas Initiative
- Maine Power Reliability Program
- Forward Capacity Market

FY2021 Activities

Following are some program activity highlights for FY2021:

- Incentivized 1,147 lighting projects, 2,183 heat pumps,[22] and 106 other heating measures.
- Launched two Funding Opportunity Notices (FONs), offering enhanced incentives for specific measures in targeted sectors:
    - *Small Municipalities FON* – Targeted lighting and single-zone high performance heat pump projects in small rural municipalities. Invested over $410,000 to support 83 municipalities. Leveraged a heat pump incentive adder from The Nature Conservancy in Maine, totaling more than $188,000 in supplementary funding.
    - *Hospitality Sector FON* – Targeted lighting, HVAC, and refrigeration equipment in the hospitality industry (e.g., restaurants, hotels, motels, etc.). Invested over $230,000 in 12 efficiency projects.
- Completed an additional three FONs, initiated in FY2020:
    - *Packaged Terminal Heat Pump (PHTP) Retrofits FON* – Targeted PHTP (a new prescriptive measure) retrofits in the lodging sector, including at hotels, motels, inns, and bed and breakfasts.
    - *School Lighting FON* – Targeted lighting retrofits in schools during the summer break.
    - *Parking and Pole Lighting Retrofits FON* – Targeted outdoor lighting and pole-mounted LED upgrades to businesses.

[22] The Trust bases its count of units on a "heat pump equivalent" to accommodate the diversity of systems installed across the residential and commercial sectors. The Trust assumes that one "heat pump equivalent" is counted for every 25.1 MMBtu/year of heat provided. This metric is based on the modeled performance of a single residential heat pump in with an AHRI-rated HSPF between 10 and 12.5.

- Continued to engage with the Qualified Partner (QP) network and other contractors to connect customers with efficiency incentives.
- Continued use of the Trust's Cost-effective Lighting Investment Calculator (CLIC) tool, which enables contractors to assess the cost-effectiveness of retrofitting individual lighting fixtures in a given project while on site, as well as to prepare all documents to close a project (e.g., scope of work, customer acceptance, bill of materials).
- Participated in virtual workshops and conferences to provide information to vendors on the program.
- Added incentives for efficient refrigeration equipment for commercial kitchens.
- Worked to build out awareness and education about the new, enhanced heat pump incentives available for small businesses.

FY2021 Results

Table 8: C&I Prescriptive Program – Electric Results

Metric	Value
Total Participants	1,221
Total Projects	1,649
Annual kWh Savings	39,961,358
Lifetime kWh Savings	514,756,912
Efficiency Maine Costs	$9,263,812
Participant Costs	$11,762,204
Lifetime Energy Benefit	$55,627,462
Benefit-to-Cost Ratio	2.65

Table 9: C&I Prescriptive Program – Thermal Results

	Value	
Metric	Natural Gas	Unregulated Fuels
Total Participants	20	22
Total Projects	21	24
Annual MMBtu Savings	13,565	20,105
Lifetime MMBtu Savings	320,780	404,202
Efficiency Maine Costs	$179,975	$443,131
Participant Costs	$47,882	$722,784
Lifetime Energy Benefit	$2,030,495	$6,332,393
Benefit-to-Cost Ratio	8.91	5.43

FY2021 Analysis

The program started to see accelerated uptake in the variable refrigerant flow (VRF) form of heat pump technology as well as heat pumps for small businesses in the marketplace. In FY2021, the program explored new C&I applications in Maine's marketplace that could benefit from the technology. All new measures will continue to be a priority in FY2022. The program also introduced new eligible measures and incentives for vertical packaged terminal heat pumps, energy recovery ventilators, refrigeration equipment, and more.

The program was able to continue investing in energy savings projects despite ongoing restrictions and marketplace hesitation due to COVID-19. The use of FONs for targeted businesses and organizations helped to keep businesses engaged and to get funds invested for the program. Participation from customers that are typically hard to reach, like small municipalities, can be stimulated by the enhanced incentives, targeted marketing and outreach, and limited-time offers. Additionally, the FON process provides more direct engagement and support, helping customers successfully complete energy projects. These FONs continued to be inspired by the Trust's desire to stimulate job opportunities for electrical contractors and supply houses during the economic downturn caused by the pandemic.

FY2022 Plans

- Launch cannabis horticultural lighting measures.
- Establish and meet with a heating, ventilation, and cooling (HVAC) advisory group of vendors to discuss program ideas.
- Add field staff to the team to enhance outreach and program support.
- Research the viability of enhancing prescriptive lighting incentives.
- Explore opportunities to offer a do-it-yourself commercial bathroom faucet measure.
- Investigate and develop commercial service water heater measure.
- Incentivize a broad range of off-the-shelf energy efficiency measures as well as targeted incentives for sector-specific solutions for key C&I customer sectors, including municipalities and local schools.
- Collaborate with participating distributors and QPs to market available incentives and discounts.
- Continue to focus on lighting retrofits by prioritizing the proactive replacement of inefficient existing fixtures.
- Accelerate electric heating and cooling solutions in the larger (greater than five units) multifamily sector.
- Engage the QP network with monthly newsletters and webinars, frequent website updates, participation in sector conferences, and ongoing distributor events.

Small Business Initiative

Small Business Initiative

Sectors Served

- Small Businesses

Funds Invested

- Electric Efficiency Procurement
- Regional Greenhouse Gas Initiative

The Small Business Initiative (SBI) delivers efficiency retrofits directly to Maine's small businesses. In FY2021, the initiative focused on lighting and heat pump upgrade opportunities at businesses that have a peak demand of 25 kW or less. The initiative combines local marketing, competitive product pricing, and contractor support with streamlined delivery to incentivize customers in targeted geographic areas. This approach is designed to overcome the specific barriers to energy efficiency that small businesses experience. These barriers include the lack of time and in-house expertise to analyze energy options, the relatively low priority that contractors place on assessing and marketing opportunities at smaller businesses, and the perceived inconvenience of making arrangements to purchase and install upgraded equipment. This initiative reduces these obstacles by bringing information and technical support to the customer's doorstep, managing the overall project, and providing enhanced financial incentives (compared to the incentives of the Commercial and Industrial Prescriptive Program) and accessible financing.

FY2021 Activities

Following are some program activity highlights for FY2021:

- Launched initiative in the Bucksport area; Belfast area; Belgrade Lakes area; and the Lewiston area.
- Completed projects that were developed in FY2020 for Calais area; Dover-Foxcroft area; Millinocket area; and Brewer area.
- Used utility data to identify and prioritize eligible small businesses for targeted outreach (phone calls, in-person sales calls, and business-reply postcards).
- Launched new heat pump retrofit incentive offering for small businesses statewide as well as an enhance incentive in targeted regions who were participating in an active SBI effort or who completed lighting projects in the past ("SBI grads"). Mailed SBI grads and businesses in active SBI areas promotional coupons for an additional $400 off an eligible heat pump system. (Participants could apply the coupons for up to three systems, representing a total potential enhanced incentive of $1,200 above the standard CIP incentive.)
- Launched financing option for small businesses conducting heat pump projects, with the option to also include lighting retrofits.

FY2021 Results[23]

Table 10: Small Business Initiative – Electric Results

Metric	Value
Total Participants	305
Total Projects	381
Annual kWh Savings	2,263,944
Lifetime kWh Savings	29,431,165
Efficiency Maine Costs	$1,777,859
Participant Costs	$998,939
Lifetime Energy Benefit	$5,145,108
Benefit-to-Cost Ratio	1.85

Table 11: Small Business Initiative – Thermal Results

	Value
Metric	Unregulated Fuels
Total Participants	235
Total Projects	282
Annual MMBtu Savings	11,264
Lifetime MMBtu Savings	168,954
Efficiency Maine Costs	$1,011,850
Participant Costs	$2,549,471
Lifetime Energy Benefit	$4,415,923
Benefit-to-Cost Ratio	1.24

FY2021 Analysis

The initiative had a significant impact in multiple rural regions and relatively small urban areas, supporting 381 lighting retrofits and 554[24] high performance heat pumps in small businesses. The initiative's Small Business Cost-effective Lighting Investment Calculator (SLIC) tool continued to allow contractors to screen small business projects on a measure level rather than for the bundled collection of measures in the project as a whole, which gives more confidence that all project elements were cost-effective. The tool also gives the flexibility to specify hours of use, allowing more seasonal businesses to participate in the program. The tool is a valuable resource that helps contractors to quickly develop and close on upgrade opportunities, and that provides customers with detailed information on project costs and benefits.

Using customer data from electric utilities to target marketing and outreach strategies continued to be an important element of the program. This data allowed the initiative to better reach eligible businesses

[23] Table 10 reflects electric results associated with lighting projects. Table 11 reflects the thermal results associated with heat pump retrofits.

[24] The Trust bases its count of units on a "heat pump equivalent" to accommodate the diversity of systems installed across the residential and commercial sectors. The Trust assumes that one "heat pump equivalent" is counted for every 25.1 MMBtu/year of heat provided. This metric is based on the modeled performance of a single residential heat pump in with an AHRI-rated HSPF between 10 and 12.5.

and to send tailored case studies and business reply cards to eligible customers to advertise the program and quickly enroll interested businesses. Outreach strategies included direct mail, phone calls, in-person sales calls, and partnering with local organizations.

In FY2021, the initiative expanded from enhanced lighting incentives for targeted areas of the state to incentives for retrofit heat pumps to all small businesses with peak demand of 25 kW or less across the state. Higher incentives were paired with a new financing option, to help reduce the first-cost barrier faced by many businesses. Small businesses in active SBI geographic areas – as well as SBI grads in areas serviced by SBI in prior months and years – received a bonus incentive (in the form of a time-limited coupon) if they installed heat pumps in addition to the more typical SBI lighting solutions. As with any new initiative, interest in the heat pump incentives started slowly, as customers and vendors became familiar with the offer and planned their projects. Some vendors reported that competition with heat pump activity in the residential sector limited the ability for the same installers and suppliers to pursue small business projects. In the end, the initiative incentivized 554 heat pumps.

The initiative continues to explore how best to address customer barriers to energy-efficient lighting and heat pumps. While the program is designed to overcome some of the barriers experienced by small businesses, the turnkey approach, enhanced incentives, and significant savings are still not enough for some business owners to move forward with cost-effective projects. The initiative will continue to explore ways to help more small businesses in a given area, while keeping administrative and delivery costs as low as possible.

The initiative experienced some participation hesitancy due to COVID-19, but overall the year met the expectations of the program staff. The initiative will continue to push direct outreach to businesses in the following areas in an effort to boost participation: Biddeford and Saco, Winter Harbor area, Brunswick and Topsham, the Bath area, and Camden and Wiscasset. Staff will also prepare to launch a statewide approach starting in FY2023.

FY2022 Plans

- Continue initiatives to emphasize coverage in rural regions and relatively small urban areas.
- Complete all open projects in the Bucksport, Belfast, and the Belgrade Lakes areas that were started in FY2021.
- Increase attention to updates on the QP website and SBI customer support.
- Prepare to shift to a statewide approach in FY2023 for reaching small businesses.

Distributor Initiatives

Distributor Initiatives offers incentives for energy-efficient products 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. This midstream program leverages relationships with distributors of energy-efficient products to provide instant product discounts and to distribute technology information at the point of purchase. In FY2021, the covered measures included heat pump water heaters, electronically commutated motor (ECM) circulator pumps for boiler systems, oil and propane boilers and furnaces, natural gas water heaters, natural gas combination (combi) boilers, screw-in LED bulbs, and smart thermostats for natural gas customers.

Distributor Initiatives

Sectors Served

- Commercial and Industrial
- Small Businesses
- Multifamily
- Residential
- Low-Income Households
- Institutions

Funds Invested

- Electric Efficiency Procurement
- Natural Gas Efficiency Procurement
- Regional Greenhouse Gas Initiative
- Maine Power Reliability Program

FY2021 Activities

Following are some program activity highlights for FY2021:

- Discounted 80,765 LED bulbs.
- Processed 7,247 instant discounts for heat pump water heaters, the most for this program in a single year. Based on survey results, the Trust estimates that 1,015 of these discounted heat pump water heaters were installed in low-income homes.[25]
- Provided discounts for 8,534 ECM circulator pumps, the most issued in a single year by the Trust.
- Provided discounts on 84 ENERGY STAR natural gas combi boilers and 9 ENERGY STAR natural gas tankless water heaters in the first full fiscal year of offering these measures through the distributor channel.
- Discontinued incentives for efficient oil boilers and furnaces mid-year in response to fully investing the budget allocated for these systems and to new climate-focused policy priorities.
- Launched a limited-time pilot for smart thermostats for natural gas customers in Bangor Natural Gas and Unitil territories. Provided a mail-in rebate of up to $200 for smart thermostats purchased through any channel (including through retail stores and online).

[25] As previously noted, in Triennial Plan IV the Trust directed a portion of the Low-Income Initiatives' electric budget to be invested in the Distributor Initiatives to capture heat pump water heater sales to low-income customers through these channels. The costs and savings associated with these sales at retail locations are not reflected in Table 12, but rather in the Low-Income Initiatives electric results in Table 17.

- Continued to track market share of heat pump water heaters and ECM circulator pumps by branch for each distributor and used this data to target product training where market share was lowest.
- Continued to focus marketing on manufacturers, distributors, installers, and property owners who are installing or replacing hot water heaters. Marketing efforts included in-distributor point-of-sale material, utility bill stuffers, emails, direct mail, e-newsletters, social media, digital ads, and the Efficiency Maine website. Avenues requiring more in-person activity, including consumer shows, counter days, industry trade shows, field visits, and in-distributor presentations, were put on hold or significantly limited due to COVID-19 restrictions.

FY2021 Results

Table 12: Distributor Initiatives – Electric Results

Metric	Value
Total Bulbs	80,765
Total Equipment	17,232
Annual kWh Savings	22,474,617
Lifetime kWh Savings	286,191,294
Efficiency Maine Costs	$7,445,951
Participant Costs	$2,188,923
Lifetime Energy Benefit	$28,383,858
Benefit-to-Cost Ratio	2.95

Table 13: Distributor Initiatives – Thermal Results

Metric	Value	
	Natural Gas	Unregulated Fuels
Total Participants	485	2,382
Total Projects	567	2,382
Annual MMBtu Savings	5,468	11,586
Lifetime MMBtu Savings	71,869	289,661
Efficiency Maine Costs	$124,999	$896,699
Participant Costs	$127,590	$299,150
Lifetime Energy Benefit	$554,333	$5,241,724
Benefit-to-Cost Ratio	2.19	4.38

FY2021 Analysis

In FY2021, the program offered distributors an incentive to sell heat pump water heaters for no more than $300. The incentive helped keep the price of heat pump water heaters competitive with standard electric water heaters, driving considerable demand. The program also updated its marketing materials to target plumbers, who are the primary customers of the distributors. By the end of the year, distributors reported that heat pump water heaters constituted 60% of the top-selling electric water heaters, compared to the national average of 2%.

Prior to FY2020, the Trust offered incentives for commercial ECM circulator pumps through the Commercial and Industrial Prescriptive Program. The Trust saw a substantial increase in demand when it moved this incentive to an instant discount on both residential and commercial measures through Distributor Initiatives. At the time, the program also increased the instant discount for the ECM circulator pumps and added an administrative stipend for distributors, helping to further drive sales. Momentum continued to build significantly in FY2021 as more plumbers tried and accepted the new technology at the discounted price. Indeed, ECM rebate activity nearly doubled over FY2020 levels. By the end of the year, distributors reported that ECM circulator pumps accounted for 44% of top selling circulator pumps.

Distributor Initiatives launched new incentives for residential natural gas space and water heating systems in the latter half of FY2020. Prior to that launch, incentives for residential natural gas measures took the form of mail-in rebates offered through HESP. In the first full year of offering these measures through the distributor channel, the Trust saw fewer overall rebates compared to the mail-in forms used through the HESP channel in FY2019. The Trust will continue to work with distributors to build familiarity with the incentives and to encourage their use. This program design is intended to remove barriers associated with covering an upfront incremental cost and better captures emergency replacements.

Distributor Initiatives launched a limited-time smart thermostat pilot for natural gas customers in Bangor Natural Gas and Unitil utility territories.[26] The program provided a mail-in rebate of up to $200 for smart thermostats purchased through any channel (including through retail stores and online). Though the measure was not generally purchased at a distributor, the Trust ran the pilot through Distributor Initiatives as a way to complement the other measures offered to natural gas customers. Using contact information from the natural gas utilities, the Trust sent targeted email offers to all eligible customers. Because funding for the pilot was limited, the program allowed customers to reserve their rebate funds to avoid adverse reliance. Once customers installed the device and submitted photographic evidence along with their rebate claim forms, the program paid out the incentive; in this way, the program design overcame the typical realization rate challenges that energy efficiency programs see with do-it-yourself (DIY) measures. The initiative was popular, with 474 units rebated in approximately 11 weeks.

The program discontinued incentives on oil and propane boilers and furnaces in February once the program fully invested the RGGI funds that had been budgeted for that purpose. The Board of Trustees decided that it would no longer use limited RGGI funds to support measures that emit significant GHGs, reasoning that oil and propane customers pay no conservation or carbon fees to help fund program incentives, and that the perpetuation of these measures is inconsistent with the carbon reduction targets established in Maine statute[27] and with the priorities and recommendations made in the climate action plan.[28]

The COVID-19 pandemic presented some challenges to the program in FY2021 in terms of gaining access to stores for outreach and merchandizing. Indeed, several distributors were closed to outside visitors for

[26] The incentive offering was not available to Maine Natural Gas customers as the program had expended all available FY2021 MNG funds by the time it launched. The Trust does not provide residential rebates to Summit Natural Gas customers.
[27] Title 38 MRS §576-A.
[28] Maine Climate Council, *Maine Won't Wait: A Four-Year Plan for Climate Action*, December 2020.

part of the year. Overall, however, because the program targets emergency replacements, COVID-19 did not have a significant impact on program activity.

FY2022 Plans

- Continue to provide in-store support for product training, best practice sharing, in-store signage, and marketing materials.
- Evaluate additional ways to capture more market share and increase uptake of ECM circulator pumps.
- Evaluate program design and lessons learned from smart thermostat pilot, determining whether to conduct another promotion in FY2022 and, if so, whether under Distributor Initiatives or under Retail Initiatives.

Retail Initiatives

Retail Initiatives focuses on energy-saving measures that sell in relatively high volumes through retail stores and that, on average and through typical usage, achieve predictable energy savings.

The program leverages relationships with retailers to promote Efficiency Maine's mail-in rebates or instant discounts on energy-efficient products. Of all the Trust's programs, Retail Initiatives reaches the largest number of Maine customers; it also serves all sectors of the economy.

Retail Initiatives

Sectors Served

- Commercial and Industrial
- Small Businesses
- Multifamily
- Residential
- Low-Income Households
- Institutions

Funds Invested

- Electric Efficiency Procurement
- Maine Power Reliability Program

FY2021 Activities

Following are some program activity highlights for FY2021:

- Processed 2,925 heat pump water heater rebates. Based on survey results, the Trust estimates that 415 of these discounted heat pump water heaters were installed in low-income homes.[29]
- Piloted an instant discount at a single retailer for heat pump water heaters as an alternative to the existing mail-in rebate, driving the considerable uptick in program activity.
- Tracked market share of heat pump water heaters by store to help manufacturers target training support.
- Continued to focus marketing on customers who are replacing products that are at or near the end of their useful life. Marketing activities included targeted online advertising for emergency replacement search terms (e.g., "broken water heater"), education of installers and retail store personnel about high-efficiency options and rebates, and distribution of in-store signage.
- The Trust's field representatives negotiated with store managers for retail merchandising space for energy-efficient consumer products and ensured a steady supply of inventory by working with department personnel to time their reordering.
- Discounted more than 1.4 million high-efficiency LED bulbs at retailers. The Trust's strategy focused on discounting some of the most common types of bulbs in combination with favorable product placement in stores.
- Reduced incentives on room air purifiers from $50 to $25 in November to adjust for updated market information on the prices of the units on the shelf. Rebated 710 units, compared to more than 1,400 in FY2020.

[29] As in the Distributor Initiatives, the Trust directed a portion of the Low-Income Initiatives' FY2021 electric budget to be invested in the Retail Initiatives to capture heat pump water heater sales to low-income customers through these channels. The costs and savings associated with these sales at retail locations are not reflected in Table 14, but rather in the Low-Income Initiatives electric results in Table 17.

- Incentivized 6,703 ENERGY STAR-certified clothes washers and 164 thermostatic low-flow shower valves.

FY2021 Results

Table 14: Retail Initiatives – Electric Results

Metric	Value
Total Bulbs	1,444,155
Total Equipment	10,561
Annual kWh Savings	39,109,578
Lifetime kWh Savings	226,218,840
Efficiency Maine Costs	$7,344,323
Participant Costs	$4,157,977
Lifetime Energy Benefit	$37,282,824
Benefit-to-Cost Ratio	3.24

FY2021 Analysis

The program continued its lighting marketing model from FY2020, focusing on "off-shelf" placement and promotion of select LED bulbs. This approach concentrated available rebate and marketing funds on a select group of the most cost-effective and common LED bulb types, ensuring that the program stretched funding as far as possible.

Mail-in rebates for heat pump water heaters continued to be offered through retail stores during FY2021. Though different retailers set slightly different starting prices on the units, the rebate generally brought the final price down to between $249-$349. The price of heat pump water heaters increased in FY2021, but the program worked with some manufacturers to hold off on price increases in Maine through the end of the year.

At the same time, the program launched a pilot initiative using an instant discount barcode available through a smartphone app, only at Home Depot. The Trust's limited instant discount offer was contingent upon stores agreeing to lower the price of a heat pump water heater to a guaranteed $249. The promotion effectively overcame the "first-cost barrier," allowing customers to get a lower price on the product without needing to wait up to six weeks for a rebate check as commonly occurs with standard rebate programs.

FY2022 Plans

- Continue to offer off-shelf marketing incentives to retailers for favorable LED product placement.
- Explore ways to provide instant discounts for heat pump water heaters in a way that does not adversely impact retailers' accounting model and inventory logistics.
- Continue to offer rebates that make the price of heat pump water heaters competitive with the baseline electric resistance water heater.
- Continue to monitor market share for heat pump water heaters to help retailers target training for sales associates.
- Continue to monitor and adjust incentives to align with changes in market prices.

Home Energy Savings Program

The Home Energy Savings Program (HESP) drives market-based home weatherization and installation of efficient heating systems by offering rebates and loans, providing customer and vendor education, and developing and maintaining a vendor network. HESP encourages energy upgrades in single-family homes and multifamily homes with up to four units.

Home Energy Savings Program

Sectors Served

- Residential
- Multifamily (2-4 units)

Funds Invested

- Electric Efficiency Procurement
- Regional Greenhouse Gas Initiative
- Maine Power Reliability Program
- Forward Capacity Market
- Federal/Other

FY2021 Activities

Following are some program activity highlights for FY2021:

- Incentivized 23,376 heat pumps, representing a 123% increase compared to FY2020 and a 177% increase compared to FY2019.[30]
- Reduced incentives on heat pumps by 20% in the spring to manage the program budget in the face of unprecedented demand. Also slowed heat pump marketing and outreach activity.
- Experienced relatively low demand for building envelope improvement projects; provided 2,991 rebates, representing an 8% increase compared to FY2020, but a 12% decrease compared to FY2019.
- Added 158 new Residential Registered Vendors (RRVs) to the Efficiency Maine network, 149 of whom are heat pump installers.
- Replaced on-site inspections for heat pumps with virtual inspections in response to restrictions related to COVID-19. Suspended all building envelope project inspections in response to these restrictions.
- Presented at 10 events and 8 training workshops (mostly virtually) over the course of the fall, winter, and spring, increasing program awareness among customers and contractors.
- Offered loans for all of Efficiency Maine's residential measures and saw an increase in demand for financing driven primarily by the overall increase in demand for heat pumps.[31]

[30] In FY2021, the Trust refined its methodology for counting heat pump units. Prior to FY2020, each *indoor* unit counted as one heat pump. In FY2020, the Trust switched its approach to count each *outdoor* unit as one heat pump unit, regardless of the number of indoor units served. This year, the Trust is basing its count of units on a "heat pump equivalent" to accommodate the diversity of systems installed across the residential and commercial sectors. The Trust assumes that one "heat pump equivalent" is counted for every 25.1 MMBtu/year of heat provided. This metric is based on the modeled performance of a single residential heat pump in with an Air Conditioning, Heating and Refrigeration Institute (AHRI)-rated Heating Seasonal Performance Factor (HSPF) between 10 and 12.5. In order to compare equivalent metrics, this annual report uses the "heat pump equivalent" figure to calculate the year-over-year percent change.

[31] The Trust offered loans (including Property Assessed Clean Energy [PACE] loans, which are secured by a lien on a property, and unsecured Home Energy Loans) to help residential customers take advantage of energy efficiency

- Rolled out "program liaison" service, assigning a dedicated program delivery team member to top-performing RRVs. Program liaisons performed regular outreach to participating RRVs to provide program collateral (e.g., brochures), take suggestions, and answer any questions. The program also provided training scholarships and matched RRV marketing dollars.
- Piloted online rebate processing with subset of top-performing RRVs.

FY2021 Results

Table 15: Home Energy Savings Program – Electric Results

Metric	Value
Total Participants	14,491
Total Projects	14,570
Annual kWh Savings	53,489,129
Lifetime kWh Savings	962,804,321
Efficiency Maine Costs	$15,481,618
Participant Costs	$34,926,865
Lifetime Energy Benefit	$93,453,680
Benefit-to-Cost Ratio	1.85

Table 16: Home Energy Savings Program – Thermal Results

Metric	Value
	Unregulated Fuels
Total Participants	1,716
Total Projects	1,721
Annual MMBtu Savings	35,006
Lifetime MMBtu Savings	814,879
Efficiency Maine Costs	$3,202,948
Participant Costs	$10,388,773
Lifetime Energy Benefit	$18,576,716
Benefit-to-Cost Ratio	1.37

FY2021 Analysis

Lower oil prices and restrictions due to COVID-19 continued to slow demand for weatherization in FY2021. Weatherization projects typically require prolonged contractor presence in a home. The Trust speculates that some of the decline in demand for weatherization this past year was due to homeowners' concerns about the level of risk associated with doing this type of work during the pandemic.

On the other hand, FY2021 was another record year for heat pump installations through HESP. Several factors converged in late FY2020 and early FY2021 that may have contributed to the sharp increase in program participation. In FY2020, with the new statutory goal of installing 100,000 high-performance heat pumps in Maine over five years, the program enhanced rebates, increased marketing, and

opportunities. In FY2021, the Trust loaned out $7,613,020 for 1,121 projects with low-income and non-low-income customers, compared to $5,805,900 for 874 projects in FY2020.

instituted a new basic training module for vendors to drive heat pump activity and ensure quality installations in a fast-growing market.[32] The Governor's announcement of the newly enacted state goal received significant coverage in the press, and many people found themselves spending more time at home starting in spring of 2020 due to COVID-19 restrictions. Also, the summer of 2020 (beginning of FY2021) was the third warmest on record. With more than 50,000 heat pumps installed in Maine by the beginning of FY2021, there was a large network of satisfied customers who helped market the product through word-of-mouth. Surveys show very high satisfaction with the equipment and over 93% surveyed said they recommended heat pumps to friends and family. Finally, most Mainers received stimulus money from the federal government increasing their disposable income. The combination of these factors led to a significant jump in purchases of heat pumps. This growth in activity emerged despite the concurrent drop in oil prices and was seemingly unaffected by the program's reduced incentives in late FY2021. It was also the primary contributing factor in the increase in residential loan activity in FY2021.

FY2022 Plans

- Develop and launch program design changes and expanded marketing and outreach to work towards doubling the current pace of weatherization activity to advance the new statutory goal of weatherizing 35,000 homes and businesses between 2021 and 2030.[33]
- Continue to drive heat pump volume to help meet Maine's statutory goals of installing 100,000 high-performance heat pumps over five years (through FY2025)[34] and, by 2030 having at least 115,000 households in the State wholly heated by heat pumps and an additional 130,000 households in the State partially heated by heat pumps."[35]
- Continue to roll out options for online rebate processing.
- Continue to revise and hone the program eligibility and incentives based on feedback from contractors and other stakeholders.

[32] In June 2019, the Maine Legislature enacted LD 1766 – *An Act To Transform Maine's Heat Pump Market To Advance Economic Security and Climate Objectives*. The new law established a goal of installing 100,000 new high-performance heat pumps in Maine over five years. It directed the Trust to use 100% of FCM revenue toward this goal.

[33] 35-A MRS §10104(4)(F)(2). This goal was established by the Maine Climate Council in 2020 and codified in statute by the 130th Legislature in 2021.

[34] 35-A MRS §10119(2)(A)(2).

[35] 35-A MRS §10104(4)(F)(7). This goal was established by the Maine Climate Council in 2020 and codified in statute by the 130th Legislature in 2021.

Low-Income Initiatives

The Trust delivered energy-efficiency benefits to low-income customers through a portfolio of initiatives in FY2021. These initiatives targeted energy conservation funding to eligible households through three channels:

- *Direct installation* of conservation measures, where the Trust covers up to 100% of the cost of equipment and installation, and oversees contractor support.
- *Market-based initiatives*, where low-income customers participate in the programs that the Trust offers to all residential customers, and where low-income customers may be eligible for enhanced rebates;
- *Direct-mail campaigns*, where eligible customers receive an offer for free, do-it-yourself (DIY) energy-saving devices, along with a postage-paid order form.

Low-Income Initiatives

Sectors Served

- Low-Income Households
- Multifamily

Funds Invested

- Electric Efficiency Procurement
- Regional Greenhouse Gas Initiative
- Maine Power Reliability Program
- Forward Capacity Market
- New England Clean Energy Connect Settlement Funds

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

FY2021 Activities

Following are some program activity highlights for FY2021:

- Provided incentives to support the installation of 557 heat pump water heaters in low-income homes having electric resistance water heaters. Launched new incentives for tankless coil replacements in the spring, supporting the installation of an additional 54 new heat pump water heaters.[36] Under this direct installation initiative, the program covered 100% of the project costs.
- Launched a new direct installation initiative to assess and provide weatherization services to low-income households at no cost to the customer. Experienced limited consumer uptake; identified 16 opportunities and completed five installations.
- Observed considerable uptick in the market-based heat pump initiative for low- and moderate-income households; incentivized 1,213 heat pumps in FY2021 versus 312 in FY2020.
- Continued to offer at least six hours of free air sealing with a home energy assessment as well as enhanced incentives for insulation upgrades. The program incentivized 239 measures through this market-based initiative in FY2021, versus 58 in FY2020.

[36] The Trust leveraged new NECEC settlement funds (Low-Income Customer Benefits Fund) to support tankless coil replacements.

- Received and fulfilled 12,448 kit requests for free DIY energy-saving kits (LED bulbs, low-flow showerheads, and faucet aerators), representing a continued decline in activity in the direct-mail initiative.
- Replaced on-site heat pump and heat pump water heater inspections with virtual inspections in response to restrictions related to COVID-19. Suspended all building envelope project inspections in response to these restrictions.
- Coordinated with the Maine State Housing Authority (MaineHousing), which administers a program that offers eligible households a no-cost heat pump installation through Community Action Agencies (CAAs). Synchronized program design changes and performed a project audit to prevent households from receiving heat pump incentives from both programs.
- Launched an Affordable Housing Pilot, providing incentives for developers of affordable housing projects to upgrade their designs to meet Passive House standards. The Pilot offered an incentive valued at 3% of the project's originally proposed construction costs for projects that meet the target standards. The program was marketed to nine projects in FY2021, and two projects (60 units each) applied for consideration to move forward in the Pilot. Awards will be made in FY2022.
- Continued to partner with the Maine Department of Health and Human Services (DHHS) to reach an expanded universe of eligible participants for low-income initiatives (i.e., households that qualified to receive assistance through *any* state or federal means-tested, low-income program).
- Paused work with AmeriCorps volunteers through Maine Campus Compact initiative due to COVID-19 precautions.
- Continued to support the electric utilities' Arrearage Management Program (AMP),[37] providing eligible customers with information and analysis about their energy use, energy-saving tips, offers for free DIY electricity-use-reduction kits, and outreach material for the Trust's other low-income program offerings. Staff prioritized direct-install heat pump water heater projects and other electricity-saving measures for these customers.
- Convened quarterly meetings of the Low-Income Advisory Group (a gathering of stakeholders, including the Office of the Public Advocate, the Public Utilities Commission, low-income advocates, state and local housing authorities, tribal group representatives, utilities, and CAAs) to collaborate on the Trust's offerings. The Advisory Group coordinated with other low-income programs and resources across the state, provided status reports on implementation, and gained valuable insights on program design and implementation.
- Raised awareness about the Trust's low income incentive offerings at various events, including a York Energy Committee meeting, a Kennebec Valley Board of Realtors meeting, GrowSmart Maine's Windham Weatherization event, a WindowDressers meeting, a session with the Neighborhood United Church of Christ in Bath, a Belfast Climate Crisis Committee meeting, a Kittery Town Council Climate Adaptation Committee meeting, an Eastport Area on Aging event,

[37] A Maine law enacted in April 2014 requires each electric utility to offer AMP initiatives. The AMP legislation was intended to help reduce the number of low-income customers in arrears on their electric bills and, therefore, lower the "bad debt" burden to ratepayers that is associated with customers who fail to pay their utility bills.

the Planeteers Climate Action Plan Talks, Green and Healthy Maine's Home & Energy Chats webinar, and A Climate to Thrive's heat pump event.

FY2021 Results

Table 17: Low-Income Initiatives – Electric Results

Metric	Value
Total Participants	14,926
Total Projects	14,926
Annual kWh Savings	10,509,982
Lifetime kWh Savings	119,996,942
Efficiency Maine Costs	$3,269,356
Participant Costs	$454,789
Lifetime Energy Benefit	$14,850,406
Benefit-to-Cost Ratio	3.99

Table 18: Low-Income Initiatives – Thermal Results

Metric	Value
	Unregulated Fuels
Total Participants	1,571
Total Projects	1,571
Annual MMBtu Savings	30,630
Lifetime MMBtu Savings	551,242
Efficiency Maine Costs	$3,355,459
Participant Costs	$7,660,046
Lifetime Energy Benefit	$15,134,197
Benefit-to-Cost Ratio	1.37

FY2021 Analysis

Activity in the program's heat pump water heater direct-install initiative remained relatively steady in FY2021. Despite an increase in the price of heat pump water heaters, participating distributors held the Trust's negotiated low price through the end of the fiscal year. The Trust focused its first iteration of the new tankless coil replacement measure on households with the largest LIHEAP benefit to target those low-income Mainers with the highest energy burden.

The Trust's new direct installation weatherization offering was less successful. The initiative intended to target eligible customers who were unlikely to receive similar upgrades from MaineHousing, and to work in close coordination with the state's CAAs to identify appropriate opportunities. Managing the initiative in a way that avoided confusing or detrimental overlap between similar initiatives proved challenging. Parties were concerned that households opting for the Trust's offering would miss out on some of the additional supports provided by the CAAs, including health and safety improvements. Ultimately the Trust worked closely with one CAA – the Opportunity Alliance – to identify roughly 16 potential opportunities in Cumberland County, five of which completed installations. Based on this experience, the Trust decided to focus its efforts on low- and moderate-income households who can

contribute a modest copay (a market-based initiative), leaving CAAs to target the state's neediest households through their direct-install initiatives.

In FY2020, the program launched new incentives and expanded eligibility requirements for high-performance heat pumps in an effort to drive activity in support of the state's new statutory goal of installing 100,000 high-performance heat pumps in Maine over five years.[38] Participants in Low Income Home Energy Assistance Program (LIHEAP) continued to access higher incentives for high-performance heat pumps if they decided to not pursue opportunities through MaineHousing. Meanwhile, the program expanded the number of moderate-income households eligible for higher incentives by setting property value thresholds by county instead of the prior approach to setting an $80,000 value statewide. The Trust also adjusted the property value thresholds for a subset of counties where activity was low, leading to a slight uptick in rebates in those areas.

While activity in FY2020 was relatively slow, the program saw significant growth as it took root in FY2021. As mentioned in the Home Energy Savings Program chapter, several factors may have contributed to the sharp increase in program participation:

- the new statutory goal of installing 100,000 high-performance heat pumps in Maine over five years;
- enhanced rebates;
- increased marketing;
- more time spent at home due to COVID-19 restrictions;
- the third warmest summer on record;
- word of mouth from the large network of satisfied customers; and
- federal stimulus money in response to the COVID-19 situation, increasing household disposable income.

Additionally, when the Trust became aware of supply challenges for the more efficient heat pump models (achieving a Heating Seasonal Performance Factor (HSPF) of 13 or greater) initially required for this initiative, it reduced the requirement to 12.5 HSPF to maintain program momentum.

The program's market-based weatherization activity increased in FY2021, partly as a result of the adjustments to eligibility established by qualifying property values. The program also sent targeted weatherization marketing brochures to all participants in the market-based heat pump program to drive further participation.

Collaborating with DHHS to reach low-income households continued to represent a significant outreach opportunity in FY2021. Prior to FY2019, the Trust relied on the LIHEAP list of 38,000 households, which

[38] In June 2019, the Maine Legislature enacted LD 1766 – *An Act To Transform Maine's Heat Pump Market To Advance Economic Security and Climate Objectives*. The new law establishes a goal of installing 100,000 new high-performance heat pumps in Maine over five years. It directs the Trust to use 100% of FCM revenue toward this goal.

is maintained by MaineHousing. There are 205,000 households on the DHHS list.[39] By providing materials to DHHS to send to its mailing list, the program was able to reduce delivery costs and provide cost-effective energy efficiency to low-income homes. At the same time, the Trust saw a continued decline in the number of DIY kit requests, suggesting that the pool of interested households is diminishing as the program may be saturating the demand available from the DHHS list.

The Trust did not install any natural gas measures through Low-Income Initiatives in FY2021. The program's successful collaboration in FY2019 with the City of Lewiston to identify potential sites and conduct landlord outreach set the stage for similar partnerships in other towns and natural gas territories in the future. Even collaborating with housing and other community-related organizations, the Trust was unable to identify similar projects in other cities of a size that aligned with available funding. Staff began looking for additional opportunities to install smart thermostats in multifamily buildings fueled by natural gas but had to postpone that initiative due to the COVID-19 restrictions.

FY2022 Plans

- Design and launch expanded market-based weatherization initiative to support new statutory goal to weatherize at least 10,000 low-income households between 2020 and 2030.[40] Leverage American Rescue Plan Act (ARPA) funds for this purpose, supporting increased incentives and expanded marketing and outreach.
- Drive demand for heat pump water heaters in low-income homes and invite new distributors to participate in the program.
- Drive demand for high-performance heat pumps in low-income homes to help meet Maine's statutory goals of installing 100,000 high-performance heat pumps over five years (through FY2025)[41] and, by 2030 achieving at least 115,000 households in the State wholly heated by heat pumps and an additional 130,000 households in the State partially heated by heat pumps."[42]
- Award Affordable Housing Pilot incentives. Track projects and disburse payments according to project milestones.
- Collaborate with the Distributor Initiatives program to offer smart thermostats to low-income natural gas customers.

[39] 2021 data from DHHS. This figure represents an increase from 175,000 households in 2019.
[40] 35-A MRS §10104(4)(F)(2). This goal was established by the Maine Climate Council in 2020 and codified in statute by the 130th Legislature in 2021.
[41] 35-A MRS §10119(2)(A)(2).
[42] 35-A MRS §10104(4)(F)(7). This goal was established by the Maine Climate Council in 2020 and codified in statute by the 130th Legislature in 2021.

Renewable Energy Demonstration Grants

Renewable Energy Demonstration Grants

Sectors Served

- Institutions (non-profits and municipalities only)

Funds Invested

- Energy Efficiency and Renewable Resource Fund

The Renewable Energy Demonstration Grants support the promotion, research, design, and demonstration of emerging clean-energy technologies. The initiative is funded by the Energy Efficiency and Renewable Resource Fund (EERRF), a revenue stream composed of voluntary contributions from electric ratepayers, as well as funds from electricity suppliers that elect to meet their renewable portfolio standard obligations through alternative compliance payments.[43] Past projects have included solar photovoltaic (PV) installations, solar hot-air systems, biomass boilers, and district heating. Projects are selected through a competitive bidding process; grant awards are provided for applications of renewable energy technologies that demonstrate uses for renewable technologies and that support community facilities.[44] Revenues to this fund have been very limited in recent years. For this reason, the staff leverages the funds by periodically issuing competitive bids and using the grant award mechanism.

FY2021 Activities

Following are some activity highlights for FY2021:

- Continued to monitor the implementation of one remaining project awarded under an FY2018 request for proposals (RFP). This RFP targeted cost-effective renewable energy technologies in affordable housing settings and sought to demonstrate models for transferring investment benefits to residents.
- As required by statute, passed 35% of the EERRF annual revenues through to the Maine Technology Institute (MTI) to help promote businesses, whether non-profit or for-profit, engaged in research and development of renewables.

FY2021 Results

The Trust does not require grantees to report savings associated with projects awarded through Renewable Energy Demonstration Grants.

FY2021 Analysis

As part of the FY2018 RFP, the Trust awarded the Portland Housing Development Corporation a grant of $83,444 to install a 45.4 kW rooftop solar array on the Portland Housing Authority's new 58 Boyd Street

[43] See 35-A MRS §10121.

[44] The cost-effectiveness of the Renewable Energy Demonstration Grants initiative is determined using the Modified Participant Cost Test (MPCT). This approach contrasts with all other Trust programs, which determine cost-effectiveness by considering both participant and program administrator costs.

development. The mixed-use building, known as “Solterra,” includes 40 affordable rental housing units. The solar panels will provide enough electricity to power all common area heating and cooling systems, interior and exterior lighting, and hot water, as well as all onsite commercial office space. The project will leverage value of energy savings to subsidize internet service for low-income residents. Though installation was completed in October 2020, the project remains open; the grantee plans to hold a public event and submit a final report in FY2022.

Before FY2018, the last time that the Trust issued an RFP for Renewable Energy Demonstration Grants was FY2014. From FY2015 to FY2017, the Trust determined that revenues were insufficient to conduct a meaningful solicitation for new projects. By FY2018, however, the pool of accumulated EERRF funds was substantial enough to support a robust RFP. Having committed the bulk of those funds in FY2019, the Trust is once again allowing revenues to accumulate so that it may offer a larger solicitation for proposals in the future.

FY2022 Plans

Staff will finalize the Portland Housing Development Corporation project in FY2022, disbursing final grant payments and assisting with plans for community education and outreach activities. The Trust will evaluate whether funding is sufficient to conduct a new project solicitation in FY2022. As directed by statute, the Trust will continue to pass 35% of annual revenues through to MTI to help promote research and development of renewables.

Electric Vehicle Initiatives

The Trust administers programs to expand availability of electric vehicle (EV) charging infrastructure (also referred to as EV supply equipment [EVSE]) and the adoption of EVs in Maine. Its programs provide instant rebates for eligible vehicles at participating car dealers in Maine and grants to fund the installation of EV charging infrastructure in Maine.

Electric Vehicle Initiatives

Sectors Served

- Commercial and Industrial
- Small Businesses
- Multifamily
- Residential
- Low-Income Households
- Institutions

Funds Invested

- Volkswagen Settlement Funds
- Maine Public Utilities Commission (MPUC) Pilot Grant

Initial funding for these EV initiatives came from the settlement of lawsuits against Volkswagen (VW) for violating environmental protection laws. Beginning in FY2021, the Trust also received funds from the New England Clean Energy Connect (NECEC) settlement, to be used for increasing the number of EVs in Maine and expanding access to EV charging. The Trust was awarded additional funding from the Maine Public Utilities Commission (PUC) for a pilot project to support beneficial electrification in the transportation sector.

FY2021 Activities

Following are some activity highlights for FY2021:

Charging:

- Oversaw the completion of Phase I of the Trust's EV Charging Initiative to install direct current (DC) Fast Charging (also called "Level 3") and Level 2 charging stations at seven targeted locations along priority corridors in southern and western Maine. Each site includes two dual-plug 62.5 kW Level 3 chargers and one dual-plug Level 2 charger. The final site, located at Hannaford on Route 302 in North Windham, was activated on March 17, 2021.
- Issued two rounds of Request for Proposals (RFPs) for Level 2 public charging stations at public locations (such as municipal lots, college campuses, general stores, and hotels), workplaces, and multifamily dwellings across Maine.
- Awarded funds to install 86 Level 2 charger plugs at 23 businesses, workplaces, state agencies, and universities across the state.
- Awarded funds through a "Phase III" RFP to install pairs of DC Fast Chargers at seven sites in central and eastern Maine. The new chargers will be in Fairfield, Newport, Bangor, Auburn, Lewiston, Belfast, and Ellsworth.
- Continued to expand access to EV chargers and educational materials about charging through the MPUC-funded Pilot Program to Support Beneficial Electrification of the Transportation Sector. The

Trust awarded rebates for 54 public Level 2 charging plugs at 11 host sites, for a total of $194,051 in awards. Staff continued to develop "how-to" manuals and instructional videos for prospective and recent EV owners. While plans for "show and tell" events remain on hold due to COVID-19, the Trust plans to re-start these events to help prospective customers get more familiar with EVs when it becomes safe to do so.

Vehicles:

- Continued to administer point-of-sale rebates for EVs, including enhanced rebates for qualified low-income customers, Maine governmental entities, tribal governments, and select non-profits.
- Increased the rebate amounts for qualified low-income customers and introduced rebates on used EVs for those customers.
- Launched promotional incentives for governmental entities, tribal governments, and select non-profits that are listed in the "211 Maine" directory of service providers and have 501(c)(3) status. Entities that purchased or leased vehicles through this promotion were also eligible for a rebate on a Level 2 charger.
- Authorized 12 new car dealerships in Maine to participate in the EV Rebate Program, bringing the total number of Participating EV Dealers to 67.
- Maintained a list of approximately 11 BEVs and 12 PHEVs eligible for rebates.
- Provided a total of 1,127 EV rebates in FY2021. Of those, 512 were for BEVs and 615 were for PHEVs. 68 rebates went to governmental entities, and 5 were enhanced rebates for qualified low-income customers.
- Issued 11 Level 2 charger rebates to governmental entities that also received a rebate on an EV.
- Distributed a bi-monthly newsletter to Participating EV Dealers containing program statistics and updates.
- Launched a Participating EV Dealer Portal webpage to help dealers navigate the EV rebate process. Content includes dealer training videos, rebate program instructions, and links to required forms and documents.

Education and Marketing:

- Expanded Public Service Announcement radio campaign to include 4 radio stations in the Bangor area and 3 stations in the Portland area. Announcements addressed common barriers to EV adoption such as range anxiety and public charging accessibility.
- Continued to run a robust digital advertising campaign to disseminate information about the rebates and the benefits of switching to an EV.
- Continued to build out webpages on Efficiency Maine's website dedicated to comprehensive public information about EVs, EV charging education, and how to access Efficiency Maine rebates.
- Presented EV program updates at stakeholder meetings such as Drive Electric Maine, the Transportation Working Group of the Maine Climate Council, and local climate action groups.
- Co-sponsored an international panel on EV technology and business opportunities hosted by E2Tech in partnership with the Province of Quebec.

FY2021 Results

Table 19: EV Initiatives Results[45]

Metric	Value
Total EV Rebates	1,127
Total Level 2 Plugs Awarded	86
Total Level 3 Plugs Awarded	14
Annual Gasoline Savings (MMBtu)	62,876
Annual Electricity Used for Charging Rebated EVs (kWh)	(3,134,160)
Lifetime Energy Savings (MMBtu)	1,029,974
Efficiency Maine Costs	$2,701,687
Participant Costs	$13,044,262
Lifetime Energy Benefit	$15,736,324
Benefit-to-Cost Ratio	1.01

FY2021 Analysis

The Trust continued to grow and implement its suite of EV initiatives. In FY2021, these initiatives—focused on vehicle charging infrastructure and EV adoption—were funded primarily by approximately $8.2 million from settlements of two successful lawsuits against the car manufacturer group headed by VW for violation of air pollution and consumer protection laws. The initiatives are also funded by a portion of the NECEC settlement designated towards expanding the use of EVs and the availability of EV charging infrastructure in Maine.[46]

One initiative focuses on expanding EV charging infrastructure. The Trust developed this initiative in collaboration with the Maine Department of Transportation, the Maine Department of Environmental Protection, and the Governor's Energy Office. Including input from EV stakeholders, the Trust developed a plan consisting of three phases to strategically locate and expand the publicly available EV charging infrastructure in Maine.

The Trust completed Phase I, an effort to establish the foundation of Maine's publicly accessible Level 3 charger network. Many projects awarded under Phase II, an effort to improve local access and destination charging with publicly available Level 2 chargers, are completed and available for use. In February 2021, the Trust issued an RFP for Phase III to expand Maine's DC Fast Charging network north and east. Through this RFP, the Trust awarded seven new sites from Lewiston/Auburn to Ellsworth along

[45] As explained in n. 12 and repeated here for convenience, for the Electric Vehicles Initiatives, the Trust reports on energy savings associated with rebates for EVs, but does not claim savings for EV chargers (EVSE). Lifetime energy savings reflect gasoline savings associated with rebated EVs, net of the increased electricity use associated with charging those EVs (converted to MMBtu). Efficiency Maine Costs include those associated with both EV rebates *and* EVSE ($2,477,241 and $224,446, respectively). Participant Costs reflect those associated with EV rebates only (not EVSE); they reflect both the customers' share of the incremental costs to purchase the vehicle and new electricity costs associated with charging those EVs. But they do not reflect avoided maintenance costs, which can be significant. The Benefit-to-Cost ratio reported for Electric Vehicle Initiatives reflects cost and savings associated with EV rebates only (not EVSE).

[46] The EV Initiatives did not expend any NECEC settlement funds in FY2021 but made awards that will do so in future fiscal years.

I-95 and Route 1. These sites will be owned and operated by multiple awardees, including a chain of service stations and a chain of grocery stores.

The Trust's EV Rebate program, launched in August 2019, offers instant rebates through participating car dealers in Maine and for vehicles purchased directly from the manufacturer. The program offers enhanced incentives for qualified low-income Maine residents, Maine governmental entities, tribal governments, and select non-profits. The Trust has placed particular emphasis on building a comprehensive public information campaign to reduce barriers to EV adoption and raise awareness about Efficiency Maine's rebates and EV charging initiatives.

The Trust saw significant growth in demand for EV rebates during FY2021, despite the pandemic and the global slowdown in auto sales. The volume of EV rebates more than doubled in the first half of 2021, reaching the highest six-month average rate of any period since the start of the program.

In December of 2021, the Trust launched new, higher rebate amounts for qualified low-income customers and introduced rebates on used EVs to those same customers. These changes were introduced with the recognition that low-income customers face higher first cost barriers to purchasing EVs than other customers. At the same time, the Trust launched promotional rebates for governmental entities, tribal governments, and select non-profits. These incentives were as high as $12,000 for governmental entities and tribal governments purchasing a BEV. This elevated incentive, when combined with generous factory incentives from several manufacturers, resulted in low- or even no-cost lease deals for some municipalities and school districts. The incentive was popular and gave many municipalities the chance to demonstrate the viability of EV technology in large and small towns across the state.

FY2022 Plans

- Issue two additional rounds of competitive solicitations for publicly accessible Level 2 chargers using the remainder of the MPUC pilot project funding and NECEC funding.
- Issue a third round of competitive solicitation for publicly accessible Level 3 fast chargers to extend the DC Fast Charging network north and east through Aroostook and Washington Counties to the New Brunswick border.
- Develop and disseminate three "how-to" guides and an accompanying suite of instructional videos to educate prospective and recent EV buyers about the essential elements of EV ownership, with an emphasis on charging.
- Launch a renewed Public Service Announcement campaign through radio, web advertising, social media, and earned media to disseminate basic information about EV ownership and charging.
- Continue to improve and expand the Trust's comprehensive library of EV information in print and online.
- Develop special promotions for customer groups facing the highest barriers to EV adoption such as low-income customers, businesses, and rural EV drivers.
- Resume the planning and execution of in-person events that have been on hold due to COVID-19-related restrictions, following state and local COVID-19 guidelines.

Strategic Initiatives

Evaluation, Measurement, and Verification

The Trust's evaluation, measurement, and verification (EM&V) activities provide research and data-driven analysis to inform program design and delivery strategies, verify program results, and facilitate continuous program and organizational improvement. The Trust carries out these activities using a combination of in-house initiatives and subcontracted, independent third-party reviews performed by firms that specialize in the evaluation of energy efficiency programs.

FY2021 Activities

Following are some activity highlights for FY2021:

- *Triennial Plan Studies* - The Trust completed the following opportunity studies to better understand the potential for cost-effective energy savings and the market channels for energy efficiency measures under the next triennial plan:
    a. Baseline Assessment of Residential New Construction
    b. Baseline Assessment of HVAC Equipment in Businesses
    c. Update of 2018 Lighting Opportunity Projections
    d. Custom, Refrigeration and Compressed Air Potential Assessment
    e. Non-Transmission Alternative Assessment
    f. Demand Management Program Assessment
    g. Storage Demand Response Study
    h. Statewide Marginal Avoided Costs for the electricity grid's transmission and distribution (T&D) Study.
- *Triennial Plan Proceedings* - Staff prepared materials for the Trust's filings at the Maine Public Utilities Commission (PUC) related to the current Triennial Plan, including the FY2021 Annual Update, scenario development, and sensitivities related to cost-effectiveness and budget levels.
- *Technical Reference Manual (TRM) Updates* - The Trust's TRMs memorialize the methods and assumptions used to calculate energy and demand savings. The Trust made updates to the TRM assumptions as new information became available in order to improve the accuracy of claimed savings.
- *FCM M&V Compliance Review* - The Trust completed its annual Forward Capacity Market (FCM) Measurement and Verification (M&V) Compliance Review. The review found that the Trust's methods and assumptions for calculating peak summer demand savings at the portfolio level are estimated at ±4.83% relative precision with 80% confidence, exceeding the requirement of the Independent System Operator for New England (ISO-NE). The ISO-NE standard is that the relative precision of the portfolio not exceed ±10% with 80% confidence.
- *Customer Surveys* - Trust staff conducted a series of online surveys with customers who had received heat pump water heater rebates, heat pump rebates, or participated in the Small Business Initiative (SBI). The surveys captured customer feedback on the type of purchase decision contemporaneous with the date of the purchase.

- *Program Evaluations* – The Trust kicked off an independent evaluation of residential heat pumps to assess achieved savings for installations under the Home Energy Savings Program and Low-Income Initiatives. The commercial heat pump evaluation team installed meters on 79 heat pump systems in 52 businesses in the Fall of FY2021 to record 9-12 months of usage. The Trust published online the results of the SBI Impact Evaluation and the Retail and Distributor Lighting Impact Evaluation.
- *Avoided Cost* Study – The Trust sponsored and participated in the regional avoided cost study performed by Synapse Energy Economics. The study findings were published in the Avoided Energy Supply Components in New England: 2021 Report (AESC 2021). The Synapse team developed AESC 2021 on behalf of a group of regional stakeholders including the Trust, other program administrators, utilities, regulators, and advocates from across New England. These parties all provided input to the study through a collaborative and open process. The results of this study and the Maine Avoided Transmission and Distribution Costs Study establish the avoided costs used in the Trust's cost effectiveness analysis.
- *Studies* - The Trust completed a study of residential EV charging behavior. The findings of this study will support the Trust's EV Initiatives and the Innovation Program. The Trust also completed a detailed cost assessment of heating system installations in new homes. The Trust also launched two studies, one metering homes heated primarily with heat pumps and another assessing customer satisfaction and installation considerations for variable refrigerant flow systems.
- *effRT 2*.0[47] – The Trust transitioned the Retail Initiatives mail-in and Distributor Initiatives rebate claim processing to the effRT 2.0 platform.

FY2022 Plans

Following are some activities planned for FY2022:

- Publish periodic updates to the TRMs as new information becomes available.
- Conduct studies in support of Triennial Plan V.
- Roll out real-time, ongoing customer surveys on other programs.
- Seek opportunities to expand the use of utility interval data and modern analytics in the performance of its EM&V activities.

[47] effRT 2.0 is the multi-program database that supports the Trust's reporting and project activity tracking.

Innovation

The Trust's Innovation Program provides funding to conduct pilot projects that demonstrate new types of energy efficiency, conservation, or alternative energy measures, and 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 greenhouse gas savings but are not yet well understood or established in the Maine marketplace. The measures piloted may or may not prove to be cost-effective or popular. Part of the purpose of the Innovation Program is to use smaller projects to generate findings about cost-effectiveness and market demand before making larger commitments of resources that a full-scale program entails.

FY2021 Activities

Following are some Innovation Program activity highlights for FY2021:

- Completed the Aggregated Demand Energy Resource (DER) Load Management Pilot
- Monitored progress on the Level 2 Electric Vehicle (EV) Smart Charging Study
- Monitored progress on the Commercial Battery Storage Load Management Pilot
- Launched the Cold Storage Facility Load Management Pilot
- Launched the Isle au Haut Thermal Energy Storage Load Management Pilot
- Launched the Commercial Split-System Heat Pump Water Heater Demonstration Pilot
- Launched the Heat Pump Optimization with Integrated Thermostats Pilot
- Awarded a contract for the Whole Home Heat Pump Solutions Pilot

FY2021 Results

The Trust completed the Aggregated Demand Energy Resource Load Management Pilot in FY2021. This pilot controlled a mix of 44 residential DERs (including high-performance heat pumps, heat pump water heaters, EV chargers, and battery storage systems) using digital signals via a third-party internet platform. Once the DER fleet of 44 devices was installed and commissioned, the provider simulated a variety of load-shaping scenarios, demonstrating the ability of DERs to participate in and respond to time-varying pricing, discrete dispatch events, and (simulated) wholesale regional markets.

Overall, EV chargers and battery storage systems demonstrated the highest potential for cost-effective load shifting. EV chargers have a peak design capacity of close to 7.5 kW, more than five times the peak demand of an average home. Additionally, customers are accepting of delaying vehicle charging to off-peak hours as long as the car is fully charged in the morning. Batteries are highly responsive to programmed events, making them ideal resources to shape peaks. The pilot also found that the primary driver for battery purchases is to secure back-up power during outages. Generally, batteries are too expensive to satisfy the Trust's cost-effectiveness test if the test accounts for the full cost of the battery and its installation. However, if a customer has already decided to purchase (and pay for) a battery for

reliability, the relatively minor incremental cost of adding controls and providing financial incentives to manage demand are more than offset by the economic benefits, making the measure cost-effective.

Heat pump water heaters and heat pumps proved less economically viable as a load management DER in the immediate future. The main reason is that these technologies are so efficient to begin with; the amount of load that can be shifted with these technologies is relatively small on a per-measure basis. Therefore, a significant volume of measures would be required to achieve meaningful demand impacts. This volume would make aggregator integration complex and impose some challenges to scale. Considering the costs of controls, customer acquisition and administration compared to the modest demand impact, the Trust will continue to monitor the associated technology and avoided costs (e.g., electricity rates) to determine when these technologies would be cost-effective and thus suitable for inclusion in a load shifting program.

Based on the results of this pilot, the Trust plans to offer incentives for load shifting through EV chargers and batteries during the Triennial Plan V under its new Demand Management Program's Load Shifting Initiative.

FY2021 Analysis

Throughout FY2021, the Trust continued to monitor progress in the Level 2 EV Smart Charging Study. The aim of this pilot is to test the effectiveness of two load management strategies for residential EV charging: (1) smart networked EV chargers with off-peak charging scheduled as the default, and (2) simulated time-of-use rates. The Trust is comparing the two interventions (each with a goal of 50 participants) against the control group (of roughly 160 participants) to test the effectiveness of each. The pilot is measuring the timing and magnitude of the peak shift and the costs associated with charging in each of the three scenarios. For the first group, the Trust is providing participants with financial incentives if they refrain from opting out of their smart chargers' pre-programmed off-peak charging schedules. For the second group, the Trust is simulating the benefit of off-peak time-of-use rates by offering an incentive when participants maintain at least 90% of their charging off peak. The participants' smart chargers report energy consumption, time of charging, and overall pilot compliance to the Trust. Preliminary results from FY2021 suggest that the managed charging interventions are successfully shifting EV charging demand, with both groups charging off-peak at roughly equal rates (averaging 77%). The Trust will continue the interventions through March of FY2022 and aim to review the final results in the next annual report.

The Trust also monitored activity on its Commercial Battery Storage Load Management Pilot in FY2021. This pilot involves the deployment of remote and automated dispatch signals to three businesses with solar-powered battery storage installations. The contractor will simulate potential revenue streams from ancillary grid services, measuring potential benefits to the customer and electric ratepayers. The contractor completed equipment installations in FY2020 and initiated the test year in FY2021. The Trust plans to review the data in FY2022 and report on the results of this pilot in the next annual report.

Among the new Innovation pilots launched in FY2021 was the Cold Storage Facility Load Management Pilot. This pilot will implement passive load management using phase change material (PCM) technology

in cold storage applications at food production facilities and warehouses. The provider will deploy and evaluate the impact of PCM-based thermal storage technologies with advanced controls. Four participants enrolled and installed equipment in FY2021. The Trust will likely review preliminary results of this pilot in FY2022.

The Trust also launched the Isle au Haut Thermal Energy Storage Load Management Pilot in FY2021. This pilot is designed to leverage the thermal storage capacity of various air-to-thermal storage heat pumps (including air-to-water heat pumps, air-to-phase change material [PCM] heat pumps and refrigeration loads) as a way to store the energy from abundant daytime solar production (during hours when it would have low-value or be wasted) and deploy it in evening and nighttime hours. After considerable delays associated with the COVID-19 pandemic, the project equipment was delivered and installed in FY2021. The data collection period will begin in FY2022.

In addition to launching load management-related pilots in FY2021, the Trust also initiated a pilot aiming to incentivize demonstration projects that use split-system heat pump water heaters cost-effectively in commercial water heating settings (the Commercial Split-System Heat Pump Water Heater Demonstration Pilot). The pilot will recruit commercial participants willing to install heat pump water heater systems for primary heating or preheating of domestic and process water, and measure the benefits of these systems over time. The provider initiated its participant acquisition phase in FY2021, targeting long-term care facilities and multifamily housing.

Finally, the Trust initiated two heat-pump related pilots in FY2021. First, it launched the Heat Pump Optimization with Integrated Thermostats Pilot to test whether heat pump usage can be increased, and overall heating cost decreased, by controlling both a heat pump and a central system with one integrated control. In FY2021, the provider began recruiting participants and installing metering equipment. In FY2022, the provider will monitor heat pump and central systems usage throughout the heating season and review preliminary results.

Second, the Trust awarded a contract to manage the Whole Home Heat Pump Solutions Pilot. This pilot aims to identify and test a whole home heat pump solution that can directly replace an existing heating system in a mobile home or stick-built home. This heat pump system should replace 100% of the heat load of an existing structure currently heated by a delivered fuel. The project will include researching and proposing specific equipment that can be placed in existing mobile or stick-built homes, recruiting Maine installers and customers to implement the proposed technology, and metering and analyzing data collected from those participants. The Trust will launch this pilot in FY2022 and report on its results in a future annual report.

FY2022 Plans

- Analyze and report on results from the Commercial Battery Storage Load Management Pilot.
- Analyze and report on results from the Level 2 Smart Charing pilot.
- Review preliminary results from the Cold Storage Facility Load Management Pilot.
- Initiate data gathering and analysis stages of the Isle au Haut Thermal Energy Storage Load Management Pilot.

- Continue participant recruitment and initiate data gathering in the Commercial Split-System Heat Pump Water Heater Demonstration Pilot
- Continue participant recruitment and initiate data gathering in the Heat Pump Optimization with Integrated Thermostats Pilot.
- Launch the Whole Home Heat Pump Solutions Pilot.
- Identify ideas for new innovation pilots and issue solicitations, as appropriate.

Public Information and Outreach

The Trust reaches 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, media relations, social media, events, and other activities to help consumers consider energy saving options as they purchase lighting, appliances, commercial and industrial equipment, home improvements, or passenger vehicles. The Trust seeks to foster energy savings by increasing awareness of the benefits of cost-effective, customer-sited energy resources and operating practices. It provides guidance on how to access its rebates and programs, as well as promotes workforce development and professional training relevant to energy conservation. Additionally, as Maine's energy efficiency program administrator, the Trust is frequently called on to participate in energy-related events and to provide input on energy policy issues.

FY2021 Activities

Following are some program activity highlights for FY2021:

- Expanded and continued to offer educational and training resources in person and through the Efficiency Maine Professional Training portal:
    - by introducing Building Energy Code training offered in partnership with the Maine Office of State Fire Marshal. Six free online courses on the residential and commercial energy provisions of Maine's new building code were conducted. More than 280 Code Enforcement Officers, architects and building trade professionals attended (115 attended the commercial sessions and 166 attended the residential sessions.).
    - by introducing training for participating dealerships about the Trust's EV rebates.
    - by continuing to offer online training for Registered Residential Vendors and Qualified Partners, including the Efficiency Maine Heat Pump Basics training.
    - by regularly supporting the Kennebec Valley Community College Heat Pump Installer Class.
- Enhanced informational web resources (available on the Efficiency Maine website – efficiencymaine.com) about heat pumps; electric vehicles (EVs); and residential, commercial, and industrial solutions. Over the course of FY2021, the website averaged close to 24,631 visits per month.
- Supported a growing EV Program by developing the first in a series of three "How to" guides -- How to Select and Install a Home EV Charger -- and the first in a series of eight to 10 instructional videos – Charging Your EV: Ways to Pay.
- Relaunched the Efficiency Maine Electricity Monitor Loaner program by distributing updated monitors and kits to 58 Maine libraries, which serve more than 316,000 Mainers. Each kit includes an electricity monitor, and updated resource materials, such as the Energy Efficiency Tips booklet, instructions on how to use the electricity monitor, a poster for libraries to display that publicizes the availability of the kits, and educational activity worksheets for families and children.

- Continued the work of advisory groups to guide program design and implementation, including the Electric Vehicle (EV) Advisory Group and the Low-Income Advisory Group.
- Addressed several regional, national, and international meetings on heat pumps, electric vehicles, and beneficial electrification, including the ACEEE 2021 Energy Efficiency Finance Virtual Forum; the MI Power Grid New Technologies and Business Models workgroup of the Michigan Public Service Commission; and an international EV technology and business opportunities virtual panel organized and hosted by E2Tech in partnership with the Province of Quebec.
- Enhanced media outreach and social media activity to publicize the benefits of existing programs and to amplify positive media coverage.
- Participated in media interviews on energy efficiency issues and Efficiency Maine programs, including discussions and articles in The Atlantic magazine, Energy News Network, Portland Press Herald, Bangor Daily News, Mainebiz, Sun Journal, The Maine Monitor, The Ellsworth American, Morning Sentinel, The Eastern Gazette, The Times Record, The Piscataquis Observer, Green & Healthy Maine HOMES, WABI TV5, Channel 8 WMTW, WERU-FM 89.9, and more.
- Participated as panelists before a variety of gatherings of Maine businesses and residents. Hosts for these events included Maine professional associations, major Maine businesses, and local energy groups.
- Leveraged digital and radio advertising and social media platforms to advertise incentives, drive potential participants to the website, answer customer questions, and promote word-of-mouth information exchange among program participants and vendors.
- Answered customer inquiries related to the Trust's programs through the Trust's call center staffed by customer service agents. In FY2021, the call center averaged more than 1,840 calls, 860 emails, and 1,820 letters a month. In addition, the call center schedules quality assurance inspections, conducts website testing, fulfills requests for print materials, enrolls participants in the low-income free water heater program, issues 20-bulb-limit waivers for LED retailers, and enters loan application information for customers who are uncomfortable using the internet.
- Shared heat pump tips and informational kits with heat pump rebate recipients. Over the course of FY 2021, 16,788 kits (an average of 1,399 kits per month) were shipped to residential and commercial rebate recipients. The Trust also mailed and emailed seasonal heat pump tips to all heat pump rebate recipients.

FY2022 Plans

- Continue to develop and provide educational resources on key solutions and technologies, including weatherization, heat pumps, and EVs. This will include continuing to send heat pump kits to heat pump rebate recipients, continuing to enhance education resources for heat pump installers, contractors interested in building energy code updates, and participating EV dealers; and additional resources on reducing energy costs, and no- and low-cost strategies for reducing energy use.
- Provide industry training (online or virtually) for the growing trade ally community to accelerate the adoption of energy efficiency technologies and to assist Maine contractors in the transition to the 2015 edition of building energy codes.

- Continue to enhance the resources available on the website and via training offerings to municipalities and school administrators looking for additional opportunities to reduce their bills and lower carbon emissions.
- Continue to support beneficial electrification as an ongoing priority through programs that provide incentives for heat pumps, heat pump water heaters, EVs, and variable refrigerant flow systems.
- Continue to respond in a timely manner to media inquiries from online and broadcast outlets interested in learning more about Efficiency Maine programs or seeking commentary on topics of growing interest, such as beneficial electrification and EVs.
- Continue to improve the functionality, responsiveness, and usefulness of the online tools and resources available via the Efficiency Maine website.
- Continue to answer customer inquiries via phone and email through the call center.
- Continue to enhance resources, such as website information, guidebooks, and informational videos, for Mainers interested in learning about EVs and related charging infrastructure.
- Continue to participate in symposiums, conferences, and industry meetings to share program information with efficiency professionals and potential customers. These forums may continue to take the form of virtual conferences due to renewed COVID-19 restrictions.

Finance and Administration

Audit Results

The independent certified public accountant firm of Runyon, Kersteen, Ouellette, Inc., issued an audit report on the Trust's activities for the year ended June 30, 2021. The report covered the Trust's internal control over financial reporting and compliance with government accounting standards and financial statements. The report was unanimously accepted by the Board of Trustees on September 30, 2021.

The report of the audit of the Trust's financial statements delivered an "unmodified opinion" and found it "free from material misstatement" related to the Trust's internal controls. The auditors wrote:

> In our opinion, the financial statements … present fairly, in all material respects, the respective financial position of the governmental activities, the major fund, and the remaining fund information of Efficiency Maine Trust, as of June 30, 2021, and the respective changes in financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.[48]

As reported in the audit, the Trust's FY2021 revenues and expenditures are $66,250,484 and $65,592,989, respectively, plus another $72,256 sent to state agencies resulting in an increase to fund balance of $585,239. The Trust's governmental fund balance as of June 30, 2021 is $71,216,520 of which $49,690,654 is restricted for operations and programs and $21,525,866 is restricted for grant and revolving loan activity.

The Trust's revenues and expenditures for the 12 months of FY2021 are summarized in Table 20.[49]

[48] Efficiency Maine Trust, "Annual Financial Report for the Year Ended June 30, 2021," prepared by Runyon, Kersteen, Ouellette, Inc., September 30, 2021, at 2.
[49] Ibid., Statement 4, at 16.

Table 20: Statement of Revenues and Expenditures – Governmental Fund

	Special Revenue Fund
Revenues	
Alternative Compliance Mechanism	$ 352
Interest income:	
Investments	$ 83,396
Loans	$ 859,228
Other Income	$ 139,733
Electric Procurement	$ 32,239,050
Natural Gas Assessment	$ 1,129,000
Agricultural Fairs	160,849
Renewable Resource	$ 49,288
Maine Power Reliability Program settlement proceeds	$ 1,500,003
VW electric vehicle settlement proceeds	$ 3,667,157
NECEC settlement proceeds	$ 2,625,000
Forward Capacity Market credits	$ 9,072,415
Regional Greenhouse Gas Initiative proceeds	$ 14,725,013
Total Revenues	**$ 66,250,484**
Expenditures	
Low-Income Initiatives	$ 6,624,524
Retail Initiatives	7,344,746
Home Energy Savings Program	$ 19,305,282
Commercial and Industrial Prescriptive Program	$ 9,886,919
Commercial and Industrial Custom Program	$ 2,863,770
Commercial Small Business	$ 2,794,708
Distributor Initiatives	$ 8,467,516
Electric Vehicle Charging Stations	$ 224,445
Electric Vehicle Rebates	$ 2,470,866
Lead by Example	$ 6,375
Administration and Strategic Initiatives	$ 5,603,838
Total Expenditures	**$ 65,592,989**
Excess of Revenues over Expenditures	$ 657,495
Other Financing Uses:	
Intra-entity grants - state agencies	$ -72,256
Net change in fund balance	**$ 585,239**
Fund balance, beginning of year	**$ 70,631,281**
Fund balance, end of year	**$ 71,216,520**

Administration

In FY2021, Governor Mills appointed three new members to the Trust's Board of Trustees for three-year terms: Kenneth Colburn (Principal at Symbiotic Strategies LLC), Heather Furth (Owner of Orono Brewing Company), and Mark Isaacson (Manager at Competitive Energy Services [Retired]). Cycling off the Board were: Kenneth Fletcher (former Director of the Governor's Energy Office [GEO]), David Stapp (Chief Executive Officer/Chief Technology Officer of Peregrine Turbine Technologies), and Al Hodsdon (owner of A.E. Hodsdon Engineers).

The Board of Trustees elected the following officers in FY2021:

- Suzanne MacDonald, Chair
- Joan Welsch, Vice-Chair
- Glenn Poole, Treasurer
- James Boyle, Secretary

The Board of Trustees did not approve any changes to the Trust's administrative policies or regulations in FY2021.

Other Initiatives

In FY2021, the Trust spearheaded the implementation of several miscellaneous initiatives, some of which leverage or supplement the Trust's existing programs, and others that are stand-alone initiatives with unique characteristics. The Trust also engaged in various State, regional, and national forums and initiatives that advance the purposes for which the Trust was established. A brief description of these initiatives and forums follows.

Prescribed Initiatives

Non-Wires Alternatives

In 2019, the Legislature enacted LD 1181 – *An Act To Reduce Electricity Costs through Nonwires Alternatives*, amending the process for planning and approving investments in the electric utilities' transmission and distribution system. The new law incorporates a formal, independent process for the consideration of NWAs.[50] The law established an NWA Coordinator (NWAC) position within the Office of the Public Advocate (OPA) to review annual plans and individual project proposals. In these reviews, the law requires the Trust to analyze the potential for cost-effective NWA resources located on the customer's side of the meter (also called "behind the meter" or BTM) such as energy efficiency, distributed generation, load management, or energy storage. It assigns the Trust the role of developing and delivering all customer-sited NWA resources that are determined to be more cost-effective than the proposed transmission and distribution (T&D) system investments.

Fiscal year 2021 was an active year for the Trust and the NWAC as the team worked jointly to establish the processes and procedures to efficiently review the utilities' investment plans for their T&D systems. Those activities included:

- Fully developing a benefit-cost test that reflects the net present value of both the wires and nonwires solutions, including deferral value;
- Implementing data-sharing protocols among the utilities, the Trust, OPA, and the NWAC;
- Creating a data digester to aggregate customer interval meter data into an hourly load shape for any given section of a utility's distribution system;
- Working with the NWAC to review the utilities' annual plans filed under Docket 2020-00125 (Commission Initiated Inquiry of the Non-Wires Alternatives Investigation Process);
- Working on the proposed Section 31A wires upgrade in the Brunswick area, the NWAC and the Trust developed and delivered for consideration (still under review)[51] a non-wires alternative by combining the new additions of solar on the distribution system, the potential to install a large, behind-the-meter battery and other reconfigurations of the T&D system; and

[50] 35-A MRS §3131-3134.

[51] Maine Public Utilities Commission, Docket 2019-00309 (Request for Approval of Section 31 Rebuild Pertaining to Central Maine Power Company).

- Continuing to work with the NWAC to analyze an alternative, nonwires solution to the proposed wires rebuild of Section 80 in the Midcoast area.

Agricultural Fair Assistance Program

In 2019, the Legislature enacted LD 1186, An Act To Address Electricity Costs of Agricultural Fairs, requiring the Trust to administer a new program to help agricultural fairs reduce their electricity demand charges. The new law established the Agricultural Fair Assistance Program (AFAP) Fund to support this program. The Public Utilities Commission assesses each electric utility an amount necessary to collect the total value of demand charges paid by the roughly 25 agricultural fairs in the State during the prior year and transfers this amount to the AFAP Fund.[52] The law sunsets at the end of June 2024.

Most agricultural fairs only operate during a few days or weeks of the year. While their electricity usage can be significant during this specific timeframe, it is generally negligible for the remainder of the year. For those agricultural fairs that are classified as commercial and industrial electricity customers above a certain size, demand charges are based on the maximum amount of electricity used during a given interval during the billing period (typically the 15-minute period during which their demand is highest over the course of a month). Beyond the demand charge challenge, several market barriers prevent agricultural fairs from investing in energy cost-reduction measures. These include the upfront cost of the improvements and lack of technical expertise. Additionally, there is a "split incentive" at play; the powered equipment is generally owned and operated by the vendors and exhibitors, while the agricultural fairs pay the electricity bills. The vendors and exhibitors therefore do not have a strong incentive to invest in energy-efficient equipment, onsite generation, or load shifting.

In FY2020, the Trust assessed the opportunity for electricity cost-reduction measures at agricultural fairs. This involved conducting a customer survey, performing site visits, and analyzing utility data. This review identified considerable electricity usage from plug loads, including amusement rides, cooking equipment, refrigeration, ice machines, vending machines, water heaters, and fans. During evening hours, lighting loads were also significant. As expected, most electricity usage spiked during the fair's active period, and fell to close to zero when the fair was not active.

The Trust's C&I Prescriptive Initiatives offer incentives on energy-efficient products that could reduce electricity costs at fairs, including LED lights, high-efficiency HVAC equipment, high-efficiency compressed air systems and components, and certain agricultural equipment. However, the Trust determined that fairs do not have sufficient run-hours throughout a full year (and therefore would not save enough energy) for these measures to satisfy the Trust's traditional cost-effectiveness test and make them eligible for energy efficiency incentives. A further complexity, noted above, is that this type of equipment is generally owned and operated by the vendors and exhibitors, not the agricultural fairs themselves.

However, the Trust's analysis has determined that there are opportunities for onsite generation measures and support infrastructure (including, for example, portable generators, solar arrays,

[52] 35-A MRS §10124.

expanded electrical connection points) and operational changes (such as charging vendors and exhibitors for electricity usage) that have a higher likelihood of helping the fairs address their demand charges than traditional energy efficiency measures. In FY2021, the Trust secured an engineering contractor to conduct a more comprehensive assessment of these opportunities and generate specific program recommendations in FY2022. The program will work directly with the industry's trade organization—the Maine Association of Agricultural Fairs—on all marketing and outreach activities associated with its future incentive offerings in this initiative.

Energy Storage

In 2021, the Legislature enacted LD 528 – *An Act To Advance Energy Storage in Maine*, establishing a goal for energy storage system development of 300 MW of installed capacity by 2025 and 400 MW of installed capacity by 2030.[53] The bill also requires the Trust to evaluate options to expand opportunities to support storage measures that reduce or shift demand or balance load. The bill states that the Trust shall consider the following:

1. Expanding energy storage pilot projects and implementing any cost-effective pilot projects as statewide programs;
2. "Bring-your-own-device" programs in which customer-owned and customer-sited battery storage is aggregated and performance incentives are provided for reducing load at times of system peak;
3. Rebate or funding programs for energy storage paired with renewable energy for residential, commercial and industrial electricity customers; and
4. Customer education initiatives regarding demand management and energy storage, including education targeted to low-income and rural populations in the State.

The bill further states that the Trust shall report on these activities in the FY2021 Annual Report. To that end, below is a description of the Trust's existing initiatives and future plans regarding energy storage.

As described in the Innovation section, above, the Trust is exploring energy storage through two pilot projects. The first is the Aggregated Demand Energy Resource (DER) Load Management Pilot (completed in FY2021). This pilot controlled a mix of residential DERs using electronic signals via a third-party internet platform (VirtualPeaker) and simulated a variety of load-shaping scenarios. Among these DERs were 19 battery storage systems (specifically, Tesla wall pack systems.) The pilot aggregated these and other customer-owned and customer-sited devices, effectively testing a "bring-your-own device program." The pilot found that the primary driver for battery purchases among these customers is to secure back-up power during outages. Generally, batteries are too expensive to satisfy the Trust's cost-effectiveness test if the test accounts for the full cost of retrofitting a home or business to purchase and install the battery. However, if a customer has already paid to purchase and install a battery for reliability, the measure entails a relatively minor incremental cost to add controls and provide financial

[53] Public Law, Chapter 298, 130th Maine Legislature, First Regular Session, LD 528, An Act To Advance Energy Storage in Maine.

incentives to manage demand. These incremental costs are more than offset by the energy benefits that can be derived from the battery, making the measure cost-effective.

Based on the results of this pilot, the Trust plans to offer incentives for load shifting through batteries during the Triennial Plan V under its new Demand Management Program's Load Shifting Initiative. The program will work with residential and small business battery owners, providing performance incentives for reducing load during the summer peak capacity period. The Trust will also leverage customer-sited energy storage systems as a solution to both load growth constraints and reliability issues within any future NWA projects.

The second pilot is the ongoing Commercial Battery Storage Load Management Pilot, which has deployed batteries with automated dispatch paired with intermittent renewables (in this case solar), simulating potential revenue streams from ancillary grid services and measuring potential benefits to the customer and electric ratepayers. The preliminary findings from this pilot indicate that the cost of the controls and batteries may not be the most cost-effective deployment of batteries.

The bill also calls on the Trust to conduct a pilot program beginning January 1, 2022, to provide energy storage systems to critical care facilities, including but not limited to, hospitals, health care facilities, fire departments, emergency medical service departments, police departments, public safety buildings, emergency shelters and other facilities providing critical services. The total energy storage capacity deployed under the pilot program may not exceed 15 MW. The Trust is on track to timely launch this pilot and will provide notice and related information to interested parties before January 1, 2022.

State Energy Initiatives

Within Maine, the Trust monitors and participates in forums and initiatives with an eye to supporting policies and programs that will promote cost-effective energy conservation or greenhouse gas (GHG) reductions, consistent with the purposes given to the Trust in the Efficiency Maine Trust Act.

Legislature

In FY2021, the Trust participated in 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."[54] The Trust staff provided information, analysis, and testimony on matters directly relating to the Trust's programs and issues of energy conservation, customer-sited alternative energy systems, or reducing GHG emissions. A sampling of the bills that the Trust monitored or participated in discussing includes:

- LD 143 – An Act Regarding the Arrearage Management Program;
- LD 226 – An Act To Limit the Use of Hydrofluorocarbons To Fight Climate Change;
- LD 340 – An Act To Allow for the Establishment of Commercial Property Assessed Clean Energy (CPACE) Programs;

[54] 35-A MRS §10104(2)(B).

- LD 347 – An Act To Facilitate Maine's Climate Goals by Encouraging Use of Electric Vehicles;
- LD 385 – An Act To Amend Conflicts in and Make Other Changes to the Laws Governing the Efficiency Maine Trust;
- LD 528 – An Act to Advance Energy Storage in Maine;
- LD 551 – An Act to Accelerate Weatherization Efforts in the State;
- LD 597 – An Act to Establish the Thermal Energy Investment Program;
- LD 815 – An Act to Support School Decarbonization;
- LD 940 – An Act To Establish Appliance Energy and Water Standards;
- LD 1554 – An Act to Provide Climate Change Transition Assistance for Maine's Energy-intensive Businesses;
- LD 1659 – An Act To Create the Maine Clean Energy and Sustainability Accelerator; and,
- LD 1733 – An Act To Provide Allocations for the Distribution of State Fiscal Recovery Funds.

Governor's Energy Office and Governor's Office of Policy Innovation and the Future

The Trust worked with the Governor's Energy Office (GEO) to report energy data and program results to the U.S. Department of Energy (DOE), Maine's federal delegation, ISO New England, the American Council for an Energy-Efficient Economy (ACEEE), and other non-profit and academic initiatives seeking energy data from Maine. The Trust also conferred with the GEO on legislation pending at the Legislature, certain dockets pending at the Public Utilities Commission, and options for implementing the settlement funds from the New England Clean Energy Connect project.

The Trust actively collaborated with the Governor's Office of Policy Innovation and the Future (GOPIF) on a variety of issues and initiatives. These collaborations covered communications planning and data collection for the Maine Climate Council, reviewing bond proposals for weatherization, developing the Clean Transportation Roadmap, and developing an initiative to spur energy upgrades at state properties.

MaineHousing

The Trust conferred with the Maine State Housing Authority (MaineHousing) on developing updates to MaineHousing's annual plan for the DOE Weatherization Assistance Program (WAP) and the Low Income Home Energy Assistance Program (LIHEAP) Weatherization and Central Heating Improvement Program (CHIP) initiatives. As it does every year, in FY2021 MaineHousing briefed the Trust's Board, at a public meeting, on the elements of the coming year's weatherization plans. This briefing gave the Trust the opportunity to ask questions and provide input regarding lessons learned, best practices, and ways to ensure that similar initiatives at the Trust are complementary and not duplicative.

The Trust also continued to coordinate with MaineHousing on heat pump program design in FY2021. With the passage of LD 1766 – *An Act To Transform Maine's Heat Pump Market To Advance Economic Security and Climate Objectives*, MaineHousing agreed to allocate a portion of its federal LIHEAP funds for heat pump installations in support of the state's 100,000 heat pump goal.[55] MaineHousing

[55] 35-A MRS §10104(8).

"piggybacked" the bulk of its heat pump program design elements on the Trust's existing equipment criteria, installation requirements, and inspection training protocols. In FY2021, the Trust and MaineHousing synchronized program design changes and performed a project audit to ensure that the two organizations were not paying twice for the same upgrades. As with weatherization initiatives, the two organizations worked to develop programs that are complementary and not duplicative.

The Trust's authorizing statute requires that it include in the Annual Report:

> Total funds received and expended by the State on energy efficiency and weatherization pursuant to the Weatherization Assistance for Low-income Persons Program of the United States Department of Energy and the Low-income Home Energy Assistance Program of the United States Department of Health and Human Services.[56]

The budgets and expenses of these initiatives are summarized in

[Remainder of this page purposely left blank.]

[56] 35-A MRS §10104(5)(B)(4).

Table 211, which was prepared by MaineHousing.

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Table 21: MaineHousing Energy Efficiency and Weatherization Initiatives

	GRANT YEAR/PERIOD		PRODUCTION BUDGET	PRODUCTION EXPENSES	UNITS	COMMENTS
HEAP WEATHERIZATION						
Weatherization efforts to maximize energy savings and reduce fuel burden; maximum health/safety per unit of $1,200 and minimal incidental repairs (20% of weatherization costs) to make installation of weatheriization materials effective; funds allocated to Community Action Agencies (CAAs), then paid directly to contractor for services; per unit average of $7,669	**2017**	**10-01-16/03-31-21**	$ 4,029,557	$ 4,025,808	462 Completed	Production Closed
	2018	**10-01-17/03-31-22**	$ 3,421,317	$ 3,416,365	399 Completed 403 Projected	Production in Process Contract extended to 03/31/2022
	2019	**10-01-18/03-31-22**	$ 1,935,513	$ 1,897,380	216 Completed 234 Projected	Production in Process Contract extended to 03/31/2022
	2020	**10-01-19/09-30-22**	$ 2,351,154	$ 1,187,746	147 Completed 265 Projected	Production in Process
	***2021**	**10-01-20/09-30-23**	$ 2,495,800	$ 157,832	18 Completed 321 Projected	Production in Process
DEPARTMENT OF ENERGY WEATHERIZATION (DOE/Wx)						
Funding used in conjunction with HEAP Weatherization funding to maximize energy savings and reduce fuel burden.	**2020**	**04-01-20/03-31-21**	$ 4,718,456	$ 2,184,072	242 Completed	Production Closed remaining funding rolled into 2021
	2021	**04-01-21/3-31-22**	$ 5,217,004	$ 1,338,201	87 Completed 482 Projected	Production in Process
HEAP CENTRAL HEATING IMPROVEMENT						
Central Heating Improvement Program is designed to repair or replace non-working or ineffective permantly installed home heating systems to increase efficiency and reduce household fuel burden. Per unit average of $5,000. HEAT PUMPS installed using CHIP funding are accounted for below	**2017**	**10-01-16/03-31-21**	$ 5,864,422	$ 5,858,450	2505 Completed	Production Closed
	2018	**10-01-17/03-31-22**	$ 5,459,679	$ 5,403,368	2078 Completed 2088 Projected	Production in Process Contract extended to 03/31/2022
	2019	**10-01-18/03-31-22**	$ 3,684,946	$ 3,465,340	1099 Completed 1143 Projected	Production in Process Contract extended to 03/31/2022
	2020	**10-01-19/09-30-22**	$ 3,757,116	$ 3,211,435	1050 Completed 1159 Projected	Production in Process
	***2021**	**10-01-20/09-30-23**	$ 4,809,432	$ 492,120	145 Completed 994 Projected	Production in Process
HEAP HEAT PUMPS						
Pays for the purchase and installation of heat pump as a secondary heating system to help reduce households' overall energy burden. Eligible households must reside in an owner-occupied dwelling that is a good candidate for effective usage of heat pumps.	**2020**	**10-01-19/09-30-22**	$ 135,700	$ 585,658	27 Completed 1714 Projected	Funding available is contingent on availability and grant amounts from LIHEAP.
	***2021**	**10-01-20/9-30-23**	$ 7,283,574	$ 1,783,649	389 Completed 1638 Projected	Production in Process

prepared by gls/MH 09-09-2021

*** Numbers are inclusive of Standard HEAP funding as well as a Supplemental Funding Award from the American Rescue Plan**

Public Utilities Commission

The Trust staff was active in proceedings at the PUC in FY2021. The Trust staff filed and presented all necessary testimony, evidence, comments, briefs, and exceptions related to the development, review, and approval of the Trust's Significant Changes to the Fourth Triennial Plan, Annual Update (to the Triennial Plan), and related dockets. A selection of the relevant dockets that were active in FY2020 included:

- Docket No. 2018-00321 – Request for Approval of Fourth Triennial Plan for Fiscal Years 2020-2022 Pertaining to Efficiency Maine Trust
- Docket No. 2019-00117 – Public Utilities Commission Procurement of Electric Resources and Assessment for Natural Gas Resources for Fourth Triennial Plan FY 2020-2022; and

In addition to the Triennial Plan dockets, the Trust staff also engaged in other proceedings at the PUC that have a direct or indirect impact on the Trust's programs. For example, the Trust was an active party in various dockets involving NWAs, having recently been assigned an official role assessing NWA opportunities in the new transmission and distribution system planning and approval process for electric utilities. (For more on this, see the "Non-Wires Alternatives" subsection above.) The NWA-related cases that were active in FY2021 included:

- Docket No. 2020-00125 – Commission Initiated Inquiry of the Non-Wires Alternatives Investigation Process;
- Docket No. 2020-00152 – Public Utilities Commission Amendments for Criteria to Exclude Small Transmission Projects and Distribution Projects from Investigation by the Non-Wires Alternative Coordinator Chapter 319;
- Docket No. 2019-00309 – Request for Approval of Section 31 Rebuild Pertaining to Central Maine Power Company;
- Docket No. 2011-00138 – Request for Approval of Non-Transmission Alternative (NTA) Pilot Projects for the Mid-Coast and Portland Areas Pertaining to Central Maine Power Company; and
- Docket No. 2018-00171 – Commission Initiated Investigation into Rate-Setting Mechanisms Regarding Non-Wire Alternatives.

Other cases that the Trust engaged with in FY2021 included:

- Docket No. 2019-00015 – Commission Initiated Investigation of Metering and Billing Issues Pertaining to Central Maine Power Company;
- Docket No. 2019-00217 – Commission Initiated Request for Proposals for Pilot Programs to Support Beneficial Electrification of the Transportation Sector (Public Law 2019 Chapter 365, Section 5);
- Docket No. 2019-00280 – Commission Initiated Inquiry Regarding Evaluation of Ownership of Maine's Power Delivery Systems
- Docket No. 2020-00120 – Request for Approval of Tariff Revision for the Processing of Conversion Incentive Rebates Pertaining to Summit Natural Gas of Maine, Inc.;

- Docket No. 2020-00165 – Request for Approval of Tariff Revision EV Charging Station Pilot Program Central Maine Power Company; and
- Docket No. 2020-00344 – Commission Initiated Inquiry Into Performance Metrics and Regulatory Mechanisms for Transmission and Distribution Utilities.

Department of Environmental Protection

In FY2021, the Trust worked with the Maine Department of Environmental Protection (DEP) on multiple issues. DEP is Maine's administrative liaison to RGGI Inc. RGGI Inc. is the non-profit entity that manages the Regional Greenhouse Gas Initiative (RGGI). In FY2021, the Trust and DEP, together with the PUC, continued their practice of preparing an annual report for the Legislature on the activities and results of RGGI in Maine.

Maine Climate Council

In late FY2019, the Legislature passed a bill establishing the Maine Climate Council to develop a four-year Climate Action Plan that would put Maine on a trajectory to reduce emissions by 45% by 2030 and at least 80% by 2050.[57] The Council and its six Working Groups are comprised of scientists, business leaders, environmental advocates, local and state officials, and engaged citizens. The Trust was named as an ex-officio member of the Council and was asked to serve as co-chair for the Buildings, Infrastructure, and Housing Working Group. The Trust was also actively involved in the Energy Working Group and the Transportation Working Group. Each Working Group was charged with developing, analyzing, and recommending strategies to inform the Council's plan to mitigate emissions and support resilience in Maine's various sectors.

The Council presented a four-year Climate Action Plan to the Governor and Legislature on December 1, 2020. During the remainder of FY2021, the Trust Staff made itself available for outreach to raise awareness about the Plan and worked with the Legislature to develop policies that would advance the Plan's goals and recommendations.

Lead by Example

The Governor's Executive Order 13, FY 19/20, An Order for State Agencies to Lead by Example through Energy Efficiency, Renewable Energy and Sustainability Measures directs State agencies to meet or exceed the State's renewable energy and GHG reduction targets.[58] The Order names the Trust as a member of the Sustainability Leadership Committee, working with sustainability coordinators from GEO, the GOPIF, DEP, the Department of Administrative and Financial Services, and the Department of Transportation to lead development and implementation of plans, seek consistency and cost efficiencies where appropriate, and track progress.

[57] Public Law, Chapter 476, LD 1679, 129th Maine State Legislature – *An Act To Promote Clean Energy Jobs and to Establish the Maine Climate Council.*

[58] Maine Executive Order No. 13, FY 19/20, An Order for State Agencies to Lead by Example Through Energy Efficiency, Renewable Energy and Sustainability Measures, November 26, 2019.

In FY2021, the Trust coordinated with the Bureau of General Services and State facilities managers in the development of an initiative to promote the increased installation and use of clean, cost-effective energy measures at State properties. Per a December 29, 2020 Memorandum of Understanding between the Trust and the Office of the Attorney General for the State of Maine, the Trust received approximately $3.7 million in Volkswagen settlement funds to support this initiative by providing project technical assistance and financial incentives for energy upgrades at State properties.

Arrearage Management Program

AMP initiatives are required of each electric utility by a Maine law enacted in April 2014.[59] As in past years, customers who agreed to join the program in FY2021 were enrolled in a payment plan with the utilities and contacted by the Trust with information and analysis about their energy usage, energy-saving options, and a free offer for a DIY electricity-use-reduction kit. The Trust also continued to collaborate with the electric utilities, the OPA, and the Commission in managing and evaluating this program.

Workforce Development

The Trust monitors workforce capacity and skillsets as part of its planning and implementation of efficiency 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. During FY2021, the Trust sponsored trainings for heat pump installers and certification classes for facility managers, hosted webinars for contractors to learn about the latest technology and building energy code developments.

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 efficiency programs in a variety of ways. For example, in 2019 the Maine Legislature reformed Maine's regulatory framework for building codes. The reforms included establishing a requirement that the Maine Uniform Building and Energy Code (MUBEC) be updated and made effective in every municipality across the State. The statute placed the Trust's executive director as an ex officio member of the MUBEC Technical Board and mandated that the Board establish a "stretch code" that municipalities may elect to adopt. With the arrival of these new codes in FY2021, the Trust provided resources from its public information and outreach budget and its contacts across Maine's network of builders, electricians, plumbers, insulation, and HVAC technicians.

[59] Public Law, Chapter 556, 126th Maine State Legislature, Second Regular Session, LD 1825, An Act To Assist Electric Utility Ratepayers.

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…"[60]

Independent System Operator for New England

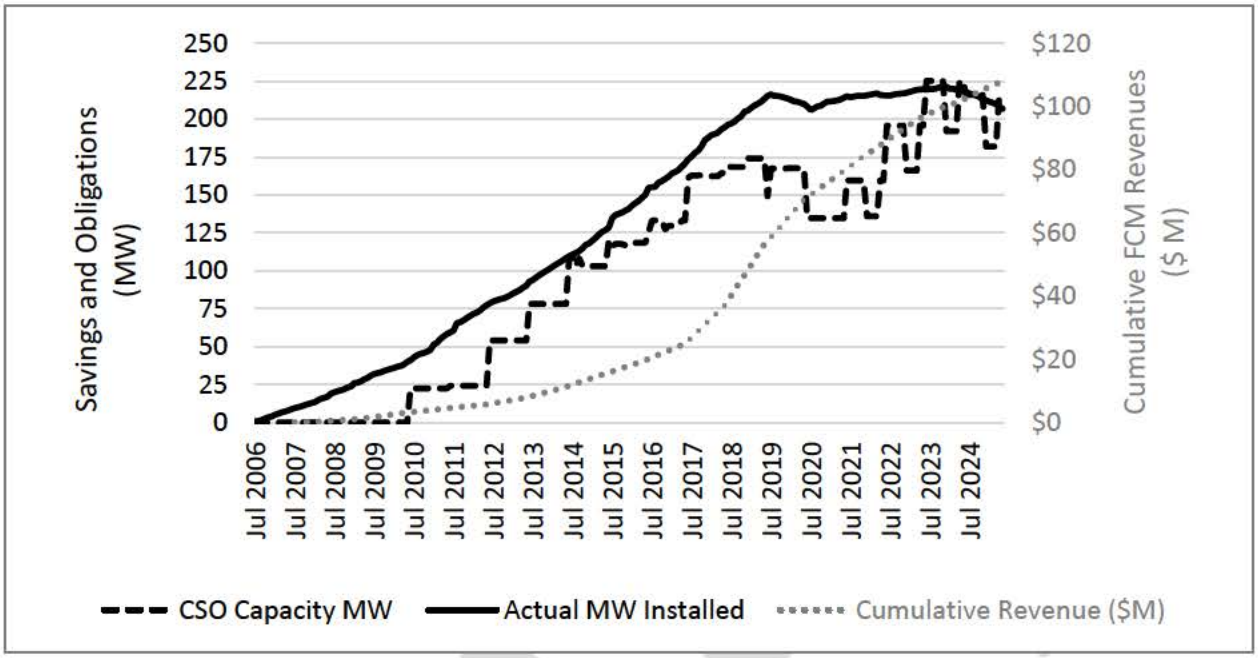
The Independent System Operator for New England (ISO-NE) operates markets that serve New England's electricity customers. Among these is the Forward Capacity Market (FCM) into which electricity generators, efficiency program administrators, and others may bid to supply qualifying "capacity" to serve the New England grid. The Trust is a participant in this market, aggregating the summer-peak electricity savings from the many electric efficiency measures supported through its programs and bidding those savings resources into the FCM auction.

As in prior years, in FY2021 the Trust's participation in the FCM entailed collecting and providing 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 participated in planning and policymaking discussions at ISO-NE.

In FY2021, the Trust participated in the 15th Forward Capacity Auction (FCA). The Trust maintained its existing resources totaling 179 MW of summer peak demand savings, for which it will be paid a price of $1.698 per kW per month. The Trust also prepared for the 16th FCA, which will be held in February 2022. By the end of FY2021, the Trust's programs had delivered a total of 209 MW of new summer peak demand savings. This represents a decline from past years due in large part to the fact that 6.27 MW of measures from prior years reached the end of their expected life and expired out. Figure 1 summarizes the Trust's delivered savings and future obligations.

[60] 35-A MRS §10110(2)(D) and (I).

Figure 1: Summary of the Trust's FCA Actions



CSO = Capacity Supply Obligation.

Regional Greenhouse Gas Initiative

Each year, the Trust contributes to Maine's RGGI Annual Report. The report is collaboratively prepared by DEP, the PUC, and the Trust. The report is submitted to two legislative committees: the Joint Standing Committee on Environment and Natural Resources and the Joint Standing Committee on Energy, Utilities and Technology.

In the most recent RGGI Annual Report, the Trust described how it invested $7.4 million of RGGI funds in FY2020. The RGGI funds expended in that year are projected to result in annual savings of 95,829 MMBtu, and 7,716 tons of carbon dioxide. The report is available on the DEP website.

Other Related Initiatives

The Trust typically engages in initiatives and forums to discuss policies or advance programs relevant to the Trust's purpose and activities, however such activities were extremely limited in FY2021 due to the disruptions of COVID-19. For example, the Trust was an active participant in the Maine Utility Regulatory Reform and Decarbonization Initiative (MURRDI) stakeholder process. Also, the Trust participated in the work of the Equity Subcommittee of the Maine Climate Council.

Legislative Recommendations

The Trust's authorizing statute provides that the Annual Report should include "[a]ny recommendations for changes to the laws relating to energy conservation."[61] The Trust does not have any such recommendations at this time.

[61] 35-A MRS §10104(4).

Appendices

Appendix A: Total Energy Savings and Lifetime Energy Benefit

Tables A-1 and A-2 illustrate the total energy savings[62] and lifetime energy benefit associated with each of the programs administered by the Trust in FY2021. Each table also shows the summary of the Trust's costs. These figures include the financial incentives given to customers ("participants") and the participants' cost-share to install energy upgrades. The costs also include the Trust's efforts to manage the programs; provide public information and outreach; hold training sessions and provide technical support; and conduct quality control, measurement and verification, and evaluation of each program. The benefit-to-cost ratio indicates the ratio of the financial benefits (from the lifetime avoided energy costs) to the combined costs of the Trust and the participants.

Table A-1: FY2021 Program Impacts – Electric Programs

Program	Annual kWh Savings	Lifetime kWh Savings	Efficiency Maine Costs	Participant Cost	Lifetime Energy Benefit	Cost/kWh (Lifetime)	Benefit-to-Cost Ratio
Commercial and Industrial Custom Program – Electric	7,043,743	102,547,310	$2,207,603	$2,415,261	$10,575,335	$0.045	2.29
Commercial and Industrial Prescriptive Program – Electric	39,961,358	514,756,912	$9,263,812	$11,762,204	$55,627,462	$0.041	2.65
Small Business Initiative - Electric	2,263,944	29,431,165	$1,777,859	$998,939	$5,145,108	$0.094	1.85
Distributor Initiatives – Electric	22,474,617	286,191,294	$7,445,951	$2,188,923	$28,383,858	$0.034	2.95
Retail Initiatives – Electric	39,109,578	226,218,840	$7,344,323	$4,157,977	$37,282,824	$0.051	3.24
Home Energy Savings Program – Electric	53,489,129	962,804,321	$15,481,618	$34,926,865	$93,453,680	$0.052	1.85
Low-Income Initiatives – Electric[63]	10,509,982	119,996,942	$3,269,356	$454,789	$14,850,406	$0.031	3.99
Strategic Initiatives – Electric	-	-	$1,753,703	-	-	-	-
Administration – Electric	-	-	$1,987,837	-	-	-	-
Total	**174,852,350**	**2,241,946,785**	**$50,532,061**	**$56,904,958**	**$245,318,673**	**$0.048**	**2.28**

[62] Savings values reported in the program summary tables are "adjusted gross savings" unless otherwise indicated. Adjusted gross savings reflect the change in energy consumption and/or demand that results directly from program-related actions taken by participants in an Efficiency Maine program, regardless of why they participated, adjusted by factors developed through program evaluations. Periodically, the Trust enlists independent third-party contractors to evaluate the savings impacts of major programs. The evaluations help the Trust develop factors to improve the accuracy of gross savings calculations based on installation rates and actual, site-verified savings rates. The evaluations are also used to analyze program attribution, including identifying program participants who would have installed the same or equivalent efficiency measures on their own even if the program had not been offered ("free-ridership" [FR]) and the percentage of efficient equipment installed due to program influences even though no incentive or technical assistance was received ("spillover" [SO]). Factoring in free-ridership and spillover delivers "net savings," which quantifies the savings directly (adjusted gross minus FR) and indirectly (SO) attributable to the program. The Trust publishes the FR and SO factors in the Technical Reference Manuals (TRMs). The lifetime energy benefit is calculated using methodologies and assumptions approved by the Maine Public Utilities Commission as part of the approval process for the Trust's Triennial Plan IV.

[63] In Triennial Plan IV, the Trust directed a portion of the Low-Income Initiatives electric budget for investment through the Retail Initiatives and Distributor Initiatives to fund heat pump water heater sales to low-income customers through these channels. The costs and savings associated with these investments are reflected in the Low-Income Initiatives electric results and not in the Distributor Initiatives or Retail Initiatives electric results.

Table A-2: FY2021 Program Impacts – Thermal Programs

Program	Annual MMBtu Savings	Lifetime MMBtu Savings	Efficiency Maine Costs	Participant Cost	Lifetime Energy Benefit	Cost/ MMBtu (Lifetime)	Benefit-to-Cost Ratio
Commercial and Industrial Custom Program – Natural Gas	9,456	144,658	$292,421	$341,284	$1,004,938	$4.38	1.59
Commercial and Industrial Custom Program – Unregulated Fuels	6,044	88,131	$384,137	$405,980	$1,502,670	$8.97	1.90
Commercial and Industrial Prescriptive Program – Natural Gas	13,565	320,780	$179,975	$47,882	$2,030,495	$0.71	8.91
Commercial and Industrial Prescriptive Program – Unregulated Fuels	20,105	404,202	$443,131	$722,784	$6,332,393	$2.88	5.43
Small Business Initiative – Unregulated Fuels	11,264	168,954	$1,011,850	$2,549,471	$4,415,923	$21.08	1.24
Distributor Initiatives – Natural Gas	5,468	71,869	$124,999	$127,590	$554,333	$3.51	2.19
Distributor Initiatives – Unregulated Fuels	11,586	289,661	$896,699	$299,150	$5,241,724	$4.13	4.38
Home Energy Savings Program – Unregulated Fuels	35,006	814,879	$3,202,948	$10,388,773	$18,576,716	$16.68	1.37
Low-Income Initiatives – Unregulated Fuels	30,630	551,242	$3,355,459	$7,660,046	$15,134,197	$19.98	1.37
Renewable Energy Demonstration Grants Program	-	-	$0	-	-	-	-
Electric Vehicle Initiatives[64]	52,182	510,484	$2,701,687	$13,044,262	$15,736,324	$30.85	1.01
Strategic Initiatives – Thermal	-	-	$490,140	-	-	-	-
Administration – Thermal	-	-	$1,372,153	-	-	-	-
Total	**195,307**	**3,364,858**	**$14,455,600**	**$35,587,221**	**$70,529,713**	**$14.87**	**1.41**

Two different cost tests are used to assess a program's cost-effectiveness, one from the perspective of all utility customers (participants and non-participants) (the Primary Benefit-Cost test) and one from the perspective of the program administrator (utility, government agency, or third-party implementer) (the Program Administrator Cost Test [PACT]). The criteria for the two cost tests are as follows:

- *Primary test:* The Primary test compares combined program administrator and customer costs to utility resource savings. The Primary test measures the benefits of the energy efficiency program for the region. Costs included in the Primary test are those used to purchase and install energy efficiency measures, including the costs incurred by program participants, costs incurred due to increased energy use, and the costs of running the energy efficiency program. The benefits included are the avoided costs of energy, demand, water, and when quantifiable, avoided operation and maintenance costs.
- *PACT:* The PACT compares program administrator costs to supply-side resource savings. A positive PACT (>1) indicates that an energy efficiency program is a lower-cost approach to

[64] For the Electric Vehicles Initiatives, the Trust reports on energy savings associated with rebates for electric vehicles (EVs), but does not claim savings for EV chargers (also referred to as "EV Supply Equipment" or "EVSE"). Lifetime energy savings reflect gasoline savings associated with rebated EVs, net of the increased electricity use associated with charging those EVs (converted to MMBtu). Efficiency Maine Costs include those associated with both EV rebates *and* EVSE ($2,477,241 and $224,446, respectively). Participant Costs reflect those associated with EV rebates only (not EVSE); they reflect both the customers' share of the incremental costs to purchase the vehicle and new electricity costs associated with charging those EVs. But they do not reflect avoided maintenance costs, which can be significant. The Benefit-to-Cost ratio reported for Electric Vehicle Initiatives reflects cost and savings associated with EV rebates only (not EVSE).

meeting load growth than a wholesale energy purchase and new generation resources (including delivery and system costs). The PACT includes only costs incurred by the program administrator and not customer contributions.

Table A-3: Benefit-to-Cost Ratios – Electric Programs

Program	Adjusted Gross Benefit-to-Cost Ratio		Last Evaluation	Net-to-Gross Ratio	Net Benefit-to-Cost Ratio	
	Primary	PACT			Primary	PACT
Commercial and Industrial Custom Program – Electric	2.29	4.79	2017	92%	2.27	4.70
Commercial and Industrial Prescriptive Program – Electric	2.65	6.00	2018, Note 2	68%	2.45	5.53
Small Business Initiative - Electric	1.85	2.89	2021, Note 2	93%	1.84	2.85
Distributor Initiatives – Electric	2.95	3.81	2021	77%	2.84	3.63
Retail Initiatives – Electric	3.24	5.08	2021	72%	3.19	4.77
Home Energy Savings Program – Electric	1.85	6.04	2019	69%	1.82	5.66
Low-Income Initiatives – Electric	3.99	4.54	2020	95%	4.06	4.65
Total	**2.28**	**4.85**		**73%**	**2.21**	**4.45**

Table A-4: Benefit-to-Cost Ratios – Thermal Programs

Program	Adjusted Gross Benefit-to-Cost Ratio		Last Evaluation	Net-to-Gross Ratio	Net Benefit-to-Cost Ratio	
	Primary	PACT			Primary	PACT
Commercial and Industrial Custom Program – Natural Gas	1.59	3.44	Note 3	92%	1.59	3.46
Commercial and Industrial Custom Program – Unregulated Fuels	1.90	3.91	2017	93%	1.84	3.68
Commercial and Industrial Prescriptive Program – Natural Gas	8.91	11.28	2018	56%	8.44	10.67
Commercial and Industrial Prescriptive Program – Unregulated Fuels	5.43	14.29	2018	54%	4.21	11.63
Small Business Initiative – Unregulated Fuels	1.24	4.36	Note 2	305%	1.22	4.17
Distributor Initiatives – Natural Gas	2.19	4.43	Note 3	-	2.17	4.32
Distributor Initiatives – Unregulated Fuels	4.38	5.85	Note 3	75%	4.20	5.52
Home Energy Savings Program – Unregulated Fuels	1.37	5.80	2019	72%	1.35	5.52
Low-Income Initiatives – Unregulated Fuels	1.37	4.51	Note 3	100%	1.37	4.51
Electric Vehicle Initiatives[65]	1.01	6.35	Note 3	75%	1.00	5.95
Total	**1.41**	**4.88**		**78%**	**1.30**	**3.96**

Note 1 New program, not yet evaluated. Program evaluation currently being planned.
Note 2 Currently being evaluated.
Note 3 Evaluation not scheduled.

[65] The Benefit-to-Cost ratios for EV Initiatives reflect cost and savings associated with EV rebates only (not EVSE), and do not reflect avoided maintenance costs of EV ownership.

Appendix B: Program Expenditures

Table B-1: Electric Program Expenditures

Program	Incentive	Delivery	Total
Commercial and Industrial Custom Program – Electric	$1,677,345	$530,258	$2,207,603
Commercial and Industrial Prescriptive Program – Electric	$8,184,158	$1,079,654	$9,263,812
Small Business Initiative – Electric	$1,441,938	$335,921	$1,777,859
Distributor Initiatives – Electric	$6,225,013	$1,220,938	$7,445,951
Retail Initiatives – Electric	$6,090,886	$1,253,437	$7,344,323
Home Energy Savings Program – Electric	$13,166,500	$2,315,118	$15,481,618
Low-Income Initiatives – Electric	$2,558,910	$710,446	$3,269,356
Strategic Initiatives – Electric	$0	$1,753,703	$1,753,703
Administration – Electric	$0	$1,987,837	$1,987,837
Total	**$39,344,750**	**$11,187,311**	**$50,532,061**

Table B-2: Thermal Program Expenditures

Program	Incentive	Delivery	Total
Commercial and Industrial Custom Program – Natural Gas	$240,239	$52,182	$292,421
Commercial and Industrial Custom Program – Unregulated Fuels	$157,101	$227,036	$384,137
Commercial and Industrial Prescriptive Program – Natural Gas	$166,774	$13,202	$179,975
Commercial and Industrial Prescriptive Program – Unregulated Fuels	$394,017	$49,114	$443,131
Small Business Initiative – Unregulated Fuels	$854,400	$157,450	$1,011,850
Distributor Initiatives –Natural Gas	$114,761	$10,238	$124,999
Distributor Initiatives – Unregulated Fuels	$738,400	$158,299	$896,699
Home Energy Savings Program – Unregulated Fuels	$2,768,882	$434,066	$3,202,948
Low-Income Initiatives – Unregulated Fuels	$2,774,318	$581,141	$3,355,459
Renewable Energy Demonstration Grants Program	$0	$0	$0
Electric Vehicle Initiatives	$2,525,679	$176,008	$2,701,687
Strategic Initiatives – Thermal	$0	$490,140	$490,140
Administration – Thermal	$0	$1,372,153	$1,372,153
Total	**$10,734,571**	**$3,721,029**	**$14,455,600**

Appendix C: Amended Budget

Table C-1: Efficiency Maine Trust FY2022 Budget as Approved by the Board of Trustees 10/27/2021

	EMT ADMIN FUND	REGIONAL GREENHOUSE GAS INITIATIVE	ELECTRIC EFFICIENCY PROCUREMENT	MAINE POWER RELIABILITY PROGRAM SETTLEMENT	FORWARD CAPACITY MARKET	FCM HEAT PUMP INITIATIVE	NATURAL GAS EFFICIENCY PROCUREMENT	ENERGY EFFICIENCY & RENEWABLE RESOURCE FUND	AGRICULTURAL FAIRS	VW SETTLEMENT FUNDS	NECEC SETTLEMENT FUNDS	AMERICAN RESCUE PLAN FUNDS	REVOLVING LOAN FUNDS	FY 2021 TOTAL BUDGET
TOTAL REVENUES AND USE OF FUND BALANCE	**5,155,807**	**22,963,760**	**63,571,482**	**1,373,995**	**1,599,149**	**14,520,542**	**2,109,430**	**362,485**	**385,758**	**6,689,458**	**12,644,242**	**15,000,000**	**876,000**	**147,252,108**
C&I CUSTOM PROGRAM	**-**	**2,817,137**	**5,472,844**	**769,000**	**1,599,149**	**-**	**412,033**	**-**	**-**	**-**	**-**	**970,000**	**-**	**12,040,162**
C&I PRESCRIPTIVE PROGRAM	**-**	**2,099,297**	**17,456,193**	**43,046**	**-**	**-**	**1,131,189**	**-**	**-**	**-**	**911,884**	**970,000**	**-**	**22,611,610**
SMALL BUSINESS INITIATIVE	**-**	**2,751,600**	**3,203,066**	**3,270**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**26,000**	**5,983,936**
Commercial Small Business	-	**2,701,600**	**3,203,066**	**3,270**	-	-	-	-	-	-	-	-	-	**5,907,936**
Commercial Loan Support	-	**50,000**	-	-	-	-	-	-	-	-	-	-	**26,000**	**76,000**
DISTRIBUTOR INITIATIVES	**-**	**-**	**11,190,624**	**10,792**	**-**	**-**	**332,069**	**-**	**-**	**-**	**-**	**-**	**-**	**11,533,485**
RETAIL INITIATIVES	**-**	**-**	**8,048,601**	**34,379**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**8,082,980**
HOME ENERGY SAVINGS PROGRAM	**-**	**6,472,000**	**6,741,612**	**7,195**	**-**	**10,380,740**	**-**	**-**	**-**	**-**	**-**	**-**	**600,000**	**24,201,547**
Home Energy Savings Program	-	**6,322,000**	**6,741,612**	**7,195**	-	**10,380,740**	-	-	-	-	-	-	-	**23,451,547**
Revolving Loan Support	-	**150,000**	-	-	-		-	-	-	-	-	-	**350,000**	**500,000**
Loan Loss Reserve	-	-	-	-	-		-	-	-	-	-	-	**250,000**	**250,000**
LOW-INCOME INITIATIVES	**-**	**1,770,000**	**4,618,762**	**389,000**	**-**	**2,746,143**	**114,791**	**-**	**-**	**-**	**3,557,358**	**2,910,000**	**-**	**16,106,054**
AGRICULTURAL FAIR INITIATIVES	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**385,758**	**-**	**-**	**-**	**-**	**385,758**
RENEWABLES	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**344,985**	**-**	**-**	**-**	**-**	**-**	**344,985**
ELECTRIC VEHICLE SUPPLY EQUIPMENT	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1,470,997**	**2,900,000**	**-**	**-**	**4,370,997**
ELECTRIC VEHICLE ACCELERATOR PROGRAM	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1,495,645**	**4,850,000**	**-**	**-**	**6,345,645**
LEAD BY EXAMPLE INITIATIVE	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3,560,782**	**-**	**-**	**-**	**3,560,782**
INNOVATION	**-**	**5,383,141**	**910,681**	**18,667**	**-**	**50,154**	**5,065**	**-**	**-**	**-**	**-**	**-**	**-**	**6,367,708**
PUBLIC INFORMATION	**-**	**161,968**	**251,384**	**2,667**	**-**	**50,154**	**7,927**	**-**	**-**	**-**	**50,000**	**-**	**-**	**524,100**
EM&V	**-**	**425,617**	**1,971,350**	**57,312**	**-**	**380,879**	**25,323**	**-**	**-**	**-**	**-**	**-**	**-**	**2,860,481**
ADMINISTRATION	**4,176,178**	**799,000**	**3,243,071**	**34,000**	**-**	**812,162**	**70,905**	**-**	**-**	**162,033**	**375,000**	**180,000**	**74,801**	**9,927,150**
INTER-AGENCY TRANSFERS	**30,000**	**284,000**	**463,296**	**4,667**	**-**	**100,309**	**10,129**	**17,500**	**-**	**-**	**-**	**-**	**-**	**909,901**
Public Utilities Commission	-	**136,000**	**463,296**	**4,667**	-	**100,309**	**10,129**	-	-	-	-	-	-	**714,401**
RGGI Rate Relief	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RGGI Inc Operating Costs	-	**85,000**	-	-	-	-	-	-	-	-	-	-	-	**85,000**
Department of Environmental Protection	-	**63,000**	-	-	-	-	-	-	-	-	-	-	-	**63,000**
Governor's Energy Office	**30,000**	-	-	-	-	-	-	-	-	-	-	-	-	**30,000**
DECD (Maine Technology Institute)	-	-	-	-	-	-	-	**17,500**	-	-	-	-	-	**17,500**
TOTAL EXPENDITURES	**4,206,178**	**22,963,760**	**63,571,482**	**1,373,995**	**1,599,149**	**14,520,542**	**2,109,430**	**362,485**	**385,758**	**6,689,458**	**12,644,242**	**5,030,000**	**700,801**	**136,157,280**
RESERVED FUND BALANCE	**1,117,062**	**4,000,000**	**1,200,000**	**-**	**-**	**1,756,235**	**58,300**	**-**	**-**	**-**	**-**	**9,970,000**	**21,525,866**	**39,627,463**

Appendix D: Public Utilities Commission Assessments and Revenue Collections

Table D-1: Public Utilities Commission Assessments and Revenue Collections

PUC Assessments and Revenue Collections - FY 2021					
Electric Efficiency Procurement					
Procurement Quarter:	**Jul-Sep 2020**	**Oct-Dec 2020**	**Jan-Mar 2021**	**Apr-Jun 2021**	**Total - FY 2021**
Billing Date:	**1-Jul-20**	**31-Oct-20**	**1-Jan-21**	**1-Apr-21**	
Name					
Central Maine Power Co	$ 6,378,544	$ 6,378,544	$ 6,378,544	$ 6,378,544	25,514,175.71
Eastern Maine Electric Coop	$ 76,493	$ 76,493	$ 76,493	$ 76,493	305,973.46
Emera (Bangor Hydro/MPS)	$ 1,427,905	$ 1,427,905	$ 1,427,905	$ 1,427,905	5,711,619.52
Fox Island Electric Coop	$ 8,398	$ 8,398	$ 8,398	$ 8,398	33,590.91
Houlton Water Co*	$ 59,036	$ 59,036	$ 59,036	$ 59,036	236,143.50
Kennebunk Light & Power*	$ 75,905	$ 75,905	$ 75,905	$ 75,905	303,619.74
Madison Electric Works	$ 22,060	$ 22,060	$ 22,060	$ 22,060	88,239.89
Van Buren Light & Power Co	$ 11,422	$ 11,422	$ 11,422	$ 11,422	45,687.27
Totals	**$ 8,059,763**	**$ 8,059,763**	**$ 8,059,762**	**$ 8,059,762**	**32,239,050.00**

Revenue Forecast**	**FY 2022**
Central Maine Power Co	$ 38,552,983
Eastern Maine Electric Coop	$ 468,952
Versant (formerly Emera)	$ 8,558,705
Fox Island Electric Coop	$ 51,140
Houlton Water Co	$ 354,614
Kennebunk Light & Power	$ 458,777
Madison Electric Works	$ 131,606
Van Buren Light & Power Co	$ 70,706
Total	**$ 48,647,484**

Natural Gas Efficiency Procurement		
	Total - FY 2021	**Revenue Forecast - FY 2022****
Name		
Northern Utilities - Unitil	$ 688,422	$ 65,521
Bangor Natural Gas	$ 224,423	$ 7,875
Maine Natural Gas	$ 147,120	$ 84,009
Summit Natural Gas	$ 69,035	$ 12,007
Totals	**$ 1,129,000**	**$ 169,412**

Alternative Compliance Mechanism (ACM)		
Assessment Timeframe:	**Jul '20- June '21**	**Total - FY 2021**
Billing Date:	**N/A**	
Name		**Total - FY 2021**
Mega Energy Holdings, LLC	$ 352	$ 352
Totals	**$ 352**	**$ 352**

* At FY2020 year end, Houlton Water Company and Kennebunk Light & Power still owed $89,815.05 and $87,740.85 of their procurement amounts, respectively. All these funds were subsequently remitted to the Trust in FY2021, but these funds are not reflected in the table. The totals received in FY2021 were $325,958.55 and $391,360.61, respectively.

** As Ordered by the PUC on 6/9/2021 in Docket 2019-00117 - "PUBLIC UTILITIES COMMISSION PROCUREMENT OF ELECTRIC RESOURCES AND ASSESSMENT FOR NATURAL GAS RESOURCES FOR FOURTH TRIENNIAL PLAN FY 2020-2022. Note: these revenue forecasts reflect the use of FY2021 carryforward funding to reduce the need for assessments.

Appendix E: Glossary

Adjusted Gross Savings: The change in energy consumption and/or demand that results directly from program-related actions taken by participants in an Efficiency Maine program, regardless of why they participated, adjusted for installation rates and savings rates verified through program evaluations.

Arrearage: Unpaid debt or overdue payments.

Avoided Energy Costs: Costs that would have been incurred had a utility and/or energy supplier otherwise been required to supply the power that was avoided through the installation of an energy efficiency or distributed generation project. The avoided costs include the wholesale cost of energy and capacity, the costs of complying with renewable energy and climate policies, plus the marginal costs of adding future transmission and distribution (but not the retail cost of transmission and distribution).

Benefit-to-Cost Ratio: The ratio of the net present value of the quantifiable financial benefits (from the lifetime avoided energy costs) to the costs of an efficiency measure. The benefits and costs included in the calculation are dependent on the test used. See glossary entries of Program Administrator Cost Test (PACT) and Total Resource Cost (TRC) test.

Community Action Agencies (CAAs): Non-profit private and public organizations established under the U.S. Economic Opportunity Act of 1964 to reduce poverty. CAAs deliver emergency services, education, training, housing, weatherization services, and more.

Free-Rider: A program participant who, in the determination of third-party evaluators, would have installed equivalent efficiency measures independent of the Trust's program or its incentives.

Lifetime Energy Benefit: The net present value of the avoided energy supply cost of energy and demand savings over the measure life.

Maximum Achievable Cost-Effective (MACE): An energy efficiency industry term that refers to the full universe of potential cost-effective energy efficiency projects that could realistically be installed given technical and economic constraints and assumed adoption rates based on offered incentives.

Measure Life: The length of time that a measure is expected to be functional. Measure life is a function of: (1) *equipment life*, the number of years that a measure is installed and operates until failure, and (2) *measure persistence*, which takes into account business turnover, early retirement of installed equipment, and other reasons that measures might be removed or discontinued. Measure life is sometimes referred to as expected useful life.

Midstream: Incentive programs for energy-efficient products are characterized as midstream, upstream, or downstream depending on who receives the incentives. Upstream programs provide incentives for manufacturers to make more efficient products, and downstream programs provide rebates for consumers, encouraging them to purchase more efficient products. A midstream program provides incentives at the retailer or distributor level, encouraging them to stock and sell more high-efficiency equipment models.

Modified Participant Cost Test (MPCT): This cost-effectiveness test, applied by the Trust only to certain renewable energy projects, compares a participant's costs after application of any rebate or tax incentives to the lifetime electricity/fuel savings based on the retail prices in place at the time of project commencement. A positive MPCT (>1) indicates that lifetime benefit achieved by a renewable energy project is lower than the funds invested by the customer.

Net Savings: An estimate of the amount of adjusted gross savings that can be directly and indirectly attributed to a program based on program participants' motivation. Participants who, in the determination of the evaluators, would have installed equivalent efficiency measures independent of the program and its incentives are considered "free-riders." To calculate net savings, the impacts of savings attributed to free-riders are excluded. By contrast, savings realized by program participants through the installation of *additional* efficiency measures due to program influences, even though no incentive or technical assistance (TA) was received (called "spillover"), are added.

Net-to-Gross (NTG) Ratio: The ratio of net savings to adjusted gross savings. The NTG ratio is defined as 1 minus the free-ridership (FR) rate plus the spillover (SO) rate (NTG ratio = 1 − FR + SO).

Program Administrator Cost Test (PACT): This cost-effectiveness test compares Efficiency Maine Trust's costs to supply-side resource savings. A positive PACT (>1) indicates that an energy efficiency program is a lower-cost approach to meeting load growth than a wholesale energy purchase and new generation resources (including delivery and system costs). The PACT includes only costs incurred by the program administrator and not customer contributions.

Qualified Partner: A term used to describe the network of contractors and vendors working with Efficiency Maine's Commercial & Industrial Prescriptive Program (CIP).

Residential Registered Vendor: A term used to describe the network of contractors and vendors working with Efficiency Maine's residential programs.

Spillover: Savings realized by program participants through the installation of *additional* efficiency measures due to program influences, even though no incentive or technical assistance was received.

Primary Benefit-Cost Test: This cost-effectiveness test captures the perspective of all utility customers—both participants and nonparticipants. It is the comparison of program administrator and customer costs to utility resource savings. The Primary test measures the benefits of the energy efficiency program for the region as a whole. Costs included in the Primary test are those used to purchase and install the energy efficiency measure, including the costs incurred by program participants, costs incurred due to increased energy use, and the costs of running the energy efficiency program. The benefits included are the avoided energy supply cost, avoided cost of water, and when quantifiable, avoided operation and maintenance costs.