Appendix D

Long-Term Target Results

Appendix D
Long-Term Target Results

By Daniel Mistro
11-2-2021

Introduction

1. What is the purpose of this testimony?

This testimony presents historical results as they relate to the Trust's progress in advancing several long-term goals established in the Efficiency Maine Trust Act (the statute). Where relevant or appropriate, it also presents forecasts.

The statute provides that an objective of the Triennial Plan is to design, coordinate, and integrate programs that advance eight long-term goals related to reducing costs: weatherizing homes; reducing peak-load electricity demand; achieving savings of electricity, natural gas, and heating fuels; building private sector jobs; reducing greenhouse gas (GHG) emissions; promoting high-efficiency heat pump systems; and promoting electric vehicles (EVs). The statute also sets a goal of installing 100,000 new high-performance air source heat pumps in the State from fiscal year 2019-20 to fiscal year 2024-25.

2. Who is introducing this testimony? Please state your name, title, and business address.

This testimony is provided by Daniel Mistro, Strategic Initiatives Manager at the Trust. My business address is 168 Capital Street, Suite 1, Augusta, ME 04330.

3. Please summarize your educational and professional experience.

I received a Bachelor of Science degree in Economics from Illinois State University and a Master of Science Degree in Resource Economics & Policy from the University of Maine. I have been working at the Trust as a member of the Strategic Initiatives team since 2018. As a Strategic Initiatives Manager, my responsibilities at the Trust include innovation and evaluation project management, research, and data analysis. Before coming to the Trust, I was researching community-led energy efficiency projects for my graduate thesis.

Long-Term Target Progress

4. What is the statutory goal relating to energy cost reduction? What are the Trust's relevant historical results?

Section 10104(4)(F)(1) of Title 35-A of Maine Revised Statutes (the statute) provides the Trust the general goal of *reducing energy costs, including residential heating costs*. It does not specify a targeted amount of cost reduction. Rather, the statute directs the Trust to use energy efficiency, conservation, and alternative energy resources to "help individuals and businesses meet their energy needs at the lowest cost"[1] and, specific to electricity customers, to "reduce energy costs for electricity consumers in

[1] 35-A MRS §10103(1)(B).

the State by the maximum amount possible."[2] The annual and lifetime energy cost reductions achieved through the Trust's programs are provided in the Trust's annual reports, all of which are posted online.[3]

5. What is the statutory goal relating to weatherization? What are the Trust's historical results and future projections?

Section 10104(4)(F)(2) of the statute establishes a goal of, *for the period beginning January 1, 2020, and ending January 1, 2030, weatherizing 35,000 homes and businesses, with at least 10,000 of such weatherization projects completed in low-income households through the combined efforts of the Trust and the Maine State Housing Authority*.

From its inception in 2010 through the end of FY2021, the Trust has provided rebates for weatherization upgrades in approximately 26,000 participating Maine homes.[4] Over that same period, the Maine State Housing Authority has provided full funding for weatherization of more than 13,000 homes through its federally funded programs to assist low-income residents.[5]

Figure 1 illustrates the number of homes, including those located in multi-unit dwellings, weatherized through the Trust and Maine State Housing Authority programs. It does not reflect homes that made improvements on their own, without participation in either of these programs. The Trust has historically assumed that approximately 20% (or 100,000 units) of the state's homes had been weatherized in prior years or were recently built and do not require additional weatherizing. A 2015 residential baseline study showed that 20% of Maine homes have basement insulation.[6] Using that figure as a proxy for weatherization, the Trust will continue to assume that 100,000 homes are already weatherized.

In July 2021, the Maine Legislature enacted a bill reflecting its plan to invest the State of Maine's allotment of the American Rescue Plan Act (ARPA)—LD 1733, An Act To Provide Allocations for the Distribution of State Fiscal Recovery Funds—which allocates $25 million to the Trust to accelerate weatherization and efficiency upgrades for homes in the State, especially for low-income, older residents and renters. This influx of federal funding is the primary driver behind the increase in weatherization activity during the Triennial Plan V period. The Trust plans to invest all of these ARPA funds in weatherization projects in low-income households.

[2] 35-A MRS §10110(2).

[3] Efficiency Maine, "Reports," http://www.efficiencymaine.com/about/library/reports/.

[4] The Trust estimates the number of unique homes weatherized from the measures installed based on the average number of measures installed per home. As of the writing of this plan, the Trust's FY2021 data is preliminary.

[5] As of the writing of this plan, the Maine State Housing Authority has not released its FY2020 and FY2021 data; the Trust has used a five-year average for these two years to match the reporting timeframe.

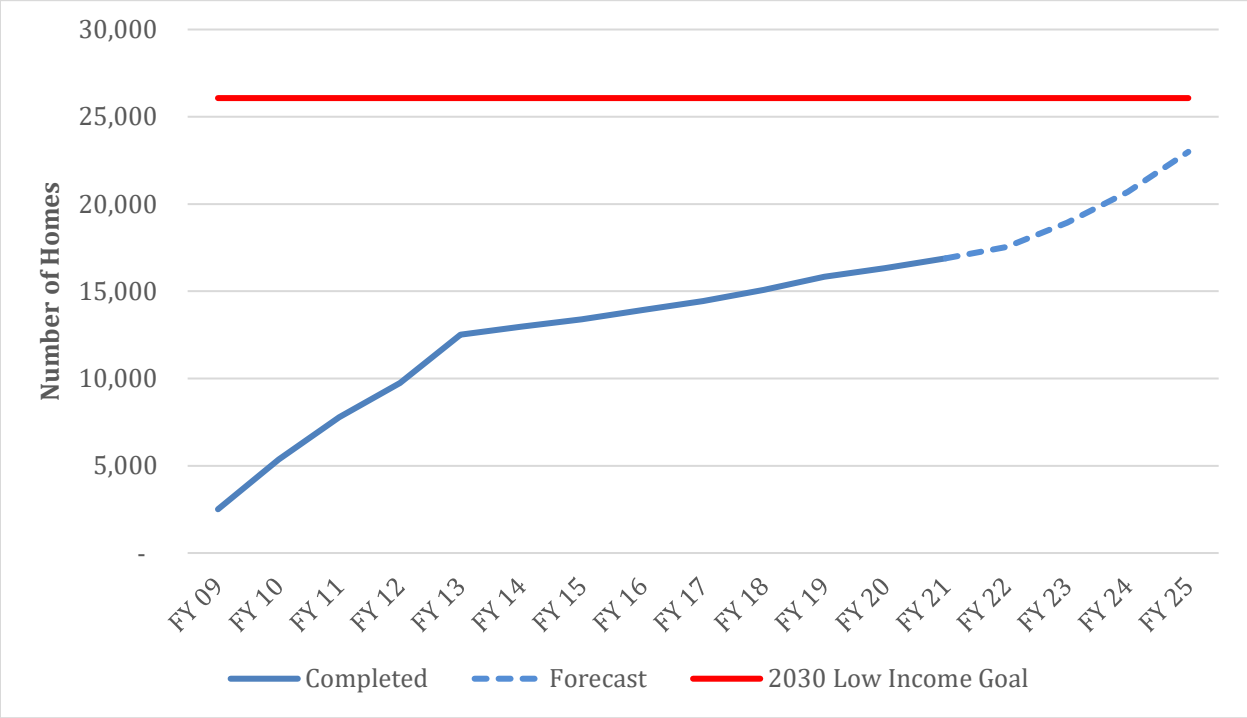
[6] NMR Group, Inc., *Maine Single-Family Residential Baseline Study,* September 14, 2015, Table 17: Foundation Walls in Conditioned Space Detailed Characteristics.

Figure 2 parses out the number of low-income homes weatherized through the Trust and Maine State Housing Authority programs, and illustrates the significant impact of ARPA funding for this sector.[7] With the help of these funds, Maine is on a considerably stronger path toward meeting the 2030 target.

Figure 1: Weatherization

[7] Note that the Trust does not have insight into the Maine State Housing Authority's actual or projected weatherization activity beyond FY2019. This figure therefore assumes the five-year average for all years beyond FY2019.

Figure 2: Low-Income Weatherization

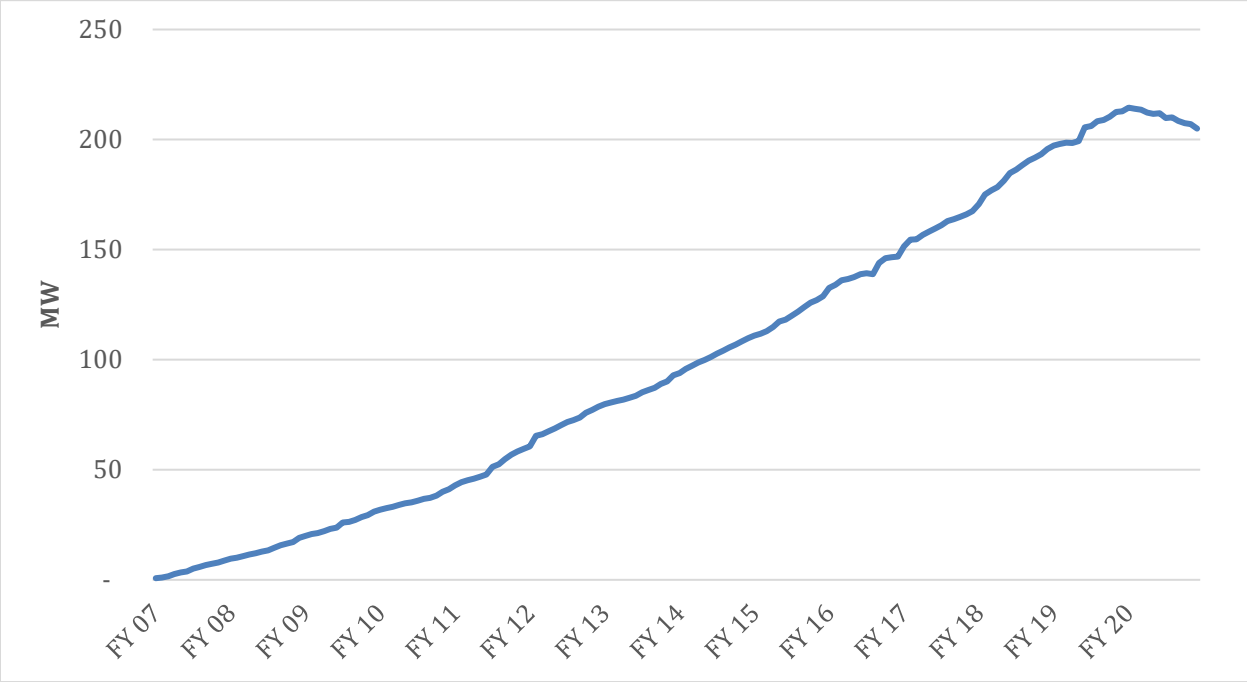


6. What is the statutory goal relating to reducing peak electricity load (MW)? What are the Trust's historical results?

When the Trust commenced administration of Maine's conservation programs in FY2011, the long-term statutory target for peak electricity reduction was 100 MW by 2020. The Trust's programs quickly surpassed that goal, and the statute was amended in 2013 to set the goal at 300 MW by 2020. In 2021, the Legislature amended this provision yet again, replacing the absolute target and the 2020 target date with a standard of *reducing the peak-load demand for electricity by the maximum achievable cost-effective amount* (MACE). Figure 3 shows historical MW savings from Efficiency Maine programs (including from the years prior to FY2011 when Maine's Public Utilities Commission managed the programs). By the end of FY2020, the cumulative effect of the Trust's programs accounted for approximately 205 MW of avoided capacity demand.[8]

[8] This accounts for measure expirations (i.e., as measures reach the end of their useful lives, their savings are no longer counted in the cumulative total).

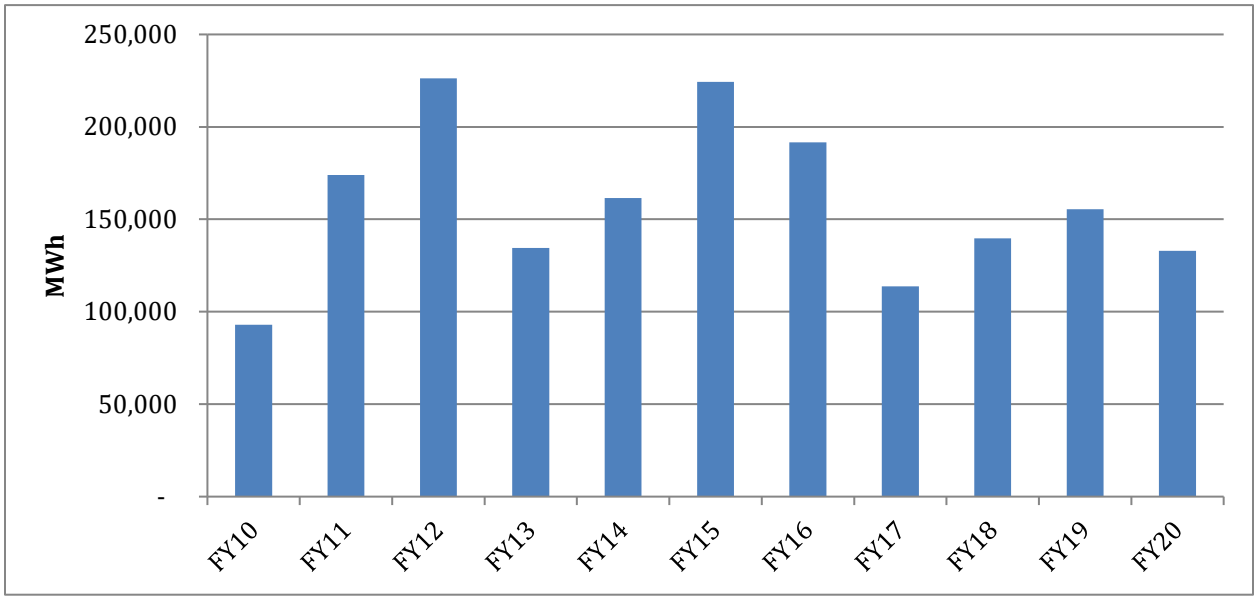
Figure 3: Cumulative Demand Savings (MW)



7. What is the statutory goal relating to electricity savings (MWh)? What are the Trust's historical results?

As with the peak demand reduction goal, the statutory goal regarding electricity savings has evolved over the past decade. Initially in FY2011, Section 10104(4)(F)(4) of the statute set a goal of achieving electricity savings of 30% by 2020. That goal was amended in 2013 to 20% savings by 2030. In 2021, the goal was amended to a standard of *achieving the maximum achievable cost-effective electricity (MACE) program savings.* The Trust's estimates of MACE are made during the preparation of each triennial plan and are updated periodically to reflect significant changes in avoided costs, equipment prices, market demand, supply chain and workforce challenges, and other factors. The savings achieved through the Trust's past programs are reflected in Figure 4.

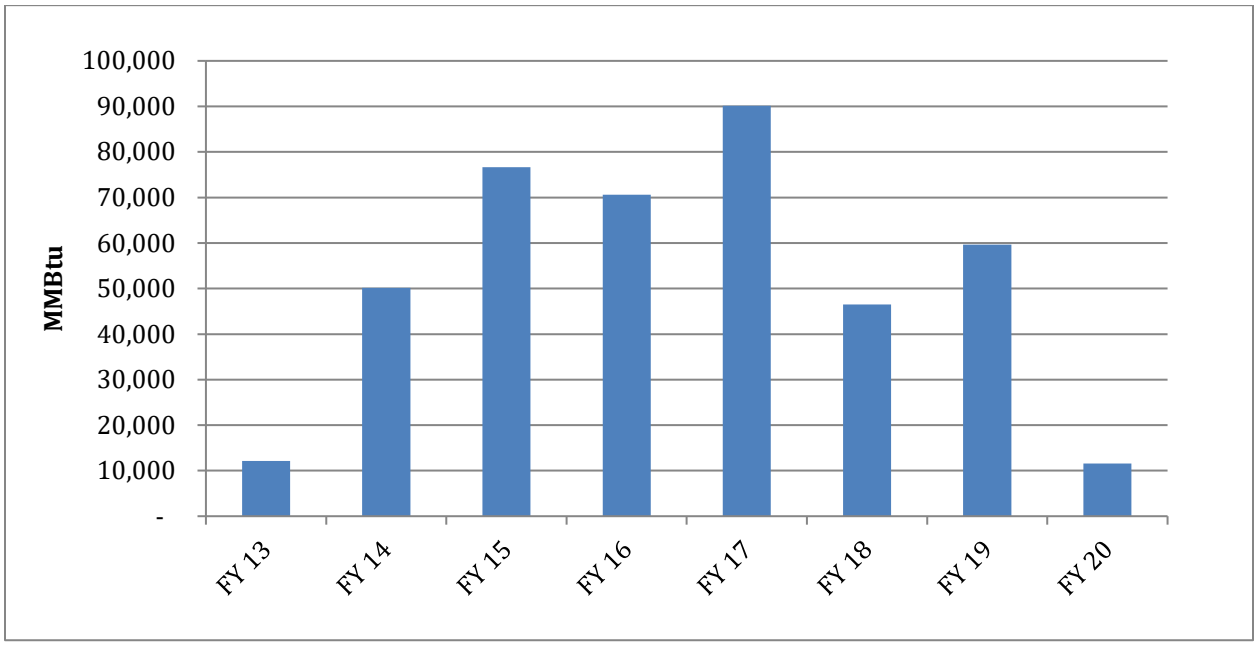
Figure 4: Annual Electricity Savings (MWh)



8. What is the statutory goal relating to natural gas savings? What are the Trust's historical results?

A second goal set forth in Section 10104(4)(F)(4) is to *achieve the maximum achievable cost-effective natural gas program savings, as defined in and determined pursuant to the performance metrics approved by the PUC under Section 10120*. Historically, the goals for natural gas savings mirrored those for electricity savings and were amended in 2013 and 2021. Actual savings achieved by the program in past years are reflected in Figure 5.

Figure 5: Annual Natural Gas Savings



9. What is the statutory goal relating to job creation in the alternative energy and energy efficiency marketplace? What are the Trust's historical results?

Section 10104(4)(F)(5) of the statute establishes a goal of *creating stable private sector jobs providing alternative energy and energy efficiency products and services in the State by 2020*. The Trust assumes 9.3 job-years are created per million dollars invested through cost-effective energy efficiency programs. A job-year is a full-time equivalent job lasting one year. This ratio is based on a Pacific Northwest National Laboratory (PNNL) report prepared for the DOE, which surveyed seven similar studies.[9]

Through 2020, the Trust invested approximately $448 million dollars through its programs, which, when applying the ratio from the PNNL report will result in an estimated 4,166 job-years.

10. What is the statutory goal relating to GHG emissions reductions? What are the Trust's historical results and future projections?

Section 10104(4)(F)(6) of the statute establishes a goal of *contributing to the effort to reduce GHG emissions in the State by amounts consistent with the state's GHG reduction requirements*.

Title 38, Section 576-A sets the following binding targets for the State:

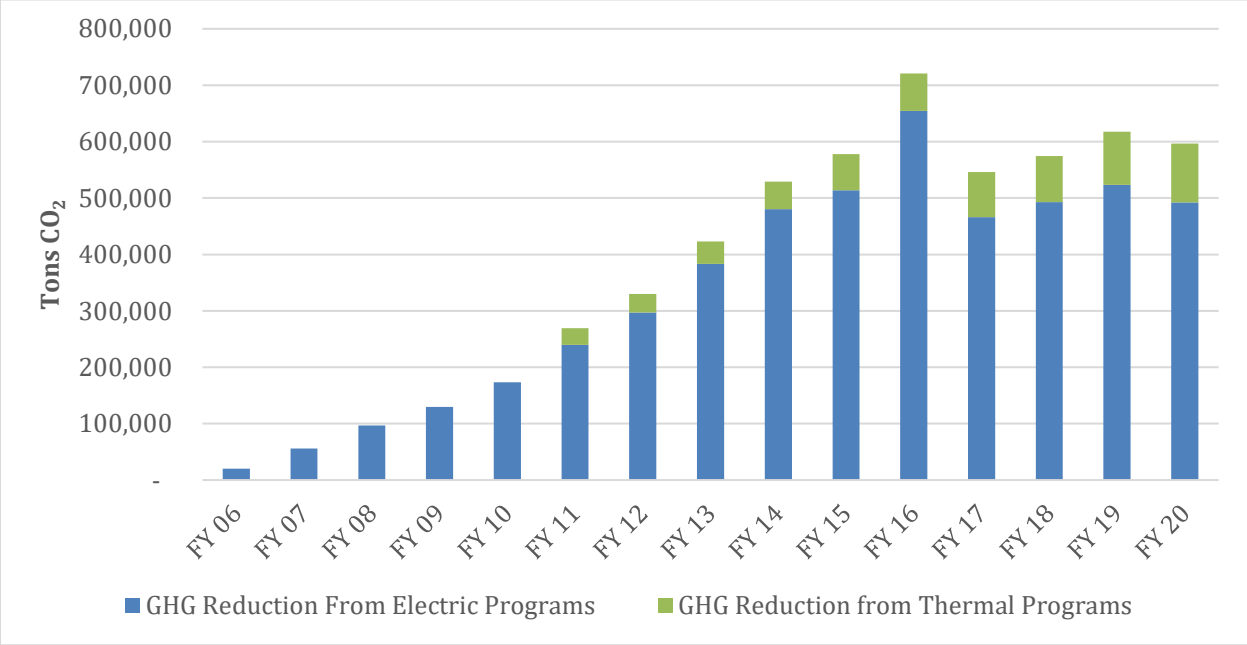
- By January 1, 2030, the State shall reduce gross annual greenhouse gas emissions to at least 45% below the 1990 gross annual GHG emissions level; and

[9] Pacific Northwest National Laboratory, *Assessing National Employment Impacts of Investment in Residential and Commercial Sector Energy Efficiency: Review and Example Analysis,* June 2014.

- By January 1, 2050, the State shall reduce gross annual greenhouse gas emissions to at least 80% below the 1990 gross annual GHG emissions level.

Figure 6 shows the cumulative annual GHG reductions associated with all of the Trust's programs (electric and thermal) from 2006 through 2020.[10] Note that GHG Reduction from Electric Programs is calculated using the ISO-New England reported marginal emissions rate for electricity each year the savings were reported. The grid became significantly cleaner in FY2017, resulting in less GHG savings despite saving more electricity than previous years.

Figure 6: Cumulative Annual GHG Reductions from Trust Programs



Note: The reported CO_2 reductions from electric generation in this figure do not factor into consideration of the impact of Maine's electricity generators' being regulated under the carbon cap of the RGGI.

11. What are the statutory goals relating to heat pump installations? What are the Trust's historical results and future projections?

There are currently two statutory goals relating to heat pump installations.

First, Section 10119(2)(A)(2) establishes a goal of, *from fiscal year 2019-20 to fiscal year 2024-25, installing 100,000 new high-performance air source heat pumps in the State to provide heating in residential and nonresidential spaces*. The statute defines "high-performance air source heat pump" as

[10] This accounts for measure expirations (i.e., as measures reach the end of their useful lives, their savings are no longer counted in the cumulative total).

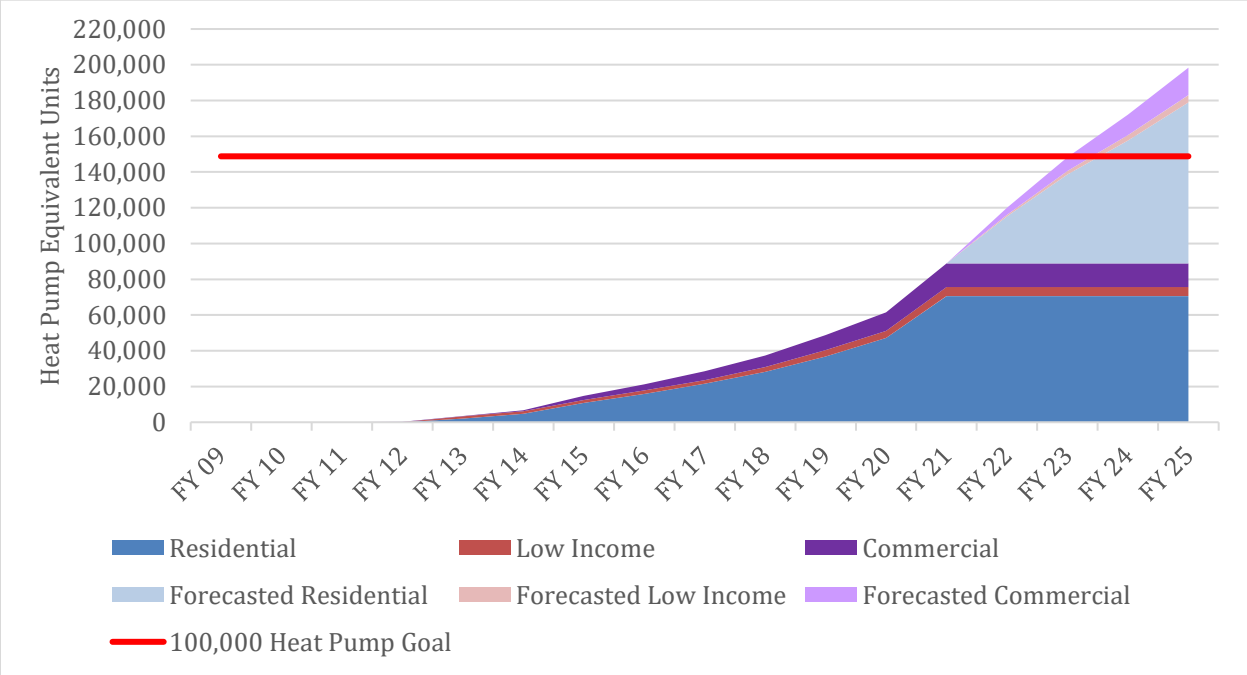
an air source heat pump that satisfies minimum heating performance standards as determined by the Trust.

Second, Section 10104(4)(F)(7) extends beyond the first goal to set a 2030 goal that matches the heat pump metrics contained in the action plan of the Maine Climate Council. Specifically, this provision of statute calls for the Trust to *promote the purchase of high-efficiency heat pump systems to achieve by 2030 the goal of 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.*

Consistent with Maine's climate action plan, the Trust will set as a further goal that *15,000 of these heat pump installations should be in income-eligible homes by 2025,* and will work with Maine State Housing Authority to help achieve this goal.

Figure 7 shows the number of high-performance air source heat pumps installed through the Trust's programs since it first began to offer incentives on this measure in 2013. This number does not reflect heat pump installations completed outside of the Trust's programs, either through the Maine State Housing Authority program or in households and businesses that pursue installations without an incentive. The Trust calculates that it is on track to meet the 100,000 heat pump target before the end of FY2025.

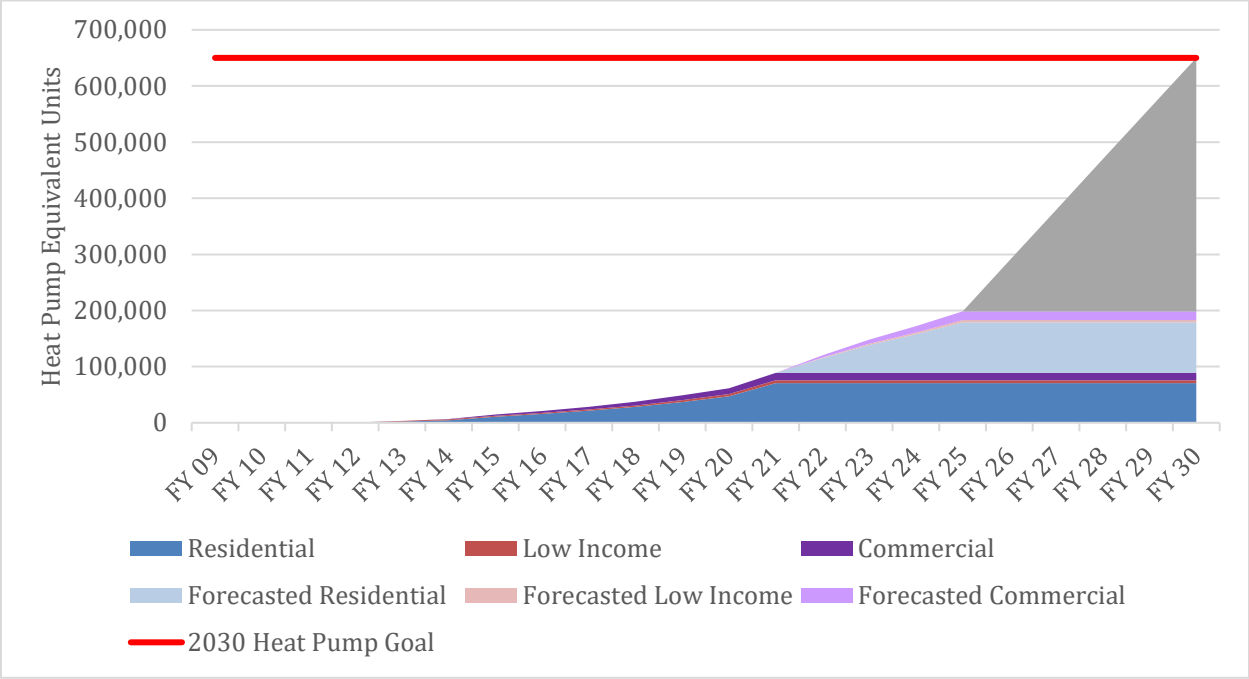
Figure 7: Cumulative Heat Pump Installations through 2025



For longer-term context, Figure 8 builds upon the same information illustrated in Figure 7, showing an extended timeframe through 2030. The Trust estimates that the 2030 target translates to roughly

650,000 heat pump units.[11] The Trust does not have any precise forecasts for its heat pump programs beyond the Triennial Plan V period. It assumes that the state will not achieve the 2030 goal with incentives alone, but rather that the pathway will entail an all-solutions approach comprising codes and standards, technology improvements, financing, and market transformation in addition to financial incentives.

Figure 8: Cumulative Heat Pump Installations through 2030



12. What is the statutory goal relating to electric vehicle (EV) adoption? What are the Trust's historical results?

Section 10104(4)(F)(8) establishes the goal of *promoting the purchase of battery electric vehicles and plug-in hybrid vehicles to achieve by 2030 the goal of at least 220,000 such vehicles registered in the State*.[12]

Figure 9 shows the Trust's historical results for EV rebates since the program's inception in FY2020. As of the writing of this plan, the Trust has only very limited funding available to continue EV rebates in Triennial Plan V, and then only for low-income customers. In Appendix N, Electric Vehicle Initiatives – Targets and Priorities for Future Funding Sources, the Trust discusses, at a conceptual level, what it would do during the Plan period if it were to receive new, as-yet-unidentified, funding to promote electrification of transportation. In Appendix N the Trust also discusses how these initiatives might

[11] See Appendix I, Heat Pump Analysis and Considerations, for further detail.
[12] Note that due to a typographical error, sub-section (8) of this provision of statute indicates that the 2030 target for EVs in the state is 120,000. To match the targets recommended in the State's climate action plan, the Trust will work toward the correct target of 220,000.

advance the 2030 EV goal. Much as with heat pumps, the Trust assumes that the state will not achieve the 2030 goal with rebates alone. The Trust anticipates that declining EV prices will be the primary driver, spurred by technology advancements and shifting priorities in the automobile industry. Other drivers will be federally funded incentives, expansion of a public network of EV chargers, and complementary education and awareness campaigns.

Figure 9: Cumulative EV Rebates from 2019 through 2021