

Appendix L
Electric Vehicle and Public Electric Vehicle Charging,
Analysis and Considerations

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By Ian Burnes, Anne Stephenson, and Hogan Dwyer
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1. What is the purpose of this testimony?

This testimony supplements the description of the Electric Vehicle (EV) Initiatives found in the body of Triennial Plan VI. It discusses the background documentation used in support of the plan's EV rebates as well as those guiding EV charger investments.

2. Who is introducing this testimony?

The testimony is provided by Ian Burnes, Director of Strategic Initiatives at the Trust, Anne Stephenson, Assistant Deputy Director for Operations at the Trust, and Hogan Dwyer, Program Manager for EV Initiatives at the Trust.

3. Mr. Burnes, please state your name, title, and business addresses.

My name is Ian Burnes, and I am employed by the Trust as the Director of Strategic Initiatives. My business address is 168 Capital Street, Suite 1, Augusta, ME 04330.

4. Please summarize your educational and professional experience.

I have a bachelor of arts degree in economics from Wesleyan University. I have been working at the Trust since 2009. My responsibilities include the oversight of the strategic initiatives team that implements the Trust's customer tracking database, maintains the Technical Reference Manuals, oversees the program evaluations, and manages the Trust's resource in ISO-NE's Forward Capacity Market. Before coming to the Trust I worked at the Governor's Office of Energy Independence and Security.

5. Ms. Stephenson, please state your name, title, and business addresses.

My name is Anne Stephenson, and I am employed at the Trust as the Assistant Deputy Director for Operations. My business address is 168 Capitol Street, Suite 1, Augusta, ME 04330.

6. Please summarize your educational and professional experience.

I have a bachelor of arts from Mount Holyoke College and master's degree and PhD from the University of Chicago in architectural history. Before working at the Trust, I worked in campus sustainability, building science education, and energy efficiency in historic buildings. I was hired by the Trust in 2013 and have worked in various communications, reporting, and project management roles since that time. I have eleven years of experience in efficiency program administration, Trust operations, and Triennial Plan development.

7. Mr. Dwyer, please state your name, title, and business addresses.

My name is Hogan Dwyer, and I am employed by Trust as a Program Manager for EV Initiatives. My business address is 168 Capitol Street, Suite 1, Augusta, ME 04330.

8. Please summarize your educational and professional experience.

I have worked at the Trust since April 2023. I focus primarily on design and implementation of light-duty EV rebates; I also support the Trust's public charging initiatives. Prior to joining the Trust, I supported local-level clean energy projects as a Research & Project Specialist at Sustainable Jersey. I have a bachelor of arts. in environmental studies and philosophy from St. Lawrence University.

9. How are you defining an EV – Electric Vehicle?

For purposes of the Triennial Plan and this testimony, the Trust includes both battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs) within the family of vehicles called "EVs." We exclude from the definition of EVs those hybrids that do not have the ability to charge with a plug.

10. Why did the Trust commission an EV Market Assessment and Load Impact Report?

The EV market has been changing rapidly in recent years, and that change is expected to continue. Many more EV models are entering the market than were available even a year ago. The costs of production for EV batteries is declining, and the performance of EVs, including energy efficiency and range, is improving. Similarly, customer attitudes and familiarity with EVs has shifting rapidly, too.

The Trust commissioned an analysis of the EV market, conducted in 2024, that resulted in the EV Market Assessment (Appendix L-3) and Load Impact Report (Appendix L-4). The study was commissioned to help the Trust better understand this changing marketplace and position its program to address these changing conditions. In addition, the Trust has operated an incentive program to promote EVs since FY2020. The scope of the study included assessing the impact of the rebate program to date.

The Trust selected Dunskey Energy + Climate Advisors (Dunskey), a consulting firm focused on energy efficiency and electric vehicles, to undertake the study.

11. What did the study discover about the influence of the Trust's rebates to date?

The Dunskey team reviewed survey results from recipients of the Trust's EV rebate in Maine. 68% of all respondents, including 92% of low- to moderate-income recipients, attested that the rebate positively contributed to their decision to purchase an EV. The study further found that rebates had a greater influence on the purchasing decision of low-and moderate-income household participants, which is a similar result to that of other states' rebate programs that have been recently evaluated.

In addition, the study conducted a regression-based model comparing the EV rebate program in Maine to programs in other states and found that the rebate in Maine was a key ingredient to EV adoption, but not the sole driving force. The model showed that the availability of public charging infrastructure positively influenced EV adoption, as did the share of the population with an annual income above \$75,000.

The regression model suggested that the total number of EV sales in Maine would have been approximately 10% lower without the influence of the rebate. While this impact is modest, it is also understandable given the limits of the rebate program. The study points out that in Maine the Legislature has instituted a price cap on the eligibility of EV models that may receive a rebate from the Efficiency Maine program. From 2020 to 2024, this restriction limited rebate eligibility to those EVs having a manufacturer’s suggested retail price (MSRP) of \$50,000 or less. During the period covered by the study about half of all EV sales in Maine were for vehicles having an MSRP greater than \$50,000, making them ineligible for a rebate and unable to be influenced by the rebate. The study was not able to isolate the impact of the rebates on the portion of EV sales for vehicles having an MSRP less than \$50,000 and eligible for the rebate. However, simple math suggests that had the pool of EV sales studied not been diluted by the vehicles for which no rebate was allowed, the measured impact of the rebate program would be significantly greater than what the study found.

The study indicated that the influence of the rebate could grow as EVs progress along the technology adoption curve from early adopters to more mainstream consumers.

12. What was the peak impact on the electrical system from residential EV charging?

The study looked at charging behavior across multiple charging use cases and vehicle types. Table 5 of the Load Impacts Report, show the impacts on peak demand on the electrical system from unmanaged charging of EVs. The table shows the average impact across all EVs in the state, and reflects the fact that not every vehicle plugs in every day. (This table does not show the impact of a single EV on any given occasion when it plugs in to charge.) EVs use their batteries during cold winter months to keep the cabin and the battery pack warm, which increases the amount of charging they need in order to travel a given distance. The aggregate impact across all EVs in the state is reflected in the slightly higher peak loads during the winter months than the warmer summer months. The average peak load impacts for each season, shown for both all-electric BEVs and plug-in hybrid EVs, are reflected in the table below:

Season	Peak load type	Per BEV	Per PHEV
Winter	Coincident	1.01 kW	0.60 kW
	Non-coincident	1.16 kW	0.63 kW
Summer	Coincident	0.72 kW	0.40 kW
	Non-coincident	0.78 kW	0.42 kW

13. How might the rapidly changing EV marketplace impact the Trust’s EV Initiatives over the Triennial Plan period?

The EV Market Assessment, demonstrates that the price of EVs is largely driven by the cost of batteries. As the price of batteries has come down, so too has the price of electric vehicles. Some lower-range electric models are already at, or near, price parity with ICE vehicles. The study cites other research that projects mid-range BEVs will reach price parity with ICE vehicles sometime before 2030 and well before that in situations where when the full federal tax incentive is applicable. In addition, the report demonstrates that the production constraints, which have suppressed the EV sales market in Maine and elsewhere, have been largely resolved. Electric vehicle and battery production capacity is expected to now outpace demand through 2030.

Additional Trust analysis found that the EV measure reliably reduces rates over the lifetime of the measure, but only when the amount of the rebate is modest and when the purchase of the EV is paired with a smart charger. As discussed in *Appendix H: Beneficial Electrification Plan*, at this time, any EV rebate that exceeds \$2,000 exceeds the rate suppression effect of that vehicle. Therefore, EV incentives funded through electric procurement will need to stay below the value of the rate suppression impact.

In order to maximize the influence of the rebate, the program will seek to avoid paying incentives to consumers for what they were likely to do anyway. The Trust’s strategy will target low- and moderate-income households, businesses, non-profits and governments, as they are mostly likely to be deterred by the incremental cost of an EV. In addition to having greater challenges or reluctance to overcome the incremental cost barrier, these customers also are less likely to benefit from available federal tax credits and will therefore be more reliant on a rebate to enter the EV market.

Should additional funds become available during the Triennial Plan 6 period that would not be constrained by the rate reduction threshold, the Trust may revisit the program’s eligibility criteria for rebates and modify the rebate amounts.

14. What is the relationship between program budgets and projected activity levels and the Maine goals for EV adoption?

The preliminary estimate of EVs in the MACE electric budget includes \$2.2 million in FY2026; \$3.1 million in FY2027; and \$3.9 million in FY 2028. This budget is projected to result in sales of over 4,000 EVs in Maine. These numbers are based on past program activity for low-income, moderate-income, and commercial rebates, and scaled to Dunsky’s projected sales growth rates after 2026. Additional program activity is constrained by the amount of the rebate the Trust might issue given the upper rebate limit that reliably reduces rates (as discussed above).

As discussed in Dunsky’s report, the EV market will likely grow in Maine, independent of the rebate program because of market shifts toward lower cost electric vehicles, customer awareness of EVs, and improving availability of charging infrastructure. What the Trust’s program in Triennial Plan VI will deliver is a degree of assurance that the shift to EVs, and the benefits they bring (such as lower lifetime cost of ownership), are accelerated and enjoyed more equitably among those consumer segments in Maine that face the highest barriers to making the transition. This program will make beneficial

electrification more accessible, and more achievable, for low- and moderate-income households, businesses, governments and non-profits.

To improve access to EVs and accelerate the transition for these specific consumer segments, the Trust's program during Triennial Plan VI will primarily target "used" vehicles. The list price for used vehicles, even those that are relatively "young" and coming off of 2- and 3-year leases, is typically \$10,000-\$25,000 less than the price when the vehicle was sold as "new." Making used vehicles eligible for the EV rebate will ensure that these consumer segments, facing elevated barriers and reluctance to purchase EVs, have more meaningful access to the program's rebates

For any EV rebates that will be paid out of the funds from the Electric Efficiency Procurement, the program will institute three additional requirements. First, when using electric procurement funds, the program will require that the vehicle be purchased, not leased. The reality of most leased vehicles is that they are owned by the manufacturers' financing arm and are not the property of the local dealerships. When the lease period ends, the vehicles are shipped out of state to be sold at auction long before they can consume enough electricity on the Maine grid to reliably reduce rates. Second, the program will establish criteria (using metrics such as model year or maximum odometer readings) to establish a reasonable likelihood that the EVs use in Maine will last long enough so that the EV can consume enough electricity to reliably reduce rates over the (remaining) life of the vehicle. Third, the program will require that in order to access the EV rebate, the customer also participate in the Trust's "smart charging" program. The "smart charging" initiative is described further below and in Appendix O.

Should other funding sources become available, such as from a federal grant or the settlement of a legal case, the Trust's EV rebate program will stand ready to expand eligibility to more consumer segments and more types of EVs, to increase the size of the rebates, and to relax the proposed restrictions.

15. As the market of medium- and heavy-duty electric vehicles expands, how might the Trust incorporate these vehicles into Electric Vehicle Initiatives?

In 2024, the Legislature enacted LD 122, *An Act to Update the Electric Vehicle Rebate Program and to Establish a Pilot Program to Support the Uptake of Medium Duty and Heavy Duty Zero-emission Vehicles*, requiring the Trust to establish a pilot program to provide commercial incentives for medium- and heavy-duty (MHD) EVs. The Trust will take any learnings from this pilot program and consider whether to continue offering incentives for MHD vehicles through its ongoing EV Initiatives rebate program. Additionally, the Maine Department of Transportation (DOT) is currently applying to the second round of competitive grant opportunities through the federal Charging and Fueling Infrastructure fund. Staff expects that Maine DOT's application will specifically request budgets to promote installation of chargers to accommodate MHD EVs in Maine. Finally, the Trust will continue to track the price of new and used MHD EVs to revisit their potential to be funded as a beneficial electrification measure through the electric procurement. As their pricing and performance evolves, if the Trust is able to demonstrate that they are both cost-effective and reliably reduce rates over the life of the measure, the Trust would ask its Board and the Commission to reflect that in a significant change to the plan.

16. Will e-bikes be included as a program measure?

Maine statute was recently amended to allow the Trust, in its discretion, to extend EV rebates to e-bikes. The legislation did not allocate or appropriate any new funding for this purpose. The amendment also limited eligibility for e-bike rebates to recipients who are low-income and moderate-income or to entities that serve those individuals where the e-bike will serve as the recipient's principal means of commuting. In FY2024, after discussing opportunities with various stakeholders (including the Bicycle Coalition of Maine, housing authorities, and State agencies) and reviewing existing e-bike programs in other jurisdictions, the Trust's EV program elected to pilot a small e-bike program, issuing a request for proposals from organizations serving low-income clients. The Trust awarded grants to proposals from three public housing authorities. The Trust will review the results of these pilot projects to analyze issues around the amount of gasoline being displaced, cost-effectiveness, carbon reductions, and the scope of the opportunity for e-bike use in Maine, and then make a decision during the Triennial Plan VI period about whether and how to expand the program offerings. Analysis of the cost-effectiveness of e-bikes, and their capacity to reliably reduce rates, is presented in Appendix H (Beneficial Electrification Plan). This analysis determines whether a measure, such as e-bikes, will be eligible for beneficial electrification funding through the Electric Efficiency Procurement.

17. How will the Trust incentivize managed home charging?

Because the Trust is relying primarily on the Electric Efficiency Procurement as the source of funding for EV rebates in Triennial Plan VI, it is essential for any proposed EV measure to establish that it will reliably reduce rates over the life of that measure. As explained in more detail in Appendix H (Beneficial Electrification Plan), determining whether a measure will reliably reduce rates entails calculating the rate suppression effect of electricity consumption over the full operating lifetime of the measure and comparing that to the sum of costs incurred by ratepayers to promote and operate the measure. These costs take account of the cost of providing the rebate, the cost of administering the program, and any marginal cost impacts on the electrical system. In the case of EVs, the Load Impacts Report (Appendix L-4) shows that unless EV charging is managed to minimize use during periods of peak demand, the charging will cause a marginal cost on the grid. To minimize that cost to the point that the measure will reliably reduce rates, the purchase of EVs will need to be bundled with "smart" home EV chargers. Only where EVs are bundled with managed or "smart" charging can they be both cost-effective and reliably reduce rates, and therefore an eligible beneficial electrification measure fundable with electric utility ratepayer dollars. To that end, in Triennial Plan VI the Trust will bundle EV rebates with incentives on "smart chargers" through the Demand Management Program where the incentive will pay the incremental cost over a standard Level 2 EV charger. For a complete discussion of the managed charging measures please see Appendix O.

18. In addition to this home charging, how much public charging infrastructure does the Trust project to install during the Triennial Plan period and how will it be funded?

Public charging projects during the Triennial Plan period will be funded primarily through federal grants that were recently awarded for projects in Maine. These include \$19 million through the National Electric Vehicle Infrastructure (NEVI) Program, \$15 million from Charging and Fueling Infrastructure (CFI) Discretionary Grant Program, \$8 million through the Maine Jobs and Recover Plan (MJRP), and \$10

million through the New England Clean Energy Connect (NECEC) settlement. In total, the Trust, as the implementation arm of the statewide initiative called “Recharge Maine,” will invest \$52 million over the next several years to continue building out Maine’s EV charging network along highways and within communities. The forecasted deliverables from these plans include at least 250 level 2 sites and approximately 62 level 3 sites.

Should other funds become available, or be awarded, additional public charging projects would be guided according to the objectives and priorities outlined below.

19. What objectives and priorities will the Trust pursue regarding the installation of EV chargers?

The Trust’s public charging investments are guided by state priorities outlined in Appendix L-2: *Maine’s Plan for EV Infrastructure Deployment (PEVID)*. PEVID was first issued in 2022 to guide strategies for level 2 and level 3 charging investment across the state. It is updated annually by the Maine Department of Transportation with assistance from the Trust and the other members of Recharge Maine.

Other charging investment areas not covered by the current PEVID plan are informed by the Maine Clean Transportation Road Map (due to be published late 2024) and the 2024 update to the State’s climate action plan.

20. What role will the Trust play in promoting utility rate designs that facilitate the objectives of the EV Initiatives?

The Trust intends to be a full participant in dockets at the Maine Public Utilities Commission on matters concerning rate design and utility costs as they relate to EVs and EV charging.¹ The Trust will review proposals on a case-by-case basis and will support rate designs that facilitate greater time-of-use price signals and more accurately reflect the principles of cost causation. The Trust will also be an advocate for keeping electric rates sufficiently competitive to facilitate beneficial electrification through the increased use of high-performance heat pumps, electric vehicles, and other measures.

21. Does this conclude your testimony?

Yes.

¹ See, e.g., Public Law, Chapter 402, LD 347, 130th Maine State Legislature, First Special Session, An Act To Facilitate Maine's Climate Goals by Encouraging Use of Electric Vehicles, 2021, which requires the Commission to open an inquiry to review alternative rate structures to support electric vehicle charging stations for nonresidential applications.