



September 18, 2019

Emily Cushman, Program Manager
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Augusta, ME 04330-6856
Submitted via email: comments@efficiencymaine.com

Re: Greenlots' Preliminary Comments on Beneficial Electrification Study, RFI EM-006-2020

Dear Ms. Cushman:

Greenlots submits these preliminary comments in response to the above-referenced Request for Information (RFI) released by the Efficiency Maine Trust (the Trust) on August 28, 2019. Greenlots' perspective is informed by participation in many EV working groups, regulatory proceedings and work with electric utilities and government jurisdictions across the country.

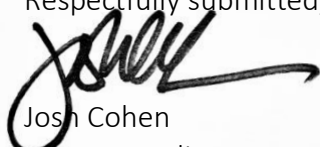
Greenlots is a leading provider of electric vehicle (EV) charging technology and services. Greenlots' product is a software platform to manage EV charging. A significant percentage of America's public DC Fast Charging infrastructure operates on the Greenlots network, as does a growing percentage of Level 2 stations. Greenlots' smart charging solutions are built around an open standards-based focus on future-proofing while helping site hosts, utilities, and grid operators manage dynamic EV charging loads and respond to local and system conditions.

These preliminary comments address the Transportation Electrification (TE) aspect of this RFI. Greenlots' three top-level comments can be summarized as follows:

1. EV charging infrastructure is essential to accelerate the beneficial electrification of the transportation sector.
2. Technology-based managed charging unlocks a suite of benefits for drivers, ratepayers, and the grid.
3. Electric utilities have a critical role to play in growing and scaling the EV market and maximizing the associated electricity system benefits.

Thank you for your consideration of these preliminary comments. Greenlots looks forward to reviewing the draft report and continuing to inform this process as it moves forward.

Respectfully submitted,



Josh Cohen
Director, Policy

1. Identify barriers to beneficial electrification in the transportation and heating sectors of the State

EV charging infrastructure is essential to enable and support transportation electrification. Not only do plentiful charging stations make charging more convenient for existing EV drivers, they also help create new EV drivers by giving prospective buyers the confidence they will be able to charge their car.

It follows, therefore, that the existing lack of charging infrastructure has the opposite impact and is a major barrier to electrification. Range anxiety—including driver uncertainty about whether charging stations will be available or working—has consistently been among the leading obstacles hindering EV adoption.

Compounding this challenge is that the business case to deploy charging stations has not yet developed. For most if not all charging stations, the costs of acquiring, installing, operating and maintaining the equipment and system dwarfs the marginal revenue a station owner receives for dispensing the charging service. For context, gas stations earn only a very small margin on the gasoline sold; the real profit is made off the snacks and drinks sold inside.

In addition to lack of charging infrastructure and the lack of a business case to deploy it, transportation electrification faces several other barriers. Lack of consumer knowledge and awareness means drivers are less likely to consider purchasing an EV. For those drivers who are interested in an EV, there is limited model availability on the market today. Although an EV generally costs significantly less to operate over the life of the vehicle than a comparable gas vehicle, the higher upfront purchase price can still be prohibitive.

2. Identify additional information that the trust may require to make additional recommendations or analyses;

Technology-based managed charging can offer a robust suite of benefits to the state and its citizens. Benefits include avoidance of costly system upgrades, greater ability to integrate variable and intermittent renewable generation into the system, and shifting load to periods of lower demand when electricity is cheaper. From the EV driver's standpoint, technology-based managed charging can be seamless and can happen in the background. Collectively, this is why technology-based managed charging will become an increasingly important tool as EV adoption becomes more mainstream.

Ultimately, the highest value of grid-connected managed charging is that it reduces system costs and applies downward pressure to rates, not just for EV drivers but for all ratepayers. This is illustrated in part by a 2018 report prepared for ChargeVC, "Electric Vehicles in New Jersey –

Costs and Benefits.”¹ This report compared different EV adoption and charging scenarios and found:

“EV adoption provides significant savings that accrue to electric utility customers overall, and those benefits grow with EV usage, affect all components of the utility bill, and are amplified significantly if policies and programs that encourage managed charging are implemented.” (page 53)

Experience shows that projections of EV growth tend to fall short and underestimate actual growth trends. As a number of factors affect growth trends, data-based projection is highly inexact. For jurisdictions such as Maine this creates a challenging circumstance in which to plan and tie outcomes to certain actions. Over time and with more scale, leveraging anonymized EV charging data in relation to when, where and how drivers charge will be a valuable tool.

This data can also be leveraged to help understand the grid impacts of charging and how to lessen those impacts by managing the charging. These impacts may suggest the need for grid upgrades, for more robust, technology-enabled managed charging, or even for rates that may enable grid-positive charging behavior for certain types of drivers or fleets that may not be able to participate in managed charging programs.

In addition, transportation electrification offers a number of benefits including economic development, cost savings, air quality, public health, and environmental. Though most of these benefits are widely acknowledged, they are rarely reflected or quantified within the parameters of cost/benefit analyses or other studies that purport to quantify the benefits of electrification. Often these societal benefits are excluded from consideration because a commission or other public agency is statutorily limited in the criteria it is permitted to consider. For this reason, we encourage the Trust to be mindful of the value of these societal benefits and convey their importance in its recommendations to legislators and other decisionmakers. In other words, Mainers will be better served by analyses that don't just look at costs but also appropriately consider value.

3. Consider potential roles of utilities in supporting beneficial electrification;

Electric utilities have a vital role to accelerate transportation electrification in multiple respects. Whether educating customers, deploying charging infrastructure, growing the market or managing the grid impact, active utility participation adds competence and value to electrification initiatives, and benefits not just EV drivers but all ratepayers.

Collectively, Maine's electric utilities cover the vast majority of the state's geography, and the utilities have trusted—often generational—relationships with their customers. Many citizens look to their local utility first for advice about electricity or EV matters. Maine will benefit by

¹ Available here: <http://www.chargevc.org/documents/electric-vehicles-in-new-jersey-costs-and-benefits/>

leveraging these relationships and communications channels to educate consumers and raise awareness about the benefits and options for owning EVs.

Electric utilities are also uniquely positioned to help scale deployment of infrastructure through a combination of programs that should include utility ownership and management, as well as support for third-party ownership. At this early stage of EV adoption, utility ownership is a key strategy to grow and scale the market for EVs and EV charging products and services.

Greenlots has seen stakeholders and even regulators be unsupportive of utility ownership based upon the assumption that such ownership will stifle competition and the growth of the private market. In fact, the opposite is the case. As noted earlier in the first section, the business case to deploy and operate charging stations does not yet exist; utility ownership therefore becomes essential to lead the growth of the market. The more charging stations there are and the more EVs that are on the road, the bigger the market becomes for all providers and market participants. Moreover, the private market is not monolithic. It includes a diversity of business models, products and services. Restricting utility ownership and operation of EV charging infrastructure distorts the market by favoring certain business models and limiting others.

Electric utilities also have a critical role to manage the grid impacts of EVs. If left unmanaged, EV charging will necessitate system upgrades and could apply upward pressure on rates. It is vitally important that utilities have visibility into EV charging behavior, anticipate EV adoption scenarios and leverage technology-based managed charging to enable and encourage broad uptake of EV charging at scale.

4. Identify areas or populations in the State less likely to benefit directly from beneficial electrification without additional policy development or utility intervention;

As with many issues surrounding transportation, equitable electrification calls for tailoring strategies to meet different needs. More rural, less urban communities, low income or disadvantaged communities, and the multi-family residential sector are three key population segments for Maine to approach thoughtfully to ensure these segments are not left behind.

The lack of available charging infrastructure in more remote, less urban areas is even greater than in more urban areas. Unlike population centers where drivers may be able to find limited workplace, retail, or other publicly-accessible charging stations, more remote parts of the state lack such resources. This poses challenges not only to rural residents but to visitors as well, contributes to a heightened sense of range anxiety, and ultimately limits EV adoption.

Similarly, low-income communities face unique challenges not experienced by wealthier communities. Examples of best practices include leveraging community-based organizations with established relationships to lead outreach efforts; maximizing resources by pairing EV education and awareness campaigns with related home energy efficiency campaigns; and allocating resources to support electrification of carpool, rideshare and transit.

Residents of multi-family apartment and condominium developments (multi-unit dwellings, or MUDs), often lack the ability to install their own charging stations, often due to bylaws, covenants or even insurance policies. Apartment residents face similar challenges but have even less ability to make a purchase decision because they rent rather than own. As a result, programs that support deployment of charging stations accessible to MUD residents and policy actions that support the ability of individual tenants and condominium owners to install their own charging stations are important. In particular, utility-led turnkey installation programs have proven to be among the most effective methodologies for addressing this market.

The private sector is unlikely to address these areas on its own. As noted earlier in the first section, the business case for public charging is challenging, and many market participants have focused on locations in areas that already have higher EV penetrations. As noted above in the third section, electric utilities are uniquely positioned to address these inequities and ensure that all Mainers, regardless of where they live, can participate in and benefit from the electrification of transportation.

5. Recommend opportunities for beneficial electrification.

Some of the most significant opportunities to accelerate beneficial electrification of the transportation sector include long dwell time charging, such as residential, workplace, and fleets – including the medium- and heavy-duty vehicle sectors, where it is often easiest to implement managed charging strategies, and where managed charging can be most impactful for cost savings. While longer dwell time charging may maximize opportunities for managed charging, public charging – including relatively short-dwell DC fast charging – can also benefit from managed charging.

As discussed earlier in the third section, utilities are well-positioned – indeed, often uniquely positioned – to deploy and manage charging infrastructure, and in so doing – help grow and scale the market. Greenlots strongly recommends that the Trust focus on utility or utility-style program development and management.

Fleets offer high-uptake opportunities for electrification which Maine should pursue. Education and outreach are important for fleet managers who are unfamiliar with EVs, but the lack of charging infrastructure is also a barrier for fleet managers who are aware of EVs and want to convert their fleet. This is why substantive initiatives to deploy charging stations such as utility-led charging programs can be so effective.

Greenlots also encourages Maine to pursue high-return electrification opportunities in the medium- and heavy-duty vehicle sectors such as transit buses and ports. Today, for instance, it is already less expensive to operate an electric transit bus than a diesel bus, but higher upfront capital costs often remain prohibitive; reducing this adoption barrier should be a priority target for the state.

Other jurisdictions are already developing policies and programs to accelerate the transition of these sectors. As a policy example which may be informative for consideration, Greenlots recommends California's Innovative Clean Transit Regulation which requires all transit agencies to gradually transition to a zero emission vehicle (ZEV) fleet.² For an implementation example, we call attention to CALSTART's Drive to Zero "beachhead" strategy which focuses on the commercial vehicle market segments where ZEV adoption is most likely to succeed first.³

As noted elsewhere in this document, because of the significant benefits that managed charging offers not just to EV drivers but to all Mainers, the state should strongly encourage managed charging as a key component of its electrification strategy.

If networked charging can be described as providing passive visibility into charging behavior, managed charging enables active operation of it. Managed charging can shift load away from peak periods, enable use of generation from intermittent renewable generation, incorporate site-specific demand charge mitigation, and perform a range of other methodologies to smooth out electricity demand and enable better utilization of grid assets. Collectively, the real value of these capabilities lies in reduced system costs, which in turn apply downward pressure on rates for all ratepayers.

Finally, we have seen that open standards and hardware/software interoperability are hallmarks of responsible planning and deployment of infrastructure to support transportation electrification that leverages ratepayer or taxpayer investments. At their core, open standards can facilitate a seamless driver experience, minimize infrastructure investment risks, and allow for the efficient integration of EVs into the electric grid. Open standards and protocols make it possible to connect an array of software, network, and utility IT systems with charging stations in a royalty-free environment that maximizes both flexibility and competition.

² Available here: <https://ww2.arb.ca.gov/our-work/programs/innovative-clean-transit>

³ Available here: <https://globaldrivetozero.org/about/strategy/>