



Plug In America
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May 13, 2019

Judith Whitney, Clerk
Vermont Public Utility Commission
112 State Street
Montpelier, VT 05602

Re: Case No. 18-2660-INV Investigation into promoting the ownership and use of electric vehicles in the State of Vermont

Dear Ms. Whitney,

Plug In America appreciates the opportunity to contribute to Vermont's investigation of the issues surrounding the ownership and use of electric vehicles (EVs). Please accept for filing the Final Recommendations of Plug In America in Commission request of March 22, 2019. In addition, please reference our various Comments submitted on November 5, 2018; December 14, 2018; January 9, 2019; March 1, 2019; and, April 8, 2019.

The following recommendations follow the outline of Act 158, Section 25.

(d) The Commission's report shall include:

(1) its analysis and recommendations on each of the following issues related to the role of electric distribution utilities:

(A) removal or mitigation, as appropriate, of barriers to EV charging, including strategies, such as time-of-use rates, to reduce operating costs for current and future EV users without shifting costs to ratepayers who do not own or operate EVs;

(B) strategies for managing the impact of EVs on and services provided by EVs to the electric transmission and distribution system;

(C) electric system benefits and costs of EV charging, electric utility planning for EV charging, and rate design for EV charging; and

(D) the appropriate role of electric distribution utilities with respect to the deployment and operation of EV charging stations;

Plug In America highly encourages utilities and regulators to adopt best practice policies for PEV charging rates and rate design as follows:

- We support offering the option of time-of-use pricing, to encourage PEV charging when it is best for the grid and least expensive for the driver;
- We oppose forcing PEV drivers onto TOU rates;
- We support the option of PEV-only TOU, using submetering or time-of-use incentives, as some PEV drivers may not be comfortable with whole-house TOU;
- We support innovative means to reduce the metering cost for PEV-only TOU;
- Where whole-house TOU is used, we support 'shadow billing' and 'hold harmless' provisions to enable PEV drivers to become familiar with the tariff and the means to shift their loads;
- We support shifting DCFC systems onto energy (kWh) based rate tariffs and reducing demand charges;
- For DCFC and industrial or commercial accounts with PEV chargers, we support emphasizing time-varying rates over kW-based demand charges as a means of system cost recovery.



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Plug In America notes that off-peak charging can place downward pressure on electricity rates for *all* ratepayers, including those who do not own or operate EVs.

We are not aware of any constraints imposed on the electricity system by EVs' near- and medium-term *energy* demand (kWh). We do realize that EVs' *power* demand (kW) could have local and grid-scale impacts. Therefore, Plug In America supports using rate design to incentivize off-peak charging. There is already sufficient intelligence in the vehicles to schedule charging, and smart meters at most homes in Vermont. Therefore, it would be possible to use price signals to encourage off-peak charging.

Plug In America recommends that Vermont adopt a Vehicle Grid Integration Strategy, to prudently plan for expanded PEV adoption and to permit (but not require) vehicles to use smart charging to benefit the grid.

Plug In America offers the following recommendations:

- For the systems to be installed in the next few years, we encourage Vermont to focus on and incentivize accessibility, visibility, reliability, and cost;
- Managed charging should focus on demand shifting through time-of-use pricing;
- Should market participants wish to attempt more advanced VGI interactions, we encourage Vermont to help them reduce the “soft costs” of doing so;
- Utilities should be permitted to include PEVs within demand response programs; and,
- Driver needs must take priority over the fairly modest revenue that can be garnered from participation in grid services markets.

Plug In America encourages utilities and regulators to adopt best practice policies that recognize the role PEVs have to play as flexible loads under storage mandates and targets. These include:

- Consider ‘Smart Charging’ of PEVs and other flexible loads when developing energy storage goals, targets, and mandates (if any);
- Credit flexible loads appropriately given their capability of achieving the goals of the energy storage targets (such as better alignment of supply and demand);
- Allow flexible loads to compete against stationary energy storage systems in providing grid services;
- Consider incentivizing incorporation of storage into publicly-supported EVSE where doing so would reduce installation costs, demand charges, or other expenses; and,
- Allow such storage to generate multiple revenue streams.

We support utility investment in “make-ready” infrastructure for EVSE, as this is consistent with other utility regulatory practice for serving additional load.

Furthermore, we support utility investment in EV charging stations in areas that are not effectively served by third parties. In Vermont in particular, this may be rural stations that allow more complete network coverage. The value of an EV station is not determined only by how much that particular station is used, but also by the degree to which it enables further EV adoption. Potential EV drivers will gauge whether the vehicles are suitable depending on the vehicles' ability to complete *nearly any* trip that they might wish to take – not only the trips they take most frequently. Stations that do not see high traffic but provide complete charging network coverage do have value in increasing EV adoption but are difficult for third parties to serve.



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(2) its analysis and recommendations on each of the following issues related to EV charging stations owned or operated by persons other than electric distribution utilities:

(A) how and on what terms, including quantity, pricing, and time of day, such charging stations will obtain electric energy to provide to EVs;

(B) what safety standards should apply to the charging of EVs;

(C) the recommended scope of the jurisdiction of the Commission, the Department of Public Service, and other State agencies over such stations;

(D) whether such stations will be free to set the rates or prices at which they provide electric energy to EVs, and any other issues relevant to the appropriate oversight of the rates and prices charged by such stations, including the transparency to the consumer of those rates and prices; and

(E) the recommended billing and complaint procedures for such charging stations; and

We recommend that charging stations be allowed to charge by the kilowatt-hour (kWh). However, it is not necessary that all such stations choose to charge in this manner. Some site hosts may have reasons for charging by the session or by the time increment, or offering a period of free charging. In some cases, the cost of adding payment methods is not worth the revenue to be gained, so a site host may simply offer the charging for free (perhaps as a means of increasing business).

We support the use of time-varying pricing at public EV chargers as a means of encouraging off-peak charging.

Plug In America supports Vermont adopting language similar to that in New Hampshire. Key elements of the New Hampshire regulations (Sections 236:132, 236:133, and 236:144) are:

- All publicly funded chargers installed after the effective date of this paragraph that are accessible to the public shall be equipped to enable universal access.
- An owner of an electric vehicle charging station shall not be deemed to be a “utility,” “public utility,” or “public service company” solely by virtue of the fact that such an owner is an owner of an electric vehicle charging station.
- All electricity distribution companies shall make available in tariffs terms and rates for electric vehicle charging stations and offer such information to the public.
- The owner or operator of a public electric vehicle charging station that requires payment of a fee shall provide multiple payment options that allow access by the public. [We would support amending this as follows “...without incurring excessive fees, inconvenience or delays. Fees must be easy to understand and fully disclosed prior to charging the user. The total actual charges for the use of an electric vehicle charging station shall be disclosed to the public at the point of sale.”]
- The owner or operator of a public electric vehicle charging station shall disclose the location and characteristics of each such public electric vehicle charging station, including, but not limited to, the address, voltage, and timing restrictions, to the federal database operated by the United States Department of Energy Alternative Fuels Data Center.
- No person shall park in a space equipped with a public electric vehicle charging station, unless such person is operating a plug-in hybrid electric vehicle or battery electric vehicle.
- The owner or operator of a public electric vehicle charging station may impose restrictions on the amount of time that an electric vehicle may be charged at the charging station.
- Owners or operators of public electric vehicle charging stations that require payment of a fee shall not require persons desiring to use such public electric vehicle charging station to pay a



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subscription fee or otherwise obtain a membership in any club, association, or organization as a condition of using such public electric vehicle charging station, but may have different price schedules that are conditioned on a subscription or membership in a club, association, or organization.

(3) its analysis and recommendations on each of the following issues:

(A) jointly with the Secretary of Transportation, recommended options to address how EV users pay toward the cost of maintaining the State's transportation infrastructure, including consideration of methods to assess the impact of EVs on that infrastructure and how to calculate a charge based on that impact, the potential assessment of a charge to EVs as a rate per kilowatt hour delivered to an EV; varying such a charge by size and type of EV; and phasing in such a charge;

(B) the accuracy of electric metering and submetering technology for charging EVs;

(C) strategies to encourage EV usage at a pace necessary to achieve the goals of the State's Comprehensive Energy Plan and its greenhouse gas reduction goals, without shifting costs to electric ratepayers who do not own or operate EVs; and

(D) any other issues the Commission considers relevant to ensuring a fair, cost-effective, and accessible EV charging infrastructure that will be sufficient to meet increased deployment of EVs.

We recognize that electric vehicles will need to contribute to the maintenance of roadways. However, at present they account for a miniscule portion of transportation funding shortfalls. Much more significant is the lack of indexing of gasoline taxes to inflation. As well, the improving fuel economy of conventional vehicles, while commendable, has contributed to this shortfall.

Owners of electric vehicles already pay taxes on their "fuel" – electricity. In addition, they pay sales taxes on the vehicles, and electric vehicles at present have somewhat higher purchase prices than conventional vehicles.

As electric vehicles come to represent a larger fraction of vehicles on the road, it will become more important to ensure they are paying for roadway maintenance. To this end, we do support the eventual development of a road usage charge program.

Any road usage charge program should be kept simple and easy to understand. Distance and vehicle weight are likely the two most critical factors that contribute to road wear and the need to build new road. The criteria for determining the annual fees under a road usage charge program should be as follows: total electric miles driven, total gas miles driven and weight. The weight of any vehicle that exceeds 10,000 pounds is also an important criteria for a road usage charge formula. Vehicles above this weight limit are generally considered medium and heavy-duty vehicles, not light-duty passenger vehicles. The medium and heavy-duty vehicles, regardless if the vehicle is a PEV or not, will cause more road damage over time compared to lighter vehicles. There are "threshold effects," meaning that the damage to roads from vehicles is not a linear function of weight, but is much greater at higher weights.

Since most charging occurs at home, a per-kWh fee on EV charging could require a separate meter for determining which electricity consumption was for the EV. This could be avoided through submetering, relying on the meters embedded in EVSE or the vehicles.

A per-kWh fee is not as precise as a weight-based metric for assessing the impact of vehicles on the roads even though heavier vehicles will generally use more kWh per mile.



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We note that submetering is accurate enough to allow for time-of-use incentives, though perhaps not accurate enough to use for billing. If the error is normally distributed, the error of submetering is not a problem, but some reports indicate that there is a directional bias in the error of submetering (perhaps indicating parasitic loads and losses that are not fully captured). These should be investigated and corrected for before attempting to use submetering for billing.

To encourage EV usage at the pace needed to achieve Vermont's targets in greenhouse gas emission reductions, we support the recommendations on EV incentives and EV infrastructure investment from the Vermont Energy Investment Corporation's presentation of April 23, 2019. VEIC noted the need for dealer training; Plug In America's PlugStar program provides that training and connects interested EV buyers with trained and certified EV sales staff. We would be happy to extend this program to Vermont.

Our recommendations for state strategies to encourage EV adoption can be found in our AchiEVe Policy Toolkit¹. Some of the most important for Vermont include the following:

- Vehicle rebates and tax credits
- Government fleet mandates
- EV-ready building codes and ordinances
- Utility EV investments (such as for make-ready infrastructure and for underserved areas)
- Keeping EV registration fees reasonable
- Developing EV car-sharing programs
- Ensuring open access and interoperability
- Engaging in EV education and outreach.

We encourage Vermont to remain engaged with the Transportation and Climate Initiative. If the Low-Carbon Transportation Policy results in, as proposed, a cap-and-invest program affecting petroleum-based transportation fuels, then we would encourage Vermont to direct a portion of that investment towards EV infrastructure and rebates in recognition of EVs' lower carbon emissions.

Most of all, we encourage Vermont to recognize the societal benefits of EV adoption. Due to the very low-emission electricity grid of ISO New England in general and Vermont in particular, EVs offer very significant reductions in emissions of greenhouse gases and other pollutants when compared to conventional vehicles. These benefits accrue not to the owners or drivers of the vehicles, but to society at large. Accordingly, some amount of societal investment in this technology is warranted and beneficial.

Thank you for the opportunity to provide these comments. Please do not hesitate to contact me with any questions.

Best regards,

A handwritten signature in black ink that reads "Pete O'Connor".

Pete O'Connor
Policy Specialist
Plug In America

¹ https://pluginamerica.org/wp-content/uploads/2018/06/AchiEVe-Policy-Toolkit-2.0_2018.pdf