



October 15, 2018

Ms. Judith Whitney, Clerk
State of Vermont Public Utility Commission
112 State St, Montpelier, VT 05620

Filed electronically on ePUC

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

Tesla appreciates the opportunity to have participated in the workshop convened by the Vermont Public Utility Commission ("PUC") on October 1 and this opportunity to provide comments with respect to the following matters as outlined in the PUC's Post-Workshop Memorandum:

- (1) How to proceed with this investigation into identifying and removing barriers to increased ownership and use of electric vehicles ("EVs") in Vermont
- (2) Specific next steps for this investigation, including proposals for future workshops;
- (3) The appropriate scope of jurisdiction, if any, over EV charging stations and whether legislative changes are necessary to effectuate participants' recommendations.

Tesla's mission is to accelerate the adoption of sustainable energy and to assist in the mitigation of climate change¹. Tesla is a developer and manufacturer of the world's most advanced electric vehicles, and electric vehicle charging stations, among other clean energy products and services. To support the accelerated adoption of electric vehicles, we have established a worldwide presence of sales centers, service stations and charging stations. As of October 2018, Tesla owns and operates 11,000 Superchargers at more than 1300 stations globally.

We believe that access to EV charging infrastructure is a key ingredient to enabling drivers to make the switch from conventional to electric vehicles. For most consumers, consistent and reliable access to charging makes the difference between buying an electric vehicle or a traditional gasoline-powered vehicle. With respect to the three key matters the Commission put forth in its post-workshop memorandum, Tesla has the following comments to offer.

¹ Intergovernmental Panel on Climate Change, IPCC Press Release, October 8, 2018. See https://www.ipcc.ch/pdf/session48/pr_181008_P48_spm_en.pdf

Tesla respectfully recommends that the PUC complete this proceeding expeditiously by focusing on near term issues. Those include:

1. **Clarifying that third-party EV charging operators, as well as site hosts, are not deemed public utilities;**
2. **Allowing third-party EV charging operators to bill drivers on a kWh (kilowatt-hour) basis as it is the most accurate, clear, and fair method of paying for the energy consumed by EV charging services, without the risk of being deemed public utilities;**
3. **Consider smart rate design to encourage the efficient use of capacity; and**
4. **Clarifying the role of utilities and their ability to undertake cost recovery for investments in EV charging infrastructure and related public awareness initiatives.**

Tesla believes the PUC has the authority and the tools to address these first immediate questions and encourages the PUC to explore more complex and less pressing issues incrementally as EV adoption increases. Pilot programs offer a good avenue to assess technologies or practices that could be implemented over the longer-term.

Public EV charging is a service provided by competitive enterprises operating under a variety of business models, and the enterprises are not operating as public utilities.

According to the U.S. Department of Energy, there are more than 400 public chargers in Vermont at more than 174 charging stations.² Some public charging stations are available to use for free, while others are available with parking or time-based fees. The operator and/or owner of each charging station is a retail customer of a Vermont Investor-Owned, Cooperative or Municipal utility.

Tesla owns and operates three Supercharger stations with 24 Superchargers in Vermont that provide Tesla customers with a convenient fast charging experience. Tesla provides Supercharging services at a price below its costs of services and is committed to ensuring Supercharging will never be a profit center. Tesla also works with local businesses to deploy Level 2 charging stations, which provide about 25 to 50 miles of driving range per hour, as part of our Destination Charging network. The network includes publicly accessible chargers located at hotels, restaurants, shopping centers and other local attractions around the country. There are over 35 Destination Chargers in Vermont.

² Department of Energy Electric Vehicle Charging Station Locations. See https://www.afdc.energy.gov/fuels/electricity_locations.html#analyze?fuel=ELEC®ion=DE

Most states did not contemplate EV charging when they defined the term “utility” or “electric supplier,” and so, under the definition of “Public Utility”³ in Vermont, many businesses including hotels and restaurants that offer free EV charging would be considered public utilities. Under the same interpretation of the code, entities that offer free public cell phone charging would also be considered a public utility. Setting aside the potential issues and challenges of establishing service territories for public EV charging, charging providers are not equipped to provide retail electric service. For example, assuming an EV charging provider’s service territory is a parking lot and adjacent property housing charging equipment, the provider would be obligated to provide retail electric service to a customer that chooses to build a store in the parking lot.

The equipment that charging providers operate can only charge electric vehicles. The operators do not provide electric service for all inhabitants and electrical equipment within the area they operate. Instead, EV operators serve a limited number of consumers that have invested in electric vehicles, including consumers that reside in other states but happen to drive and charge their vehicles in Vermont. Another key fact to consider is that EV charging providers are themselves customers of the utility, paying rates to the utility. It would be nonsensical to classify an EV charging provider as a utility, given this reality.

Regulating EV charging service providers as public utilities is unprecedented in the United States.

Over twenty states have formally determined that EV charging services are not public utilities, and no state has taken an action that deems EVSE owners and operators as public utilities, under any state’s statute defining public utility.

Most recently, the Alabama Public Service Commission initiated a generic proceeding in October 2017 to determine its jurisdiction over electric vehicle charging stations. The Alabama Commission issued an order on June 22, 2018 that concluded a person who owns, operates, leases or controls EV charging equipment is *not* considered a public utility.⁴ The Alabama Commission noted that they could not “...discern a circumstance where *the operation of an [electric vehicle charging station], in and of itself, gives rise to utility status or implicates the jurisdiction of this Commission.*”⁵

³ In Vermont “public utility” is defined as a person selling electricity *to the public*. [30 Ver. Stat. Ann. §203\(1\)](#). “A company engaged in the manufacture... distribution or sale of ... electricity directly to the public or to be used ultimately by the public for lighting, heating or power”

⁴ See Alabama Public Service Commission Docket No. 32694: “Generic Proceeding to Determine the Commission’s Jurisdiction Over Electric Vehicle Charging Stations.”

⁵ *Ibid.* at pg. 7.

Entities offering public electric vehicle (“EV”) charging in the State are not operating as public utilities

Declaring that EVSE owners/operators and potentially local businesses who host charging stations, including hotels or restaurants, are operating as public utilities would have significant negative implications to the EV charging industry and ultimately EV drivers in Vermont and across the region. Such a declaration would not be in the public interest and unnecessary because charging network owners operate in a competitive environment and would lead to unnecessary costs and burdens that could potentially lead to a halt in charging station development at time of growing EV adoption.

Tesla recommends that the PUC make a determination that competitive charging service providers (i.e., non-utility owned entities) are exempt from utility regulation. If the PUC does not feel it has the authority, the PUC can seek legislative action to provide the exemption.

Energy-based billing (by the kWh) of EV charging services is fair and transparent

Tesla prices the Supercharger service for customers on a per-kilowatt-hour (kWh) basis where regulations allow for non-utilities to bill for electric charging. In areas where non-utilities are restricted, including Vermont, Tesla bills customers for charging services on a per-minute basis. Tesla believes that EV owners should pay for energy delivered to the vehicle given that it is the fairest and most transparent method to pay for electricity. Several variables make *per-minute billing* inconsistent for any charge session.

Two primary factors affect the time required to recharge a battery. The first is the basic structure of the battery, including its overall capacity, capacity of on-board chargers (the device that converts alternating current to direct current), and state of charge. The second is the level of electrical service (i.e., voltage and amperage) of the charging station. There are three industry-common charging levels used by EV-drivers to charge their vehicles, these are typically referred to as; Level-1, Level-2, and DC fast charging (Level 3). Level 1 is alternating current from a 110-volt outlet, typically found in most North American homes and offices today. Level 2 power comes from a 208/240-volt outlet typically operating between 20 and 90 amps and is generally equivalent to the power coming from a dryer outlet or electric stove. Finally, DC fast charging (Level 3) is a direct current charge typically occurring at over 400 volts.

The charge levels directly relate to the rate of electrical energy transfer and thus the time required to charge. For example, an EV with a 200-mile range charging at a DC Fast charger (50kW–120kW) can take anywhere from 30 to 90 minutes to fully charge. The same vehicle charging at a Level-2 outlet (3.3–19.2 kW) may take 8-10 hours to fully charge or can take several days if charged from a Level-1 outlet. This means that over a specific period, one hour for example, a driver charging his or her EV will see a wide

range of possible recharge rates depending on whether he or she charged at a Level-1, Level-2, or a DC-fast charging outlet and depending on the capacity of their vehicle's battery. Thus, if customers are billed by the minute or by the hour, as opposed to by the amount of energy they receive, some drivers may end up paying more than others due to circumstances out of their control.

Pricing by the minute has several disadvantages relative to pricing by the kWh, and limits price transparency with the consumer. Battery technology, vehicle state of charge, power sharing algorithms, and even the weather can influence the rate of charge of a vehicle in a specific period. For example, the state of charge of a vehicle can affect the recharge rate. Typically, the recharge rate of battery is quickest when the battery is empty, and the recharge rate slows down as the battery fills. Therefore, two drivers parked at identical charging stations (with same level of electrical service) may have a different amount of kWh delivered despite charging for the same amount of time. A driver billed by the kWh is assured that none of these external factors matter during the charge session because their bill is proportional to the energy delivered.

Many charging station service providers are operating in a competitive environment and customers are sensitive to price of their fuel, whether it be gasoline or electricity, so it is important that billing is transparent and fair. Allowing charging station operators to bill on a kWh basis will also make it easier for them to price their product and is more transparent to customers. Most charging station operators are on their electric utility's commercial tariffs, which typically include demand charges and therefore, makes estimating the effective operating costs of a charging station challenging because it will be dependent on the peak demand and overall throughput of the station. Trying to convert those effective operating costs into a time-based rate for end use drivers is very challenging due to additional factors and considerations described above that can affect the rate of charge.

Investor-Owned Utilities, Electric Cooperatives, Municipal Utilities and other public utilities have an important role to play

Investor-Owned Utilities, Electric Cooperatives, Municipal utilities and other public utilities have an important role to play in enabling the expansion of the EV charging network. Across the country, utilities have explored and advanced proposals to make investments in "make-ready" infrastructure that helps attract third parties to the location of a potential charging infrastructure deployment. Development costs of DCFC ("Direct Current Fast Charging") can be significant and so, within partnerships between utilities and third party EVSE owners/operators, site development costs can be shared, which can reduce the total cost for both parties and utilize economies of scale.

Many utilities have undertaken successful workplace and customer education and awareness programs. These programs allow utility customers to learn more about EVs and engage on relevant matters such as *where to charge*, and *ways to charge*. Utility EV infrastructure programs can give added consideration for communities or customer groups that require special consideration in the placement of EVSE facilities such as underserved communities, workplaces and multi-use dwellings where currently access to EV charging may be limited.

Rate Design is critical for beneficial charging behavior and fast charging business cases

Tesla recommends the PUC explore several specific topics in separate tracks but address the most pressing topics first. One priority should be rate design for both DCFC as well as Level 2 charging. According to the Rocky Mountain Institute,⁶ at current utilization rates, Demand Charges of DCFC stations contribute to almost 90% in some cases to the cost of operating a DCFC station and that can be significantly cost-prohibitive. Some public utility commissions around the country have examined and approved utilities proposals to offer providers of DCFC charging a Demand charge holiday—in other words, a removal of the demand charge component of the rates (usually a Commercial and Industrial rate), and to use a volumetric rate to recover the costs.

Additionally, Tesla also encourages the PUC to explore time-varying rate designs that can encourage beneficial charging behavior. Specifically, sending price signals to charge during times of high renewable or solar generation, or encouraging off peak charging at night when excess capacity on the grid is greatest.

Conclusion

Finally, Tesla urges the PUC and other stakeholders to keep the EV driver's experience central to all efforts aimed at developing the charging network, increasing access to charging and enabling greater EV adoption. EV and EVSE technology and business models are still evolving, and making the EV driving experience as enjoyable, convenient and seamless as possible is critical to increasing EV adoption.

Tesla welcomes the opportunity to continue contributing to the Vermont PUC inquiry and thanks the commission for its interest in an important and timely topic.

⁶ Fitzgerald, Garrett and Chris Nelder, *EVgo Fleet and Tariff Analysis*, Rocky Mountain Institute, 2017, p. 1, available at https://www.rmi.org/wp-content/uploads/2017/04/eLab_EVgo_Fleet_and_Tariff_Analysis_2017.pdf

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