

State of Vermont
Department of Public Service
112 State Street
Montpelier, VT 05620-2601
<http://public.service.vermont.gov>

[phone] 802-828-2811
[fax] 802-828-2342
[tdd] 800-734-8390

March 1, 2019

Ms. Judith Whitney, Clerk
Vermont Public Utility Commission
112 State Street, Floor 4
Montpelier, Vermont 05620

Re: Docket 18-2660-INV
Investigation into promoting the ownership and use of electric vehicles in the State of Vermont

Dear Ms. Whitney:

The Public Utility Commission (“Commission”) issued a Notice of Workshop on February 4, 2019. The notice contained a request for information on a number of issues. Please find the Department of Public Service’s (“Department”) responses to these topics below.

- 1) Planned or currently available EV-specific rate offerings for both home charging and service to public charging stations, how they will be or are being implemented, how successful the offerings are expected to be or have been, and any difficulties expected to be encountered or that have been encountered in offering such rates.*

Two of Vermont’s distribution utilities have electric vehicle (“EV”) end-use rates applicable to home charging. The City of Burlington Electric Department (“BED”) offers a credit to EV owners that charge during off-peak hours. Under BED’s tariff, the customer is billed approximately \$.08/kWh after an EV rider is applied and if the customer charges between 10pm-12am. The rider equates to an approximate credit of \$.067/kWh. Customers have the option of managing their charging behavior or providing BED with control over their Level 2 home-based charging station. Green Mountain Power Corporation (“GMP”) also offered an innovative services pilot for EV charging. Under GMP’s pilot rate, the customer could charge their EV off-peak an unlimited amount for \$30 per month. GMP also offered an incentive that covered the cost of level 2 charging stations. In exchange, the customer yielded some measure of control over the charge to GMP. The customer could elect to charge during a called peak event but would pay \$.60/kWh for that on-peak charging session. It is the Department’s understanding that both GMP and BED are utilizing the submetering capability that is built into pre-approved Level 2 charging stations in order to isolate the kWhs specific to EV charging. These kWhs are then deducted, sometimes through manual processes, from the customer’s overall energy usage as measured by their revenue-grade utility meter.

The Department expects that owners of EVs who live in other utilities’ service territories are being charged for the kWhs consumed by the owners’ vehicle under the existing general service

residential rate. Some utilities have residential rate structures that include inclining block rates. These rates are designed to encourage conservation and efficiency, which can conflict with efforts to encourage greater reliance on electricity. Increasing reliance on electrification is now recognized as critical to meeting the State’s renewable energy and greenhouse gas (“GHG”) goals. As such, a deeper reconsideration of rate design as it relates to new loads for electric vehicles will be needed.

This deeper consideration will also be needed for commercial rates that likely apply to rates charged to the owners and providers of public charging station services (i.e., the rates charged by the utility for electricity sold at public charging stations to end users.) To our knowledge, no Vermont utilities have established a separate commercial rate for EV service to public charging station providers. Two utilities in Vermont, however, have established tariffed rates for retail delivery of public EV charging services.

Stowe Electric Department (“SED”), and BED have tariffs for publicly available charging stations that are owned by the utility within their service territories. The SED rate is a flat fee \$2.08 per charging session plus \$.51/hour for the first four hours and then \$1.03/hour beyond four hours.¹ BED’s rate consists of a flat \$.17/kWh plus \$1/hour for any hours after four hours.²

There may be other at-home or publicly available tariffs offered by Vermont utilities that the Department has not included above. The Department looks forward to learning about any such offerings.

- 2) *Demand charges and DC fast-charging stations, including the effects of demand charges on the deployment of such stations and how such effects can be mitigated or eliminated without undue impact to electric ratepayers.*

Demand charges as they exist today present a potential cost barrier to the addition of direct current fast-charging (“DCFC”) stations. The Department recommends that utilities develop an alternative to traditional demand charges that provides sufficient compensation for system costs, i.e. alternative rate designs that would cover the incremental costs plus contribute a margin to cover joint and common and embedded components of costs that are designed to ensure recovery of all costs. Such alternatives could be structured to help the system avoid new costs and empower customers to manage loads for cost savings. The Department recommends that utilities should either (or both) establish an energy-only charge that includes the full costs of demand-related cost drivers, analogous to the residential energy charge (or general service rate for small commercial customers), or develop a rate that reflects a standard usage charge, analogous to the current general service energy charge element, with the ability to send a sharper demand-related price signal more narrowly targeting the monthly and annual peaks, and potentially even high energy charges that benefit the system.

¹ Available at: <https://www.stoweelectric.com/images/rates/2018Rates/Rate - 35 - EVCHRGSTN - Clean.pdf>

² Available at: <https://burlingtonelectric.com/rates-fees>

On the customer (or public charging station owner) side of the framework, stations owners could then choose between strategies to self-manage these charges. Potential strategies include implementation of storage solutions, simply accepting the higher rates and passing the costs along, or other creative solutions that manage operations to reduce their own bill.

Other jurisdictions have also recognized that demand charges present a barrier to the deployment of DCFC stations. For example, see the New York proceeding³ specific to the issue of demand charges and the deployment of DCFC stations as well as some alternative rate designs being tested by the large California Investor Owned Utilities.⁴

3) Incorporation of growing EV charging load into the electric grid and issues associated with serving that new load.

The Vermont Electric Power Company's ("VELCO") 2018 Long Range Transmission Plan ("LRTP") included a forecast of EV adoption prepared by the Vermont Energy Investment Corporation ("VEIC").⁵ The forecast projects approximately 125,000 EVs in Vermont by 2037. Projected additions to both summer and winter peak by the new EV load is approximately 70MW. It is important to note that the forecast assumes no load management measures. The Department expects that the peak MW associated with EVs could be significantly reduced through both passive, e.g. time-of-use rates, and active,⁶ e.g. customers giving the utility control over their charging during peak events in exchange for a lower rate, load management measures.

Additionally, the Department concludes that there is already sufficient capacity on New England and Vermont's bulk transmission system to handle the additional EV charging load over the forecast horizon. Nevertheless, there may be potential for adverse impacts to Vermont's distribution utilities at the distribution system level. Some circuits have sufficient head room to accommodate additional load, while others are much closer to their capacity. It is possible that the distribution utilities will have to upgrade transformers or substation components to handle additional EV load; these types of situations highlight the need to strengthen the visibility and control of individual circuits as well as for utilities to incorporate the following considerations into their planning processes: adoption rates of EVs, distribution and type of chargers being used, and the timing of charging.

4) The potential benefits of managed EV charging to the electric grid, including using EV batteries for purposes such as peak shaving and regulation, and the likelihood of realizing such benefits based on EV usage in Vermont and existing and expected technological capabilities.

³ See New York State Department of Public Service matter number 18-00561, *Proceeding on Motion of the Commission Regarding Electric Vehicle Supply Equipment and Infrastructure*.

⁴ For example, Pacific Gas and Electric provides the following overview of the rates they offer to publicly available charging stations: https://www.pge.com/en_US/small-medium-business/energy-alternatives/clean-vehicles/ev-charge-network/program-participants/rates-and-billing.page

⁵ Vermont Electric Power Company, *2018 Vermont Long Range Transmission Plan*, 2018. Available at: https://www.velco.com/assets/documents/2018%20LRTP%20Final%20_asfiled.pdf

⁶ By "active" here we mean actively managed by the utility. Even passive rate offerings that may include either time-of-use or even dynamic rate offerings like real-time pricing, will require active engagement of either end-users or third-party aggregators that manage loads on behalf of customers.

EVs present distribution utilities with the opportunity for a new source of revenue to reduce average costs, and a source of load management to reduce costs and provide system reliability benefits.⁷ Potential benefits can be categorized based on their scale of influence, i.e. the benefits can either be realized on a regional or local level.

Potential upstream, or regional, benefits include energy price arbitrage, the provision of ancillary services such as frequency regulation and operating reserves, as well as using the batteries for peak shaving. Peak shaving could be targeted for both the regional system peak, thus lowering the utility's Forward Capacity Market obligation, or the Vermont monthly peaks thereby lowering the utility's Regional Network Services charges. Potential local benefits, i.e. those that are realized on the distribution system, include passive voltage and frequency support, capacity support, as well as a tool to manage system losses.

It is important to recognize that vehicle-to-grid ("V2G") is not necessary for these benefits to be realized. While V2G may increase the scale of benefit available, simply turning off or ramping down EV charging can provide the benefits discussed above.

5) *The accuracy of electric metering and submetering technology for charging EVs.*

Separate end-use metering capability is critical to advancing the penetration of EVs in the State. The function of separately metering EVs is essential to the establishment of separate EV end-use rates. Separate metering of EVs also enables other options, such as the imposition of a per-kWh road user fee. A utility, revenue-grade meter presents a costly method of separate metering. The Department concludes that some form of submetering presents a lower cost alternative to the installation of a separate utility meter.

The California Independent System Operator (CAISO) has an ongoing energy storage and distributed energy resources initiative which has examined, among other things, different approaches to submetering.⁸ Generally speaking, there are challenges associated with data collection and validation from both utility-owned and third party-owned submetering devices. Currently in Vermont, both GMP and BED own the submetering devices that enable their EV end-use rates. It is the Department's understanding that these systems are reasonably accurate even today, especially when coupled with a customer's revenue-grade utility meter. The Department looks forward to hearing from both BED and GMP regarding the specific accuracy of the systems they have deployed.

⁷ Regulatory Assistance Project, *In the Driver's Seat: How Utilities and Consumers can benefit from the Shift to Electric Vehicles*, 2015. Available at: <https://www.raponline.org/wp-content/uploads/2016/05/rap-veic-utilitiesandconsumersbenefitevs.pdf>

⁸ California Independent System Operator, Energy Storage and Distributed Energy Resources Initiative, Available at: http://www.caiso.com/informed/Pages/StakeholderProcesses/EnergyStorage_DistributedEnergyResources.aspx

Dated at Montpelier, Vermont this the 1st day of March 2019.

VERMONT DEPARTMENT OF PUBLIC SERVICE

By: /s/ James Porter
James Porter, Director for Public Advocacy
112 State Street
Montpelier, Vermont 05620
(802) 828-4003
james.porter@vermont.gov