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November 5, 2018

Vermont Public Utility Commission  
Attn: Judith Whitney, Clerk of the Commission  
112 State Street  
Montpelier, VT 05620-2701

**Re: Case No. 18-2660-INV – Order Commencing Next Step of Investigation**

Dear Clerk Whitney,

Attached for electronic filing in the above-referenced matter, please find comments on behalf of ChargePoint, Inc. Please let me know if you have any questions.

Respectfully,

A handwritten signature in black ink, appearing to read "Kevin Miller", written in a cursive style.

Kevin George Miller  
Director, Public Policy  
ChargePoint

## **Case No. 18-2660-INV: Order Commencing Next Step of Investigation**

*Comments by ChargePoint – November 5, 2018*

### **INTRODUCTION**

ChargePoint is pleased to offer these comments in response to the Order Commencing Next Step of Investigation issued by the Vermont Public Utility Commission (the Commission) on October 24, 2018.

### **BACKGROUND ON CHARGEPOINT**

ChargePoint is the nation's leading electric vehicle (EV) charging network, with charging solutions for every charging need and all the places EV drivers go: at home, work, around town and on the road. With more than 56,000 independently owned charging spots, ChargePoint drivers have completed more than 45 million charging sessions, saving upwards of 45 million gallons of gasoline and driving more than 1 billion gas-free miles. More than 300 of our charging spots are deployed in Vermont.

ChargePoint designs, develops, and deploys residential and commercial AC Level 2 (L2) and DC fast charging (DCFC) electric vehicle charging stations, cloud-based software applications, data analytics, and related customer and driver services aimed at creating a robust, scalable, and grid-friendly EV charging ecosystem.

ChargePoint sells EV charging supply equipment (EVSE) and network services that enable EV charging station owners to provide charging services. In almost every case, ChargePoint does not own or operate the equipment. ChargePoint sells charging solutions to a wide variety of customers, including residential EV owners, employers, commercial and industrial businesses, cities and public agencies, ports, schools, public transit, delivery truck fleet operators, and multi-unit dwelling owners. ChargePoint offers a broad array of products and services that can serve light, medium or heavy-duty electric vehicles.

The site host network services offered by ChargePoint enable customers to manage their charging infrastructure using cloud-based software tools. These tools provide the station owner or operator with everything needed to manage and optimize utilization of their charging stations, including online management tools for data analysis, billing and payment processing, load management and access control. Stations connect to ChargePoint over a secure, cellular data network (or Wi-Fi in the case of single-family residential) allowing station owners to manage all their charging operations from a single dashboard. Maintenance and customer service are a priority for our company. ChargePoint offers a comprehensive set of support services, including: a 24/7/365 hotline for station users, parts and labor warranty, site qualification, installation and validation services, and a helpline for site host specific questions.

### **RESPONSES TO QUESTIONS**

#### *Usage Fees*

- 1. Describe how usage fees would be calculated for Vermont customers using public EV charging stations. Please identify each component used in determining the final fee,**

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**and if a component is not always used in determining the final fee, explain the circumstances under which it is used and the reasons why.**

As ChargePoint noted in our Post-Workshop Comment, there are many ways that usage fees can be calculated by EV charging station site hosts:

“Networked, or “smart,” EV charging stations provide site hosts with the ability to set pricing for EV charging services in many ways. These dynamic pricing tools allow site hosts to incentivize driver behavior, which is essential given that EV charging is a combination of vehicle refueling and parking. Flexibility in pricing allows site hosts to tailor pricing to the unique needs of the site, including, but not limited to:

- A free charging session;
- A fixed rate for the session, for which the driver pays a set fee for the entire session;
- An energy rate, for which the driver pays for the energy consumed on a per kilowatt-hour (kWh) basis;
- An hourly rate, for which the driver pays per hour, similar to how a parking meter operates;
- Length-of-Stay pricing, for which one price is charged during the first x hours and another price is charged for every hour afterwards;
- Time-of-Day pricing, for which one price is charged during peak hours and another during off-peak hours.
- A minimum and/or a maximum fee per session;
- A combination of the above, in which, for example, a flat session fee followed by an hourly rate, an hourly rate followed by per kWh pricing, a minimum session fee followed by an hourly rate, or a free period of time followed by per kWh pricing; and
- Driver groups, for which station owners may set unique policies for different classifications of drivers (e.g. employees vs. visitors) using the options above.”<sup>1</sup>

Station owners on the ChargePoint network set their own fees for charging and parking, which are communicated to drivers in a number of different ways, including a screen on the station, ChargePoint’s station locator on our web site and app, and other websites and apps.

- 2. Are usage fees variable based on factors such as time spent at the charging station, time of day when charging occurs, type of vehicle charging at the station, etc.? For example, if a kWh charge applies to the first hour of charging and a vehicle remains at the station charging beyond that hour, could or would an additional fee above and**

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<sup>1</sup> Case No. 18-2660-INV. Post-Workshop Comments by ChargePoint at 6.

**beyond the kWh fee apply to all subsequent hours? Please explain your company's approach to setting and applying fees at charging stations.**

ChargePoint's site hosts, who independently own and operate EV charging stations, are responsible for determining what usage fees, if any, to set EVSE deployed on their property. Please see the response to Question 1 for listing of the possible components that are available for a site host to optimize utilization and the driver experience associated with their specific use case.

**3. Describe any limitations imposed on the fee structures for EV charging station use in states other than Vermont.**

In total, 23 states and the District of Columbia have clarified that EV charging stations should not be regulated for providing a charging service, which is included as Appendix A. States that lack specific clarification that EV charging is a service, and not the resale of electricity, would put third-party EVSE site hosts at risk of being regulated as though they were a public utility should they opt to assess fees including a per-kWh basis. This effectively prevents third-party site hosts from reflecting volumetric energy usage as a component of a fee set for EV charging services. This can be important as EVs charge at different charging rates based on the onboard vehicle technology, which will lead to vehicles receiving a different number of electric miles for the same time period of active charging.

Please see ChargePoint's Post-Workshop Comments beginning on page 7 for further discussion on practices in states other than Vermont.

**4. Do or should the fees charged to consumers at public EV charging stations vary based on the electricity rates charged by the utility that serves the charging station?**

Currently, site hosts in Vermont set pricing to drivers by considering many factors, including attractiveness to drivers, projected utilization of charging stations, desired charging behaviors, comparable services from other competitors, and effective utility rates. Pricing to drivers is inherently connected to the success of charging deployments, as it is used to align site circumstances and achieve site host goals. ChargePoint believes that in order to maintain a level playing field among all market participants, regulation over charging station pricing to the driver must continue to be outside of commission jurisdiction for all charging station providers. Regardless of the entity owning or operating charging infrastructure, all charging station providers must respond to the same market forces and conditions in setting pricing to drivers. To the greatest extent possible, government and regulated entities should avoid setting EV charging pricing to drivers in a manner that is anti-competitive to the broader market. Given that non-government/non-regulated entities cannot socialize risk and costs for such investments, the private market will be discouraged from further investment if they must compete against attracting such entities and pricing to attract EV drivers.

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It is appropriate and beneficial for utilities to continue sending price signals through electricity rates from the utility to site hosts, who are the utility's customer of record. Site hosts can choose to pass on fluctuating electricity rates or to determine another fee structure that will better optimize station utilization. Site hosts have a direct relationship with visitors to their locations and are better suited to meeting the interests of their customers (i.e., EV drivers).

ChargePoint cautions against excluding site hosts from determining fees for EV charging services or limiting EV usage fees to only a utility's pass-through electricity rates. A study of over 400,000 charging sessions found that a strict "per kWh" price for EV charging services leads to the least efficient usage of EVSE.<sup>2</sup> On the other hand, charging stations are used more efficiently when the site host is able to set pricing through a combination of either hourly or kWh pricing, along with a time-based fee to incent turnover once charging is complete.

### **5. Will or should variations in electricity rates due to time-of-use rate structures offered by the electric utility serving a public charging station be passed through to the users of public EV charging stations?**

Variations in electricity rates due to time-of-use (TOU) rate structures offered by utilities to a commercial customer of record that is serving as a site host of EV charging stations can be used as one of many considerations for the site host to set driver pricing. As noted in the response to Question 4, imposing a requirement that a TOU rate be passed through directly to drivers would severely limit the flexibility of the site host and station operator to optimize utilization of the station, recover reasonable costs from any upfront investment and ongoing expenses, and to appropriately match the driver experience to the use case.

It is also important to consider that TOU rate structures are ideal for situations where the consumer has some ability and flexibility to shift their own behavior, such as charging at home. Public charging station usage is the one of the most difficult use cases for TOU rates as drivers are highly transient, infrequent, and often need to charge immediately leaving no flexibility to adjust their charging time to a different, cheaper period. Please see the answer to Question 19 for additional detail.

### **6. Can the charging capabilities (e.g., speed) of the EV affect the rates that a consumer will be charged at the EV charging station? Please explain and offer examples from your experience.**

Different EV models are able to charge at different speeds based on the vehicle technology itself, the charging station/connector technology, and the capacity constraint of the supplying electrical circuit. If fees for EV charging services only include a time- or session-based component, consumers will be charged the same rate regardless of the specific use case charging capabilities. However, if usage fee includes a per-kWh component, consumers with

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<sup>2</sup> Wynn, Ryan. "Electric Vehicle Charging at Work: Understanding Workplace PEV Charging Behavior to Inform Pricing Policy and Investment Decisions." University of California – Los Angeles Luskin Center for Innovation. Available at: <http://innovation.luskin.ucla.edu/content/electric-vehicle-charging-work>.

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different EV models may be charged different prices over the same period of time. As we noted in our Post-Workshop Comments:

“When pricing options are limited to being either free or flat hourly rates, site hosts are prevented from considering the wide array of power needs across the EV market. The battery capacity and rate of charge of EV models vary greatly, from the 3.3 kW charging rate of the 2017 Toyota Prius Prime Plug-in Hybrid to the ~7.4 kW charge rate of the BMW i3. By failing to incorporate a variable cost component associated with each vehicle’s power draw, a Prius Prime would be assessed the same flat hourly or session fee as a BMW i3 while receiving approximately half of the electric mile range provided during the same period.”<sup>3</sup>

### **7. How would drivers charging their vehicles at a public EV charging station pay for their usage (e.g., by credit card)?**

In the event that a fee is set for charging services at a public EV charging station, drivers can pay for their usage in a number of different ways that include, but are not limited to:

- RFID cards
- Tap-to-charge, which opens network app for payment through membership
- Contactless credit cards
- Payment via credit card (or free unlocking) through 1-800 number
- Third party app linked to credit card or bank account (e.g., Apple Pay, Android Pay)
- Payment through third party network with roaming agreement
- Vehicle-based credentialing
- Text to pay (similar to text to pay for parking)

### **8. What factors affect the charging speeds for different EVs?**

Charging speeds for different EVs can vary based on a number of different factors. The primary determinants of charging speed are the vehicle’s on-board charger and/or battery capability, the capability of the EV charging station and its supplying electrical infrastructure, as well as the vehicle’s state of charge, weather, or other factors.

### **9. How will a utility determine the electricity usage of a charging station connected to its distribution grid?**

Utilities can determine the electricity usage of a charging station connected to its distribution grid in a number of different ways. ChargePoint recommends that the Commission consider the range of options to safely, accurately, and reliably measure and monitor electricity usage attributable to EVs.

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<sup>3</sup> Case No. 18-2660-INV. Post-Workshop Comments by ChargePoint at 11.

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The successful implementation of EV TOU rate designs for commercial or residential customers, as well as other load management techniques, hinges on being able to accurately measure the energy usage that is solely attributable to charging an EV on a per station basis. This can be achieved through the installation of an additional utility meter. However, the upfront costs of secondary meters can be a significant barrier to enrolling customers.

The installation of a new “under the glass bulb” meter on a per circuit level is not the only way to determine the electricity usage at a charging station. As we note in our Post-Workshop Comments:

“It is not necessary to install an additional utility meter to ensure accurate measurement of kWh fees included in EV charging services. ChargePoint, and other smart charging solution providers, integrates a meter as part of the charging station. These meters are capable of providing both cumulative and interval level data for the electricity dispensed to an EV. This data is easily accessible to utilities, secure, and reliable. For example, the Minnesota Public Utilities Commission recently approved a pilot proposal by Xcel Energy to reduce the upfront cost burden for customers looking to opt into EV tariffs by implementing the tariff directly with smart EV charging stations.”<sup>4</sup>

In Vermont, ChargePoint is currently providing the networked charging solution for Green Mountain Power’s managed home charging program. This program includes both demand response and an off-peak charging plan that leverages embedded metering within the EVSE to then compare against total premise metered data from the utility meter.

Regardless of the application (e.g., commercial or residential), networked charging solutions that are incentivized in any way by a utility can provide the same level of access to the station data and reporting as if the utility owned the station. This provides a much more granular and valuable data set than just collecting data from metered service standpoint which may contain multiple charging stations downstream or even other loads. Nearly all major utility EV charging programs across the country requiring the collection of such data to support grid planning.

### **10. Would utilities prefer to install their own meters or rely on meters included in the EV charging stations?**

ChargePoint cannot speak to the preferences of utilities between installing traditional utility meters and taking advantage of the metering capabilities of EVSE. In terms of accuracy, ChargePoint meets or exceeds the requirements set forth in the electricity-as-motor-fuel sections of NIST Handbooks 44, which is discussed further in the answers to Questions 13-15. In utility terms, our charging stations meet the accuracy requirements of ANSI C12.1-2008 (1% class) as applied to embedded EVSE metering.

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<sup>4</sup> Id at 6-7.

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It should be noted that data on the consumer preferences of residential customers and EV charging site hosts indicate that the additional cost of deploying traditional utility meters is a barrier to enrolling in TOU rates and load management programs. The Minnesota Public Utilities Commission cited the need to overcome this barrier in approving a pilot proposal by Xcel Energy to reduce the upfront cost burden for customers looking to opt into EV tariffs by implementing the tariff directly with a “smart” EVSE. See Minnesota Docket No. 17-817: Petition for Approval of a Residential EV Service Pilot Program.

**11. If a utility relies on the meter in a charging station to measure electricity service to that charging station, will the utility be able to determine the time of sale for each kWh delivered to the charging station for the purpose of applying time-of-use-rates to the electricity delivered?**

Speaking only for ChargePoint, our embedded metering technology provides for clock-aligned, 15-minute interval data and includes the ability to set pricing on a TOU basis to drivers. Our technology is utility vetted in terms of accuracy and is currently used to support such billing in the San Diego Gas & Electric Power Your Drive program, along with other programs.

However, as noted previously, such an approach may not be ideal in the commercial sector. Utilities can offer fair and appropriate electricity rates to the customer of record, who in turn can incorporate in their pricing of services to the driver.

The residential sector, in which the driver is the site host, provides an ideal scenario for using embedded EVSE metering to implement a utility time-of-use program. Interval level charging data on EV charging only can be provided to the utility and used to provide either an off-bill, or adjust on the bill, a credit for any charging that occurs during off-peak periods.

**12. Can EV charging stations be configured so that more than one vehicle can charge at a single station at the same time (e.g., multiple cables or automatic disconnect when one car is fully charged) to avoid the need for one car to move to a new parking space in order for the second car to charge?**

Yes, with certain caveats. For L2 stations, ChargePoint manufactures single and dual-port stations. Dual-port stations allow up to two vehicles to charge simultaneously. This can be supported by dedicated electrical circuits for each connector, or by sharing a single circuit power between the two connectors. Our software features allow for virtual load management by managing aggregate power supply to a group of stations and by implementing a logic such as round-robin, first-in-first-out, or some other method to optimize charging amongst several EVs plugged in at one time.

For DC fast charging, ChargePoint manufactures stations that provide multiple ports to allow drivers whose vehicles use different connector standards to plug in. The DC fast charging stations that we provide allow drivers to connect with either an SAE Combo Charging System



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(CCS) or CHAdeMO connector. Due to the design considerations for DC fast charging, most solutions on the market allow for only one of the connectors to be in use at any time at a given station. The same intelligent software noted earlier can help manage the aggregate power to a group of DC fast chargers.

### **13. Does any State of Vermont entity currently have the authority to verify the accuracy of the electricity meters in EV charging stations? If yes, which agency? Please describe an appropriate regulatory oversight structure for that role. If no, what agency is best positioned to take on that oversight role and why?**

The Agency of Agriculture, which oversees statewide Weights & Measures issues, would be the most appropriate state entity to adopt requirements to verify the accuracy of EVSE. The National Institute of Standards and Technology's (NIST) Handbook 44 Section 3.40 includes a Tentative Code for Electric Vehicle Fueling Systems. Section 3.40 includes specifications on elements including but not limited to operating requirements, design of measuring elements and measuring systems, and type evaluation.

Additional work is necessary to make Section 3.40 enforceable, which is underway in other jurisdictions. The California Department of Food and Agriculture (CDFA) recently posted a Notice of Proposed Rulemaking related to Section 3.40 of NIST Handbook 44.<sup>5</sup> As explained by the CDFA:

“A tentative code is oftentimes not made permanent for several years; this allows jurisdictions sufficient time to study its requirements prior to finalization and adoption of a permanent code. A 2016 interagency agreement between the Department and the California Energy Commission (CEC) has provided the resources necessary to review the tentative code language, and research and acquire the most suitable test equipment for type evaluation and field testing. Upon adoption of the proposed regulation, the Department will be prepared and equipped to offer type evaluation services to EVSE manufacturers.”<sup>6</sup>

ChargePoint recommends that the Agency of Agriculture's Metrology Lab be afforded sufficient opportunity and resources to review tentative code language and research and acquire suitable test equipment for type evaluation in order to support the implementation of type evaluation and testing, as necessary.

### **14. What recourse would consumers have for complaints arising from public EV charging station usage absent Department of Public Service and Commission jurisdiction?**

The Agency of Agriculture provides recourse for addressing consumer complaints through its Consumer Protection Section for all weights and measures concerns. ChargePoint

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<sup>5</sup> CDFA Measurement Standards Regulations. <https://www.cdfa.ca.gov/dms/regulations.html>

<sup>6</sup> CDFA Initial Statement of Reasons: [https://www.cdfa.ca.gov/dms/pdfs/regulations/EVSE\\_ISOR.pdf](https://www.cdfa.ca.gov/dms/pdfs/regulations/EVSE_ISOR.pdf)

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would welcome the opportunity to serve as a resource to the Agency of Agriculture to ensure that staff are familiar with EV charging equipment and network services.

### **15. What information should be available to the users of public EV charging stations at the time they are charging their vehicles (e.g., phone number for technical assistance from station operator, phone number for consumer protection assistance, etc. posted in plain view on the charging station)?**

Section 3.40 of NIST Handbook 44 identifies key information that should be available to users of public EV charging stations:

“S.1.1. Electric Vehicle Supply Equipment (EVSE). – An EVSE used to charge electric vehicles shall be of the computing type and shall indicate the electrical energy, the unit price, and the total price of each transaction.

(a) EVSEs capable of applying multiple unit prices over the course of a single transaction shall also be capable of indicating the start and stop time, the total quantity of energy delivered, the unit price, and the total price for the quantity of energy delivered during each discrete phase corresponding to one of the multiple unit prices.

(b) EVSEs capable of applying additional fees for time-based and other services shall also be capable of indicating the total time measured; the unit price(s) for the additional time-based service(s); the total computed price(s) for the time measured; and the total transaction price, including the total price for the energy and all additional fees.

S.1.2. EVSE Indicating Elements. – An EVSE used to charge electric vehicles shall include an indicating element that accumulates continuously and displays, for a minimum of 15 seconds at the activation by the user and at the start and end of the transaction, the correct measurement results relative to quantity and total price. Indications shall be clear, definite, accurate, and easily read under normal conditions of operation of the device. All indications and representations of electricity sold shall be clearly identified and separate from other time-based fees indicated by an EVSE that is used for both the sale of electricity as vehicle fuel and the sale of other separate time-based services (e.g., vehicle parking).

S.1.2.1. Multiple EVSEs Associated with a Single Indicating Element. – A system with a single indicating element for two or more EVSEs shall be provided with means to display information from the individual EVSE(s) selected or displayed, and shall be provided with an automatic means to

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indicate clearly and definitely which EVSE is associated with the displayed information.”<sup>7</sup>

The ChargePoint stations that are deployed for public use feature clear identification of our 24/7 customer service line, as well as screen that displays relevant consumer information.

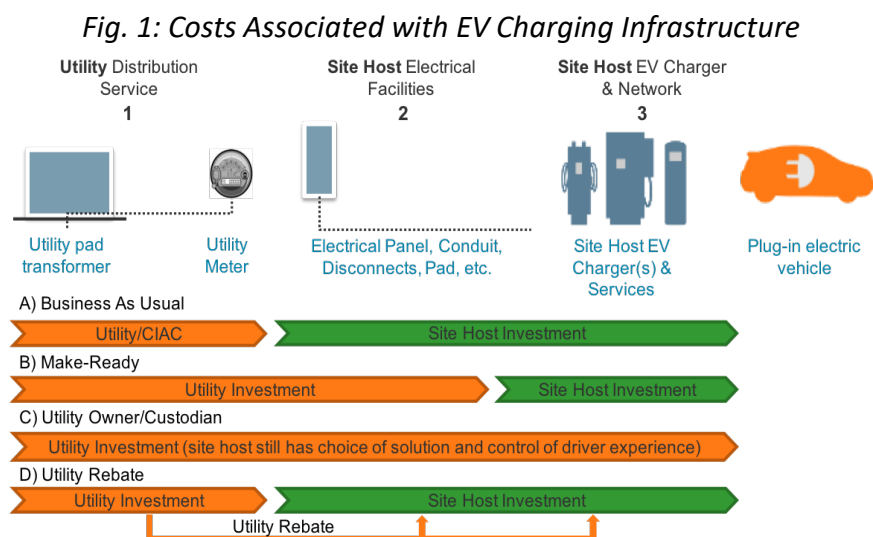
### 16. Do third-party charge providers compete directly with utilities in any other states?

As discussed in our Post-Workshop Comments, third-party providers do not compete with utilities on the utility side of the meter because EV charging is a service and not the transmission, distribution, or sale or resale of electricity.<sup>8</sup> Please see below for our response regarding competition on the customer’s side of the meter.

### 17. Do any Vermont utilities have an interest in offering their own charging facilities? If so, how would that arrangement be structured (e.g., facilities and services subject to traditional utility regulation or services provided by an affiliate subject to the same level of regulation applied to non-utility providers of charging services)?

Before identifying how arrangements for utility participation in the competitive EV charging market could be structured, it is important to identify the range of infrastructure involved in the EV charging ecosystem.

The costs associated with installing EVSE can be broadly categorized as distribution buildout, or service; customer make-ready work, or the electrical facilities on the customer’s side of the meter; and the EV charging equipment and network services themselves. Figure 1 identifies these broad categories and lists a range of utility program designs and which party would typically carry costs under each category:



<sup>7</sup> NIST Handbook 44 Section 3.40.

<sup>8</sup> Case No. 18-2660-INV. Post-Workshop Comments by ChargePoint.

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Utilities have very important roles to play in supporting transportation electrification in Vermont. First and foremost, utilities are ideally situated to ensure that the associated new load is incorporated in a safe, reliable, and efficient manner. ChargePoint is proud to be a partner of utilities around the country in deploying utility-supported charging infrastructure and pilot programs that incorporate capability for load management. We believe that there is a vital role for utilities in supporting efficient integration of EV load and that the right program design can encourage the installation of more charging stations around the state in a manner that complements, and does not duplicate or conflict with, the private market.

When considering whether to expand the role for utilities to utilize ratepayer funds for cost recovery of incentives or assets on the customer side of the meter (i.e., the competitive EV charging market), it is important to consider Vermont's market today and how it is growing into tomorrow's market.

### *Public Charging Infrastructure*

Publicly-available EV charging infrastructure is installed by a range of different site hosts to provide charging services to customers, employees, tenants and other EV drivers. Site hosts provide EVSE for a wide variety of reasons. Private businesses, including retailers, grocery and convenience stores, hotels, multi-unit dwelling (MUD) owners, among others, may install EVSE to attract new customers or tenants with a valuable amenity. State and local governments may install EVSE to support their emission reduction goals, electrify their own fleet vehicles, attract visitors, and provide a valuable amenity to the community. A wide variety of site hosts may also find it valuable to demonstrate their commitment to sustainability.

Regardless of the reason for hosting a station, site hosts may use pricing as a signal to incentivize charging behavior. Some site hosts offer free charging for customers and some charge a nominal fee, while still others offer free charging for the first hour or so and then begin charging in order to encourage drivers to make the EVSE available to others. EV drivers can typically find these charging locations, along with information about applicable fees and the number of charging ports, in smartphone apps.

### *Potential Program Design Options for Utility Programs*

There are several ways in which ratepayer-funded investments in EV charging can expand access to charging while also complementing the competitive EV charging market. It would be valuable for any of these options to be evaluated by the Commission based on a set of criteria that ensure that programs lead to widespread grid benefits and complement the competitive EV charging market.

### *Make Ready Programs*

"Make-ready" refers to the line extension on the distribution side of the meter as well as wiring, conduit, and sub-panels that are often needed to provide power to EVSE located in a

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site host's parking lot on the customer side of the meter. Make-ready infrastructure is essentially an extension of distribution system infrastructure, except that most of it is located behind the site host's meter and so would usually be considered the responsibility of the site host. However, deploying and maintaining distribution system infrastructure is one of a utility's core competencies. Accordingly, one of the most effective ways for a utility to support EVSE is for it to support make-ready deployments. A make-ready program could take the form of a rebate or upfront payment to a site host to use toward make-ready costs, or the utility could use existing personnel and resources to construct the make-ready for interested site hosts. Either way, the utility can receive valuable charger utilization information by providing this consideration and prepare for future load management programs to better integrate vehicles and the grid.

One advantage of make-ready programs is that the utility effectively leverages the private capital of the site host to purchase the actual EVSE. When site hosts share in the total cost of installing the EVSE, program dollars can go further. A make-ready program also has the advantage of focusing the utility on one of its core competencies – long-lasting distribution infrastructure – and allowing the site host to choose the charging equipment and network services that best meet its needs and support its own goals for installing the EVSE.

As long as the utility spends funds prudently in a way that minimizes costs and maximizes benefits to ratepayers and meets criteria established for the program by the Commission, a utility should be allowed to recover the full cost of a make-ready program from ratepayers, including administration costs. Program criteria should be established in advance and be based on the principles we discuss below. Because make-ready is essentially the extension of distribution infrastructure, a utility should be allowed to recover make-ready costs in the same manner as it recovers the cost of distribution system investments made in the ordinary course of business, namely, by putting the value of the make-ready investments into its rate base. Recovering make-ready costs in this manner would allow a utility to earn its authorized rate of return on the value of these investments, thereby incentivizing and rewarding a utility for supporting the deployment of public EVSE and helping it maintain visibility in to this new and unplanned load.

### *Utility Rebates*

A rebate program would work similarly to a utility's demand-side management (DSM) rebate programs in that it would offer a specific dollar amount to site hosts for installing qualifying EVSE. It is important that the utility create a list of equipment that qualifies for the rebate to ensure that any EVSE that is installed meets functional requirements and supports the goals of the program, such as providing an open network and managed charging capabilities. The utility should also update the list of qualifying equipment regularly to keep up with the pace of innovation and allow site hosts to install the newest products.

As with make-ready programs, if the utility spends funds prudently in a way that minimizes costs and maximizes benefits to ratepayers and meets the program's criteria, a utility

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should likewise be allowed to recover the full cost of a rebate program for customers, including both the cost of rebates and administration costs. Such costs can be recovered similar to how the utility recovers costs for its DSM programs. Alternatively, the Commission could consider allowing a utility to treat the rebate program costs as a regulatory asset and earn its authorized rate of return on the amortized amount. While rebates are not typically included in a utility's rate base, doing so provides an efficient and effective mechanism to reward and incentivize the utility for supporting the nascent transportation electrification market and promote efficient grid integration of EV load.

Similar to the Commission's role supervising a utility's investments in its distribution system or administration of a DSM program, the Commission's role in a make-ready or rebate program is to review, approve, or modify the utility's proposal and supervise the utility's implementation of the approved program. Prior to a utility proposing a transportation electrification program, the Commission should consider establishing standards and guidelines for any utility proposal leveraging industry best practices and input from industry stakeholders.

### *Utility Ownership*

There may be some justifiable use cases where full utility ownership and responsibility of all capital costs may be warranted, such as with economically disadvantaged communities. It is important to note that, even in such situations, the local site host participant can still play an important role in the selection and operation of the station. For example, the site host can still be the customer of record for the utility, paying the standard commercial tariff rates, while also setting the driver pricing for those stations. The utility, through ownership of the station, is able to fully cover the capital costs to deploy the stations and can provide the necessary maintenance and monitoring to ensure the station remains operational.

Should the Commission consider allowing direct ownership of EVSE by utilities, ChargePoint respectfully recommends that the Commission identify program requirements associated with such ownership to avoid any unintended negative market impacts. We identify several examples from other jurisdictions in the response to Question 18.

For example, the Commission could ensure that such programs include local site host choice of networking solution vendors and control over the pricing to the EV driver. In doing so, market forces can still be in play, private market actors will be encouraged to invest their own capital and local site hosts will be able to maximize station utilization and optimize the driver experience. Examples of such programs that include utility ownership with local site host choice and control include San Diego Gas & Electric "Power Your Drive" and Pacific Gas & Electric's EV Charge Network in California.

**18. Are there states that treat charging stations owned by utilities differently than they treat charging stations owned by non-utilities? If so, please identify those states and describe the differences in treatment and the reasons therefor.**

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Utilities around the country have successfully initiated EV charging programs that complement and support the competitive market. The following examples include utility programs that are structured as rebates, make-ready, direct utility-ownership, and “portfolio” approaches that combine some or all of these elements. These following examples allow for customer choice in hardware and network services and ensure that site hosts have operational control over pricing and access to stations, regardless of how the EVSE deployment is incentivized:

- AEP Ohio (OH): 375 ports via rebates
- Eversource Energy (MA): 4,167 ports via utility make ready investments
- National Grid (MA): 1,278 ports via rebates for EVSE and site-host owned make ready
- San Diego Gas & Electric (CA): 3,500 ports via utility-ownership
- Southern California Edison (CA): 1,500 ports with utility make ready and customer rebates for EVSE

Another example that is Duquesne Light Company (DLC) in Pennsylvania, which recently proposed an “EV Charge Up Pilot” Program that is currently under review by the Pennsylvania Public Utilities Commission (Docket No. R-2018-3000124). In its testimony supporting the EV Charge Up Pilot, DLC established and adhered to six “Guiding Principles”:

### **1. Support state and local EV policies and goals**

- The Company [DLC] will engage with its customers, such as the City [of Pittsburgh] and the ... [Port Authority of Allegheny County], to help them meet their vehicle electrification goals and help facilitate the connection of ... [transportation electrification] to the electrical distribution system.

### **2. Support a competitive charging market while maintaining market neutrality**

- The Company will engage with the competitive charging industry, foster competition, innovation and equipment and network choice without picking winners and losers.

### **3. Maintain site host choice and control**

- The Company will promote customer-site host equipment choice and charging control and enable customer-site hosts to choose how or if to bill EV drivers for charging services.

### **4. Ensure equipment is installed safely and maintained efficiently**

- The Company will require customer-site hosts participating in the Pilot to contribute financially to help ensure equipment is deployed safely and utilized and maintained effectively.

### **5. Require detailed data from program participants**

- The Company will require participating customer-site hosts and authorized equipment and network providers to provide detailed data, such as:
  - load profiles including interval data covering charging event duration and site specific charging load management strategies;
  - equipment performance data including but not limited to reliability and percent utilization; and

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- driver experience data including price signals, access to user apps, and 24/7 call center support information.

### 6. Manage program operations and costs

- The Company will leverage its project management resources to administer the Pilot and track program costs.<sup>9</sup>

Guiding principles such as those identified by DLC facilitate the development of utility programs that accelerate sustainable and scalable growth in the EV and EV charging markets. ChargePoint recommends that the Commission consider adopting similar principles or directing the utilities to adopt these principles in any utility EVSE program proposals. Several jurisdictions have already established criteria for regulators to evaluate EV charging programs proposed by utilities. In addition to traditional cost-recovery considerations, these criteria often evaluate issues that are specific to the EV and EV charging markets, e.g.:

- California PUC Code 740.12 (a)(2)(b) as amended by SB 350 of 2015 (Sec. 32): “Programs proposed by electrical corporations shall seek to minimize overall costs and maximize overall benefits”;
- Utah SB 115 of 2016: “54-20-103. Electric vehicle incentive program. (1) The commission shall, before July 1, 2017, authorize a large-scale electric utility to establish a program that promotes customer choice in electric vehicle charging equipment and service...”;
- California PUC Code 740.12 (a)(1)(F) as amended by SB 350 of 2015 (Sec. 32): “The commission shall approve, or modify and approve, programs and investments in transportation electrification, including those that deploy charging infrastructure, via a reasonable cost recovery mechanism, if they are consistent with this section, do not unfairly compete with nonutility enterprises as required under Section 740.3, include performance accountability measures, and are in the interests of ratepayers as defined in Section 740.8.”
- In Massachusetts, the Department of Public Utilities established a clear set of criteria for evaluating whether utility EVSE investments are eligible for cost recovery without any direction by the Massachusetts General Court (state legislature). See D.P.U. Docket No. 13-182-A, Final Order.

From ChargePoint’s perspective, utility programs that appropriately make use of ratepayer funds share a set of common principles that the Commission should consider. Namely, successful utility transportation electrification programs maintain customer choice, encourage innovation, and stimulate competition; leverage matching payments from site hosts, whenever possible; support site host access and control over pricing; avoid island networks and ensure open access for EV drivers; support equitable access to electric transportation options; and encourage smart charging behavior to enable widespread grid benefits.

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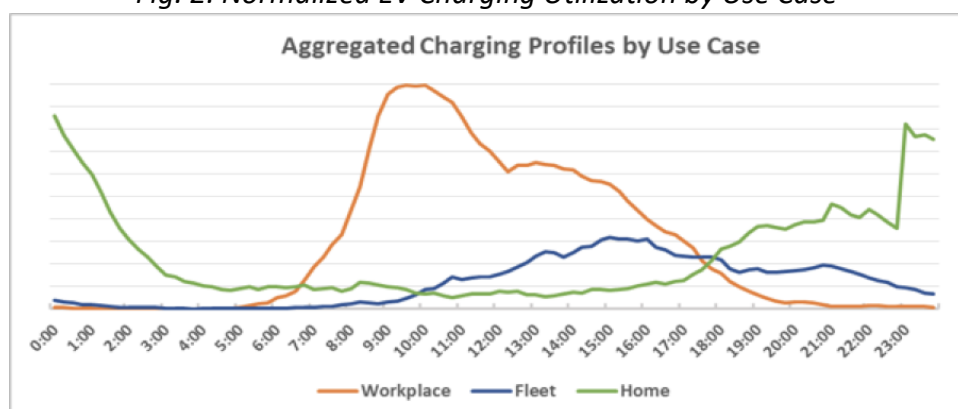
<sup>9</sup> The testimony of DLC Witness Joseph DeMatteo can be found in Statement No. 6 and is available at: [http://www.puc.pa.gov/about\\_puc/consolidated\\_case\\_view.aspx?Docket=R-2018-3000124](http://www.puc.pa.gov/about_puc/consolidated_case_view.aspx?Docket=R-2018-3000124).



**19. If a utility offers time-of-use rates to a residential customer for charging an EV at home, or to a business customer for charging employee EVs at work, would or should that utility also offer the same time-of-use rates to non-utility operator of a public EV charging station? What considerations would go into determining whether to tariff such an offering?**

As discussed in the response to Question 5, TOU rates and other load management techniques can help to ensure that EV charging takes place at times that are beneficial to the grid. The types and levels of benefits to the grid from EV charging taking place under an energy management program will vary greatly by EV charging use case, as illustrated in Fig. 2:

Fig. 2: Normalized EV Charging Utilization by Use Case



- **Residential** charging is perfectly suited for demand-side management programs due to the long dwell times available for charging, the ability to shift charging within that time period, and the EV driver typically serving as their own “site host”. Furthermore, charging at home is far the location where the most EV charging will occur. One analysis conducted through the Idaho National Labs found that EV drivers charged their vehicles at home 64% of the time.<sup>10</sup> In addition, numerous studies have shown that residential charging is extremely responsive to price signals through TOU rates.
- **Fleet** charging is an ideal use case to support demand-side management and smart charging of EVs. This is due to long dwell times, certainty around vehicle operational needs, and the direct relationship between the vehicle’s owner and the charging station’s owner.
- **Workplace** charging presents opportunities to shape charging during the day due to the extended dwell times and repeat users of such charging stations. The same INL study noted above also found that approximately 33% of EV charging is conducted at work. Workplace charging can be incentivized to avoid early morning peaks or to serve as a “sponge” for overgeneration of solar in the middle of the day.

<sup>10</sup> Smart, John. *Lessons Learned About Workplace Charging in the EV Project*. Idaho National Labs. 2015.