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April 30, 2019

Ryan A. Silvey, Chairman
Missouri Public Service Commission
200 Madison Street, PO Box 360
Jefferson City, MO 65102-0360

**RE: Case No. EW-2019-0229**

Dear Chairman Silvey,

Attached are comments filed on behalf of ChargePoint. Please let me know if you have any questions.

Respectfully,

David Schatz
Director, Public Policy
ChargePoint

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

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| In the Matter of a Working Case to Evaluate Potential Mechanisms for Facilitating Installation of Electric Vehicle Charging Stations | ) ) ) ) | Case No. EW-2019-0229 |

**COMMENTS OF CHARGEPOINT, INC.**

## I. INTRODUCTION

Consistent with the Public Service Commission of Missouri's ("Commission") Order in the above-captioned proceedings on March 22, 2019, ChargePoint, Inc. ("ChargePoint") thanks the Commission for the opportunity to provide these comments regarding potential mechanisms to facilitate the installation of electric vehicle ("EV") charging stations. The Commission and Staff's evaluation comes at a point of significant growth in the electric vehicle market in Missouri and nationally. In reviewing initiatives and technologies in the EV space, state utility commissions across the country are considering how best to prepare for and leverage the benefits of greater electrification of the transportation sector.

ChargePoint is the leading electric vehicle charging network in the world, 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 64,000 independently owned charging spots, including over 1,300 public stations in Missouri, ChargePoint has thousands of customers – including workplaces, cities, retailers, apartments, hospitals, and fleets.

ChargePoint is the only charging technology company on the market that designs, develops, and manufactures hardware and software solutions across every market segment. Hardware offerings include Level 2 and DC fast charging ("DCFC") products, and ChargePoint provides a range of options across those charging levels for specific use cases. ChargePoint's software and

cloud capabilities enable site hosts to control the charging services onsite and provide easy use for EV drivers, including features like waitlists, access controls, charging analytics, and real-time availability. Leading EV charging hardware providers, automakers, and other partners rely on the ChargePoint network to make charging station details available in mobile apps, online, and in navigation systems for popular EVs. ChargePoint drivers have completed more than 53 million charging sessions, saving upwards of 58 million gallons of fuel, and driving more than 1.3 billion electric miles.

In ChargePoint's business model, the company sells its smart, networked charging station equipment and services directly to site hosts, and site hosts own and operate the charging stations on their properties. For a subscription, ChargePoint provides charging network services, or data-driven and cloud-enabled capabilities that enable site hosts to better manage their charging assets and optimize the services they provide drivers. For example, with those network capabilities, site hosts can view data on charging station utilization, frequency and duration of charging sessions, set access controls to the stations, and set pricing for charging services. These features are designed to maximize utilization and align the EV driver experience with the specific use case associated with the particular site host. In addition, we have designed the network to also allow other parties, such as electric utilities, the ability to access charging data and conduct load management to enable efficient EV load integration with the grid.

## II. SUPPORTING MODELS OF UTILITY INVESTMENT IN EV CHARGING INFRASTRUCTURE

Nationally, utilities in many jurisdictions have supported the adoption of electric vehicles through programs that enable the build out of networked charging infrastructure across a range of use cases. Those programs can significantly lower barriers to EV charging infrastructure deployment and accelerate EV charging markets overall. Most importantly, utility investment in charging

infrastructure can catalyze and foster a long-term, scalable, and competitive market for charging equipment and networks. To that end, ChargePoint strongly supports utility investment in electric vehicle charging infrastructure that seeks to achieve those outcomes.

The right program design for utility investment in EV charging markets can take many forms, and no single solution is appropriate for every jurisdiction and use case. Moreover, each segment of the charging market – fleets, multi-unit dwellings, retail establishments, workplaces, municipalities, and corridors – has a different set of circumstances to consider the most effective investment. ChargePoint has supported a range of utility programs across the country, including approved programs in California[1], Nevada[2], Utah[3], Ohio[4], Massachusetts[5], New York[6], Rhode

[1] *See* California Public Utilities Commission. Application 17-01-020. "Transportation Electrification Proposals Pursuant to SB 350." 2018. http://www.cpuc.ca.gov/sb350te/

[2] *See* Public Utilities Commission of Nevada. Docket No. 18-02002. "Joint Application of Nevada Power Company d/b/a NV Energy […] Electric Vehicle Infrastructure Demonstration Program for Program Year 2018-2019." June 27, 2018. http://pucweb1.state.nv.us/PDF/AxImages/DOCKETS_2015_THRU_PRESENT/2018-2/31126.pdf

[3] *See* Public Service Commission of Utah. Docket No. 16-035-36. "In the Matter of the Application of Rocky Mountain Power to Implement Programs Authorized by the Sustainable Transportation and Energy Act." June 28, 2017. https://pscdocs.utah.gov/electric/16docs/1603536/2949541603536ptrao6-28-2017.pdf

[4] *See* Public Utilities Commission of Ohio. Docket No. 16-1852-EL-SSO. "In The Matter of the Application of the Ohio Power Company for Authority to Establish a Standard Service Offer Pursuant to R.C. 4928.143."April 25, 2018. http://dis.puc.state.oh.us/DocumentRecord.aspx?DocID=1a7d9c25-92bc-42e4-896d-c888c1a015ac

[5] *See* Massachusetts Department of Public Utilities. Docket 17-05. "Order Establishing Eversource's Revenue Requirement." November 30, 2017. https://eeaonline.eea.state.ma.us/EEA/FileService/V1.4.0/FileService.Api/file/FileRoom/dehehcjj

[6] *See* New York Public Service Commission. Matter No. 17-00887. "Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation d/b/a National Grid for Electric Service." http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=17-E-0238

Island[7], Maryland[8], Michigan[9], and in programs proposed in Pennsylvania[10], Washington[11]. ChargePoint believes that these programs are designed to accelerate EV charging markets and help to create a robust and competitive market for charging equipment and services.

## III. EQUIPMENT CONSIDERATIONS FOR EV CHARGING INFRASTRUCTURE

The EV charging market is defined by two separate segments: hardware vendors and network providers. Hardware vendors typically design and manufacture the physical charging station, which a third-party may install on a customer site. Network providers manage cloud services connecting the charging stations to both the charging station operator and the drivers who use the stations. In some cases, the hardware vendor and network provider may be the same company. It is the evolution and competition in network services that is primarily driving innovation in the EV charging market and delivering new value to end customers. New software features are continually released and pushed out over-the-air as they become available, making that market extremely dynamic, while the charging hardware itself remains a fixed asset once manufactured and deployed.

As mentioned above, smart charging features enable controls and tools for site hosts, including, most notably, setting the pricing to drivers. In the event that a fee is set for charging

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[7] *See* Rhode Island Public Utilities Commission. Docket No. 4770. "The Narragansett Electric Co. d/b/a National Grid - Application for Approval of a Change in Electric and Gas Base Distribution Rates." http://www.ripuc.org/eventsactions/docket/4770page.html

[8] *See* Maryland Public Service Commission. Case No. 9478. "In the Matter of the Petition of the Electric Vehicle Workgroup for Implementation of a Statewide Electric Vehicle Portfolio." https://www.psc.state.md.us/search-results/?keyword=9478&x.x=16&x.y=13&search=all&search=case

[9] *See* Michigan Public Service Commission. Case No. U-20134. "In the matter of the application of Consumers Energy Company for authority to increase its rates for the generation and distribution of electricity and for other relief." https://mi-psc.force.com/s/case/500t0000009fPPSAA2/in-the-matter-of-the-application-of-consumers-energy-company-for-authority-to-increase-its-rates-for-the-generation-and-distribution-of-electricity-and-for-other-relief

[10] *See* Pennsylvania Public Utilities Commission. Docket Number R-2018-3000124. "Pa. PUC v. Duquesne Light Company." http://www.puc.pa.gov/pcdocs/1586084.pdf

[11] *See* Washington Utilities and Transportation Commission. Docket No. UE-180877. Tariff Revision – Puget Sound Energy.

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 credential identification
- Text to pay (similar to text to pay for parking)

ChargePoint strongly believes that utility programs for EV charging should not prescribe specific payment methods, but may require multiple payment methods broadly defined. Prescribing specific forms of payment risks reducing vendor eligibility and participation and curtails the deployment of innovative, secure payment methods the market adopts.

The ability, or lack thereof, to "roam" between EV charging networks is frequently cited as a barrier to EV adoption. Charging station networks typically issue members RFID cards, provide mobile apps, or direct communication with the network to facilitate quick access to charging stations, and each network typically operates independently. While most networked charging station providers allow for multiple forms of payment, the approaches of each network are often unique to that network. This means that a driver with Network A would typically not be able use the same process to access a station on Network B.

However, this barrier is becoming increasingly surmountable. The competitive market is already aligning around agreements that allow drivers to roam between networks with one network

account through seamless communication on the backend. For example, ChargePoint has signed agreements to develop network-to-network roaming to enhance the driver experience with both EVBox, Flo, and Greenlots, three other charging networks.[12] With these agreements EV drivers are able to maintain their native EV charging account without the need to sign up for and receive bills from multiple charging networks they may use - a ChargePoint driver account could be used on EVBox and Flo seamlessly.

## IV. RATE DESIGN CONSIDERATIONS FOR EV CHARGING PROGRAMS

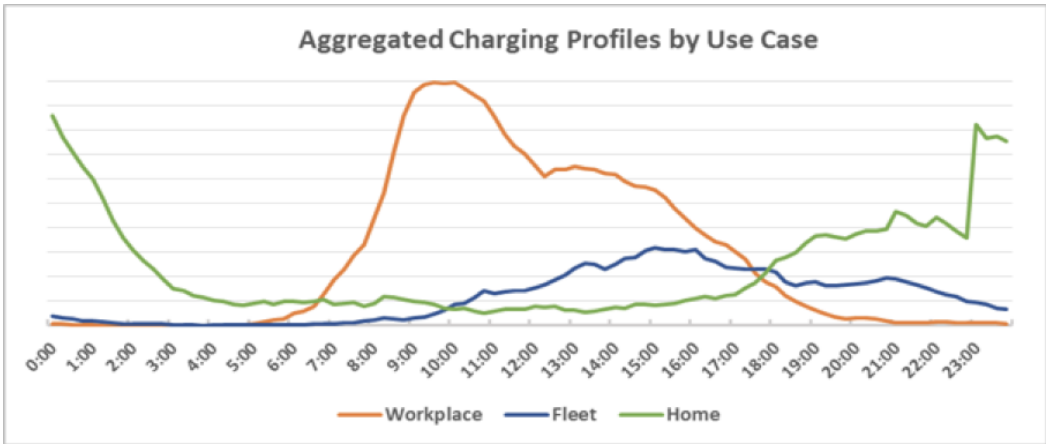
As EV adoption increases, load created by EV charging will impact the electrical grid. It will be important for stakeholders and regulators to establish programs and rate structures that encourage load management, demand response, and charging when it is most beneficial to the grid.

*Time-of-Use Applications*

Time-of-use ("TOU") rates serve as a prime example of an effective rate design may be implemented to encourage off-peak energy use, and specifically EV charging during off-peak times. TOU rate structures are ideal for situations where the consumer has some ability and flexibility to shift their own energy use behavior, such as residential settings. By contrast, 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 little flexibility to adjust their charging time to a different, cheaper period. 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. 1:

[12] Press releases available at https://www.chargepoint.com/about/news/chargepoint-and-greenlots-partner-increase-access-ev-charging-throughout-north-america/ and https://www.chargepoint.com/about/news/chargepoint-and-evbox-pave-way-fully-electric-future-forward-thinking-partnership/ and https://www.chargepoint.com/about/news/chargepoint-and-flo-make-driving-electric-across-north-america-more-accessible-ever/.

*Fig. 1: Normalized EV Charging Utilization by Use Case*




Given the differences and nuances of each representative use case above, it is clear that certain use cases would be best aligned for an effective TOU rate:

- **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 the location where the most EV charging will occur. 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. Workplace charging can be incentivized to avoid early morning peaks or to serve as a sink for overgeneration of solar energy in the middle of the day.

For the residential context, where TOU can be effectively employed, ChargePoint also encourages consideration of EV-only TOU rates that can leverage the embedded metrology within connected home EV charging stations. In these programs, advanced metrology that comes installed in smart charging stations can be utilized to track usage for EV loads and assess specific rates. An investor-owned utility in Minnesota, Xcel Energy, filed a petition for approval of an EV charging pilot, specifically making use of embedded load-monitoring capabilities. In its filing Xcel noted the potentially significant cost savings associated with embedded metrology over installation of a secondary utility meter.[13] ChargePoint recommends that Commissions examine pilot programs to gather data on how connected charging station technologies can be leveraged to allow residential customers in Missouri to subscribe to an EV-Only TOU rate while avoiding the additional costs of deploying new meters at every charging station.

*DC Fast Charging Rate Alternatives*

Utilities use peak demand to properly size electrical facilities for their individual customers, and to ensure they have adequate generating capacity available for all customers. DC fast charging stations are currently characterized by having a low load factor with sporadic instances of very high energy use due to a limited number of vehicles in the market that will use these stations in the near term. This means that site hosts, or charging station owners, face high demand charges, which could reach hundreds of thousands of dollars in operating costs annually, due to the few peak charging sessions that occur each month.

ChargePoint recommends that the Commission-led dialogues evaluate alternative rate structures for high-energy-use charging stations. There are several options to consider that would maintain utility cost recovery, while at the same time encourage sites to operate fast chargers in this

[13] *See* Minnesota Docket No. 17-817: Petition for Approval of a Residential EV Service Pilot Program.

early stage in the market. Examples include:

- Demand (kW) charges could be replaced with or paired with higher volumetric (kWh) pricing to provide greater certainty for charging station operators with low utilization. This rate could be scaled based on utilization or load factor as charging behavior changes over time with increased EV adoption.
- The bank of charging stations could be placed on a separate service drop with a separate meter in order to use a unique "EV charging" rate that is designed to reflect charging needs.
- A pilot rate could be developed specifically for fleet operators, particularly those that operate during non-coincident peak times, like electric bus fleets that charge overnight and thereby provide benefits to the grid.
- The utility could consider pricing signals to the station operator, such as time-of-use or critical peak pricing under specific programs.
- Utilities could consider and factor in the overall EV load from all vehicles in its service territory and its benefit to the grid, not just load that is metered at the DCFC.

## V. CONCLUSION

Thank you for the opportunity to provide comments. ChargePoint looks forward to continuing this discussion and working with the Commission and utilities on smart EV charging in Missouri.