**STATE OF NEW HAMPSHIRE**
**PUBLIC UTILITIES COMMISSION**

**Docket No. DE 20-170**

**ELECTRIC DISTRIBUTION UTILITIES**

**Electric Vehicle Time of Use Rates**

# INITIAL COMMENTS OF CHARGEPOINT, INC.

ChargePoint, Inc. ("ChargePoint") appreciates the opportunity to provide these initial comments pursuant to the Commission's September 16, 2020 Notice opening this proceeding for the utilities to develop electric vehicle ("EV") time of use ("TOU") rate proposals and alternative metering feasibility assessments, and consistent with the procedural schedule established by Secretarial Letter dated November 13, 2020.

## I. Background on ChargePoint Services and Products

ChargePoint is the leading EV charging network in the world, with scalable solutions for every charging need and for all of the places that EV drivers go, whether at home, work, around town, or on the road. ChargePoint's hardware offerings include Level 2 ("L2") and direct current ("DC") fast charging products. ChargePoint provides a range of options across those charging levels for specific use cases, including light and medium duty and transit fleets, multi-unit dwellings, residential (multi-family and single-family), destination, workplace, and more. ChargePoint's scalable and networked charging solutions enable businesses to provide more support for EV drivers by adding the latest software features to their chargers and expanding their EV and fleet needs with minimal disruption to their businesses. ChargePoint's software and cloud services enable site hosts to manage charging onsite with features like waitlist, access control, charging analytics, and real-time availability. Site hosts can manage their charging assets and

optimize services using network capabilities by viewing data on charging station utilization and frequency and duration of charging sessions. Site hosts can access controls to the stations and set pricing for charging services.

ChargePoint's Level 2 EV charging stations, such as Home Flex, our residential charging solution, include embedded metrology designed to meet the requirements set forth in the electricity-as-motor-fuel sections of National Institute of Standards and Technology ("NIST") Handbook 44.[1] In utility terms, ChargePoint Home Flex meets the accuracy requirements of ANSI C12.1-2008 (1% class) as applied to embedded EV service equipment metering.

Because smart EV charging devices such as these embed load monitoring technology with billing quality accuracy, they can be an important tool to reduce participation costs and increase participation levels in EV TOU and load management programs. Embedded metering can provide valuable granular data at a lower cost to customers than separate metering options. ChargePoint has designed its charging network to enable other parties such as electric utilities to access charging data and to conduct load management in order to facilitate efficient EV load integration onto the electric grid. ChargePoint L2 products are UL-listed, ENERGY STAR® and CE (EU) certified. The embedded metering capabilities that ChargePoint and other competitive solution provides offer have been vetted for accuracy in other states[2] and are currently in use to support a number of utility TOU rate billing pilot programs.

## II. Comments

The market for electric vehicles is taking off in New England and across the nation, underscoring the importance of offering New Hampshire customers the services they need to

[1] *See* NIST Handbook 44 Section 3.40.
[2] *See, e.g.*, Minn. PUC Docket No. E002/M-17-817, discussed further below.

enable EV use, as well as the value of preparing for widespread adoption by maximizing EV benefits and testing programs to mitigate potential system impacts.

These comments address first the parameters of the EV TOU rate proposals that the utilities will file in this proceeding, and second alternative metering feasibility assessments. The Commission's conclusions in Order No. 26,394 in Docket No. IR 20-004 serve as the foundation for this discussion. These comments build off of those conclusions and in part seek to answer questions raised by the Commissioners at the prehearing conference on November 9, 2020 and by Commission Staff at the Technical Session convened the same day.

### A. EV TOU Rate Proposals

ChargePoint supports the Commission's decision to move forward with EV TOU rates. Utility rate design is an effective tool for incentivizing off-peak EV charging, particularly for residential and fleet customers. Well-designed volumetric EV TOU rates are consistent with New Hampshire energy policy including the Restructuring Act which fosters "a more productive economy by reducing costs to consumers while maintaining safe and reliable electric service with minimal adverse impacts on the environment," as well as "increased customer choice," "open markets for new and improved technologies," and "appropriate price signals" for both buyers and sellers of electricity.[3] The adoption of EV TOU rates is also supported by SB 575, which requires consideration of whether rate designs affecting electric customers with EVs would "encourage energy conservation, optimal and efficient use of facilities and resources by an electric company, and equitable rates for electric consumers."[4] EV TOU rates with appropriate price signals encourage conservation, promote the optimal use of electric resources, and advance equity among

[3] NH RSA 374-F:1, I-II.
[4] NH RSA 236:133.V(b), as amended by SB 575.

customers. They also support a safe and reliable electric system that is well-prepared to serve the plug-in electric vehicles and EVSE that are increasingly chosen by electric customers.

As an initial matter, at the prehearing conference on November 9, 2020, Unitil expressed an interest in filing EV TOU rate proposals in a separate general rate case docket. ChargePoint has no objection to utilities filing EV TOU rate proposals as part of general rate cases, but also appreciates the interests of the Commission, Staff, and other stakeholders in resolving issues of general applicability or related concerns in a consistent manner.

ChargePoint also notes that Eversource plans to file a rate design proposal for a demand charge alternative (or alternatives) for high-demand draw applications such as fleet and public charging use cases (either DC fast charging or clustered L2 charging) in a separate docket that will also include a make ready proposal, as determined by settlement in Docket No. DE 19-057. This approach makes sense because it consolidates issues related to public charging in Eversource's utility territory together in a single docket. However, there may also be relevant issues raised in this docket that can readily cross-apply.

ChargePoint appreciates the efforts of each of the investor-owned utilities to make progress through a number of means, whether in prior proceedings or those yet to come. These initiatives all offer important support for the increasing number of customers who drive EVs, charging station site hosts, and electric transportation markets and demand more generally.

The comments below begin with a brief summary of the Commission's directives in Order No. 26,394 with respect to EV TOU rate designs, second address the model for EV TOU rates that has already been established by Liberty Utilities based on its earlier battery storage TOU rate, and last discuss several specific considerations for rate designs in further detail, including demand charge alternatives and consistency across utility territories.

i. The Commission Established Parameters for the EV TOU Rate Proposals in Order No. 26,394.

The Commission has already provided significant direction regarding the scope and content of the utility EV TOU rate proposals that will be filed in this proceeding on April 30, 2021. As a result, the utilities and stakeholders can use Order No. 26,394 issued in Docket No. IR 20-004 as the basis for a checklist for the rates developed in this proceeding. In Order No. 26,394, the Commission directed that the following must be included in the forthcoming rate design proposals:

- For each utility, an EV TOU rate proposal addressing separately metered residential and small commercial customers, and a separate proposal addressing high demand draw applications, including direct current fast charging ("DCFC") and clustered level two chargers (e.g., fleet charging);[5]
- Testimony explaining the development of and supporting the rate designs filed with both proposals, together with projected cost data and illustrative tariff language;[6]
- Rate designs that reflect cost causation; incorporate time-varying energy supply, transmission, and distribution components; have three periods; and be seasonally differentiated;[7]
- Quantification of costs including but not limited to billing, metering, and marketing costs;[8]
- A five-hour peak duration;[9] and
- A 3:1 peak to off-peak ratio that represents an average ratio during a given year (not during an individual season).[10]

The Commission also advised the utilities to address the following:

- Consideration of applying the marginal cost methodology approved in DE 17-189, as explained in the TOU Technical Statement marked Exhibit 20 in that docket; and in the event this approach is not adopted, an explanation in the testimony as to why this approach is not used;[11]
- Consideration of demand charge alternatives in any high demand draw rate proposals;[12]
- Issues relating to incorporation of the EV rate class load shape when procuring default energy service from the wholesale market, and that a flexible approach to

[5] Order No. 26,394 at 18.
[6] *Id*.
[7] *Id.*, adopting Staff recommendation summarized at 15.
[8] *Id.* at 17.
[9] *Id*.
[10] *Id*.
[11] *Id.* at 5.
[12] *Id*. at 9.

energy procurement would be appropriate given that any initial cost shifting between EV TOU and non-EV TOU default service customers during initial years would likely be of "*de minimis* nature;"[13] and
- Quantification of the benefits associated with each EV TOU proposal.[14]

Finally, the Commission further noted that:

- EV TOU rates should be updated and reconciled on a regular basis to ensure they reflect costs associated with the applicable class of customer's usage patterns;[15]
- Whereas information is lacking including as to load shape or peak coincidence for the new rate class and therefore designing embedded costs allocations with accuracy is impossible, therefore initial rate designs should reflect the marginal costs of providing EV charging services "to the maximum extent practicable;"[16]
- Declining block rates are not appropriate for EV charging for separately metered EVSE, though where declining block rates are already offered, they may be appropriate for customers who do not want to separately meter their EVSE;[17]
- Seasonal rates can appropriately account for seasonal cost drivers, and may take place coincident with an electric utility's default energy service rate change;[18]
- Interruptible rates are not appropriate for EV charging;[19]
- A peak coincident demand charge rate component should be considered;[20]
- Load management offerings may provide near-term ratepayer benefits without installation of metering infrastructure and other associated upgrades;[21] and
- Load management techniques may be an appropriate strategy for EV rate design, especially combined with EV TOU rate offerings.[22]

The utilities should incorporate and reflect this guidance in the development of proposals in this proceeding. In addition, ChargePoint agrees with Unitil's comment in IR 20-004 that in practice "a suite of rate offerings tailored for different customer types and use cases may be appropriate," as "TOU structures may not be suitable for all charging applications (such as public commercial and Direct Current Fast Charging (DCFC))."[23]

[13] *Id.* at 15.
[14] *Id.* at 17.
[15] *Id.* at 5.
[16] *Id.* at 4-5.
[17] *Id.* at 6.
[18] *Id.* at 7.
[19] *Id*.
[20] *Id.* at 10.
[21] *Id.* at 8.
[22] *Id*.
[23] Follow-up Comments of Unitil Energy Systems, Inc. in Docket No. IR 20-004 at 3 (July 24, 2020).

ii. Liberty Utilities Has Provided a Potential Model for Residential EV TOU Rates.

Liberty Utilities did not participate in Docket No. IR 20-004 but has done substantial work to set the stage for the discussions in this proceeding through other dockets, including Liberty's recent electric distribution rate case which established an EV TOU rate for residential customers that is based on a TOU rate developed in a prior battery-storage pilot case, Docket No. DE 17-189. In Docket No. DE 19-064, Liberty sought and received approval to implement an optional EV TOU rate for residential customers taking service under Rate D as a separately metered service. That EV TOU rate was developed using Liberty's battery storage TOU rate as a foundation.[24] In Order No. 26,394 in Docket No. IR 20-004, the Commission referenced Liberty's battery storage docket and the "TOU Technical Statement" filed in that proceeding as Exhibit 20.[25]

Customers who choose to participate in Liberty's recently approved residential EV rate are obligated to participate for a minimum of two years.[26] The rate per month is the sum of a customer charge of $11.35 plus an energy charge that is comprised of time-varying distribution, transmission, and energy services charges.[27] Off-peak hours are 12 AM to 8 AM and 8 PM to 12 AM daily, with weekday mid-peak hours from 8 AM to 3 PM (except holidays) and weekend mid-peak hours from 8 AM to 8 PM on Saturdays, Sundays, and holidays.[28] Liberty's critical peak hours run from 3 PM to 8 PM Monday through Friday except holidays.[29]

Liberty's residential EV TOU rate can provide a model for Eversource and Unitil to consider as they develop residential EV rates in this proceeding. A number of utilities in other jurisdictions have also developed or piloted EV-specific TOU rates to support the use of EVs and

[24] *See* Docket No. DE 17-189.
[25] *See* Order No. 26,394 at 5.
[26] NH PUC No. 21 – Electricity Deliver, Liberty Utilities Original Page 123, Rate EV.
[27] *See id.*
[28] *Id.*
[29] *Id.*

facilitate grid management for a range of EV charging use cases including home charging, workplace charging, and fleet charging.[30] ChargePoint does not suggest a particular rate that a utility should charge but recommends that any rate design proposal consider both the charging context and the goals of the utility and state. ChargePoint further recommends the Commission and utilities consider a suite of load management approaches, including managed (smart) charging or demand response programs which can be implemented directly through the EV meter.

While Liberty has provided a helpful model in the residential context, additional models exist outside of New Hampshire for residential and non-residential contexts including high-demand draw applications like fleet charging and public charging. The majority of vehicle charging takes place at home, but other charging contexts are also critical to consider and necessary for transportation uses. Accordingly, the Commission has also asked the utilities to separately address high demand draw applications, which include fleet charging and public charging, in their upcoming rate design proposals.[31]

High demand draw rate designs will necessarily vary from residential rates. In developing rate designs applicable to public charging stations, for example, it is essential to consider that drivers utilizing a public charging station while in transit have limited ability to shift their charging to a different time period. Unlike a customer who plugs a vehicle into their home charger after

[30] *See, e.g.*, Pacific Gas and Electric: Electric Schedule EV, available at https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHEDS_EV%20(Sch).pdf; Electric Schedule EV2, available at https://www.pge.com/tariffs/assets/pdf/tariffbook/ELEC_SCHEDS_EV2%20(Sch).pdf; Southern California Edison EV Time-of-Use Rates, available at https://www.sce.com/business/rates/electric-car-business-rates/business/rates/electric-car-business-rates; Xcel Energy (MN) EV Time-of-Use Rate, available at https://www.xcelenergy.com/staticfiles/xe-responsive/Energy%20Portfolio/EV-Electric-Pricing-Plan-Set-Up-Guide%20.pdf; Rocky Mountain Power, Utah EV Time-of-Use Pilot, available at https://www.rockymountainpower.net/savings-energy-choices/electric-vehicles/utah-ev-time-of-use-rate.html; Consolidated Edison Company of New York EV Time-of-Use Rate, available at https://www.coned.com/en/our-energy-future/technology-innovation/electric-vehicles/electric-vehicles-and-your-bill; BC Hydro Fleet Electrification Rate: British Columbia Utilities Commission Order Number G-67-20 (March 26, 2020), available at: https://www.bcuc.com/Documents/Proceedings/2020/DOC_57665_G-67-20-BCH-Fleet-Electrification-Final-Order-Reasons.pdf.

[31] *See* Order No. 26,394 at 18.

work, drivers in transit have a limited time window to charge – a charge may last only as long as it takes to grab lunch on the go, or to visit a tourist destination. In addition, as explained further below, public charging station site hosts are the recipients of utility electric bills, not the EV drivers who use those charging stations. Fleets, on the other hand, are a high demand draw application that can be flexible in terms of when charging must take place, and therefore more susceptible to time-varying price signals. Further, the cost of a second meter may be a higher barrier for residential uses cases than for some commercial or high-demand draw use cases. For reasons such as these, it is important to consider specific use cases in developing EV rate designs.

iii. Additional Discussion of Rate Design Principles.

As the utilities develop rate designs, it is important to keep in mind several additional considerations including demand charge alternatives that have been adopted in other states, methods to address peak coincident costs without erecting undue barriers, and the extent to which consistency across utility jurisdictions may provide customer benefits.

***a. Utility Proposals Should Include Demand Charge Alternatives that May Be Modeled After Rates in Other Jurisdictions.***

As noted above, the Commission found in Order No. 26,394 that the utilities should consider demand charge alternatives "in any high demand draw rate proposals,"[32] which includes rate designs developed for the use cases of public charging stations as well as EV fleet charging. ChargePoint applauds this finding, as demand charges remain a significant operating cost barrier to public EV infrastructure deployment. Implementing appropriate rate designs that eliminate, defer, or reduce demand charges is key to unlocking increased investment in the EV charging infrastructure needed to support EV drivers in New Hampshire as well as those transiting through the state. As the New Hampshire utilities develop demand charge alternatives, they should

[32] *See id*. at 9.

consider specific use cases as well as alternatives that have already been demonstrated by utilities in other states, including Eversource in its Connecticut territory.

Demand charges are not an effective price signal for public charging stations because the only way to avoid or reduce demand charges is to shift or curtail load, which is typically not an option for travelers "on-the-go" who must charge their vehicles at a public charging station in order to complete their travel. Demand charges also do not accurately reflect cost causation. The Regulatory Assistance Project concluded in a November 2020 report that demand charges "provide an inaccurate price signal," "reflect[] an outdated perspective of the engineering and economics of the electric system," and "time-of-use and other kinds of time-varying rates remain more efficient and equitable" than even modified demand charges such as peak window demand charges.[33] Demand charges can present a particularly high barrier to EV charging stations located in rural areas where utilization may be more infrequent than in urban areas.

In addition to presenting a major barrier to public charging options, demand charges also present a barrier for electrifying public- and private-sector fleets, including municipal service vehicles, school buses, and public transit buses. Addressing unique fleet charging needs through appropriate rate designs that do not include traditional demand charges will reduce barriers to EV adoption, as fleet operators are uniquely suited to maximize the operational cost savings of transportation electrification. Reducing barriers for fleet operators to electrify their vehicle fleets can create widespread and equitably accessible benefits for ratepayers and the general public.

[33] Regulatory Assistance Project, "Demand Charges: What Are They Good For? An Examination of Cost Causation" at 13 (November 2020), available at https://www.raponline.org/wp-content/uploads/2020/11/rap-lebel-weston-sandoval-demand-charges-what-are-they-good-for-2020-november.pdf.

In evaluating what alternatives to demand charges are appropriate for different vehicle use cases, the utilities can adopt or modify models established by utilities in other states. Models that have been employed by utilities in other states include:

- **Eversource Energy (Connecticut)** offers customers an EV Rate Rider (EVRR) which converts any demand charges that might otherwise apply to an equivalent $/kWh charge.[34]
- **PECO (Pennsylvania)**: EV DCFC Pilot Rider: A monthly bill credit representing a percentage of the nameplate demand associated with installed charging stations behind a commercial customer's metered service.[35]
- **Dominion (Virginia)**: GS-2 rate is a technology-neutral, low-load factor rate applicable to customers with a load factors below 200 kWh per kW.[36]
- **Pacific Power (Oregon)**: Schedule 45 which provides a demand charge transition discount paired with an on-peak energy charger transition discount.[37]
- **Pacific Power (Oregon)**: Schedule 29 which combines a TOU rate with a demand charge based on utilization in which the average energy price declines as utilization increases.[38]
- **Public Service Company of Colorado**, a unit of Xcel Energy, offers a low-load-factor rate with a lower demand charge and higher TOU volumetric rates.[39]

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[34] *See* This rate rider was approved by the Connecticut Public Utilities Regulatory Authority in a decision dated March 6, 2019 in Docket No. 17-10-46RE01, available at http://www.dpuc.state.ct.us/dockcurr.nsf/8e6fc37a54110e3e852576190052b64d/78a25b4e83776981852583b50057c9d1/$FILE/171046RE01-030619.pdf (approving rate available to all public EV charging stations for a term of 3 years) ("In the EV RATE Rider, the rate calculation for EV charging stations is based on a per-kWh equivalent to the demand charges applicable to the Company's general service rate schedule that would otherwise apply to the load being served."). This is a successor rate to the EVRR Pilot rate originally approved in Docket No. 13-12-11, by decision dated June 4, 2014. The current Eversource-Connecticut EVRR rate is available at https://www.eversource.com/content/docs/default-source/rates-tariffs/ct-electric/ev-rate-rider.pdf?sfvrsn=e44ca62_0. For reference, this rider has been appended to this filing as Attachment I.

[35] *See* EEI, *EV Trends and Key Issues* at 2 (March 2019) ("On December 20, 2018... the Pennsylvania Public Utility Commission approved PECO's five-year EV DCFC Pilot Rider (EV-FC). This rider...will provide a demand credit to the customer's billed distribution demand. The credit...will be equal to 50 percent of the combined maximum nameplate capacity rating for all DCFCs connected to the service. Eligible customers will receive the credit for up to 36 months or until the pilot ends, whichever comes first. (Docket No. R-2018-3000164).)") at https://www.eei.org/issuesandpolicy/electrictransportation/Documents/EV_Trends_and_%20Key%20Issues_Mar2019_WEB.pdf. *See also* https://www.peco.com/SiteCollectionDocuments/ThirdPartyEV.pdf.

[36] *See* Schedule GS-2, available at https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/virginia/business-rates/schedule-gs2.pdf?la=en&rev=65c74050107549f299d48689f738e948&hash=7CBE70107AE10C66B8EB5C5A1E248D12.

[37] *See* Pacific Power, Oregon Schedule 45, Public DC Fast Charger Optional Transitional Rate Delivery Service at https://www.pacificpower.net/content/dam/pcorp/documents/en/pacificpower/rates-regulation/oregon/tariffs/rates/045_Public_DC_Fast_Charger_Optional_Transitional_Rate_Delivery_Service.pdf. Approved in Oregon PUC Docket No. 485 on May 16, 2017.

[38] *See* In the Matter of PACIFICORP, dba PACIFIC POWER, Request for a General Rate Revision, Oregon PUC Docket No. UE 374 (Proposed), available at https://apps.puc.state.or.us/edockets/DocketNoLayout.asp?DocketID=22279.

[39] *See* https://www.xcelenergy.com/staticfiles/xe/PDF/Regulatory/CO-Rates-&-Regulations-Entire-Electric-Book.pdf, at Sheet No. 44.

- **Madison Gas & Electric (Wisconsin)** offers a low-load-factor rate which provides a 50% discount in the demand charge for customers with load factors below 15%. This technology-neutral rate is targeted not only for DCFC facilities, but also other types of low-load-factor customers.[40]
- **Northern States Power (Minnesota**), a unit of Xcel Energy, offers a low load factor rate which forgives a portion of billed demand.[41]
- **NVEnergy (Nevada)** has implemented Schedule EVCCR-TOU in its Northern and Southern Nevada service territory.[42] This rate is applicable to separately metered DC fast chargers by utilizing a 10-year demand rate reduction period which starts at 100% reduction and phases back in at 10% each year. The demand rate reduction is offset with TOU dollar per kWh transition rate adders that are in addition to the normal billed TOU volumetric rates for commercial customers.
- **Tacoma Power (Washington State)**: EV-F rate which has a similar structure to NVEnergy's rate above.[43]
- **SCE (California)**: TOU-EV-8, which provides TOU rates for the initial 5 years with demand charges phased back in during years 6-10.[44]
- **SDG&E (California)**: TOU-M, an interim rate, under which sites can switch to a rate with a $2.50/kW demand charge and the cap is waived.[45]
- **Ameren (Illinois)** offers a multi-phase "rate limiter" designed to limit the average monthly cost for customers who limited their total kWh usage during the four summer billing periods of June through September to 20% or less of their annual kWh consumption.[46]
- **DTE (Michigan):** GS-D3 is a low load factor rate where the 1000 kW demand cap for this non-demand general service rate is waived for DC fast chargers through June 1, 2024.[47]
- **Hawaiian Electric (Hawaii)** offers Schedule EV-F for separately metered public EV charging facilities with peak demands for EV charging not exceeding 100 kW.[48] The rate is an all-volumetric rate, with no demand charges. The lowest rate is in the midday TOU period when output from the state's high penetration of rooftop solar is greatest.

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[40] *See* https://www.mge.com/MGE/media/Library/pdfs-documents/rates-electric/E32.pdf.
[41] *See* Xcel-MN Tariff, available at https://www.xcelenergy.com/staticfiles/xe/Regulatory/Regulatory%20PDFs/rates/MN/Me_Section_5.pdf.
[42] *See* https://www.nvenergy.com/publish/content/dam/nvenergy/brochures_arch/about-nvenergy/rates-regulatory/electric-schedules-south/EVCCR-TOU_South.pdf.
[43] *See* Schedule FC, available at https://www.mytpu.org/wp-content/uploads/FC_July_2020.pdf.
[44] *See* CPUC Decision 18-05-040, Ordering Paragraph 45, and SCE Advice Letter 3853-E (filed August 29, 2018) to implement the new commercial EV rates approved in that order. The decision is available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M215/K783/215783846.PDF. *See also* https://library.sce.com/content/dam/sce-doclib/public/regulatory/tariff/electric/schedules/general-service-&-industrial-rates/ELECTRIC_SCHEDULES_TOU-EV-8.pdf.
[45] *See* San Diego Gas & Electric, Interim Rate Waiver, available at https://www.sdge.com/interim-rate-waiver.
[46] *See* Ameren Tariff, available at https://www.ameren.com/-/media/rates/files/illinois/aiel14rtds4.pdf.
[47] *See* https://www.michigan.gov/documents/mpsc/dtee1cur_579203_7.pdf.
[48] Schedule EV-F was established in Hawai'i PUC Final Decision and Order No. 35545 in Docket No. 2016-0328, filed on June 22, 2018, available at https://puc.hawaii.gov/wp-content/uploads/2018/06/DO-No.-35545.pdf.

Each of these options has been designed to alleviate barriers to EV adoption while reflecting cost-causation and maintaining equity among ratepayers. These illustrative examples may be helpful in the development of New Hampshire-specific rate designs.

***b. Incorporating a Coincident Peak Pricing Element Does Not Require a Demand Charge.***

There is an increasing consensus that traditional demand charges are outdated and incompatible with EV charging, but some discussion continues with regard to the merits of coincident peak demand charges. When coincident peak demand charges are in place, customers are charged based on their highest demand level that coincides with system peak conditions. However, such demand charges can be hard to understand and lack predictability, and therefore are not preferrable. In addition, because demand charges should only be applied when the customer is able to respond to the price signal, coincident peak demand charges are inappropriate for public charging use cases where drivers have little or no flexibility with respect to when they charge. Demand charges that cannot be reduced or avoided by the customer create market barriers rather than constructive price signals. Coincident peak demand charges are thus not well-suited to public charging, for which volumetric rates are better-suited.

However, it is important to note that a coincident peak pricing element can be adequately incorporated into a volumetric rate for high demand draw use cases without requiring the adoption of a peak coincident demand charge. When a volumetric time of use rate, for example, is matched to system peaks for appropriate cost recovery, it is not necessary to create a separate demand charge to reflect the costs of coincident peak demand. A volumetric rate that reflects cost-causation in this way can be more understandable to customers, equitable, and effective.

### *c. Consistency of Rate Design Across Utilities May Be One Factor in Developing Just and Reasonable Rates.*

A measure of consistency in rate designs across utility jurisdictions is reasonable. EV TOU rate design consistency is valuable to the extent that all ratepayers should be provided with similar opportunities to charge their EVs at reasonable rates in accordance with law and Commission policy. Policies that encourage consistency across the state can help to encourage well-dispersed EV charging station infrastructure. Potential site hosts may be discouraged from installing EV charging stations if rates are unduly burdensome in certain parts of the state. It is also reasonable to anticipate that cost causation and load shapes will ultimately be similar for similar use cases across the territories of New Hampshire's three investor-owned utilities.

For purposes of clarity, however, stakeholders should understand that drivers who charge their vehicles at public charging stations will not necessarily receive a direct pass-through of the utility rates that the charging station site host must pay. Charging station site hosts design the price structure for EV charging services based on the business case for installing a charger, the types of drivers likely to use those chargers, and the optimal charging behavior for that location. For instance, a convenience store or gas station may decide that a pay-per-use DC fast charger is a good way to attract customers to visit. A big box store might prefer to offer free Level 2 charging for the first hour but require a nominal payment for additional time beyond the first hour in order to encourage patrons to move on and make the space available to others. The owner of a multi-family dwelling may choose to offer free charging in order to attract tenants. It is important to preserve this autonomy for site hosts in order to support all of the different business cases that exist or that may be developed, and to accommodate different types of charging needs.

Because public charging stations site hosts are the recipients of the price signal conveyed by a utility rate, not EV drivers, customers who use public stations may never be aware that one

New Hampshire utility charges the charging station host a different rate than another New Hampshire utility. For instance, if an EV customer has the option to charge a vehicle in Eversource territory versus Unitil territory, the charging rates that driver is choosing between may be the same, or they may be different. The charging station site host may choose to insulate customers from any cost variation. Regardless, the charging customer is unlikely to experience a rate that directly reflects the prevailing utility rate design.

Any rate design that is developed for public charging stations as a general category consequently must be suited to this overall use case. In developing rate designs for this category of charging, just and reasonable rates will be ones that send price signals appropriate for site hosts, and that do not create a barrier to market development.

### B. Alternative Metering Feasibility Assessments

ChargePoint commends the Commission for its decision in Order No. 26,394 in Docket No. IR 20-004 directing the state's utilities to further consider advanced metering options using EVSE embedded meters. We look forward to reviewing the alternative metering feasibility assessments that will be filed on April 30, 2021.[49] In Order No. 26,394, the Commission noted that Eversource has developed experience with third party metering approaches in other jurisdictions.[50] The Commission further suggested that other states can offer examples of how to use EVSE to build an initial framework for integrating advanced metering functionality.[51]

Also in Docket No. IR 20-004, in proposing that the utilities develop alternative metering feasibility assessments, Commission Staff explained that such filings should include an assessment of the feasibility of using embedded metering, together with a quantification of costs to offer

[49] *Id*. at 13.
[50] *Id.* at 14.
[51] *Id.* at 14-15. Eversource noted at page 2 of its July 24, 2020 comments in IR 20-004 that it has used alternatives to traditional metering successfully in demand management programs in both Connecticut and Massachusetts.

customers this option.[52] Staff indicated that, in the event a utility finds such an option preliminarily infeasible, the utility should identify and explain any barriers that may currently exist to providing such an option and provide a roadmap detailing how any barriers can be overcome.[53] ChargePoint appreciates the guidance Commission Staff have provided, which should ensure a measure of consistency across the assessments that are filed, as well as an actionable level of detail and specificity.

This section addresses the demonstrated benefits of utilizing alternative metering and describes the use of alternative metering in other states, including necessary eligibility criteria for customer participation and for device qualification. ChargePoint also recommends that, in addition to preparing feasibility assessments, the utilities propose pilot programs that utilize the embedded meters in smart charging stations to test customer responsiveness, gain important experience, and prepare for widespread EV adoption.

i. Using the embedded metrology in smart EV chargers can offer both utilities and customers reliable benefits.

Embedded metering can enable near-term EV charging opportunities at a lower cost to customers than installing a second EV-specific meter or replacing a whole-home non-smart meter with an AMI meter. AMI is not necessary to utilize embedded metering, but embedded metering can complement grid modernization efforts. Metering embedded in smart charging stations can provide the following important capabilities to satisfy utility and customer needs while maintaining security:[54]

- Precise accuracy across all supported current and temperature ranges;
- Measurement of energy delivered to vehicle only, separate from any other loads;

[52] *See* Staff Recommendations at 2, 7.
[53] *See id.*
[54] *See* Joint Presentation on Embedded Metering of ChargePoint, Greenlots, and Enel North America in Mass. Dep't Pub. Utils. Case No. 20-69, Grid Modernization Phase II, included as Attachment II and available at https://fileservice.eea.comacloud.net/FileService.Api/file/FileRoom/12903642.

- Granular clock-aligned interval data;
- Capability to receive remote firmware updates;
- Real-time power monitoring;
- Secure communication between the charging station and a utility or third-party server;
- Local storage of charging data on the charging station; and
- Compliance with cybersecurity requirements.

NIST Handbook ("HB") 44 Section 3.40 provides the basis for EVSE internal meter calibration. Smart charging stations that comply with NIST HB 44 provide at least 1% accuracy in the laboratory and 2% accuracy in the field. While not all states have adopted NIST HB 44 metering guidelines, major U.S. markets such as California have done so. As a result, compliance with this code by many smart charging station manufacturers enables consistency and reliable performance across the country.

Two of the key benefits of using embedded metering technologies provided by smart charging stations include substantial cost and time-savings because there is no need to purchase or install a second meter. This enables immediate or near-term participation in utility TOU rate programs, dynamic rate programs, and managed charging programs. For the customer, the use of embedded metering provides a seamless experience utilizing the built-in capabilities of the customer's smart charging station investment to communicate directly with the utility, and in some cases helping the customer to realize additional fuel cost savings.

ii. Embedded meters are already being used to offer successful EV rates and programs that would not otherwise have been possible.

Baltimore Gas & Electric ("BG&E") in Maryland,[55] Xcel Energy in Minnesota[56] and Wisconsin,[57] and San Diego Gas & Electric ("SDG&E")[58] in California are among the utilities that currently use embedded metering for customer billing in connection with EV rates. A number of other utilities, including Eversource, as noted earlier, have used embedded metering for EV demand management programs. In the case of Minnesota's EV rate offering, Xcel Energy initially required all EV TOU customers to purchase a second meter and pay for the installation of that meter. However, Xcel found that this additional cost presented a substantial obstacle to program participation.[59] Many customers were unwilling to pay the additional cost for a second meter, therefore few customers chose to participate in the EV TOU tariff.[60] As a result, Xcel then developed a pilot program using embedded metering to implement the same TOU tariff.[61] The pilot program using embedded metering reduced barriers to customer adoption by decreasing program costs.[62] The pilot program proved to be successful and the Minnesota Public Service

[55] MD PSC Docket No. 9478, Order No. 88997 (January 14, 2019) ("the Commission directs the Utilities to utilize the "smart" features of such technology to their maximum potential, like advanced metering, to develop and implement time variant rate, load management, and demand response programs").
[56] *See* Northern States Power Company, Order Approving Pilot Program, Minn. PUC Docket No. E002/M-17-817 (May 9, 2018).
[57] *See* Northern States Power Company-Wisconsin, Final Decision, Wisc. PSC Docket No. 4220-TE-104 (July 16, 2020).
[58] *See* https://www.cpuc.ca.gov/general.aspx?id=7728.
[59] *See* Northern States Power Company, Order Approving Pilot Program at 2, 5, Minn. PUC Docket No. E002/M-17-817 (May 9, 2018).
[60] *See id.*
[61] *See id.*
[62] *See id.*

Commission recently approved an expansion of Xcel's embedded metering pilot to a larger program.[63]

BG&E in Baltimore, Maryland offers another example of utility employment of EVSE embedded metering capabilities to support EV TOU rates for residential customers. BG&E was offering a whole-home TOU rate available to EV customers, but this program had low levels of customer participation. BG&E implemented a program making use of EVSE embedded metering to increase customer participation.[64] The BG&E program uses smart charger interval data aggregated into on-peak and off-peak charging by a third party, together with subtractive billing.[65]

iii. Customers that elect to participate must meet eligibility requirements.

In order for customers to be eligible for participation in BG&E's rate offering, BG&E requires that a residential customer, among other things: (1) maintain WiFi internet at the charging premise; (2) have a smart Level 2 EV charger; and (3) agree to share charging data from the smart EV charger with BG&E and any vendor designated by BG&E.[66] Customers receive an adjustment for charging station usage during the on-peak and off-peak periods on their monthly bill based on the data received from the customer's charger.[67] If there is any delay in BG&E receiving EV charging data, such as due to inoperable WiFi, the customer's total metered consumption for the premise is charged the standard whole-home rate, and applicable EV TOU adjustments are provided on the customer's next monthly bill, as long as the delay is less than 60 days.[68] The

[63] *See* Order Approving Pilot with Modifications, Minn. PUC Docket No. E-002/M-19-186 (October 7, 2019).
[64] *See* MD PSC Docket No. 9478.
[65] Subtractive billing separates the EV electricity usage from the rest of a home's electricity usage, which can be applied to create a separate EV usage bill.
[66] *See* BG&E Electric Rider 6 at 83 (effective May 1, 2020), available at https://www.bge.com/MyAccount/MyBillUsage/Documents/Electric/Rdrs_6_7_8.pdf.
[67] *See id.* at 83-A.
[68] *See id.*

customer is responsible for ensuring operable WiFi, and if BG&E does not receive the data within 60 days, BG&E does not provide any adjustments or credits to account for the EV TOU rate.[69]

The utilities can consider applying similar requirements to New Hampshire electric customers interested in participating in EV programs.

iv. Smart EV chargers satisfy rigorous screening criteria prior to deployment.

In jurisdictions that have employed embedded metering, utilities have also adopted important device eligibility criteria to ensure that participating charging stations have essential qualities such as accuracy, reliability, privacy, efficiency, security, and compatibility with utility systems.

Northern States Power Company, a subsidiary of Xcel in Minnesota, for instance, screened market-available EV charging devices for its EV-TOU pilot program in accordance with specified minimum requirements, such as the following:[70]

- Capable of storing interval data for up to 90 days to ensure charging data is retained locally until it can be transmitted and received;
- Meter accuracy as shown by the manufacturer must be within 2%;
- Ability to retrieve 15-minute interval energy usage data;
- Secure data transfer between the customer and the utility;
- 10-watt standby power consumption maximum;
- Charging device is UL-listed;
- Ability to offer utilities access to charging data via API; and
- Editing controls that prevent data tampering.

As part of the RFP process, charging stations can be screened for compliance with metering requirements such as accuracy within a 2 percent range. Northern States Power Company-Wisconsin used similar screening criteria and tested to confirm this high level of accuracy during

[69] *See id.*
[70] *See* Northern States Power Company, Petition for Approval of a Residential EV Service Pilot Program at 9, Minn. PUC Docket No. E002/M-17-817 (filed November 17, 2017).

the RFP process in order to ensure compliance.[71] Adopting screening criteria such as these improves the success of a pilot program from the perspective of the utility as well as the customer. Screening criteria enable the secure use of networked charging solutions that can provide utilities with visibility of, and access to, port-level data for EV behavior that takes place on the customer's side of the meter. This offers a more granular and valuable data set than just collecting data from a metered service standpoint, which may contain multiple charging stations downstream or even other loads.

As indicated earlier, the same embedded metering technology in EV charging hardware and software can be used for offering EV TOU rates as well as for conducting other types of demand management programs, which can provide additional value. Therefore, developing criteria and a process for eligibility over time can enable the utilities to offer customers multiple cost-saving benefits that can also contribute to system reliability and emissions reductions. Any Commission regulations that would otherwise restrict utilities from utilizing embedded metering that meets necessary criteria including accuracy, reliability, and security standards can be waived as appropriate for the purposes of piloting embedded meter utilization. Billing integration also should not become an undue barrier to piloting EV programs for rate and demand reduction purposes.

v. <u>The utilities should propose near-term pilot programs that utilize embedded metering.</u>

Given that alternative metering offers substantial benefits and the meters embedded in smart chargers have already been vetted and employed successfully for metering and demand management in other jurisdictions, ChargePoint recommends that the New Hampshire utilities

[71] *See* Northern States Power Company-Wisconsin, NSP Comments on the Application of NSP for Approval of EV Service Programs, Wisc. PSC Docket No. 4220-TE-104 at 13 (filed June 3, 2019); see also Order, Wisc. PSC Docket No. 4220-TE-104 (July 16, 2020) (approving pilot program).

propose residential EV TOU pilot programs that employ alternative metering that has been appropriately screened in accordance with minimum functional criteria, such as those listed above. Pilot programs can test customer responsiveness and provide valuable experience at least cost consistent with New Hampshire energy policy, including the directive set forth at RSA 378:37 to meet the energy needs of citizens and business at the lowest reasonable cost. Such pilot programs can also position the state to better manage EV load when it becomes ubiquitous, in order to spread system costs effectively across more customers without increasing infrastructure costs. By using the embedded metering in the customer's charging station, pilot programs can launch quickly and at low cost to New Hampshire consumers. The utilities can propose these pilot programs as part of their April 30, 2021 filings.

## III. Conclusion

ChargePoint appreciates the opportunity to provide these initial comments on EV TOU rate designs and alternative metering and looks forward to further discussions over the course of this proceeding.

Respectfully submitted,

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December 9, 2020

**Enclosed:** Attachment I, Eversource Energy – Connecticut EV Rate Rider
Attachment II, Joint Presentation on Embedded Metering in MA DPU 20-69

**Attachment I**
**Eversource Energy – Connecticut EV Rate Rider**

THE CONNECTICUT LIGHT AND POWER COMPANY, DBA EVERSOURCE ENERGY

ELECTRIC VEHICLE RATE RIDER



AVAILABILITY AND APPLICABILITY:

This rider is available to serve the entire requirements of electric vehicle (EV) charging stations, which are available to the public. The Company defines public charging stations as those made available and accessible by, the public and may include on-street parking spaces and public parking spaces in lots or parking garages. Eligibility and acceptance of a customer for service under this rider is subject to the review and approval by the Company.

Service under this rider shall be separately metered and is available only to the load of an electric vehicle charging station approved by the Company.

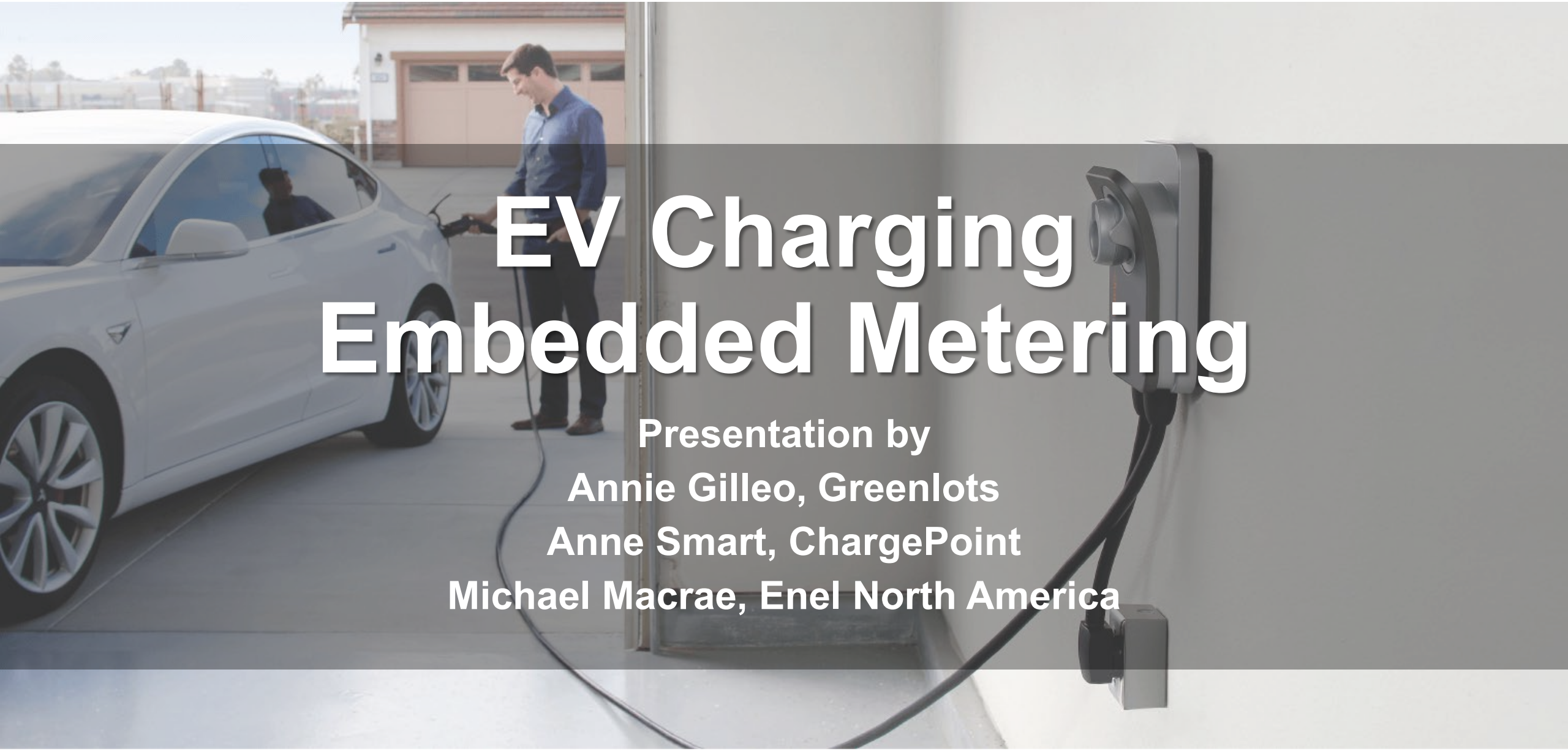
MONTHLY RATE:

Rates for electric service provided to a facility under this rider shall be determined in accordance with the Company's general service rate schedule that would otherwise apply to the load being served. Where a rate component of such schedule is priced on a demand basis (i.e., per kW or per kVA) the EV customer under this Rider will be subject to a charge determined on an equivalent per kWh basis using the corresponding average price of such rate component.

TERM:

There is no minimum term for customers electing to receive service under this rider.

**Attachment II**
**Joint Presentation on Embedded Metering in MA DPU 20-69**



# EV Charging Embedded Metering


Presentation by

Annie Gilleo, Greenlots

Anne Smart, ChargePoint

Michael Macrae, Enel North America

# EVSE and Grid Modernization

- EV charging can be beneficial to the grid
- Managed charging and/or use of dynamic rates if implemented effectively can cause real customer savings
- Embedded metering can enable near-term EV charging opportunities at a lower cost to customers
- AMI is not necessary to utilize embedded metering, but embedded metering can be a complement to a modernized grid

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# Embedded Metrology of EVSE

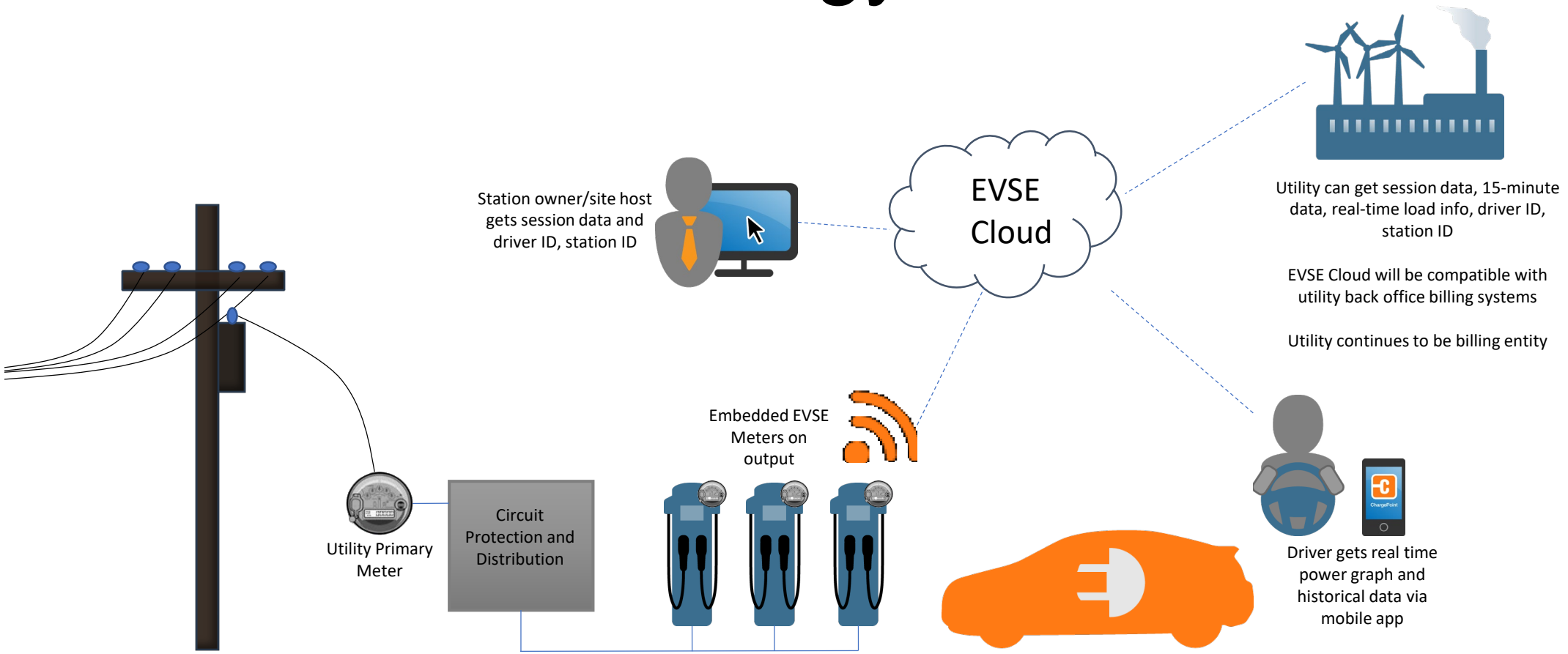


Diagram by ChargePoint

# Embedded Meter Capabilities

- 1% accuracy across all supported current and temperature ranges
- Measures energy delivered to vehicle only
- 15-minute clock aligned interval data
- Capable of remote firmware updates
- Real-time power monitoring
- Secure communication channel between station and server
- Local storage of data on station for 90 days
- Will meet cybersecurity requirements

# NIST HB 44 Provides Guidelines for Embedded Meters

- National Institute of Science and Technology (NIST) Handbook 44 Sec 3.40 provides the basis for EVSE internal meter calibration
- 1% lab / 2% field accuracy
- NIST HB 44 metering guidelines may be adopted by state Weights and Measures (CA, others)
- Enables consistency across U.S. so companies are not building state-specific products
- Aligns with G.L. c. 164, § 120 statutory standard for meters (2%)

https://www.nist.gov/pml/weights-and-measures/publications/nist-handbooks/other-nist-handbooks/other-nist-handbooks-2-2

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# Benefits to Customers

- No need to purchase a second meter
- Opportunity to participate in TOU, dynamic rates, and/or managed charging programs
- Could realize additional fuel cost savings
- EV load can be separated from house load
- Seamless experience since the EVSE communicates w/utility
- Near-term program deployment potential

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# Utilities Currently Using Embedded Metering for Billing

- San Diego Gas & Electric - Power Your Drive
- Xcel Energy Minnesota – Home Program
  - State passed legislation requiring utilities to establish EV TOU rates
  - Originally Xcel Minnesota required all EV TOU customers to purchase a second meter and pay for installation of it
  - Many customers were unwilling to pay this extra cost and sign ups for the TOU tariff were very low
  - Xcel then developed a successful pilot using embedded metering for the TOU tariff
  - The Commission recently approved an expansion

# Utilities Currently Using Embedded Metering for Billing

- Baltimore Gas & Electric – EV-Only TOU
  - Required offering per Commission Order
  - Existing whole-home TOU for EV customers had low participation
  - Smart charger interval data aggregated into on-peak and off-peak charging by third-party
  - Subtractive billing
- Smart charging incentives and active load management solutions
  - Valuable alternative or complement to time varying rates

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**STATE OF NEW HAMPSHIRE**
**PUBLIC UTILITIES COMMISSION**

**Docket No. DE 20-170**

**Electric Distribution Utilities**

**Electric Vehicle Time of Use Rates**

## CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing documents has, on this 9th day of December 2020, been sent by email to the service list in Docket No. DE 20-170.

Alicia Zaloga

Alicia Zaloga