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ABB E-mobility Comments on Second Draft Staff Report Tracking and Improving Reliability of Californiaâ€™s EV Chargers

Additional submitted attachment is included below.

May 15, 2024

California Energy Commission
Fuels & Transportation Division
715 P Street
Sacramento, CA 95814

Re: **Docket No. 22-EVI-04 – Comments in Response to Second Draft Staff Report: Tracking and Improving Reliability of California's Electric Vehicle Chargers**

Dear California Energy Commission staff,

ABB E-mobility is pleased to provide the following submission to the California Energy Commission (CEC) in response to Docket No. 22-EVI-04 relating to the Second Draft Staff Report: Tracking and Improving Reliability of California's Electric Vehicle Chargers.

ABB E-mobility has been manufacturing EV chargers for the US market for over a decade and is the leading manufacturer of electric vehicle chargers globally, having sold more than 1 million electric vehicle chargers, including 80,000+ direct current fast chargers (DCFC). ABB E-mobility has been manufacturing EV chargers in the US since 2019 and beginning in early 2023, expanded US manufacturing operations, in part, to meet Build America, Buy America Act requirements. ABB E-mobility can produce up to 10,000 chargers per year, ranging from 20kW to 600kW in power, meeting the needs of public charging, transit and school buses, medium- and heavy-duty vehicles, and fleets of all kinds.

ABB E-mobility provides charging technology to owners and operators of charging equipment across the transportation sector including public charging networks, transit bus operators, electric utilities, auto dealerships, auto manufacturers, shipping and logistics fleets, commercial fleets, and more. As a long-time member of the e-mobility industry, ABB E-mobility is actively involved in developing not only charging technology, but also industry-wide standards for both hardware and software interoperability.

Figure 1. ABB E-mobility public charging references

Scope - Limit Public and/or Ratepayer Funded Charger Uptime Report Requirements to "Publicly-Available" Chargers

§ 3123 (3) (A) *For each charging port of a publicly and/or ratepayer funded charger required to report under subsection (b) of this section, for the first six years after a charger is installed, the uptime data required by section 3124 of this Article.*

ABB E-mobility has significant concerns regarding the uptime reporting requirements for fleet operators using only "behind-the-fence," non-publicly available chargers. While ABB is in agreement with the CEC that these chargers, whether they receive public funding or not, should achieve high uptime, the proposed reporting requirements would cause significant administrative burden on both small and large fleets. Further, these operators are well-motivated to achieve high-uptime and may employ different methods to achieve high uptime than what public operators may use.

We welcome the opportunity for further conversation on this, and recommend that where possible, within the constraints of AB 2061, the CEC consider only requiring reliability reporting for publicly funded charging stations that meet CARB's definition of "publicly available":

> *"Publicly available Electric Vehicle Supply Equipment (publicly available EVSE, publicly available DCFC EVSE, or publicly available Level 2 EVSE)" means an EVSE and associated parking space or spaces designated by a property owner or lessee to be available to, and accessible by, the public for any period of time. An EVSE designated by a lessee or a property owner to be available only to customers or visitors of the business is a publicly available EVSE for purposes of this chapter. EVSE and associated parking spaces located in parking garages or gated facilities are considered publicly available for purposes of this chapter if any member of the public can obtain vehicular access to the facility for free or through payment of a fee.* [1]

Downtime Event Duration – OCPP 2.0.1 Messages, BootNotificationResponse and HeartbeatResponse

§ 3124 (c) (1) (C) *If using OCPP Version 2.0.1 or a subsequent version of OCPP, the time between a BootNotificationResponse transmitted by the Central Management System and the last HeartbeatResponse transmitted by the Central Management System prior to the BootNotificationResponse. The timestamps in the relevant BootNotificationResponse and HeartbeatResponse shall be used to quantify downtime.*

ABB E-mobility recommends that the CEC consider updating the language in §3124 (c) (1) (C) to the following:

"If using OCPP Version 2.0.1 or a subsequent version of OCPP, the time between a BootNotificationResponse transmitted by the Central Management System and the last OCPP message that contained a date time stamp transmitted by the Central Management System prior to the BootNotificationResponse. The timestamps in the relevant

BootNotificationResponse and the last OCPP message that contained a date time stamp transmitted shall be used to quantify downtime."

We recommend this change because there are a variety of situations where the last HeartbeatResponse is not an accurate representation of when the charger may have entered into a downtime state. For example, if a car is actively charging and the network goes down, the last HeartbeatResponse may have been sent before the charge session was initiated. Yet, many OCPP messages were transmitted following the HeartbeatResponse. ABB E-mobility recommends that the CEC look at the last OCPP message sent that contained a date and time stamp transmitted before the network goes down or the charger enters into a faulted state to determine a more accurate duration of downtime.

Excluded Downtime – Outage for Preventative Maintenance or Upgrade

§ 3124 (d) (3) Outage for Preventative Maintenance or Upgrade: *Downtime caused by any preventative maintenance or upgrade work that takes the charging port offline. This must be scheduled at least two weeks in advance of the charger being placed in an inoperative state. The maximum downtime that can be excluded for preventative maintenance or upgrade work is 24 hours for any 12-month period.*

ABB E-mobility conducts preventative maintenance and upgrade activities to enhance charger reliability and improve the driver experience. For example, preventative maintenance visits can include replacing air filters and inspecting the fan cabinet, power modules, DC fuse(s), CPI board, connectors and more. These inspections require close visual examination, and when necessary, based on inspection, can include part replacement to avoid unplanned downtime in the future. Additionally, regular preventative maintenance activities are conducted by ABB E-mobility's network provider. These activities are directly correlated to improved charger uptime and can require more than 24 hours of work in a 12-month period. Beyond the preventative work already mentioned, "upgrades" could also include additional in-field work like adding a NACS connector. With these activities in mind, ABB E-mobility recommends that the CEC increase the maximum allowable downtime exclusion to at least 72 hours in a 12-month period.

Additionally, ABB E-mobility is concerned with the requirement for companies to provide a notification to the CEC two weeks ahead of planned preventative maintenance or upgrade activities. Providing a two-week notification for preventative maintenance adds significant administrative burden and it is unclear what value that would provide to CEC. ABB E-mobility acknowledges the need for detailed reporting of what work was conducted within the claimed hours, but recommends that the CEC consider removing the requirement to notify the CEC prior to preventative maintenance or upgrades.

Definition of a Charge Attempt – Interval Length, Successful Charge Attempt Duration, & StoppedReason Values

§ 3124 (e) (1) *Charge Attempt. A charge attempt occurs upon transmission of one or more of the protocol data units identified in following subsections (A) through (G) between the Central Management System and the charger as specified in OCPP Version 2.0.1 or a*

subsequent version of OCPP. Any number of the Protocol Data Units described in (A) through (G) of this subsection timestamped within a **two-minute interval** *shall be counted as one charge attempt. Any number of TransactionEventRequest described in (D) through (G) of this subsection transmitted with identical identifier strings in the transactionId subfield of the transactionInfo field shall be counted as one charge attempt*

ABB E-mobility is supportive of the CEC's proposed definition of a Charge Attempt but recommends that the proposed two-minute interval be updated to a three-minute interval to more accurately capture a single charge attempt while accounting for common driver delays in presenting payment information. ABB E-mobility determined this recommended time interval by assessing the following time windows associated with initiating a charge session: when a vehicle is plugged in and everything goes smoothly to access the authorization phase, it takes ~8 seconds. Once the driver gets to this stage, they need to present payment. If they present payment within 60 seconds, the charge session begins successfully. If they do not present payment within 60 seconds, the charger will attempt a session restart for about 45 seconds, if the charger successful restarts the session, the authorization phase will be another 8 seconds, and the driver will have another ~30 seconds to present payment. This proposed scenario assumes that the driver is ready to quickly provide payment in the second scenario (~30 seconds), and in total is ~151 seconds. To provide additional time to account for a driver presenting payment more slowly, ABB E-mobility would recommend a three-minute (or 180 seconds) interval.

§ 3124 (e) (3) *Successful Charge Attempt. A successful charge attempt is a charge attempt, as defined in subsection (e)(1) of this section, that is followed by either (A) or (B) of this subsection prior to another charge attempt.*

(A) A charging session that lasts for 5 minutes or longer as determined by the timestamps described in section 3124(e)(2) of this Article.

(B) The stoppedReason subfield of the transactionInfo field of the TransactionEventRequest protocol data unit ending the charging session, as described in section (e)(2)(B) of this Article, is set to one of the following:

1. *"EVDisconnected"*
2. *"EmergencyStop"*
3. *"Local"*

ABB E-mobility is supportive of 5 minutes or longer being used as the threshold to define a successful charge attempt as a majority of charge session failures, if they are going to occur, occur within the first few minutes of charging. The 5-minute window will capture the critical moments where a charger is ramping up to the highest power output based on

what the vehicle is requesting and the demands on the infrastructure decrease significantly as the charge session continues.

ABB E-mobility strongly recommends that the following values are added to section § 3124 (e)(3)(B), in addition to keeping the “EVDisconnected,” “EmergencyStop” and “Local”:

- StoppedbyEV: The transaction was stopped by the EV. This is used in the case where a driver presses the release button next to the vehicle’s inlet and the vehicle sends a “StopCharge” request.
- EnergyLimitReached: EV charging session reached a locally enforced maximum energy transfer limit.
- SOCLimitReached: EV has reported reaching a locally enforced maximum battery state of charge.
- TimeLimitReached: EV charging session reached a locally enforced time limit.

The “StoppedbyEV” value indicates an orderly end to the charge session and should not be counted as a failed charge attempt as it is driver initiated via the release button on the vehicle’s inlet. The "EnergyLimitReached,” “SOCLimitReached,” and “TimeLimitReached” stop reasons may end a charge session prematurely (<5mins) based on the EV’s initial state of charge (SOC), battery size, and charging speed based on what the vehicle can accept and charger can provide. All the "limit" stop reasons are enforced by charge point operators. While “limit” cases may be considered “corner cases” and may not be often reported, they should not be counted as failed charge sessions.

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Thank you for the opportunity to provide comments on the CEC’s Second Draft Staff Report: Tracking and Improving Reliability of California’s Electric Vehicle Chargers. ABB E-mobility shares California’s commitment to electrifying transportation and providing EV drivers with reliable charging experiences.

If you have any questions or want to discuss any of these topics further, please do not hesitate to reach out to Alex Ehrett, Public Policy & Market Development Manager, at alex.ehrett@us.abb.com.

Respectfully submitted,

Alex Ehrett
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ABB E-Mobility