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BTC POWER Comments on 22-EVI-05 NEVI Pre-Solicitation Joint Workshop

Additional submitted attachment is included below.

BTC POWER

September 28, 2022

Elissa Konove, Undersecretary
California State Transportation Agency
915 Capitol Mall, Suite 350B
Sacramento, CA 95814

Steven Keck, Acting Director
California Department of Transportation
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Drew Bohan, Executive Director
California Energy Commission
715 P Street
Sacramento, CA 95814

Re: BTC POWER Comments on 22-EVI-05 NEVI Pre-Solicitation Joint Workshop

Dear Ms. Konove, Mr. Keck, and Mr. Bohan;

BTC POWER respectfully submits the following comments and suggestions in response to the California Department of Transportation's (Caltrans) and California Energy Commission's (CEC) joint request for feedback on the design of California's solicitation for funding EV charging infrastructure (EVSE) under the Infrastructure Investment and Jobs Act's National Electric Vehicle Infrastructure (NEVI) Formula Program. As you finalize the state's NEVI solicitation, we thank you for recognizing this as a critical opportunity to strategically invest the allocated public funds, leverage California's impressive ongoing and planned public and private investments in public EVSE, and drive policies that will spur greater private sector investment and participation in the development of successful, sustainable EV fast charging infrastructure in California as well as the workforce needed to build and maintain this critical infrastructure.

About BTC POWER
Headquartered in Santa Ana, CA, BTC POWER is a leading manufacturer of electric vehicle charging systems in North America. BTC POWER's product portfolio consists of both DC and AC charging systems with power ranges from 6.6kW to 360kW. With over 18,000 charging systems sold worldwide, BTC POWER's DC Fast Chargers and AC Chargers serve charge point operators (EVSPs), convenience stores, retail centers, municipalities and public parks, transit networks, logistics operations, on- and off-road fleets, the oil and gas sector, and others for charging electric vehicles and equipment of all types, sizes, and duty cycles.

BTC POWER has a strong manufacturing and service presence in California and is well qualified to help the state achieve its alternative fuel goals. Founded in 1999 to commercialize its proprietary Flat Matrix Transformer (FMTx) technology power supplies and converters for the telecom and internet infrastructure market. The FMTx technology enabled the company to offer the highest current density converters in the market, receiving numerous industry rewards and recognitions. In 2005, BTC POWER turned its power electronics expertise to the design, development, and manufacturing of electric material handling vehicle chargers. In 2011, BTC POWER responded to the newly resurgent electric vehicle market by launching the single and dual port 30 Amp Level 2 AC charging system for workplace and

commercial locations. Following up, in late 2013, BTC POWER introduced the ubiquitous 25kW and 50kW dual protocol (CHAdeMO/CCS) DC Fast Charger, which continues to be the primary choice of DC fast chargers in North America. Today, the DC product line has increased both in performance and flexibility with modular architecture and power ranges from 25-360 kW systems. Today, BTC POWER manufactures both in California and overseas in Cebu, Philippines. BTC POWER's California manufacturing capabilities are expected to comply with "Buy America" standards established by the Federal Highway Administration ("FHWA"), Federal Transit Administration ("FTA"), and the Infrastructure Investment and Jobs Act ("IIJA") including under the NEVI Program.

BTC POWER is a proven, long-term partner to California's leading charging station operators and EVSE network developers, including private industry, the California Energy Commission, the Department of General Services, and numerous municipalities and local agencies. For instance, BTC POWER was the preferred provider to many of the projects awarded funding under the CEC's West Coast Electric Highway and East-West Charging Corridors grant programs, providing BTC POWER with the expertise and skills to successfully deploy publicly funded EVSE while accurately adhering to budget, schedules, and reporting requirements. Today, BTC POWER has deployed more than 18,000 AC Level 2 and DC fast charging stations—including more than 5,000 high-power charging stations providing >100 kW charging rate. Cumulatively, BTC POWER's DC fast charging and high-power charging stations (>100 kW) account for some 25% of the North American EVSE market with more than 25 GWh dispensed annually.

Question: Is $250,000 per charger an appropriate estimate for the total project cost?
Based upon our extensive experience deploying DC fast charging stations throughout California in partnership with major electric vehicle service providers, network operators, and site hosts, BTC POWER is confident that a proposed allocation of up to $250,000 per charging port is an appropriate estimate for the total project cost. Yet, prospective applicants would benefit from the Commission providing greater clarity around the definitions of "charger", "port", and "dispenser". For instance, if a dual port charger provides more than 150 kW per dispenser to two vehicles simultaneously, would that charger be eligible to receive $250,000 or $500,000? Establishing the maximum incentive at $250,000 per charging port capable of delivering 150 kW could achieve cost savings and reduce the cumulative amount of land and real estate required to be dedicated to the charging infrastructure.

Question: Should there be any additional minimum requirements?
BTC POWER recommends that liquid cooled cables be included in minimum requirements. Liquid cooled cables are a commercially available technology with additional new vendors entering the market. Liquid cooled cables actively manage the temperature within charging cables and at the DC contacts at a vehicle's electrical connector, enabling the cable to be manufactured with less conductive material and insulation, and providing for a smaller, lighter, and more manageable cable/connector solution for customers. Liquid cooled cables are lighter and more manageable than their non-liquid cooled counterparts, for instance, a 500A liquid cooled cable weighs only 11 pounds, whereas a 200A and 300A non-liquid cooled cable weigh 22 and 13 pounds, respectively (see, Figure 1).

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		400 Volt Passenger EVs	900 Volt Passenger EVs	Weight Comparison of 10ft Cable
500A Liquid Cooled Cable		180kW 80% Charge 10-15 Mins	180kW 80% Charge 10-15 Mins	11 lbs
300A Non-Liquid Cooled Cable		120kW 80% Charge 15-23 Mins	180kW 80% Charge 10-15 Mins	22 lbs
200A Non-Liquid Cooled Cable		80kW 80% Charge 35-40 Mins	180kW 80% Charge 10-15 Mins	13 lbs

Figure 1. Comparative Power and Weight of Liquid and Non-Liquid Cooled Cables

The lightweight and ergonomic nature of liquid cooled cables therefore improve user experience and ADA compliance and accessibility, making charging more manageable and accessible for all drivers. Moreover, liquid cooled cables have the ability to extend operability of EVSE in extreme temperatures by cooling during warmest times and warming during the coldest times.

Site power is expected to be greater than or equal to 600 kW, supporting at least 150 kW per port across four ports simultaneously. Charge speed is influenced by both voltage and current, the product of which is power. Increasing the minimum amperage requirement to 375A continuous at max operating temperature will ensure capability for 150 kW charging for EVs with 400V battery architectures. Today, 400V EVs make up some 90 percent of light-duty (LD) vehicles on the market, including offerings from Tesla, VW, Volvo, Audi, and a vast majority of EVs eligible for the federal tax credit. Increasing the minimum amperage requirement will guarantee that sites are capable of achieving desired charging capacity for EVs with lower voltage battery architectures. Establishing a minimum amperage for all NEVI-compliant stations would provide for a more reliable and consistent driver experience across the charging corridor.

Question: Is requiring conduit for 350 kW, and one additional space/stub-out, adequate future proofing?
Requiring conduit for 350 kW for AC input power, across all deployed EVSE and one additional space/stub-out is sufficient future proofing as a baseline, but the CEC should provide additional scoring consideration for applications providing 1) higher power conduit, 2) additional stub-outs beyond the one required, or 3) both. The construction and trenching process associated with laying conduit is costly, labor intensive, and can disrupt site operations and traffic flows. Providing higher power conduit and additional stub-outs during initial development lowers construction costs of future deployment and installation of charging infrastructure, allowing for more rapid acceleration of operations. Scoring should reflect the proportionate cost savings of an increased scale of operations and the ability to improve the cost-effectiveness of those chargers deployed in the immediate as well as under future efforts.

Question: Do you have any concern on the proposed minimum requirements?
We recommend the CEC prioritize accessibility and operability within the minimum requirements. For example, stations should be required to include charging cables and cable management systems that

provide for lightweight, flexible, and reliable cables in all operating conditions. To date, the leading manufacturers of non-cooled cables have struggled to decouple weight, cost, and higher amperages, impacting maximum charge rates and operability in extreme weather conditions. Commercially available liquid-cooled cables are becoming increasingly prevalent and cost-competitive while enabling higher charging rates, increased operability, and greater accessibility due to their lighter weight and improved flexibility over non-cooled cables. Including requirements for accessibility and operability as related to cable systems will allow the CEC to emphasize driver experience and compliance with the Americans with Disabilities Act (ACT).

Additionally, if included in the minimum equipment requirements, the CEC should clarify any demands for "power" and "continuous current" and clearly define these two terms as relates to any proposed requirements.

Question: Are there other criteria that should be evaluated?
BTC POWER recommends that scoring criteria give priority to California-based businesses and project teams composed of California businesses. Utilizing and supporting California-based entities should fall under the Cost category during evaluation as it will drive program, EVSE, and tax revenue back into the local and state economies, further strengthening California's investment in EV technologies and infrastructure.

The CEC should evaluate dynamic power sharing and EVSE enabling charging rates above 150+ kW as they relate to the customer experience at charging stations. Faster charging times increase parity with existing internal combustion engine (ICE) vehicles, and current charging sessions of 12-15 minutes remain competitive and efficient, particularly when charging stations are capable of power sharing. Dynamic power sharing refers to the ability of chargers to charge vehicles simultaneously according to demand and capacity. Power sharing distributes available power to all connected charge ports, maximizing the number of possible ports that can be deployed while ensuring that all drivers receive an adequate charge. Enabling distributed resilient power sharing will increase energy efficiency while meeting the demands of customers and improving both customer and operator experience.

Question: Are the proposed points for each category appropriate?
Generally, we believe that the proposed points for each category are nearly appropriate except for the heavy emphasis on Project Cost. The heavy weighting and focus on cost and cost share may provide inequitable outcomes in which large Fortune 1000 companies are better positioned to provide increased match, further attracting investment and visitors away from small and local businesses. The Cost category should reflect potential direct benefit to California-based businesses and potential local and state economic revenues, such as for project teams including greater representation among California-based companies. The CEC should evaluate increasing scoring for Project Location where there is a greater need for EVSE to support those drivers without reliable access to dedicated charging, such as those NEVI-qualified sites nearest to multi-family housing developments, low- and moderate-income neighborhoods, or other factors impacting access to dedicated charging. Similarly, we recommend the CEC evaluate increasing scoring for Project Benefits to better incentivize project teams incorporating California-based businesses and vendors to maximize dollars spent in California.

Question: Is a 3-month application period the right length of time?
Based upon ample prior experience developing EVSE deployment projects and applications for related grant funding, BTC POWER and its partners believe that a three-month application period is an appropriate and equitable length of time for prospective applicants to develop their project(s) and proposal(s). Shortening the application period may provide unintentional advantages to some prospective applicants and project teams, particularly entrenched stakeholders such as major retailer site hosts as well as established charging network operators and electric vehicle service providers (EVSPs). Similarly,

extending the application period beyond three months may disadvantage some project teams, for instance, by increasing the time and resulting costs associated with deploying personnel to develop the project and proposal. Thus, BTC POWER believes a three-month application period will make the proposal process equitable without forcing an undue burden on prospective applicants.

Sincerely,

Stephen Israel

Stephen Israel
Sr. Director Product Management

Michael Wagner

Michael Wagner
Chief Operating Officer