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ABB E-mobility Comments on CEC's MDHD Drayage Infrastructure CFI RFI

Additional submitted attachment is included below.

June 28, 2024

California Energy Commission
715 P Street
Sacramento, CA 95814

RE: Docket No: 24-EVI-01: RFI Considerations for the California Energy Commission Zero-Emission Medium- and Heavy-Duty Drayage Infrastructure Application for the U.S. Department of Transportation's Charging and Fueling Infrastructure Program

Dear California Energy Commission staff,

ABB E-mobility appreciates the opportunity to submit comments in response to the California Energy Commission's request for information, "*Considerations for the California Energy Commission Zero-Emission Medium- and Heavy-Duty Drayage Infrastructure Application for the U.S. Department of Transportation's Charging and Fueling Infrastructure Discretionary Grant Program*." ABB E-mobility is supportive of California's funding pursuit to install electric truck charging to support zero-emission medium-and heavy-duty (MDHD) drayage trucks at California ports and along routes serving the ports and their drayage activity.

1. Please disclose your business type and vehicle class, if applicable. Are you a driver, fleet operator, truck stop operator, installer, manufacturer, utility, public agency, or other? Are you part of a small, veteran-owned, woman-owned, or minority-owned business?

ABB E-mobility is the leading global manufacturer of electric vehicle chargers and has sold over one million chargers across 85+ markets globally, including over 50,000 DC fast chargers. ABB provides charging technology ranging from 6 kW to 450 kW 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. Vehicle and truck manufacturers rely on our chargers for R&D and interoperability testing, as well as for their dealerships. Our bus and truck focused heavy vehicle chargers are used by over 60 state and local transit agencies, including some of the largest agencies in the US, totaling well over 80MW of charging capacity. As a long-time member of the e-mobility industry, ABB 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 MHD EV Chargers in the field.

ABB E-mobility does not own or operate chargers available to the public, but is squarely focused on developing, manufacturing, and delivering innovative and reliable charging technologies to the market. As part of that commitment, ABB E-mobility has a robust service and maintenance operation providing 24/7/365 monitoring, troubleshooting, and repair services for ABB chargers in the field.

2. The purpose of this RFI is to help inform the CEC's application to the Federal Highway Administration (FHWA) for federal funding. If awarded, the CEC will release a competitive grant funding solicitation to provide funding to end recipients who would develop and construct the zero-emission MDHD infrastructure. Would you consider applying for CFI grant funding for site development if the CEC is awarded funding?
ABB E-mobility would not be a direct applicant for CFI grant funding, as we do not own or operate chargers available to the public. However, ABB E-mobility would actively support our customers in the development of their proposed projects, funding applications, and eventual project deployment if awarded. Our customers include public MDHD charging site owner operators, major fueling retailers, commercial fleets, and more. ABB E-mobility would provide these partners with Build America, Buy America phase 2 compliant charging equipment that aligns with FHWA requirements for the CFI program.

3. Do you already operate or are you planning to use zero-emission battery electric MDHD vehicles in the next five years? Please use a 1-5 rating scale where 1= least likely and 5= most likely. Please add additional information regarding your (planned) use of zero-emission battery electric MDHD vehicles as desired.
ABB E-mobility's partners are currently operating hundreds of zero-emission battery electric MDHD vehicles across the west coast and within California, specifically. ABB E-mobility is supporting these zero-emission battery electric MDHD vehicles with charging infrastructure at more than 100 individual sites across the west coast with over 300 chargers currently deployed and hundreds more slated for installation in 2024-2025.

5. For EV charging and hydrogen fueling providers, describe:

a. Your organization's business model for public charging and/or hydrogen fueling offerings.

ABB E-mobility does not own or operate chargers available to the public, but is squarely focused on developing, manufacturing, and delivering innovative and reliable charging technologies to the market.

ABB E-mobility cautions that the electric MDHD transportation segment is still in the early stages and charging solutions and business models are rapidly evolving, necessitating a flexible approach. The CEC CFI application should allow applicants flexibility in both technology and business models to accommodate diverse solutions to meet the varied needs of different MDHD ZEV operators. Below, ABB E-mobility provides characteristics of primary MDHD charging segment and their public charging needs:

Last Mile.

The first trucks to electrify in this segment tend to adopt an overnight depot strategy. Given the size of these vehicle batteries and their typical route length, charging over 6-12 hours with charging ports ranging in power 19kW-50kW (both AC and DC) is an appropriate solution. Because the vehicles are often idle for many hours during the night, they do not need higher power and faster charging which can cost more.

In addition to overnight depot charging, there is a growing need for "charge and go" stations for this segment. Some last mile vehicles do not return to the depot every night, but rather go home with drivers, or their routes are long. For these drivers and vehicles, public or semi-public charge and go stations are needed where they can obtain a quick charge, which is possible with a DC fast charger capable of delivering 150kW-400+kW per port.

Middle Mile.

The first trucks to electrify in this segment tend to adopt an overnight depot strategy for their deployments. Unlike last mile trucks, middle mile trucks are larger and have bigger batteries. While they can charge for a few hours overnight, their larger batteries require DC charging solutions. The power rating typically used for these depots chargers ranges from 22kW to 150kW per charging port. Importantly, chargers used in these depots can have innovative dispenser solutions which vary from dispensers located on charging islands to charging cables and ports that retract into the ceiling gantry.

Figure 2. Charging Site with Overhead Charging Dispensers

Looking into the future, charging sites and configurations that allow for charging while vehicles load and unload may become more popular. Overhead-mounted charging dispensers with retractable connectors enable trucks to back into loading docks with less risk of damaging the charging infrastructure versus ground-mounted dispensers. Additionally, split-charging systems enable the higher-value power conversion equipment to be mounted away from traffic areas and behind protective barriers if needed.

Long-haul.
The routes and distances are predictable and range at least 300 to 500 miles or more. Long haul vehicles need en route charging at predetermined stops. These MDHD EVs may need high powered public or semi-public DCFC charging located mostly along interstates and busy corridors, many of which are in rural areas.

ABB E-mobility offers fleet and transit EVSE hardware to support every main MDHD EV segment and use case.

Use Case	Car & LCV	Medium-mile logistics	Long haul logistics	Public transport
Depot charging • Primarily overnight, **22- 150kW charging,** depending on vehicle class • Ability to track and manage energy consumption • Occasional top-up charging with faster chargers (**300kW+**)				
En-route charging • Primarily, **high-power charging at 350kW+** • Primary objective at the location is to charge and go. • Typically, public or shared infrastructure, requires payment/billing solution				
Loading/unloading charging • Primarily top-up charging, (**150-350**kW) during unloading/loading process • Typically, a shared infrastructure across multiple fleet companies, may require payment/billing solution • Cohesive energy management to cover all site operations				

Table 1. ABB E-mobility EVSE offers by Fleet Use Case

c. The scope of services, facilities and amenities provided at your recharging/refueling locations.

As discussed in response to question 5a, last mile, middle mile, and long-haul trucks all require different charging speeds and varied site configurations based on their daily operations or "duty cycle". ABB E-mobility recommends that minimum power levels and specified numbers of charging ports be avoided in order to serve the widest range of business models and vehicle operation schedules as possible. ABB E-mobility's partners that are currently operating MDHD charging hubs in California often include a range of equipment at their site, including a mix of lower power AC/DC chargers and higher power DC fast chargers. By offering this flexibility, they provide customers the option to choose the charging model that works best for their business operations. For example, a commercial fleet customer may choose to charge their last mile MDHD vehicles at lower power for a few hours overnight at 24kW and their middle mile MDHD vehicles between routes at 400kW.

	Last Mile	Middle Mile	Long-Haul
Truck Class	Class 2, 3,4: e.g. Step Van, Walk-in, City Delivery, Box Truck	Class 5,6,7: e.g., Single-axel Van, Beverage, City Delivery, Day-cab Tractor, Garbage Truck, Transit Bus, School Bus; Bucket Truck	Class 8: e.g., Full size Tractor
Charging Method			
Overnight Depot	19kW-50kw	22kW-100kW	50-150kW
Loading/Unloading	150-400kW	150-400kW	150-400kW
Charge and Go Stations	150-400kW	150-400kW	Megawatt Charging Standard (MCS)

Table 2. MHD Segments: Vehicle Class and Charging Infrastructure

d. The anticipated site size, parking configuration (e.g., pull-through), total number of charging stalls capable of simultaneous charging, and total number of truck parking spaces that are not dedicated to charging or refueling.

To support the widest possible range of vehicle types and charging needs, ABB E-mobility encourages the CEC to allow applicants maximum flexibility regarding MDHD site design. While site configurations generally must provide enough space to allow for safe and efficient truck maneuverability, specifically accommodating larger turning radii for Class 6-8 vehicles, some sites may benefit from a pull-in configuration while others would better support a pull-through design. Each MDHD EVSE infrastructure site design is unique to the vehicle or fleet's use and operations, vehicle type, site characteristics (available power capacity, electricity rates, physical space, etc.), and workforce limitations; with no one size fits all development solution.

ABB E-mobility currently has partners successfully operating MDHD charging sites supporting Class 2- 8 vehicles with varied station configurations, including pull-in parking, overhead gantry, and pull through islands. Due to limited availability of suitable sites, zoning restrictions, bridge and road weight limits, and other geographic considerations, identifying locations for MDHD charging can be incredibly challenging. With these challenges in mind, flexibility in station configuration is critical as requiring a specific configuration could inadvertently remove otherwise attractive and available sites from consideration.

e. How your organization approaches right-sizing infrastructure for near-term market demand and future-proofs infrastructure to be responsive to evolving needs.
Regarding right-sizing and future-proofing infrastructure, ABB E-mobility recommends that the California Energy Commission should consider the following technologies in developing their CFI request and assessing applications:

- ***Megawatt Charging Standard (MCS).*** While this standard is still in development, it will allow for charging power levels ranging from 1-3MW per charging port or connector. Tremendous progress has been made on this standard and we expect initial pilot deployments of this solution beginning in 2025, but caution that vehicles that can accept MCS power levels are not yet commercially available.

- ***Energy Management Software.*** Software that actively manages charging sessions across a site based on the amount of energy needed for a particular vehicle to complete a route, combined with utility rate pricing, can unlock significant energy and cost optimization. ABB E-mobility recommends that energy management software be considered an eligible cost for projects, but caution that participation in managed charging should not be a requirement for MDHD charging hubs or their customers to access incentives.

- ***On Site Battery Energy Storage & Microgrids***. On-site battery energy storage and renewable electricity generation offer important energy management capabilities, resilience, and cost reductions to fleet operators. These technologies can help reduce make-ready costs, speed interconnection times, reduce energy costs associated with demand chargers, and provide reliance and redundancy in the event of a power outage or low power quality. We strongly encourage the CEC to support and incentivize deployment of these technologies at MDHD charging sites.

6. What distance should separate stations to support zero-emission drayage truck activities around California ports? Provide a description of a typical route or use case considered when making this recommendation. Describe the vehicle class and vocation if it differs from the information provided in question 1.
ABB E-mobility cautions against establishing a minimum distance requirement between sites or pre-determining locations to host charging hubs. By nature of their business

models, owners and operators of MDHD charging hubs are incentivized to identify locations that can serve the highest levels of truck traffic in a manner that facilitates faster, lower-cost infrastructure deployment. ABB E-mobility partners carefully consider factors such as proximity to routes used by MDHD vehicles, proximity to high-traffic areas where congestion is low, distance from interstate and highway exits, availability of parking space, distribution and warehouse development clusters, proximity to ports, access to power capacity, length of time needed for grid upgrades, and connectivity access and reliability (cell phone and internet service). By allowing flexibility for applicants, the CEC will allow for the market to identify these preferred locations and avoid possible unintended consequences of specific geographic or locational requirements, such as unintentionally triggering additional utility upgrades by artificially constraining developers to prioritize location over grid capacity.

8. If possible, provide any general cost estimates for MDHD charging and/or hydrogen fueling stations you have designed, built, or have experience with, including charger power levels and number of stations installed. Please provide a range of public cost-share as a percentage of the total project cost necessary to support more public charging stations to serve zero-emission trucks along drayage corridors. For example, should the publicly funded cost share be 50% CEC/federal and 50% private/other?
ABB E-mobility would be happy to discuss charger pricing with the CEC in a one-on-one setting as this information is commercially sensitive.

At a high level, project costs for MDHD sites vary widely depending on numerous factors, including but not limited to the size of the site, the number of vehicles to be powered, the power levels of the charger on site, grid infrastructure requirements, labor and material costs, and whether the developer owns the land.

Regarding cost share, ABB E-mobility recommends that the CEC align with the cost share parameters defined in the Federal Highway Administration Notice of Funding Opportunity for the CFI grant program.[1]

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ABB E-mobility appreciates the opportunity to respond to this RFI to inform the development of the CEC CFI request. ABB shares California's commitment to eliminating emissions in the transportation sector and creating U.S. jobs and economic growth in the process.

[1] The Notice of Funding Opportunity states that "the Federal share of the cost of a project carried out with CFI Program funds under both programs shall not exceed 80 percent of the total project cost (23 U.S.C. § 151(f)(10)). Cost sharing or matching is required, with the maximum Federal share being 80 percent of the total cost of the project. Awardees must provide at least 20 percent of the total project cost (not 20 percent of the Federal share) as a matching share." (pg. 22)

If you have any questions or want to discuss any of these topics further, please do not hesitate to reach out to me at alex.ehrett@us.abb.com or +1 303-493-1452.

Respectfully submitted,

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ABB E-mobility