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Terawatt Infrastructure 24-EVI-01 Comments

Additional submitted attachment is included below.

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June 10, 2024

California Energy Commission
715 P Street
Sacramento, California 95814

Re: Project Proposal Ideas and Considerations for California, Oregon, and Washington's Medium- and Heavy-Duty Joint Application for the U.S. Department of Transportation's Charging and Fueling Infrastructure Discretionary Grant Program - Docket #24-EVI-01

Introduction

Thank you for the opportunity to submit information to assist the States of California, Oregon, and Washington (States) with their development of a joint Charging and Fueling Infrastructure (CFI) Corridor Program application to support the charging needs of medium- and heavy-duty (MHD) vehicles along Interstate 5. Terawatt Infrastructure (Terawatt) is a California-based company building a nationwide network of charging solutions for light-, medium-, and heavy-duty fleet vehicles. Terawatt provides convenient, reliable charging infrastructure that keeps fleets running efficiently. We own, develop, operate, and maintain charging sites and operational solutions that form the backbone of commercial EV transport in the U.S., and have raised more than $1 billion to deliver our national network.

With a purpose-built platform that combines a robust portfolio of property assets, capital, asset financing capabilities, and energy and project development expertise, Terawatt is filling the multi-trillion dollar investment gap in fleet EV infrastructure and leading the way in this pivotal moment in the transition to a zero-emission transportation sector and clean energy economy. The company develops, operates, and finances EV charging solutions which can ease grid congestion, and help customers manage demand charges and reduce peak load, while ensuring reliable, resilient energy supply for vehicle charging. Terawatt's unique infrastructure and real estate strategy lowers cost and risk for partners, while providing asset-backed downside protection and capital efficiency through institutional capital backing, as well as additional upside potential with the layering on of Terawatt's capabilities in energy infrastructure and management.

Terawatt's mission is to power electrified fleets with the most reliable network of charging centers. The company was founded, in the absence of anything like it, to be the nation's reliable, long-term partner providing solutions for the large scale electric vehicle charging infrastructure required to meet the transformative shift to all-electric transportation for commercial fleets. Terawatt's business model is to develop large scale charging centers to serve medium- and heavy-duty trucking customers. Terawatt matches the expected

site build to the region's expected charging demand, over time and in phases. The development of a Terawatt Charging Center provides significant incentive for trucking fleets to electrify, and Terawatt is highly engaged with fleets to ensure charging solutions are sufficient to enable their electrification. We're a diverse team with backgrounds in real estate development and construction, data centers, clean energy, and mobility. Playing our part to reduce carbon emissions at scale is what gets us out of bed in the morning, and we're excited to collaborate with people, governments and companies that share our ambitions.

We provide these comments informed by our experience developing and deploying charging infrastructure for fleets in California, where we have 11 sites under development and a large portfolio of existing properties and planned site acquisitions along the I-5 corridor. Additionally, Terawatt in partnership with the New Mexico Department of Transportation was awarded the largest MHD EV charging award in the first round of the CFI Program. Terawatt is interested in responding to a future competitive solicitation should the States be awarded a CFI Grant.

For more information, please contact:

Jarrett Stoltzfus, Director of Policy & Incentives
jarrett@terawattinfrastructure.com | 607-592-7210

Sam Vercellotti, Senior Policy Manager
samv@terawattinfrastructure.com | 413-588-8629

https://www.terawattinfrastructure.com/

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RFI Response

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?

Terawatt Infrastructure is a charging provider for commercial fleet vehicles. Terawatt works with MHD commercial fleets to meet their demand for charging in electrified last mile, drayage, short-, medium-, and long-haul vehicle use cases.

2. Would you consider applying for CFI grant funding for site development if the tri-state agencies are awarded funding?

Yes, Terawatt would apply for CFI grant funding if the tri-state agencies are awarded funding. Terawatt owns a portfolio of properties along I-5 that are located less than five miles off of the corridor with sufficient power available to meet the demand for electric fleet charging.

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.

Not applicable.

4. What type of MDHD ZEV public charging do you anticipate being most important in the next three years (2024-2027) – en route or overnight charging? For what purposes do you anticipate needing public charging infrastructure – drayage, last-mile, delivery, long-haul freight, other?

As a company specifically focused on meeting the charging needs of electric fleets, Terawatt offers multiple charging products to fleet customers to meet the variety of vehicle use cases in the commercial trucking industry. These include publicly accessible Terawatt Charging Centers, shared charging depots accessible to multiple fleets, and behind-the-fence charging infrastructure to serve a single fleet.

Terawatt recommends that the application focus solely on corridor charging that can meet medium- and long-haul duty cycles. Additionally, Terawatt recommends that the States propose site designs that accommodate both en route and overnight charging infrastructure where feasible, with some stalls publicly available for fast charging and others available for advanced reservation and a longer dwell time. While the majority of electrified freight routes in California today are drayage, last mile, short- or medium-haul duty cycles, by the time sites funded through this application are brought online, there will be significant demand for medium- and long-haul charging along I-5.

85 2nd Street, Suite 400
San Francisco, CA 94105

Sites funded through this application will likely not be brought online for at least two years, given the potential timeline for submitting an application and receiving an award notification, a subsequent multi-state competitive procurement process, environmental reviews and due diligence, design, utility interconnection, and construction. This would be consistent with Terawatt's experience implementing its CFI Grant in partnership with the New Mexico Department of Transportation.

While this timeline unfolds, Terawatt expects further significant advancements in the economic and operational cases for long-haul battery electric trucking, as battery technology will continue to become more efficient and powerful at a lower cost and weight. For example, Tesla recently announced that its long-range class 8 semi truck has a range of 500 miles, tare weight of 23,000 lbs., and can achieve 1,000 daily miles[1], making these vehicles operationally viable as a replacement for internal combustion engine (ICE) trucks, which generally cannot travel further than 715 miles per day due to hours of service regulations and the use of speed limiters[2]. Additionally, significant advancements have been made towards the commercialization of a Megawatt Charging Standard, with multiple companies successfully demonstrating and deploying electric vehicle supply equipment (EVSE) that can provide 1 MW of charging to MHD trucks.

Therefore, it is critical that the States future-proof the MHD charging stations funded with this application by prioritizing medium- and long-haul charging sites as these sites will have lower utilization in their early years of operation compared to drayage, last mile, and delivery vehicle serving sites, which have less of a need for federal investment to be completed as a result.

5. From 2024-2027, what is your first priority for power level and number of charging ports for public en route charging at a station? For public overnight charging? Do you have a second or third configuration preference?

Terawatt only develops and operates high-powered charging infrastructure, and recommends requiring sites to offer high-powered charging in excess of 350 kW, with a commitment to upgrading EVSE to 1 MW chargers once sufficient energy capacity is available at the site. Fleets operate on tight margins, and require the fastest charging speeds available for corridor travel to ensure that goods can be delivered as fast as possible.

6. Please identify the percentage of pull-in or pull through parking preferred and other desired station configurations at a given site. Describe the vehicle class and vocation considered when making this recommendation if it differs from the information provided in question 1.

[1] https://www.teslarati.com/tesla-semi-program-nevada-factory-details/
[2] https://ratings.freightwaves.com/miles-driven-per-day-by-truck-drivers/

For corridor charging applications, the majority of charging stalls at stations should be pull-through as the majority of trucks on the road will be hauling a trailer at any given time. Pull-in or bobtail parking can be used for overnight charging or at a fleet's central depot location, but are less suited for corridor sites compared to pull-through stalls that can accommodate trucks with and without a tractor.

7. What distance should separate charging stations to support zero-emission trucks along the I-5 corridor? Provide description of 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.

Terawatt is developing a network of Terawatt Charging Stations along the I-10 Corridor with seven sites located 100-150 miles apart which will enable long-haul electric MHD travel between the Port of Long Beach, CA and El Paso, TX. We recommend that California follow a similar spacing to ensure that sites are future-proofed for long haul corridor travel. In Washington, Terawatt recommends that both facilities be sited in the Kent Valley to be able to serve fleets operating at both the Port of Seattle and the Port of Tacoma. The Northwest Seaport Alliance received a CFI Grant in round one for medium- and heavy-duty vehicles operating at the Port of Seattle and the Port of Tacoma, and recommends siting the Washington charging facilities in between these locations to avoid redundancy. Finally, Terawatt recommends that both Oregon locations be sited close to Portland with a distance of 50 miles to enable regional electrification and serve as anchor sites for future long-haul travel through Oregon. At present, Oregon and Washington do not have the same regulatory drivers of fleet MHD adoption as California and as a result have less demand for corridor charging. California must site locations to accommodate near term long-haul use as fleets work to comply with the Advanced Clean Fleets regulation.

8. What amenities are you seeking at a charging facility? Is there a desire for additional parking at a facility beyond charging stalls? Is there a desire for reservation options?

Terawatt provides this input as an organization designing charging and amenities for electric fleets, rather than a site user. Terawatt offers amenities including drivers lounges, wifi, and food and beverage services at sites. However, Terawatt does not offer the amenities found at diesel truck stops such as showers or multiple restaurants. Terawatt's sites are often located in close proximity to full service diesel truck stops that can offer those amenities to drivers.

Terawatt can offer truck parking where a site configuration permits it. Nationally, there is a shortage of truck parking and building additional truck parking to meet the safety and operational needs of fleets is critical. Facilities that are built specifically for truck parking would greatly benefit from also offering low powered DCFC charging options so that trucks can charge while they are parked. However, Terawatt does not recommend

requiring truck parking to be offered at sites funded under this application, as these sites should be focused on charging MHD vehicles at the fastest possible speeds and ensuring that stalls can be turned over efficiently so that more vehicles can charge each day. These sites could be located in close proximity to truck parking to provide fleets with the option to park their vehicles elsewhere before returning to the site to charge.

The use of advanced reservation systems is a standard best practice among MHD charging providers. This is because fleets require guaranteed access to charging infrastructure so that charging sessions can be planned and optimized to deliver the greatest cost savings as well as be integrated into a planned route to ensure that vehicles do not run out of charge on their way to a charging station. Terawatt has developed a proprietary advanced reservation system that allows customers to plan their routes and optimize their charging sessions. Without an advanced reservation system that can guarantee access to a charging stall, fleets will not electrify their operations due to concerns that charging will not be accessible.

9. If possible, provide any general cost estimates for MDHD charging stations you have designed, built, or have experience with, including charger power levels and number of chargers installed. Please provide a range of public cost share as a percentage of total project cost that would be necessary to support more public charging stations to serve zero-emission trucks along freight corridors.

Terawatt in partnership with the New Mexico Department of Transportation was awarded $63.8M of CFI funding to build two MHD charging centers in Vado and Lordsburg, NM along Interstate 10. In addition to this funding, Terawatt is contributing almost $17M in non-federal matching funds, bringing the total project size to $80M. This funding covers multiple phases of the charging center's development.

MHD charging sites are very capital intensive and require significant utility upgrades, battery energy storage systems, and onsite generation where feasible. They also must scale up over time, as it is not common to have a shovel-ready project location that has secured significant amounts of power in advance of demand. Terawatt recommends funding at least two phases of site expansion during this project's lifecycle as more power becomes available at the sites.

To ensure an adequate number of sites can be built along I-5, the States may need to consider a non-federal match that is greater than 20% to boost the overall project size, or contribute other title 23 formula funding such as funding from the National Electric Vehicle Infrastructure Program, Carbon Reduction Program, or Congestion Mitigation and Air Quality Improvement Program (for sites in non-attainment areas).

10. Use the maps under the "Corridor Segments" section below to identify locations within the National Zero-Emission Freight Corridor Strategy hubs along I-5 (identified in the map segments below) you anticipate needing EV charging in the next three

years (2024-2027). You may identify sites where you plan to or would be interested in building charging stations or where you would like to see charging as a consumer. Please detail preferred locations across California, Oregon, and Washington. For each location, please provide desired site characteristics including number of chargers, power levels, type of charging desired (overnight or en route), and vehicle class and vocation if the information differs across locations or differs from the information provided in the questions above.

Terawatt owns a portfolio of land along I-5 that is located under 5 miles from the interstate and has available power to support MHD charging. Terawatt also plans to acquire additional parcels over the next year for future development. We look forward to sharing more specific information about these sites in a future formal solicitation if the application is awarded funding.

While there will be significant charging demand across the entire I-5 corridor in the coming years, within the selected segments included in the RFI, we recommend:

California

- Lebec
- Kettleman City
- Stockton

Oregon

- Multiple sites in close proximity to Portland in alignment with the National ZEV Freight Corridor Strategy

Washington

- Multiple sites in the Kent Valley to serve corridor traffic between the Ports of Seattle and Tacoma.

For each site, Terawatt recommends a base number of eight en route chargers rated above 350 kW for a site's phase 1, with upgrades to 1 MW chargers in phase 2, and an expansion of the number of 1 MW chargers serving the site during phase 3 of the site's scaled buildout.

11. If you represent a utility, please use the maps under the "Corridor Segments" section below to identify locations within the National Zero-Emission Freight Corridor Strategy hubs along I-5 (identified in the map segments below) where there may be capacity for 5 megawatts or more of power in the next five years. This information may be considered in the development for future Requests for Proposals.

Not applicable.