

DOCKETED

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Proterra Comments on MHD ZEV Infrastructure Funding Concepts

Additional submitted attachment is included below.



March 18, 2022

California Energy Commission
715 P Street
Sacramento, CA 95814

RE: Docket No. 19-TRAN-02 – Medium- and Heavy-Duty ZEV Infrastructure Funding Allocation

Dear Commissioners and Energy Commission Staff,

Thank you for the opportunity to provide comments on the proposed concepts for medium- and heavy-duty zero-emission vehicle (ZEV) infrastructure funding, as presented in the California Energy Commission (CEC) workshop on February 28, 2022.

Proterra is a leader in the design and manufacture of zero-emission electric transit vehicles and electric vehicle (EV) technology solutions for commercial vehicle applications. Proterra's battery electric bus achieves up to 25 MPGe compared to 4 MPG for a diesel bus and can deliver nearly twice the horsepower and five times better fuel efficiency than a diesel bus. Proterra electric buses have zero tailpipe emissions or pollutants, eliminating about 230,000 pounds of CO₂ emissions annually for every diesel vehicle replaced. Our EV technology also powers coach buses, school buses, delivery vans and other commercial vehicles.

Proterra strongly supports the CEC's efforts to support the deployment of medium- and heavy-duty ZEV technologies. The CEC's multi-year investment in infrastructure for medium- and heavy-duty ZEVs will accelerate the adoption of these technologies, which will help California achieve its climate and emissions reduction goals. Proterra supports all of the CEC's proposed EV infrastructure funding categories and encourages the CEC to implement all of them. In particular, we recommend that the CEC prioritize implementation of the following two concepts: School District Vehicle Grid Integration and Rural Small Transit Fleet Infrastructure Deployment.

Proterra has provided comments on several of the CEC's proposed infrastructure funding concepts below.

School District Vehicle Grid Integration

Proterra strongly supports the CEC's concept for a School District Vehicle Grid Integration solicitation. Proterra recommends that the CEC consider allowing both vehicle-to-grid and vehicle-to-building projects.

Charging hardware as well as required energy management software should be eligible for program funding and be eligible for stacking with other grants and funding programs. Schools

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often have limited budgets to support these projects, so sufficient funding will be required to gain their support.

Direct current fast charging (DCFC) should be required to ensure sufficient power can be sent back to the grid during limited duration requests from the utility. Some utility programs may only provide support if more than two vehicles are electrified, so alternative funding source requirements should be considered when evaluation applications. For example, a site with a single vehicle would require less funding from the CEC, but will not receive funding from the utilities, so the total project cost may be higher for the site than if multiple buses were acquired.

Warehouse and Regional Trucking

The optimal and least expensive way to deploy fleet charging solutions for warehouse and regional trucking fleets is to focus on depot charging that takes advantage of the ability to optimize the number of chargers required to charge the fleet so that the ratios of chargers to vehicles is higher than 1:1. This is possible due to the fact that the required energy usage for fleet charging is relatively predictable, since most fleets run similar routes each day and already have the knowledge of when each vehicle will be available to charge at the depot. The required charge time is usually significantly less than the time period the fleets are at idle in the depot, which gives a fleet the ability to have multiple dispensers associated with a single charger - meaning that multiple vehicles can use the same charger to sequentially charge.

Proterra believes that depot should be sufficient for warehouse and regional trucking. On-route charging is probably not necessary, except in the case of very long-haul routes.

Innovative EV Charging and Hydrogen Refueling Technologies

Winners of the most recent BESTFIT grant focused on developing and demonstrating new ways to dispense energy from chargers to vehicles using wireless charging, pantographs, vehicle-t-grid (V2G), or large public charging deployments. Innovative charging solutions that can scale and help lower costs should continue to be the focus on the program.

In addition, Proterra recommends that the CEC consider funding projects that focus on ways to utilize second-life vehicle batteries to help lower a project's overall charging infrastructure costs and operating costs. Moreover, the development of second-life battery solutions that can be integrated into fleet charging solutions can provide resiliency and can also be integrated into microgrid charging solutions to help lower the cost of energy storage. This is a technology that is developing but has not yet been deployed for medium- and heavy-duty fleets, which would make it a great candidate for BESTFIT.

Mobility-as-a-Service Models

The economics work for mobility-as-a-service models. One example is providing simple

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customer financing resources to lower the upfront cost of an electric vehicle, while providing equipment warranties for vehicles and chargers with fixed payment approaches. Another approach is a complete Public-Private Partnership (P3) where a third-party entity owns and operates an entire fleet, which can include providing the use of vehicles, chargers, service, and drivers, as well as financing. The P3 approach has been in existence for years with internal combustion engine (ICE) buses and there are companies that provide a complete service that is paid for as it is used. This approach can be translated to electric buses and chargers. Technologies now exist as well that allow for payments to be made on a “per kWh” or “per mile” basis that track vehicle/charger usage dynamically so that users, service providers, and capital providers can accurately track what is being used and paid for. This incentivizes all parties involved to use the service as efficiently as possible.

Any sector that has predictable operations, such as the drayage sector, should be able to utilize mobility-as-a-service models for financing if they have a contract with the ultimate user to pay for their services. Shared charging infrastructure could also be developed and financed for the drayage sector.

It would be advantageous for the CEC to consider funding a model that integrates a complete charging solution (with or without vehicles) that can be financed and paid for on a mile or kWh usage. Energy costs can also be included in the total payment, which as well Projects that include a solar canopy and the integration of battery storage can help lower the overall energy costs that are paid for as they are used. Since much of the project would be financed by a third party, the grant funding would go toward helping develop the project and buy down the cost of the project usage payment.

Proterra is actively working with financing companies who are developing mobility-as-a-service models. We believe this is the way that most future large-scale charging solutions will be developed.

Rural Small Transit Fleet Infrastructure Deployment

Proterra agrees with the CEC that there should be separate solicitation specifically for rural, small transit fleets. These agencies often have smaller budgets and can greatly benefit from additional support to electrify their fleets. Also, this program could be a great complement for rural agencies that are awarded a grant for electric buses from federal programs, such as the Federal Transit Administration’s (FTA) Low or No Emission Vehicle Program.

Beyond infrastructure costs, this solicitation concept should also include ongoing charging management and data fees to support rural small transit fleets. Ensuring that the most cost-effective charging solutions are deployed by comparing EVSE hardware and infrastructure costs will also enable CEC funds to go further and support more projects. CEC could for example fund 100% of charging costs up to a given dollar per kW dispensed level (e.g., \$600/kW for the charger only, not including the make-ready infrastructure).

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Infrastructure should be allowed to electrify other portions of the fleet, beyond transit buses. Goals can be defined to ensure program dollars are used most effectively, such as a dollar per transit bus threshold or a dollar per kW dispenser threshold as mentioned above. Some utility programs provide additional financial support to electrify other categories of medium and heavy-duty vehicles, so enabling those EVs to utilize the same infrastructure is key for customers to be able access all available funding.

Proterra believes that a 90% / 10% cost share would be a better option for rural small transit fleets. Ensuring that applicants can stack incentives from other programs, such as utility programs, will also help reduce overall costs for these agencies.

The amount of funding needed per district will vary significantly depending on the size of the fleet and the power of the chargers, as well as the local grid conditions and required make-ready upgrades. Total infrastructure costs may range from \$500/kW to \$2,500/kW.¹

MD/HD Blueprint Planning Documents

California transit agencies can benefit from more blueprint documents to help them comply with California's Innovative Clean Transit rule. Additionally, the FTA's Low or No Emission Vehicle Program and Bus and Bus Facilities Program both require applicants to submit a Zero-Emission Fleet Transition Plan.

MD/HD Loan Pilot

Proterra supports loan programs that can help finance charging infrastructure at scale. Direct lending from the State of California may be viewed as more acceptable debt terms, which would encourage local governments to engage in these types of programs more readily.

Ideally, a loan pilot program will be simple to apply for and require minimal reporting requirements to encourage participation.

In order to deliver maximum effectiveness, a loan program should consider tools to help leverage more funding with less upfront costs, including:

1. Funded loan/loss reserve funds to help act as a buffer for a loan pilot that utilizes private capital
2. Direct loans at 0% in combination with market loans at higher % to lower the overall cost
3. A guaranty fund could be set up to help offset losses from loans that may not pay to help increase the amount of private capital that could be used to fund projects

¹ PG&E infrastructure costs listed on slides 20-21 (divide costs by 7.2kW charger power to receive \$/kW): https://www.pge.com/pge_global/common/pdfs/solar-and-vehicles/your-options/clean-vehicles/charging-stations/program-participants/EVCN-PAC-2020-Q4.pdf



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4. Capital leases, which can be repaid with up to 85% of FTA funding for buses
5. Grants could be used as a down payment on private financing to lower the overall payment
6. A loan program could have the primary purpose of establishing a payback record for an innovative loan technology that tracks usage and repayments, which would provide metrics to help prove this concept works for financing ZEV infrastructure

Proterra appreciates the opportunity to provide feedback on the CEC's proposed concepts for medium- and heavy-duty ZEV infrastructure. We look forward to continuing to work together to deploy ZEVs and infrastructure.

Sincerely,

Lindsay Battenberg
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Proterra, Inc.

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