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Response to CECâ€™s GFO Concept on DERs for MDHD Charging

Additional submitted attachment is included below.

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California Energy Commission
Docket Unit
RE: Docket No. 19-ERDD-01
1516 Ninth Street
Sacramento, CA 95814-5512

Comments of the Center for Sustainable Energy®
on the California Energy Commission's Grant Funding Opportunity (GFO) Concept
regarding DERs for MDHD Vehicle Charging

The Center for Sustainable Energy (CSE) is a mission-driven national nonprofit dedicated to decarbonizing the transportation sector and the built environment. CSE believes that the clean energy future depends on a strong, low-carbon economy that provides abundant jobs and business opportunities, a high quality of life, and a clean, healthy environment. CSE empowers customers to participate in the achievement of their clean energy goals by providing them with information, incentives, and opportunities to help make these choices easier. We work with policymakers, public agencies, local governments, utilities, business and civic leaders, and consumers to transform the energy marketplace and beyond.

CSE commends the California Energy Commission (Commission) staff for identifying distributed energy resources (DERs) as a mechanism for charging medium- and heavy-duty (MDHD) battery electric vehicles (BEVs). MDHD vehicles represent a substantial share of the State's greenhouse gas emissions and criteria air pollutants, but electrifying this fleet of vehicles will require significant upgrades to the existing distribution grid infrastructure. The integration of DERs can optimize these charging strategies while minimizing greenhouse gas emissions. CSE applauds the Commission for designing a Grant Funding Opportunity (GFO) to test this concept and is pleased to offer feedback on the development of this GFO and any future demonstration projects.

CSE's comments are organized around the following questions outlined in the Commission's request for comments on this GFO concept:

1) Of the candidate use-cases and vehicle types listed, which ones should be prioritized in this solicitation and why?
2) What is the best way to characterize the grid impacts and other costs associated with deploying MDHD BEV charging infrastructure without a managed charging/DER strategy?
3) How does the target technology need to improve?

1) OF THE CANDIDATE USE-CASES AND VEHICLE TYPES LISTED, WHICH ONES SHOULD BE PRIORITIZED IN THIS SOLICITATION AND WHY?

There are many applications in which DERs can be used to charge MDHD vehicles, but transit buses and school buses constitute the most effective candidate use-cases for this demonstration project. Pursuant to the California Air Resources Board's (CARB's) Innovative Clean Transit Regulation, public transit agencies have a mandate to fully convert to zero-emission bus (ZEB) fleets by 2040. Starting in 2029, transit agencies must ensure that 100% of new bus purchases are ZEBs. Given the large number of transit buses in the State, and the high on-site power needs for bus charging applications, the next decade will be a critical time period for fleet operators to identify and address the challenges of charging these vehicles. In addition to transit buses, school buses are also an effective use-case given their short and standardized travel patterns. Moreover, school buses are not frequently used during the summer months, and can therefore take greater advantage of DERs and the high proliferation of renewables on the grid during this time period. Both of these use-cases can offer valuable lessons that can be replicated across other applications.

There are already substantial market and policy influences driving electrification in the MDHD sector. As mentioned above, the Innovative Clean Transit regulation requires transit buses fleets to electrify by 2040. There are also a number of incentive programs, such as CARB's Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP), and the funding for MDHD charging infrastructure offered through the Commission's Clean Transportation Program. The high level of consumer interest in these programs underscore the importance of developing innovative solutions for electrifying the MDHD sector.

Despite these incentives, there are numerous challenges to utilizing DERs for MDHD vehicle charging. In the long-term, distribution capacity constraints will likely be a substantial barrier, as existing distribution infrastructure is not well-suited to incorporate the level of DERs necessary to charge high numbers of MDHD vehicles. These constraints will be directly proportional to the number of vehicles being charged at a given site. However, for the scale of projects being considered for these demonstration pilots, these constraints will likely not be a major concern. In the short- and medium-term, the vehicles and chargers necessary for these applications will be readily available. Electric buses are already available, as is charging infrastructure for these vehicles (although additional State investment will be needed to achieve economies of scale and reduce the costs of these technologies). Additional innovation will also be necessary to improve the software controls and integration necessary to provide for optimized energy management.

The reliability and resiliency benefits that this demonstration project could offer would be particularly useful for schools, which often serve as community centers or emergency shelters, and are a prime use-case for DERs. While school bus charging does not generally occur at the school facilities they serve, there are still opportunities to integrate school bus charging with the deployment of DERs that are already used for

resiliency purposes. Commission staff should prioritize use-cases that can test this application, and should seek to ensure that DERs, vehicle charging, and resiliency are all key features in any grant-funded projects.

2) WHAT IS THE BEST WAY TO CHARACTERIZE THE GRID IMPACTS AND OTHER COSTS ASSOCIATED WITH DEPLOYING MDHD BEV CHARGING INFRASTRUCTURE WITHOUT A MANAGED CHARGING/DER STRATEGY?

Charging MDHD vehicles can have significant grid impacts that stress existing utility infrastructure. For this reason, it will be beneficial for site hosts to charge MDHD vehicles using a managed charging strategy that incorporates DERs. The best way to develop this charging strategy is by incorporating a wide variety of metrics that capture the unique needs of various project sites.

CSE supports the metrics that were identified by the Commission, including the balance of system costs (for both the site host and the utility), carbon intensity considerations, and the cost of delays in upgrading upstream distribution systems. With respect to system costs, the Commission should consider utilizing the Avoided Cost Calculator maintained by the California Public Utilities Commission (CPUC). With respect to carbon intensity, marginal greenhouse gas emissions are the primary metric that should be tracked in any demonstration project. The Avoided Cost Calculator mentioned above includes a methodology for capturing marginal emissions and could be used for tracking carbon intensity in these projects. In addition, a forecasted GHG signal is currently being developed by WattTime for use in the Self Generation Incentive Program (SGIP), and could also be used for this demonstration project. Finally, the Commission should also account for any ancillary benefits provided by DERs, especially resiliency and reliability benefits, which can generate net benefits for

the community at large. These ancillary benefits may be more difficult to capture and evaluate, and should be quantified to the extent possible.

In addition to the metrics described above, it will be important to understand the capacity constraints on the grid that could limit the deployment of MDHD charging infrastructure. While the existing Integration Capacity Analysis (ICA) maps provide detail on some aspects of the grid infrastructure, these maps do not offer information on the secondary low-voltage distribution system. Specifically, they do not provide sufficient data on the capacity of the distribution feeders and circuits that may need to be upgraded for MDHD charging infrastructure. Therefore, it will likely be necessary for potential site hosts to request more granular and precise information from the utility beforehand to identify optimal locations for charging infrastructure.

Finally, it will also be important to ensure that any metrics used in the evaluation of this project can reliably be captured in a real-world setting, and to recognize that not all metrics will be standardized across use-cases. While DER deployment will differ based on locational characteristics, and MDHD charging needs will vary based on the travel pattern of specific vehicles, demonstration projects should be selected based on their ability to provide practical data that can inform future projects across multiple use-cases.

3) HOW DOES THE TARGET TECHNOLOGY NEED TO IMPROVE?

There are numerous barriers to the integrated deployment of DERs and MDHD BEV charging infrastructure. Specifically, additional information and clarity is needed regarding the costs of the technologies, and the challenges associated with deploying them in a practical setting. The financial advisory firm Lazard prepares an annual report on energy storage pricing, which may provide insight into the system costs. In addition, SGIP also provides data on behind-the-meter energy storage system costs.

While much of this data will be project-specific and may vary depending on the technologies being used, there is some general information that will likely be valuable for potential demonstration project site hosts.

The Commission's demonstration project offers the opportunity to showcase innovative solutions to key implementation challenges. For example, interconnection for non-wires alternative projects is often cited as a difficult and lengthy process by project developers and local governments. This process is likely to become even more complicated if DERs and MDHD BEV charging infrastructure is being deployed simultaneously. Site hosts would need to commission engineering studies and work with the utility to determine specific capacity upgrades, which would add to the total cost and length of the project. Developing streamlined interconnection processes and planning frameworks could be a beneficial result of this demonstration project, which could result in standardized designs that could be replicated in future projects.

Another opportunity for this demonstration project is to provide insight into the revenue-generation potential of projects that integrate DERs with MDHD BEV charging infrastructure. Electricity cost savings would likely be the primary financial benefit for site hosts. In addition, DERs and charging infrastructure technologies could participate in demand response programs, or participate directly in the California Independent System Operator (CAISO) wholesale market as Proxy Demand Resources that provide any combination of day-ahead energy, real-time energy, and spinning reserves. Site hosts utilizing DERs for BEV charging could also be able to generate credits through the Low Carbon Fuel Standard (LCFS). It will be important for site hosts to determine which revenue-generation mechanisms are most appropriate during the design stage of the project. For example, for wholesale market participation, projects must be sufficiently large enough to be eligible to participate. Similarly, the generation of LCFS

credits will require site hosts to understand the value of the credits for the specific charging application and the expected changes in credit value over time.

CONCLUSION

CSE appreciates the opportunity to provide feedback on the Energy Commission's forthcoming Grant Funding Opportunity (GFO), and looks forward to continued collaboration with the Commission and other stakeholders. Continued investment in innovative clean energy and transportation technologies will ensure that California meets its ambitious decarbonization goals and remains a leader in the transition to a clean energy economy.

Sincerely,

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