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Biodico Response

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 Biodico, Inc.
on the California Energy Commission's Grant Funding Opportunity (GFO) Concept
regarding DERs for MDHD Vehicle Charging

Biodico, Inc. is a private for-profit corporation that specializes in renewable fuel and power. The principals of Biodico have demonstrated the use of on-site distributed energy resources to support sustainable transportation since their first project in 1992. Biodico believes that renewable energy can lead to a cleaner environment, green jobs and a sustainable social and economic fabric. This is particularly true if the project in located in a Low Income and/or a Disadvantaged Community.

We commend the CEC for recognizing that DER is one of the solutions for charging MD/HD EVs. DER provides an alternative to the grid and simultaneously makes the grid more resilient in serving the needs of energy consumers. On-site renewable resources are diversified and compatible, and include solar, wind and biomass (anaerobic digestion and gasification). In fact, CARB recently publish a pathway for diary manure to biogas to CHP to charging EVs with a -630.72 score.[1] Electricity was generated by renewable natural gas using an ultralow NOx Guascor ICE with selective catalytic reduction.

Questions from the CEC. *Answers in italics*.

1. **Of the candidate use-cases and vehicle types listed above, which ones should we prioritize in this solicitation and why?**
   a. Will distribution capacity constraints be a major barrier to the deployment of the charging infrastructure needed for that use-case in the short- to medium-term?

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[1] https://ww3.arb.ca.gov/fuels/lcfs/fuelpathways/comments/tier2/tier2_comments.htm, Application #B0037.

Given recent advances in technology, DER charging of EVs can be islanded, and/or grid connected with an even load recognizing the constraints of the grid for demand response, time of use and demand charges.

b. Will vehicles and charging equipment be readily commercially available in the short- to medium-term?

Grid-to-vehicle chargers are commercially available for MD/HD EVs, but bi-directional chargers are not, but several demonstrations have occurred.

c. Are there market and policy influences driving electrification in the use-case now?

Yes, the recent pathway for charging EVs by CARB already cited in footnote 1 is just one example. Advanced smart energy storage will be required, and CEC funding through GFO-19-305 and 306 has been allocated for that.

d. Are there use-cases that would particularly benefit from the reliability and resiliency value of the DER strategy?

Low Income and Disadvantaged Communities would benefit the most from DER for MD/HD Vehicle Charging, particularly those projects that create support for ride sharing programs (Green Raiteros), agricultural uses and schools.

e. Are there vehicle types that are particularly suited to providing reliability services to the grid or to individual buildings during an outage?

Bi-directional capable vehicles are particularly suited.

f. What incentive or funding mechanisms already exist to support MDHD fleet operators looking to electrify?

LCFS pathway already cited in footnote 1.

g. What is the total potential market size in California for the use-case?

The over 2,000 census tracts that are included in Disadvantaged Communities.

h. Which use-cases have the most potential to replicate the DER package and achieve a meaningful scale?

Projects in Low Income and Disadvantaged Communities should be emphasized first. These communities have abundant solar, wind and waste biomass resources that can be turned into energy and provide transportation and jobs where it is needed most. Instead of making those communities an afterthought, this GFO should be solely limited to those communities.

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?

a. What metrics should be used to evaluate the cost and performance of the baseline incumbent technology? Metrics currently under consideration include:

i. Itemized balance of system costs considering both site host costs and utility costs,

ii. Carbon intensity,

iii. Cost of delays associated with upgrading upstream distribution systems/substations, and

iv. Risks associated with long-term investments in permanent upgrades.

v. The value of lost time and opportunity associated with brown outs and black outs.

b. What information about existing grid infrastructure, beyond the Integration Capacity Analysis (ICA) maps, is needed to evaluate capacity constraints that could limit deployment of MDHD BEV charging infrastructure?

"Opportunity for Use and the Benefits of Resiliency" maps and CAISO maps of the sources of demand response and frequency modulation needs should be developed.

3. How does the target technology need to improve?

a. What are the current balance of system costs associated with deploying DERs as a non-wires solution for integrating MDHD BEV charging equipment?

Cost depends on the size of the project and the degree of integration with the grid. For an "islanded" project there are no grid interconnection costs.

b. What publicly available resources provide visibility into these costs?

EDGAR for budget costs of projects by IOUs.

c. What types of costs can be further reduced through innovation and require demonstration (e.g., soft costs, software, design, hardware, permitting, interconnection, etc.)?

AI for smart overlays to existing vehicles, chargers, DER, energy storage and automated response to dispatch request form CAISO and utilities.

d. What is the revenue-generation potential and business model for the targeted technology (e.g., customer bill savings, low carbon fuel standard, wholesale market participation, distribution grid services, resiliency, etc.)?

Business modeling and revenue-generation potential will depend on the details of the project. The greater the risk/reward ratio, the greater the need to CEC funds for validation for conventional financing to be possible.

e. What metrics can be used to evaluate cost and performance attributes of the targeted technology?

These will depend on the scope of the project and technologies used, but can be summarized in proforma templated spreadsheets. Human benefits need to be added to economic metrics.

f. How can those metrics be normalized across different use-cases and project sizes (e.g., ratio of PV size to stationary energy storage size, ratio of soft costs to hardware costs, load factor on the utility distribution system, resiliency/reliability metrics)?

These metrics do not take into account quality of life other than cost, such as job creation, community economic development and the value of grid reliability.

g. How well can the targeted technology meet the operational requirements of the priority use cases?

A DER resource assessment needs to be conducted for each project to determine what technology is appropriate for the type of resources available, and whether those resources meet community needs.

4. What level of investment would be needed from EPIC to make a meaningful difference on this issue?

a. What size of a project should we be targeting (MW, MWhs, number of charging ports, number of vehicles, etc.)?

The question that should be asked is, if the cost/benefit ratio of the project is good, no matter what size, does it lead to an expanded market? For example, a small demonstration project with a variety of DER (solar, wind and biomass) with a single charger that is very cost effective and capable of being expanded though out California, should be prioritized over a large bloated project with many chargers that has limited replicability.

b. What portion of the DER equipment costs should be covered by EPIC in order to appropriately incentivize site host participation?

50%

Thank you for this opportunity,

Russell Teall

Russell Teall, JD
President