| DOCKETED | |
|---|---|
| **Docket Number:** | 19-TRAN-02 |
| **Project Title:** | Medium- and Heavy-Duty Zero-Emission Vehicles and Infrastructure |
| **TN #:** | 242360 |
| **Document Title:** | Sierra Club CA Comments on MHD EVSE Funding Concepts |
| **Description:** | N/A |
| **Filer:** | System |
| **Organization:** | Sierra Club California |
| **Submitter Role:** | Public |
| **Submission Date:** | 3/17/2022 4:13:51 PM |
| **Docketed Date:** | 3/17/2022 |

*Comment Received From: Ray Pingle*
*Submitted On: 3/17/2022*
*Docket Number: 19-TRAN-02*

## Sierra Club CA Comments on MHD EVSE Funding Concepts

*Additional submitted attachment is included below.*

March 18,2022

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Advanced Vehicle Infrastructure Office
Fuels and Transportation Division
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Submitted via docket at:
https://efiling.energy.ca.gov/EComment/EComment.aspx?docketnumber=19-TRAN-02

Subject**:** Sierra Club California Comments re**:** Funding Allocations for Future Medium- and Heavy-Duty Charging and Refueling Infrastructure Project - Workshop on February 28, 2022

Dear Mr. Wenzel,

We appreciate the opportunity to offer recommendations on these proposals.

We greatly appreciate that the CEC is focusing on innovative ways to more rapidly and cost-effectively advance essential fueling infrastructure for MHD vehicles. We believe that all of the proposed concepts warrant consideration but will focus our comments on those we view as priorities.

1. **MD/HD Blueprint Planning Documents**

   We believe this is a critically important project. The state and all stakeholders would benefit from a state drawn master plan than is updated periodically.

   Currently we have multiple overlapping public and privately funded planning projects that exist or are in the process of being created. This is inefficient and may result in costly charger oversupply in some areas and insufficient supply in others inhibiting ZEV adoption and full EVSE utilization. Lack of a plan creates suboptimal coordination between all the stakeholders including EVSEs', utilities, vehicle OEMs and fleet operators resulting in wasted dollars and unnecessary delays. The successful grantee(s) should be required to accomplish at least the

following and include this information in their deliverables for the final plan and report.

a. Gather and review data from all other known significant sources
    i. Gather data from other State projects- e.g. Past CEC and other state funded and produced blueprint projects.
    ii. Gather data from other private studies e.g. The West Coast Clean Transit Initiative[1]
    iii. Invite other private stakeholders to participate. E.g. Daimler (planning a privately funded national charging network for MHD vehicles)[2], National Electric Highway Coalition[3], National Highway Charging Collaborative[4], etc.
    iv. Invite EVSPs and other developers. The opportunity for businesses to thrive in this environment is not in private master plans but in successful implementation and operation.
b. Gather technical data that can inform this process
    i. Obtain truck volume projections and routes by truck types with similar charging needs by year from the HEVI- Load tool. (If needed, it could be enhanced to fully support these requirements or it may be robust enough with what's being planned this year.)
    ii. Determine where sectors of the grid do and don't have sufficient electrical capacity to support new charging needs for both light duty and MHD vehicles by year. Obtain from the EVSE Deployment and Grid Evaluation Tool (EDGE) tool Data.
c. Create the detailed master plan and blueprint to guide EVSPs, utilities and others in where the infrastructure needs to be installed, by year and at what power.
d. The deliverables should include
    i. A computer model to incorporate all these assumptions to produce the plan. (Potentially, the CEC may be developing this which could be used by the grantees.)
    ii. All key assumptions of projected MHD volume growth by year by truck type, by geography and charger needs.
    iii. EDGE Capacity maps showing available capacity and capacity shortfalls
    iv. Recommendations on how utilities can use this data to proactively begin least regrets grid update projects to meet all needs but especially large project needs that will require more time to develop.
    v. Maps showing numbers, types and locations of chargers by year.

[1] West Coast Clean Transit Corridor Initiative | HDR (hdrinc.com)
[2] Daimler, NextEra Energy, BlackRock Commit to U.S. Public Charging Infrastructure - NGT News
[3] Electric Companies Join Together to Form National Electric Highway Coalition (eei.org)
[4] National Highway Charging Collaborative - Best Practices - Resources - Alternative Fuel Corridors - Environment - FHWA (dot.gov)

vi. Considerations in terms of the types of sites that should be considered – e.g. existing trucks stops, new truck stops, DOT right of ways, industrial locations, rest stops, etc.
vii. Considerations for when ultra DCFC chargers e.g. 350 kW use may be optimal in order to increase turnover and reduce real estate requirements.
viii. Considerations for including Megawatt Charging System (MCS) chargers and what the mix of these vs Ultra High -peed chargers e.g. 350kW should be and why.
ix. Recommendations on how to update this plan every 2-3- years based on updated assumptions.

e. Make these plans available on the CEC website from a downloadable database or other locations where they can be easily found and downloaded in full or by selected subset.
f. Optionally, this project could include recommendations for next steps including
    i. Education of its existence and how to use it.
    ii. Possibly offering technical advice services, etc.

**2. General Recommendations - that should apply to most of the conceptual projects**

a. Most projects involving the installation of EVSE should be relatively large (doing small projects is easy.) In general, fewer large projects is better than more smaller ones.
b. At the conclusion of all projects, the project summary and report should include key assumptions, key decisions they had to make and the process they followed to make those decisions, lessons learned, best practices, key takeaways and how their success could be replicated by others. These project summaries should be posted on the CEC website where they can be easily found.
c. Each project that involves installation of EVSE for MHD vehicles, in the final project report, should include a discussion of what factors went into the design of parking and access space since this is such a critical consideration for these larger vehicles.
d. All chargers paid for under these CEC funded projects should be required to support basic standards listed by the CEC in their RFPs such as OCPP, ISO 15118 and others as specified. They should also be V2G and plug and charge ready.

**3. Warehouse and Regional Trucking**

Return to depot for overnight charging will provide a significant amount of charging but will not be sufficient to meet all needs. Public charging will also be needed for MHD vehicles. Examples of needs that can be met with public charging include:

- Fleets that either can't afford depot charging infrastructure or have existing leased depots with a landlord unwilling to allow construction of infrastructure.

- Opportunity charging for depot charged vehicles.
- Opportunity to achieve lower costs with a larger more efficient charging facility.

We recommend that

- The most value that can be gained from these projects is not the installation of EVSE per se but the effort and thought that went into the planning and design of how best to meet business requirements. Grantees should be requested to list the key questions that they will seek to answer in order to advance the knowledge and best practices for these types of projects. The project deliverables should include these questions and their answers. Examples of questions that they might answer for a warehouse project are:
  - How do you determine the number, power and location of the chargers?
  - How will the public pay for the charging?
  - What impact would having other publicly available charging nearby have on this project? Etc.
- Projects should be of sufficient size to be meaningful
- Charging power – these projects could determine the pros and cons of using ultra-fast chargers and how their analysis led to their conclusions.
- Grantees should address how they planned for incorporating sufficient parking and access space.
- Some grant applicants may want to explore innovative methods that facilitate more rapid development and installation of these kinds of projects and describe these processes in their deliverables.
- Part of the deliverable should be developing methods to site these facilities in optimal locations to meet fleet needs. There should be a discussion of this in the deliverable.
- Funding should be made available to support some of the expense of integrated on-site storage and/or switching equipment needed to support solar. (Capital for the solar itself should not be made available through this program since it has a high ROI already and funds are available from numerous other sources. )

4. **Truck Parking EV Charging and Hydrogen Refueling**
   a. We recommend that this concept be re-configured into two newly defined projects:
      i. A new concept for a Transportation Corridor Charging Station for MHD Vehicles Project and
      ii. A separate study on designing parking needs at charging stations for MHD vehicles.
      iii. Since planning for adequate parking is a critical issue for essentially all the projects in this program, a discussion on parking design and implementation should be a required section and deliverable for all of these projects.

b. The new Transportation Corridor Charging Station for MHD Vehicles Project.
    i. What are special issues that need to be addressed in the design and implementation of these projects such as
        1. Determination of number and power of chargers needed at the station both initially and in the future
        2. How many chargers should be MCS, Ultrafast DCFC (e.g. 350 – 500 kW or other?
        3. Design of truck traffic flow through the chargers including parking needs.
        4. Design of traffic flow to support different types and sizes of MHD vehicles.
        5. Any special requirements in working with utilities to obtain sufficient power and in a timely manner.
        6. Any special requirements in finding sites near or on traffic corridors.
        7. Considerations for needed amenities – e.g. food, water, restrooms.
        8. Different site types – e.g. new site, retro fitting existing truck stops, etc.
        9. Different business models – subleasing a part of a truck stop to provide charging services, etc.
        10. What are the costs and benefits of also installing storage and / or solar.
    ii. White Paper on MHD Parking needs Project.
        1. The primary deliverable of this project would be a white paper that analyzes the following within the state of California:
            a. Current parking needs for MHD vehicles (perhaps excluding those trucks that have a home base depot that includes all the charging they may need.)
            b. Current sufficiency
            c. How electrification may alter these needs
            d. How both current shortfalls and these new needs might best be met
        2. It may be that the CEC could do this internally as an option.

5. **Zero-Emission Rural Small Transit Fleet Infrastructure Deployment**
This should be a funded category as a way to set aside a section of funds for at least a few projects in rural areas where available capital may not otherwise be as readily available and to serve as models to other small transit agencies on how best to do this.

6. **Mobility as a service**- There are some very innovative concepts here that are worth pursuing. It may be possible to combine this objective with the other concepts above as a financing / business model option for the infrastructure.

7. **Large Scale Ultra-Fast Charging Stations**

This is a high priority project. Looking at the ROI and return on capital for large scale ultra-fast charging stations in different settings could provide valuable lessons such as:

> How does the ROI improve using e.g. 350 kW chargers in increased charging session throughput for the EVSE, how the levelized cost of charging is reduced due to less required expensive real estate and how much is customer satisfaction improved compared to slower charges e.g. 150kW.

One study that includes a discussion on the economic benefits of installing 350kW stations over 150 kW chargers and installing more ports / station rather than fewer is "How much should the U.S. invest in public EV charging? $39 Billion"[5]

These projects should be medium to large size and sited in different kinds of locations – travel corridors, urban, warehouse, etc.

8. **Hydrogen Refueling**

   a. **Carbon Content of Electricity and Hydrogen fuels –** FCEVs are only as effective at reducing GHG emissions as the hydrogen fuel is renewably produced.

   While both BEVs and FCEVs are zero emission vehicles at the tailpipe, the well to tank renewable content of these fuels can have a significant impact on how truly green these vehicles are on a well to wheels basis. Please see "Hydrogen: Future of Clean Energy or a False Solution?"[6] We know that the electricity grid is on a trajectory to achieve 100% renewable generation by no later than 2045 with an interim target of 60% renewables by 2030. California's zero GHG generation could easily exceed 80% in 2030 when factoring in hydropower (10%) and displaced utility generation due to behind-the-meter solar PV systems (10%+). Further, in a letter to CARB dated July 9, 2021, the Governor stated "Today, I am requesting that the Air Resources Board evaluate how to achieve carbon neutrality no later than 2035 as part of its 2022 Climate Change Scoping Plan. …This work can identify a pathway for achieving carbon neutrality a full decade earlier than the existing target of 2045, which is also being assessed in the Scoping Plan."

   For hydrogen, SB 1505 – 2006 requires that "…on a statewide basis, no less than 33.3 percent of the hydrogen produced for, or dispensed by, fueling stations that receive state funds be made from eligible renewable energy resources…" Hydrogen produced by renewables is known as "green hydrogen." Beyond SB 1505, no requirement exists for the amount of green hydrogen to increase over time like there is for electricity.

   CARB has the authority and responsibility to increase this requirement. "It is further the intent of the Legislature that the state board consider including in a

[5] How much should the U.S. invest in public EV charging? $39 Billion – Atlas Public Policy (atlaspolicy.com)

[6] Hydrogen: Future of Clean Energy or a False Solution? | Sierra Club

future revision of the California Hydrogen Highway Blueprint Plan a study to determine the necessary steps to maximize the production of hydrogen fuel made from eligible renewable resources."

"The state board, in consultation with other relevant agencies as appropriate, shall review the renewable resource requirements adopted pursuant to paragraphs (2) and (3) of subdivision (a) and paragraphs (2) and (3) of subdivision (b) every four years and shall increase the renewable resource percentage requirements if it determines that it is technologically feasible to do so and will not substantially hinder the development of hydrogen as a transportation fuel in a manner that is consistent with this section."

We recognize there are some industry efforts to increase green hydrogen production, but California lacks regulatory requirements. Since California is investing millions of dollars in hydrogen fueling stations, CARB must require an increasing amount of renewable content in hydrogen fuel, ultimately rising to 100% green hydrogen to achieve the GHG and criteria pollution emissions reductions on its substantial investment that it should receive.

**We recommend that the CEC work with CARB to have them set new increasing green hydrogen content standards that match those required for electricity with an interim required target by 2030. To arrive at this target, they should include consideration for the 60% RPS requirement from SB 350 2015, + the projected amount of generation from carbon free hydro power + the projected amount of behind the meter renewable generation that is not otherwise included in the RPS by 2030. We believe that having a regulatory requirement that sets a trajectory for increasing the renewable content of hydrogen fuel should be a requirement before further long-term investment in hydrogen fueling infrastructure. CARB should seek to monitor and appropriately regulate the transportation and distribution of hydrogen fuel to minimize emissions throughout the supply chain. Finally, we recommend that the CEC include a plan to accomplish these objectives in its next IEPR report.**

**b.** The CEC should undertake a new project to reassess its overall strategy on FCEVs for light duty and MHD transportation in order to adjust its funding plan in terms of volume and distribution to insure that the state is making the best use of its limited resources to promote zero emission transportation.

An article entitled "New study finds hydrogen unlikely to play major role in road transport, even for heavy trucks."[7] notes that "at the beginning of 2021, there were about 25,000 hydrogen fuel-cell cars on the road [globally], two FCEV models available to purchase (the Toyota Mirai and Hyundai Nexo), and about 540

[7] Charged EVs | New study finds hydrogen "unlikely to play major role in road transport, even for heavy trucks" - Charged EVs

hydrogen filling stations in operation around the world. “In contrast, by the beginning of 2022, there are likely to be about 15 million battery-electric and plug-in hybrid vehicles on the road across the world. Almost all manufacturers now sell such vehicles, with more than 350 models available globally.

“Hydrogen will play a vital role in industry, shipping and synthetic aviation fuels. But for road transport, we cannot wait for hydrogen technology to catch up, and our focus now should be on battery-electric vehicles in both passenger and freight transport,” writes Dr. Patrick Plötz, of the Fraunhofer Institute for Systems and Innovation Research (ISI). “The window of opportunity to establish a relevant market share for hydrogen cars is as good as closed.”

Recent technological developments have eliminated the main arguments in favor of FCEVs—longer range and shorter refueling times. “When battery-electric vehicles had limited ranges of under 150 km, and charging took a few hours, there was an important and large market segment for fuel cell vehicles: long-distance travel,” says Dr. Plötz. “But battery-electric vehicles now offer about 400 km real-world range, and the newest generation use 800 V batteries, which can be charged for a range of 200 km in about 15 minutes.”

The CEC needs to reassess its strategy in light of this reality. Several parties who provided comments at the workshop suggested that the CEC’s funding distribution should change from the current 30 % for hydrogen fueling compared to 70% electrical fueling to change to 50/50. We oppose that recommendation.

One party suggested that available CEC funds for hydrogen fueling should we shifted to focus on fueling for MHD FCEVs where the most interest and best business case is. We believe that would be a better use of the CEC’s funds. We would recommend that the CEC focus on siting new hydrogen fueling stations such that they would create a statewide network to meet the needs of MHD FCEVs. But again, in light of essentially very low market uptake of FCEV light duty vehicles, the CEC should re-evaluate its strategy on investing funds in siting infrastructure for this sector.

We recommend that the CEC consider funding not only the hydrogen fueling infrastructure but also for on-site electrolyzer generation for 100% renewable fuel generation where feasible and to eliminate GHG emissions that may otherwise be produced in transporting the hydrogen fuel from the production site to the fueling station.

Sincerely,

**Sierra Club California**
Ray Pingle
Daniel Barad