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CaFCP response to 19-TRAN-02

Additional submitted attachment is included below.

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November 8, 2019

California Energy Commission
Docket Unit, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

Re: Docket No. 19-TRAN-02, Medium- and Heavy-Duty Zero-Emission Vehicles and Infrastructure Solicitation Concepts

Dear CEC Administrator,

The California Fuel Cell Partnership (CaFCP) respectfully submits this letter of comment to the California Energy Commission (CEC) in response to 19-TRAN-02, Medium- and Heavy-Duty (M/HD) Zero-Emission Vehicles (ZEV) and Infrastructure Solicitation Concepts. CaFCP, working within its charter, provided the membership a platform for open discussion and input. These comments are reflective of the medium- and heavy-duty vehicle and infrastructure members of CaFCP. These are intended as broad comments, based on learnings from our over 20 years of collective global experience in the fuel cell electric vehicle market and specifically for the rapidly growing heavy-duty fuel cell vehicle and infrastructure deployment.

Infrastructure First - Stations Before and Coordinated with Vehicles to Provide Market Certainty

A primary learning from the fuel cell vehicle efforts is that robust infrastructure deployment is needed to facilitate broader market adoption of fuel cell electric vehicles in the state of California. It is critically important to build fueling infrastructure somewhat before and in close coordination with vehicles coming into the marketplace. Vehicle manufacturers and customers need to see signals of infrastructure availability in order to make production and purchase decisions. Market certainty is an important signal that California policy and funding can provide.

$47.5million is Seed Investment Towards Sustained Support for Commercialization

CECs proposed $47.5 million investment will serve as an early indicator of the State's commitment to broader deployment of M/HD ZEV where hydrogen and fuel cell vehicles can compete. However, a large portion of the $47.5MM proposed funding allocated toward hydrogen fueling infrastructure will not, alone, support CARB's M/HD ZEV transition regulations. As such, we recommend this be established and communicated as the initial seed investment for what will become sustained support for M/HD hydrogen fueling infrastructure to facilitate goods, freight and people movement. This is the market signal needed to support CARB's M/HD ZEV transition regulations, where the approved Innovative Clean Transit rule sets increasing transit bus purchase requirements up to 100% by 2029,

and the proposed Advanced Clean Truck (ACT) regulation sets a goal of 15% of all Class 7/8 tractor sales to be ZEV by 2030.

An example of the scale of Heavy-duty ZEV projects is the recent CARB Zero- and Near Zero-Emission Freight Facilities (ZANZEFF) funded project at the Port of Los Angeles to deploy ten Class 8 hydrogen fuel cell tractors and build two, large-capacity hydrogen fueling stations with a total project budget of $82.5million (total cost of ownership support).[1]

We recommend structuring continued support around (a) the total cost of ownership (i.e., vehicle and fuel) in (b) scalable and sustained mechanisms, with (c) certainty of continued funding support.

Fund Scale-Focused M/HD ZEV Infrastructure Projects

The development of a commercial M/HD ZEV marketplace is critically dependent on scale focused investment in infrastructure. This concept represents a critical alignment with California's broader ZEV framework (regulatory and investment), which has a robust portfolio of M/HD ZEV demonstration projects underway that are expected to become early commercial market launch pads. Industry has a keen interest in turning this nascent pilot stage of M/HD ZEV investment into a commercial marketplace.

To put this in perspective and provide a sense of the scale required for the heavy-duty vehicles:

- A light-duty fuel cell vehicle will typically fill an average of 3.8 kilograms of hydrogen. A class 8 fuel cell tractor/truck is expected to have greater than 60 kg of on-board storage with a minimum daily consumption of about 30 kg. A 40-foot transit bus requires an average of 25-30 kg hydrogen per fill.
- Heavy-duty trucks fuel every day and use forty times the amount of hydrogen of an average light-duty automobile.
- Light-duty retail hydrogen stations have a rated capacity to provide 250-800 kilograms per day, where a heavy-duty truck station is expected to dispense 8,000 kg/day.

We suggest CEC staff looks to the draft GFO 18-HYD-04 as a funding concept example of how to structure sustained and scalable funding for big, transformative projects, as opposed to small-scale demonstrations. The Draft GFO 18-HYD-04 is the right approach, and we commend CEC for that. We recommend that CEC use the same line of thinking for M/HD ZEV investment, moving forward.

Heavy-Duty in Addition to a Light-Duty Focus

We applaud CEC's increased attention to the medium- and heavy-duty ZEV categories. We welcome this expansion into medium- and heavy-duty, in addition to CEC's continued focus on light-duty needs. Both applications are needed and are complimentary to one another – helping the broader market reach economies of scale and therefore sustainability in a shorter timeframe than if a singular deployment of one or the other.

[1] "CARB announces more than $200 million in new funding for clean freight transportation," https://ww2.arb.ca.gov/news/carb-announces-more-200-million-new-funding-clean-freight-transportation, accessed November 5, 2019.

Over the past several years, our members and others have increasingly recognized the interdependence of vehicle categories. In simple terms, light-duty vehicles will help drive down component costs for heavy duty and heavy duty will help drive down hydrogen fuel costs for light duty.

We emphasize this point because the core powerplant, the fuel cell, has been demonstrated to integrate into both light- and heavy-duty applications. The light-duty vehicle market represents potential for scaling up production volumes of fuel cells, illustrated by increased production of automobiles, and the heavy-duty market represents potential for scaling up production volume of hydrogen, due to a significantly larger per-vehicle fuel uptake. Should both markets scale simultaneously, the total cost of ownership of a hydrogen fuel cell powered vehicle should decrease due to economies of scale.

Diversity of Vehicle Classes and Applications
The class of vehicles under consideration have vast differences in operating patterns, power duty cycles, and business models. Given this complexity, longer-term flexible and scalable funding mechanisms will likely be most effective in allowing market forces to find the most cost-competitive applications and sequence of deployment. In the short-term, we recommend targeting funding toward those applications with the best immediate economic potential and emission reduction benefit: transit buses and class-8 HD tractors.

Transit Buses
Transit bus investment represents a category that provides multiple benefits, including those to disadvantaged communities, opportunity for long-term public investment and early commercial M/HD ZEV opportunities. Specific to HD passenger transport, CARB's Innovative Clean Transit (ICT) regulation's initial focus is ZEV requirements on forty-foot transit bus purchases, indicating a need to focus on this bus category. This is further indicative of funding priorities that support larger scale transit fleet ZEV implementation. CaFCP recommends HD ZEV fueling infrastructure capacity supportive of transit fleets of twenty-five or more forty-foot buses per site. Funds should also support capital fueling equipment that supports 12 years or more of ZEB operations – to align with US DOT FTA's 12-year requirement.

Benchmark Conventional M/HD Vehicle Operations (Voice of the Customer)
ZEV adoption in M/HD commercial applications is predicated on fitting into the operational and logistical business models based around conventional fuels. The fueling experience should be similar to conventional technologies, therefore M/HD ZEV fast fill technologies should receive preference. A fueling time within 5-30 minutes for 80-100% state of charge (applicable to both hydrogen and electricity) to achieve a minimum vehicle operating range of 250 miles should receive priority. In addition, preference should be given to technologies with an infrastructure footprint capable of serving existing fleets within existing facilities. A fuel-cell electric vehicle can be a one-for-one replacement for conventional vehicle range, fueling time and infrastructure needs.

Authorize and Allocate Funds to Provide Certainty of Funding
If we recall pre-AB8 light-duty funding, putting all funds into one basket for both ZEV technologies, there was heavy competition for that funding. The way to signal certainty to industry is to authorize and allocate funding; a primary illustration is the certainty that came when AB8 funds were secured at $20M/year for at least 100 light-duty hydrogen stations.

We compliment CEC in its forethought and vision and appreciate the opportunity to provide this feedback. The door is open to providing any insights, guidance and support CEC finds necessary to initiate this early commercial M/HD ZEV market.

Sincerely,

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