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January 21, 2020

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: “Draft Assessment of CARB’s Zero-Emission Vehicle Programs per SB 498”

Dear CARB Board members and staff,

The California Fuel Cell Partnership appreciates the opportunity to comment on the “*Draft Assessment of CARB’s Zero-Emission Vehicle Programs per SB 498*”. Our comments are reflective of the light-, medium- and heavy-duty fuel cell electric vehicle and hydrogen infrastructure applications. While we largely agree on the recommendations presented in this report, we provide specific comments to contribute to the strengthening of the report’s recommendations. Our comments are based on learnings from over 20 years of collective global experience in the fuel cell electric vehicle market and especially for the rapidly growing heavy-duty fuel cell vehicle and infrastructure deployment. The State’s goal is assumed to be to facilitate industry to work towards a future where ZEV fuel costs are competitive, sustainable and refueling times are comparable to conventional fueling times for long distance operational ranges per filling event

Authorize and allocate funds to provide certainty of funding

We agree with the recommendation to extend the California Energy Commission’s Clean Transportation Program or something similar beyond 2023, with a dedicated \$20M/year allocation for light-duty H2 retail stations in support of achieving the implementation of the 200 H2 retail stations by 2025 goal, the first tranches of retail stations towards the 2030 envisioned 1,000 H2 stations target, and a dedicated allocation for heavy-duty H2 stations to initiate a HD fueling infrastructure that can facilitate the rollout of fuel cell electric trucks and fuel cell electric transit buses.

For HD FCEVs, such allocations will be critical in helping fleet operators meet the requirements of the forthcoming Advanced Clean Truck rule, the adopted Innovative Clean Transit rule, and the adopted Zero-Emission Airport Shuttle rule. In turn, dedicated funding for both retail and HD H2 stations can be expected to trigger private industry investment to scale up decarbonized fuel production capacity to supply fuel to meet market demand.

Heavy-duty in addition to a light-duty focus

Both light-duty and heavy-duty applications are needed and complimentary to one another – helping the broader market reach economies of scale and therefore sustainability in a shorter timeframe than a singular deployment of one or the other.

Over the past several years, our members and other stakeholders have increasingly recognized the interdependence of vehicle categories. In simple terms, light-duty

vehicles will help drive down component costs for heavy-duty vehicles and heavy-duty will help drive down hydrogen fuel costs for light-duty.

We emphasize this point because the fuel cell powerplant 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 cars, and the heavy-duty market represents potential for scaling up production volume of hydrogen, due to a significantly larger per-vehicle fuel use. Should both markets scale simultaneously, the total cost of ownership of a hydrogen fuel cell powered vehicle should decrease due to economies of scale.

The Hydrogen Council's recently released "*Path to Hydrogen Competitiveness*" report¹ acknowledges these cost reduction opportunities when approached systematically and highlights that most hydrogen mobility applications will reach total cost of ownership parity with other low carbon alternatives by 2030, with heavy-duty trucks reaching parity with conventional options by then.

Align State agencies' considerations and align public policies to facilitate optimal ZEV rollout to create certainty for private industry to invest

CalEPA, CARB, CDFA, CNRA, CEC, CalSTA, CalTrans, CPUC, CalGovOps, and DGS should align and give equal consideration to DC fast-charging and hydrogen fueling for all vehicle applications in all transportation related programs (on-road, off-road, rail, maritime). This alignment should include applications such as mitigation efforts (for example, VW Mitigation Trust for California and VW ZEV Investment Commitment) that could include investments in hydrogen production and/or fueling infrastructure, and adoption of equal new renewable resource requirements for electricity used for newly installed ZEV fueling infrastructure capacity (both DCFC and H2). Often, the default ZEV planning activities around achieving the 5M ZEV target are not inclusive of hydrogen and fuel cell technologies.

Other measures could include allowing flexibility within the Low Carbon Fuel Standard to better facilitate early HD commercial ZEV fueling infrastructure investment that will lead to the installation of higher capacity fueling locations before HD ZEVs are on the road in larger numbers.

As part of such an alignment effort, State agency staff issued reports should use restraint in making statements about future cost when comparing hydrogen and electricity for ZEV applications at scale and conventional fueling times. For example, the current draft assessment clearly indicates a steep capital cost for HD fleet charging infrastructure and difficult to predict electricity cost, while simultaneously qualifying hydrogen as expensive and not considering comparable cost numbers for an equivalent HD fleet H2 infrastructure.

Support renewable H2 to allow for 100% decarbonized H2 by 2030

The goal of the members of the global Hydrogen Council is to fully decarbonize H2 for transportation purposes by 2030, and CaFCP's fuel production and infrastructure members are working towards the same goal. In addition, renewable hydrogen production capacity will facilitate the electric grid to integrate a higher content of renewable power in a faster, more stable systematic approach towards achieving California's 2045 decarbonized electricity goal.

¹ Available at: https://hydrogencouncil.com/wp-content/uploads/2020/01/Path-to-Hydrogen-Competitiveness_Full-Study-1.pdf

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 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 one of the most important signals that California policy and funding can provide.*

Prioritize scale-focused projects

The development of a 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 the current nascent pilot stage of both LD and M/HD ZEV investment into a commercial marketplace.

Benchmark conventional M/HD vehicle operations (voice of the customer)

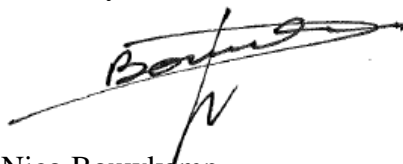
ZEV adoption in M/HD commercial and transit applications is predicated on fitting into the operational and logistical business models based around conventional fuels. The fueling experience should be similar to conventional technologies, therefore M/HD ZEV fast fill technologies should receive preference. A fueling time within 5-30 minutes for 80-100% state of charge (applicable to both hydrogen and electricity fuel) 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, further encouraging faster adoption. A fuel-cell electric vehicle can be a one-for-one replacement for conventional vehicle range, fueling time and infrastructure needs.

Establish a dedicated, fulltime GO-Biz HD ZEV position to support ACT and ICT rule implementation

Considering the transition ahead for both public and commercial vehicle fleets, fleet operators would benefit from dedicated staff within the State's administration. Currently the focus of the transportation group within GO-Biz is mainly on light-duty ZEVs with a workload that does not allow for the needed infrastructure rollout support of HD ZEV applications.

We appreciate the opportunity to provide this feedback. The door is open to providing any insights, guidance and support CARB Board members and staff find necessary to continue to build out the foundational work done to establish a sustainable ZEV market.

Sincerely,

A handwritten signature in black ink, appearing to read "Nico Bouwkamp", with a stylized flourish extending from the end.

Nico Bouwkamp
Technical Program Manager