**California Hydrogen Business Council**

*Hydrogen Means Business in California!*

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Ms. Lisa Williams
California Air Resources Board
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**Re: Comments of California Hydrogen Business Council Regarding the Discussion Document for the Volkswagen Environmental Mitigation Trust for California**

The California Hydrogen Business Council (CHBC) appreciates the opportunity to provide input to the Air Resources Board's Discussion Document for the Volkswagen Environmental Mitigation Trust for California. We applaud the ARB staff's work on the development of this plan and offer a few additional comments. The CHBC is a California industry trade association with the mission to advance the commercialization of hydrogen in the energy sector, including transportation, goods movement, and stationary power systems to reduce emissions and dependence on oil.[i] The CHBC provided an array of comments to the VW consent decree and proposed plan by Electrify America, and we gladly comment on ARB's Discussion Document.

To recap, the Volkswagen Group consciously and willfully manipulated and mislead customers and regulators for years, leading to as many as 38,000 "premature" deaths globally in 2015[ii]. The CHBC is supportive of the actions taken by regulators and the judiciary to focus on helping those harmed by VW's offenses. However, as expressed in our previous comments submitted in 2016 and 2017, we see VW and Electrify America as doing too little to substantially decrease $NO_x$ and $SO_x$ emissions in California. They do so by solely relying on investments in battery technology under the Cycle 1 Investment Plan, and by ignoring ARB Board members' guidance "that Plan investments, to meet the terms and goals of the Consent Decree, must be technology-neutral, thus supporting Hydrogen infrastructure"[iii].

The main sources of particulate matter are diesel engines, which tend to be concentrated in the medium and heavy duty transportation sector. Therefore, the sole focus of investment in battery technology by Electrify America (VW) displays a continued misunderstanding in the need to develop a broad portfolio of technology options. Furthermore, the medium and heavy duty sector is one in which fuel cell technology, not battery vehicles, can play a much more significant role in meeting the needs to reduce emissions and replace existing dirty diesel technology, pending initial infrastructure and technology investment. Without initial investment in hydrogen infrastructure, it becomes even clearer that VW is missing out on developing refueling infrastructure for medium and heavy duty transportation fuel cell applications.

Therefore, the CHBC urges the ARB to specifically look at hydrogen fuel cell vehicles as a key technology option in order to reduce PM emissions in the State. With initial investment under this Mitigation Plan, the hydrogen industry, including many of CHBC's members, will be able to deliver results. Fuel cell electric buses have been operating in California for decades and can seamlessly replace diesel buses. Heavy duty hydrogen fuel cell trucks are undergoing heavy testing in real world operations in California. Several recent announcements have focused on medium and heavy-duty vehicles from US Hybrid[iv], Toyota[v], Kenworth[vi], GM[vii], Loop Energy[viii], Nikola Motor Company[ix], FedEx[x], and UPS[xi].[xii]

Specifically, CHBC proposes the following actions. The CHBC:

- Seeks the ARB to be supportive of proposals that address several categories, e.g. railyards/freight switchers, local freight Class 4-7 and Class 8 trucks, and Light-Duty Zero-emission Vehicle Supply Equipment, even if some of the technology options are not fully commercialized yet.

- Supports ARB's initiative to direct one third of the mitigation trust towards public transit. This will benefit disadvantaged communities immediately, and improve the health and lives of people most directly affected by particulate emissions.

- Seeks ARB to consider larger scale projects that can reduce NOx emissions at lower cost per unit, e.g. conversion of several dozen buses in one fleet. Hydrogen fuel cell technology allows for large scale conversions without impacting grid stability or grid upgrades born by electric rate payers, while providing similar power, fueling, durability and range characteristics to existing diesel fleets. Hydrogen infrastructure cost, while significant for initial vehicle deployment, does not increase significantly when adding additional units to a fleet.

- Is very supportive of investments in the rail sector, which in certain areas can cause some of the worst local air pollution. Examples from Europe[xiii], China[xiv] and Canada[xv] show that hydrogen rail is a viable option. Light and passenger rail currently relying on diesel-electric technology should also be considered as a category. However, it is vital to include funding for hydrogen infrastructure in those proposals. The ability for hydrogen infrastructure to support multiple applications and technologies, including potential public FCEV fueling near railyards should also be considered to increase the value of project funding.

- Hopes the ARB will consider directing additional funding to refueling infrastructure, a vital and currently underfunded aspect of zero-emission transportation deployment in California. Hydrogen fueling requires a higher upfront investment, but can more easily support large fleets of vehicles without additional upgrades.

- Hopes the ARB will require all projects funded under this plan to prominently display language identifying the source of the project funding and the original offense committed by VW.

- Urges the ARB to consider these investments as a part of a sustainable technology development project for California, in which near-commercial ZEV technologies are treated not only for their emission reduction potential over the lifetime of each project, but also the cost-reduction value gained for future projects. Hydrogen fuel cell technology can become cost competitive if applied at scale, which will then be a massive force for reducing NOx emissions in the entire State.

- Urges the $10M investment in Light-Duty ZEV infrastructure to only apply to hydrogen dispensing equipment as a means to address the massive imbalance in investment from several organizations, including electric utilities, that are subsidizing electric charging and BEV infrastructure expansion, in addition to $200M from Appendix C funding that is already exclusively allocated to this buildout.

Thank you for your consideration!

Sincerely,

Emanuel Wagner
Assistant Director
California Hydrogen Business Council

[i] The views expressed in these comments are those of the CHBC, and do not necessarily reflect the views of all of the individual CHBC member companies. Members of the CHBC include Advanced Emission Control Solutions, Air Liquide Advanced Technologies U.S., Airthium, Alameda-Contra Costa Transit District (AC Transit), American Honda Motor Company, Anaerobe Systems, Arriba Energy, Ballard

Power Systems, Bay Area Air Quality Management District, Beijing SinoHytec, Black & Veatch, BMW of North America, California Performance Engineering, Cambridge LCF Group, Center for Transportation and the Environment (CTE), CNG Cylinders International, Community Environmental Services, CP Industries, DasH2energy, Eco Energy International, ElDorado National – California, Energy Independence Now (EIN), EPC - Engineering, Procurement & Construction, Ergostech Renewal Energy Solution, EWII Fuel Cells, First Element Fuel, FuelCell Energy, GenCell, General Motors, Geoffrey Budd G&SB Consulting Ltd, Giner ELX, Gladstein, Neandross & Associates, Greenlight Innovation, GTA, H2B2, H2Safe, H2SG Energy Pte, H2Tech Systems, Hitachi Zosen Inova ETOGAS GmbH, HODPros, Hydrogenics, Hydrogenious Technologies, Hydrogen Law, HydrogenXT, HyET - Hydrogen Efficiency Technologies, Hyundai Motor Company, ITM Power, Ivys, Johnson Matthey Fuel Cells, Kontak, KORE Infrastructure, Life Cycle Associates, Linde North America, Longitude 122 West, Loop Energy, Luxfer/GTM Technologies, McPhy Energy, Millennium Reign Energy, Montreux Energy, National Renewable Energy Laboratory (NREL), Natural Gas Fueling Solutions – NGFS, Natural Hydrogen Energy, Nel Hydrogen, New Flyer of America, Next Hydrogen, Noyes Law Corporation, Nuvera Fuel Cells, Pacific Gas and Electric Company - PG&E, PDC Machines, Planet Hydrogen, Plug Power, Port of Long Beach, PowerHouse Energy, Powertech Labs, Primidea Building Solutions, Proton OnSite, RG Associates, Rio Hondo College, Rix Industries, Sacramento Municipal Utility District (SMUD), SAFCell, Schatz Energy Research Center (SERC), Sheldon Research and Consulting, Solar Wind Storage, South Coast Air Quality Management District, Southern California Gas Company, Sumitomo Corporation of Americas, Sunline Transit Agency, T2M Global, Tatsuno North America, The Leighty Foundation, TLM Petro Labor Force, Toyota Motor Sales, True Zero, United Hydrogen Group, US Hybrid, Verde, Vinjamuri Innovations, Volute, WireTough Cylinders, Zero Carbon Energy Solutions.

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[iii] https://www.arb.ca.gov/msprog/vw_info/vsi/vw-zevinvest/documents/zip_supplement_request_052417.pdf

[iv] https://www.trucks.com/2017/05/04/us-hybrid-hydrogen-fuel-cell-truck

[v] https://www.trucks.com/2017/10/12/toyota-hydrogen-fuel-cell-electric-truck-hits-road

[vi] https://www.trucks.com/2017/05/02/kenworth-class-8-hydrogen-fuel-cell-truck

[vii] http://media.gm.com/media/us/en/gm/news.detail.html/content/Pages/news/us/en/2017/oct/1006-fuel-cell-platform.html

[viii] http://www.marketwired.com/press-release/loop-energy-fuel-cell-range-extended-yard-truck-in-operation-2228935.htm

[ix] https://arstechnica.com/cars/2017/09/nikola-motor-company-and-bosch-team-up-on-long-haul-fuel-cell-truck

[x] https://www.gasworld.com/plug-power-fuel-cell-engines-power-fedex-/2012236.article

[xi] https://www.trucks.com/2017/05/02/ups-fuel-cell-electric-delivery-truck

[xii] https://www.trucks.com/2017/05/08/hydrogen-fuel-cell-trucks-holy-grail;
https://www.forbes.com/sites/heatherclancy/2014/01/30/run-your-engine-on-water-sprint-fedex-test-hydrogen- fuel-cells/#736b4ef874ec

[xiii] http://www.railwaygazette.com/news/single-view/view/hydrogen-could-replace-diesel-in-15-years-says-lnvg-as-fuel-cell-train-contract-signed.html

[xiv] http://www.iflscience.com/technology/china-develops-worlds-first-hydrogen-powered-tram/

[xv] https://news.ontario.ca/mto/en/2018/02/ontario-taking-next-steps-in-testing-hydrogen-powered-train-technology.html