CALIFORNIA HYDROGEN BUSINESS COUNCIL

CA Office: 18847 Via Sereno Yorba Linda, CA 92886
DC Office: 1211 Connecticut Ave NW, Ste 650 Washington, DC 20036

Phone: (310) 455-6095 | Fax: (202) 223-5537
info@californiahydrogen.org | www.californiahydrogen.org

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CHBC Feedback to ARB's Draft Rulemaking for Changes to the LCFS program as Presented at August 7 Workshop

Dear LCFS team,

The California Hydrogen Business Council is pleased to respond to the request for feedback on the draft rulemaking for the LCFS program. The CHBC is committed to advancing the commercialization of hydrogen in the energy sector – including, transportation, goods movement, and stationary power systems – to reduce emissions and dependence on oil. [i] As the trade association also representing the fuel cell electric vehicle industry, we are interested in creating a framework for LCFS that provides opportunities for all electrofuels, including hydrogen. Therefore, we offer the following comments to amend the existing LCFS rule (§ 95488(b)(2)(F)) to allow grid-connected electrolyzers to utilize RECs to generate renewable hydrogen:

"In order to qualify as an innovative, low CI process energy source, energy from that source must be directly consumed in the production process. No indirect accounting mechanisms, such as the use of renewable energy certificates, can be used to reduce an energy source's CI. Innovative, low-CI energy sources include, but are not limited to renewable electricity from a dedicated (non-grid) form of generation, such as wind turbines and photovoltaic arrays."

In CHBC's opinion, this rule puts grid-connected electrolysis at a severe disadvantage compared to other forms of hydrogen generation, such as directed biogas reforming. This would undermine the state's priority to provide ample low carbon hydrogen, as electrolysis enables high-volume, renewable or low carbon hydrogen production. In the 2017 AB8 report for hydrogen network developments, ARB states:

"Establishment of new production capacity, especially renewable production capacity, within California would be a significant step. This would also help ensure the State's goals of renewable hydrogen throughput, implemented through Senate Bill 1505 could continue to be met in the future.[ii]

State authorities have consistently predicted a shortage in the availability of low carbon hydrogen for vehicles in the 2020-2022 timeframe. For example, ARB also states in the AB8 report:

> *"…In addition to dispensing capacity, the state's hydrogen network may similarly face a shortage in hydrogen production capacity, especially for hydrogen produced instate and with large contributions from renewable resources. Industry stakeholders are increasingly sharing the expressed desires of their customers to make the greatest environmental impact possible by choosing to drive an FCEV. Continued adoption of the vehicles may rely critically on ensuring the availability of renewably-sourced hydrogen at a reasonable, competitive market-driven price. Incentives like the Low Carbon Fuel Standard may help build industry interest in establishing new hydrogen production facilities in California, especially for low-carbon production methods."*

The CHBC recommends removing any obstacles to the widespread deployment of renewable hydrogen production pathways, thereby improving the ability of hydrogen companies to produce renewable hydrogen in state.

The biogas and electrolysis pathways for producing hydrogen have fundamental differences that warrant different regulatory frameworks to enable their advancement.

For example, renewable methane can be injected into the gas network at one location (Point A) and be removed at another location (Point B), to be processed in a central reformer to generate renewable hydrogen, if a 'physical pathway' exists. The requirement is that the renewable molecule can theoretically travel from point A to point B via the pipeline. In reality, the gas is metered in at point A, metered out at point B, and recorded in the system, creating an accounting mechanism. This makes sense, as the distances and physical size of the biogas generation facilities make it difficult to co-locate with reformers and/or hydrogen refueling stations.

While this is possible for the gaseous pathway, it is not currently possible to do the same for the electrical pathway, e.g. a renewable electron using the REC system. The CHBC feels this is an unfair treatment of hydrogen production via electrolysis, and in effect a barrier to the industry's ability to create a renewable fuel, particularly in the early deployments of large-scale plants. The REC system already allows for full traceability of the renewable generation. If this approach is acceptable by utilities for their RPS, why would this approach not be possible to be used for hydrogen generation?

It is also not cost-effective nor reasonable to require hydrogen production facility be co-located with renewable generation plants. This limits the ability for hydrogen plants to be sited geographically.

Early stage electrolysis production facilities must rely on revenue from LCFS credits to ensure an economically stable facility. Without it, many projects simply are not financeable in the current market, despite the growing number of fuel cell electric vehicles.

Another big imbalance at present is the fact that under the rules of the California Energy Commissions (CEC) AB8 hydrogen station initiative, electrolyzers that are grid tied can use RECs to generate renewable hydrogen (to meet SB1505 requirements). This is also true of the CEC's newly proposed renewable hydrogen production solicitation (see docket 17-HYD-01[iii]). There is clearly a mismatch in

thinking between the LCFS program and the state infrastructure program, which we feel should be addressed.

Lastly, as we move into a future with an increasingly renewable electricity grid, reactive loads such as electrolyzers will become increasingly valuable to grid operators to prevent curtailment of renewables and manage network loads such as the California "duck curve." Penalizing early adopters of electrolysis plants will severely limit the amount of renewable hydrogen fuel that can be produced in state.

CHBC thanks you for your time and dedication to the LCFS program; we look forward to participating in the future.

Sincerely,

Emanuel Wagner
Assistant Director
California Hydrogen Business Council
ewagner@californiahydrogen.org

[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, LP, Advanced Power and Energy Program (APEP) - UC Irvine (UCI), Air Liquide Advanced Technologies U.S., Airthium, Alameda-Contra Costa Transit District (AC Transit), American Honda Motor Co., Anaerobe Systems, Ballard Power Systems, Bay Area Air Quality Management District (BAAQMD), Beijing SinoHytec, BMW of North America LLC, Boutin Jones, California Air Resources Board (CARB), California Fuel Cell Partnership (CaFCP), California Performance Engineering, CALSTART, Cambridge LCF Group, Center for Transportation and the Environment (CTE), China Hydrogen Fuel Cell Corporation, Coalition for Clean Air (CCA), Community Environmental Services, CP Industries, E4 Strategic Solutions, Eco Energy International LLC, ElDorado National – California, Energy Independence Now (EIN), EPC, Ergostech Renewal Energy Solution, First Element Fuel, FuelCell Energy, General Motors, Geoffrey Budd G&SB Consulting, Giner, Gladstein, Neandross & Associates (GNA), Golden State EPC, Greenlight Innovation, GTM Technologies, H2B2, H2Safe, H2SG Energy Pte, H2Tech Systems, Hitachi Zosen Inova ETOGAS, HODPros, Horizon Fuel Cells Americas, Hydrogenics Corporation, Hydrogenious Technologies, HydrogenXT, Hyundai Motor Company, i-2-m, Idaho National Laboratory, Intelligent Energy, IRD Fuel Cells, ITM Power, Ivys, Johnson Matthey Fuel Cells, Linde North America, Loop Energy, McPhy Energy, Millennium Reign Energy, Montreux Energy, MPL Consulting, National Renewable Energy Laboratory (NREL), Nel Hydrogen, New Flyer of America, Next Hydrogen Corporation, Noyes Law Corporation, Nuvera Fuel Cells, Pacific Gas and Electric Company (PG&E), Paramount Energy West, PDC Machines, Planet Hydrogen, Plug Power, Port of Long Beach (POLB), PowerHouse Energy, Powertech Labs, Primidea Building Solutions, Proton OnSite, Ramco Consulting Company, Rio Hondo College, RIX Industries, Sacramento Municipal Utility District (SMUD), SAFCell, Schatz Energy Research Center (SERC), Sheldon Research & Consulting, Solar Hydrogen System, South Coast Air Quality Management District (SCAQMD), Southern California Gas Company, Sumitomo Corporation of Americas, SunLine Transit Agency, Tatsuno North America, Terrella Energy Systems, The Leighty Foundation, TLM Petro Labor Force, Toyota Motor North America, United Hydrogen Group, US Hybrid Corporation, Volute, WireTough Cylinders, Zero Carbon Energy Solutions.

[ii] https://www.arb.ca.gov/msprog/zevprog/ab8/ab8_report_2017.pdf

[iii] http://www.energy.ca.gov/altfuels/2017-HYD-01/