CALIFORNIA HYDROGEN BUSINESS COUNCIL

*Hydrogen Means Business in California!*

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Commissioner Cliff Rechtschaffen
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

**Subject: Incorporating hydrogen made from organic and renewable electricity feedstocks in renewable gas proceeding**

Dear Commissioner Rechtschaffen:

The California Hydrogen Business Council (CHBC)[i] intends to be a party in the upcoming proceeding on renewable gas and writes to offer our perspective on some aspects of what the scope should include, a perspective that we think you may already share.

We believe strongly that the scope of the renewable gas proceeding should encompass a full spectrum of renewable gases, including renewable hydrogen made by bioenergy and renewable electricity pathways.

In 2016, the CHBC worked closely with Senator Lara, the author of SB 1383, to ensure that the law explicitly directs the Public Utilities Commission to take a big tent, technology neutral approach when considering renewable gas as a solution to mitigating short lived climate pollutants – one that includes not only biomethane and biogas, but also renewable hydrogen derived from bio-resources and or renewable electricity.

Renewable hydrogen can be produced from several pathways, including biogas, syngas made from bio-waste, solar water splitting, or electrolysis using renewable electricity. All these pathways to produce renewable hydrogen can play a critical role, along with other renewable gases like biomethane and biogas, in deeply decarbonizing the energy system.

Due to limited availability of organic waste feedstocks for bio-based gas and the early stage of solar hydrogen technology, electrolytic hydrogen is the renewable gas pathway with the greatest volume potential and flexibility to be applied to multiple uses. The significant role electrolytic hydrogen has to play in California to achieve deep decarbonization, high renewable energy penetration and high electrification, was recently underscored in a presentation to the California Energy Commission by its consultant E3. It stated that hydrogen is among the flexible loads that are potentially needed to "absorb surplus renewable generation, and avoid costly need for additional storage and renewable overbuild."[ii]

Similar to batteries, electrolytic hydrogen can carry many benefits when grid electricity is used, and the more electricity that comes from renewables, the greater the emissions benefits.

Among the many specific beneficial capabilities electrolytic hydrogen carries are:

- **increasing grid reliability and integrating increasing levels of renewables onto the regional electric grid** by using electricity from over-generation of intermittent renewables that would otherwise be wasted to produce hydrogen, which can then be used in a variety of ways or stored for later use.;
- **turning the "duck curve" challenge into an opportunity** by repurposing low or no cost surplus renewable electricity that would otherwise have to be curtailed;
- **providing highly scalable, cost-effective, geographically flexible storage and the only pathway to providing storage at terawatt-hour scale,** which is particularly important for seasonal storage in a high renewables, high electrification future.
- **Suppling low or zero GHG fuel to hydrogen stations to fuel zero-emissions vehicles.**
- **Enabling a climate protective pathway for energy uses that are difficult to decarbonize with battery electrification only**, such as medium and heavy- duty vehicles, shipping, aviation, and certain industrial applications.

Renewable hydrogen is already a priority in California, which has mandated that at least 33% of hydrogen for transportation come from renewable sources[iii]. The industry has surpassed this target, although to realize the full emissions reductions and job creation benefits within California, as well as to help keep up with rapidly growing demand for affordable hydrogen for ZEV transportation and other beneficial uses, regulators must step up efforts to support economical in-state production.

Renewable hydrogen, especially produced via electrolysis, is also a cornerstone of greenhouse gas reduction, grid resilience and renewable integration strategies in Europe, Japan, and Canada, among other regions.[iv] The US Department of Energy's H2@Scale program additionally encourages expanded use of hydrogen "to enable resiliency of the power generation and transmission sectors, while also aligning diverse multibillion dollar domestic industries, domestic competitiveness, and job creation."[v]

In addition, we urge the Public Utilities Commission to include in the scope of the upcoming proceeding issues related to use of the natural gas system to transport and store hydrogen as a blend-stock with natural gas and biomethane, and methane synthesized from hydrogen and CO2, particularly biogenic CO2, which is a bi-product of biomethane production. Specific to hydrogen blending, the proceeding should address blend limits and the potential establishment of off-system blending tariffs that would allow, for example, hydrogen producers to "borrow" system gas to dilute the injected hydrogen to an acceptable concentration prior to injection onto the natural gas system.

The CHBC looks forward to participating in the upcoming proceeding and working with the California Public Utilities Commission to design a regulatory framework for renewable gas that maximizes California's potential to realize its climate and clean energy goals.

Sincerely,

Emanuel Wagner
Deputy Director | California Hydrogen Business Council

[i] The CHBC is a California industry trade association with a mission to advance the commercialization of hydrogen in transportation and stationary sources to reduce greenhouse gas, criteria pollutant emissions and dependence on oil. The CHBC is comprised of over 100

companies, agencies and individuals creating businesses for hydrogen-fueled zero emission energy and transportation markets in California. 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 AC Transit, Air Liquide Advanced Technologies U.S. LLC., American Honda Motor Co., Inc., Ballard Power Systems, Bay Area Air Quality Management District, Beijing SinoHytec, BMW of North America LLC, California Air Resources Board, California Fuel Cell Partnership, California Performance Engineering Inc., CALSTART, Cambridge LCF Group, Center for Transportation and the Environment, China Hydrogen Fuel Cell Corporation, Coalition for Clean Air, Community Environmental Services, E4 Strategic Solutions, ElDorado National – California, Energy Independence Now, Engineering, Procurement and Construction, LLC, Ergostech Renewal Energy Solution, First Element Fuel Inc, FuelCell Energy, Inc., General Motors Corporation, Giner, Inc., Gladstein, Neandross & Associates, Greenlight Innovation, GTA, Inc., GTM Technologies Inc., H2B2, H2Safe, LLC, H2SG Energy Pte Ltd, H2Tech Systems, Horizon Fuel Cells Americas, Inc., Hydrogenics Corporation, Hydrogenious Technologies, HydrogenXT, Hyundai Motor Company & Kia Motors Corp, i-2-m, Idaho National Laboratory, Intelligent Energy, IRD Fuel Cells LLC, ITM Power Inc, Ivys Inc., Johnson Matthey Fuel Cells, Linde North America Inc, Loop Energy Inc, McPhy Energy, MPL Consulting, Inc., National Renewable Energy Laboratory, Nel Hydrogen, New Flyer of America Inc, Next Hydrogen Corporation, Noyes Law Corporation, Nuvera Fuel Cells LLC, Pacific Gas and Electric Company, Paramount Energy West LLC, PDC Machines, Inc., Plug Power, Inc., Port of Long Beach, PowerHouse Energy Americas, Powertech Labs, Inc., Proton OnSite, Ramco Consulting Company Inc, Rio Hondo College, RIX Industries, Sacramento Municipal Utility District, SAFCell Inc, Schatz Energy Research Center, Solar Hydrogen System, South Coast Air Quality Management District, Southern California Gas Company, Sumitomo Corporation of Americas, SunLine Transit Agency, Tatsuno North America Inc, Terrella Energy Systems Ltd, Toyota Motor North America Inc., Advanced Power and Energy Program - UC Irvine, United Hydrogen Group Inc, US Hybrid Corporation, WireTough Cylinders, LLC, Zero Carbon Energy Solutions, Ztek Corporation

[ii] See E3 Presentation (file name "Renewable Integration Update) at http://www.energy.ca.gov/2018_energypolicy/documents/2018-06-20_workshop/2018-06-20_presentations.php

[iii] SB 1505

[iv] See: 1) https://renewablesnow.com/news/france-unveils-hydrogen-ambitions-615072/; 2) https://cdn.eurelectric.org/media/3172/decarbonisation-pathways-electrificatino-part-study-results-h-AD171CCC.pdf; 3) https://www.umweltbundesamt.de/en/press/pressinformation/a-greenhouse-gas-neutral-germany-is-almost-possible.; 4) http://www.ieso.ca/en/sector-participants/engagement-initiatives/engagements/power-to-gas-request-for-expression-of-interest; 5) https://www.japan.go.jp/tomodachi/2016/spring2016/tokyo_realize_hydrogen_by_2020.html

[v] https://www.energy.gov/eere/fuelcells/h2-scale