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September 10, 2017

The Honorable Senator Mendoza
State Capitol
1315 10th St
Sacramento, CA 95814

RE: CHBC Support for SB 433 - Zero-carbon Gas: Renewable Hydrogen

Dear Senator Mendoza,

The California Hydrogen Business Council (CHBC)ⁱ would like to express its strong support for SB 433 - Zero-carbon Gas: Renewable hydrogen because the bill addresses an existing gap in energy legislation in the State of California for the development and broad deployment of renewable hydrogen. The members of the CHBC are involved in the commercialization of hydrogen in the energy sector, including transportation, goods movement, and stationary power systems to reduce emissions and dependence on oil.

While hydrogen has been utilized by industry sectors like oil, gas, chemical production and aerospace for many decades, there has not been movement to broaden the production of **renewable hydrogen** in California. With recent technology advancements that demonstrate the viability and potential cost reductions to produce hydrogen, now is the right time to update state energy frameworks to support this new renewable energy resource.

Renewable hydrogen can be produced from water, using electric energy to separate the hydrogen from the oxygen. The hydrogen produced is 99.999% pure and can power fuel cell electric vehicles and replace heavy-duty diesel trucks. It can be stored and used to replace natural gas to power electric turbines, and it can be used in a fuel cell to generate electricity back to the grid.

As the state’s electric system, wind and solar power plants, and the increasingly renewable grid continue to evolve, long-term seasonal energy storage is becoming more important. Renewable hydrogen can provide such long-term and seasonal storage.

Additionally, California should continue to leverage valuable wind, solar and other renewable electricity resources to decarbonize the

transportation and gas energy sectors. This is being done today with electric vehicles and battery storage. Renewable hydrogen can expand that strategy by leveraging wind and solar to produce zero emission and zero carbon gas that can be used in heavy-duty transportation and industrial gas applications, thereby displacing fossil based gases, like natural gas and diesel, currently used today.

Last year, the University of California, Irvine successfully installed this technology on campus. The system creates hydrogen from an on-site water source, using its existing solar plant to power the electrolysis process that splits the water into hydrogen and oxygen. The renewable hydrogen then powers the existing on-site gas turbine, supplanting some of the natural gas that was previously used to power the turbine. As was demonstrated by this UCI project, one of the most valuable applications of in-state renewable hydrogen is its capacity to use underutilized solar energy, convert water to a gaseous energy fuel, store it and return it later to the UC campus' electric grid. Because the hydrogen produced from this water reformation process is 99.999% pure, it can also be used in a fuel cell electric vehicle, which produces zero emissions.

This bill provides additional direction to energy agencies and gas (and electric) retail providers to provide an **option** to open the transportation fuel and industrial gas markets to renewable hydrogen. The CHBC believes the California energy policy framework should be updated to promote the in-state development of renewable hydrogen, especially as this supports three aspects of California environmental policy simultaneously: clean air, zero-emission transportation, and increasing renewable electricity integration across energy sectors.

SB 1383 (Chpt 385 -- Lara, Statues of 2016) includes the term "renewable gas" and "other gases," along with references to biomethane and biogas, which was intended to allow other renewable gases like renewable hydrogen to be included in updates to statewide energy markets. However, over the course of this year, our organization experienced a lack of understanding among agencies of what renewable hydrogen is and how it can be used to store energy, balance the electric grid, power FCEVs and supplant natural gas in certain use cases. The lack of a specific reference to renewable hydrogen in SB 1383 unfortunately initially led to a lack of inclusion of hydrogen derived from water as a renewable gas in important policy framework proceedings.

SB 433 is a step toward beginning to update California's comprehensive energy market policy to include new technologies and renewable energy resources, like renewable hydrogen. Moreover, it does so without creating a new mandate, carve-out, or subsidy. The bill also allows renewable hydrogen technology the opportunity to be treated equally with other important renewable energy resources. SB 433 has CHBC's full support. For any questions, please feel free to reach me at 310-455-6095 x360.

Sincerely,



Emanuel Wagner

Assistant Director

California Hydrogen Business Council

¹ 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 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 Air Liquide Advanced Technologies U.S. LLC., Alameda-Contra Costa Transit District (AC Transit), American Honda Motor Co., Inc., Bay Area Air Quality Management District (BAAQMD), Ballard Power Systems Inc., Beijing SinoHytec, BMW of North America LLC, California FuelCell Partnership, California Air Resources Board, 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, Ergostech Renewal Energy Solution, First Element Fuel Inc, FuelCell Energy, Inc., General Motors Corporation, Giner, Inc., GNA, Golden State EPC, 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, ICS, Idaho National Laboratory, Intelligent Energy, IRD Fuel Cells LLC, ITM Power Inc, Ivys Inc., Johnson Matthey Fuel Cells, Lillium Energy Inc, Linde North America, Inc., Longitude 122 West, Inc., Loop Energy, McPhy Energy, MPL Consulting, Inc., National Renewable Energy Laboratory – NREL, Nel Hydrogen, New Flyer of America Inc, Next Hydrogen Corporation, Noyes Law Corporation, Nuvera Fuel Cells, Pacific Gas and Electric Company - PG&E, Paramount Energy West LLC, PDC Machines, Inc., Plug Power, Port of Long Beach, Power Planet, PowerHouse Energy, Powertech Labs, Inc., Proton OnSite, Ramco Consulting Company Inc, Rio Hondo College, Sacramento Municipal Utility District (SMUD), SAFCell Inc, Schatz Energy Research Center, Solar Hydrogen System, South Coast Air Quality Management District, 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.