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California Energy Commission
Dockets Office, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

March 24, 2017

Re: CHBC Comments on California Energy Commission's 2017 IEPR

Dear Chairman Weisenmiller and fellow CEC Commissioners,

The California Hydrogen Business Council (CHBC) would like to take the opportunity to submit comments on the California Energy Commission's "The Proposed Guideline Topics for Publicly Owned Utilities' Integrated Resource Plans" from the 2017 Integrated Energy Policy Report (IEPR) draft staff document.

Publicly owned utilities are required to report at least once every five years on how they are aligning with state goals under SB 350. California's goals include improving air quality, reducing greenhouse gases, and increasing the share of renewables. The CHBC believes that POUs can satisfy the requirements in several ways by employing Power-to-Gas (P2G) technology. On page 4 of the 2017 IEPR Scoping Order, P2G is explicitly included as an option for consideration.

The CHBC's White Paper "Power-To-Gas: The Case For Hydrogen" ii explains how P2G technology has the potential to provide a large-scale, cost-effective solution for storing excess energy produced from renewable sources. In summary, Power-to-Gas (P2G) uses excess renewable energy via electrolysis of water to produce hydrogen gas, serving as a "gas battery". Like regular batteries, P2G technologies have excellent **load-following** capabilities, which are necessary to manage the intermittency of solar and wind resources. Unlike battery storage, however, **P2G can store utility-scale quantities of energy indefinitely**, without self-discharge, either in tanks, the natural gas grid, or directly in hydrogen caverns.

This seasonal storage capability plays a role when wind power generated in March can be delivered into the high-value energy markets of August and September. These unique attributes have the potential to enable very high levels of renewable energy production while maximizing economic value. In addition, P2G and electrolyzer technology can provide the following grid services:

- Energy time shifting (arbitrage)
- Voltage and frequency regulation
- Ramping
- System Capacity
- Rapid Demand and Supply Response
- T&D investment deferral

Using P2G, energy from renewable sources, such as solar photovoltaic and wind generators, can be generated during periods of low demand for use in high demand periods and reduce the need for curtailment. This can be effective in alleviating the “ramping” problem experienced by electric utilities in the afternoon and evening periods and smooth the “duck curve”.

There are over 28 P2G facilities operational in Germany alone ⁱⁱⁱ, three more are operational in North America. Two P2G projects are active at the National Renewable Energy Laboratory in Golden, Colorado, and at the University of California, Irvine, respectively. These demonstrations will assess the feasibility and potential benefits of using the natural gas pipeline system to store photovoltaic and wind-produced energy.

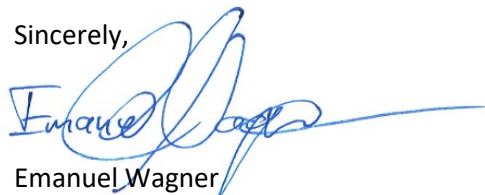
P2G can also provide renewable, emissions-free hydrogen that can be used as fuel for fuel-cell electric vehicles (FCEVs) for the transportation sector, which is responsible for the largest share of criteria pollutants in California. Furthermore, P2G can also help decarbonize hydrogen production at oil refineries, which, according to CARB, represent the state’s largest individual industrial GHG source.

Conclusion

California is facing an increasingly urgent need to deploy utility-scale energy storage solutions to support renewable energy generation. P2G enables long-term storage of large amounts of emission-free energy, critical for California to meet its ambitious climate goals cost-effectively and needs to be part of California’s energy portfolio. Investing in the commercialization of P2G now will help accelerate its adoption and move this technology to market. Therefore, the CHBC believes P2G should be strongly considered by the POUs.

Thank you for your consideration!

Sincerely,



Emanuel Wagner

Assistant 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 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, Bethlehem Hydrogen Inc, 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., Hydrogen in Motion, 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 CHBC White Paper “Power-To-Gas: The Case For Hydrogen”

<https://californiahydrogen.org/sites/default/files/CHBC%20Hydrogen%20Energy%20Storage%20White%20Paper%20FINAL.pdf>

ⁱⁱⁱ Pilot Projects in Germany: <http://www.powertogas.info/power-to-gas/pilotprojekte-im-ueberblick/>