BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes.	Rulemaking 20-05-003 (Filed May 7, 2020)

COMMENTS OF THE CALIFORNIA HYDROGEN BUSINESS COUNCIL ON ORDER INSTITUTING RULEMAKING TO CONTINUE ELECTRIC INTEGRATED RESOURCE PLANNING AND RELATED PROCUREMENT PROCESSES

William Zobel
Executive Director
California Hydrogen Business Council
18847 Via Sereno
Yorba Linda, CA 92866
310-455-6095
wzobel@californiahydrogen.org

June 15, 2020

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes.	Rulemaking 20-05-003 (Filed May 7, 2020)

COMMENTS OF THE CALIFORNIA HYDROGEN BUSINESS COUNCIL ON ORDER INSTITUTING RULEMAKING TO CONTINUE ELECTRIC INTEGRATED RESOURCE PLANNING AND RELATED PROCUREMENT PROCESSES

I. Introduction

The California Hydrogen Business Council (CHBC)[1] appreciates the opportunity to provide comments on the *Order Instituting Rulemaking to Continue Electric Integrated Resource Planning and Related Procurement Processes* (Continued IRP OIR) issued on May 14, 2020. Our comments focus on encouraging the PUC to continue considering hydrogen resources in its integrated resource planning modeling and specifically going forward to include hydrogen as a resource for long duration storage and for electricity generation, where either in its pure form or combined with carbon dioxide to produce synthetic methane, it can be a drop-in, zero carbon replacement for fossil natural gas in power plants and fuel cells.

Our main points are:

- **Including green electrolytic hydrogen in IRP modeling is in line with state law.**
- **Green electrolytic hydrogen is the most scalable, geographically flexible long duration storage option and more cost effective than lithium ion batteries at longer durations.**
- **Additional variable renewable generation, which will be needed to achieve state policy targets and which is part of the PUC's proposed integrated resource**

[1] The CHBC is comprised of over 100 companies and agencies involved in the business of hydrogen. Our mission is 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.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 are listed here: www.californiahydrogen.org/aboutus/chbc-members/

planning, risks not being financeable without electrolytic hydrogen as a storage resource.

- **By including hydrogen as a storage and electricity generation in IRP modeling, the PUC would be responding to rising interest not only internationally, but also in the US and California, by investing in renewable hydrogen solutions to decarbonize the electricity sector while maintaining system reliability.**

II. Comments

A. Including green electrolytic hydrogen in IRP modeling is in line with state law.

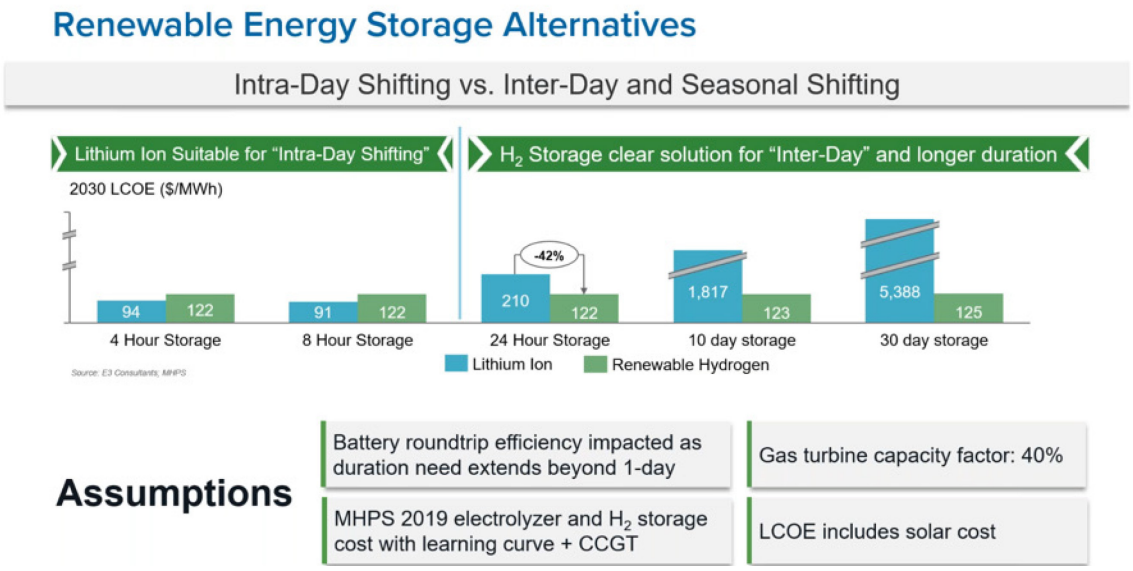
SB 1369 (Skinner, 2018) requires the Commission to consider green electrolytic hydrogen as an eligible storage resource and for other potential uses and calls for its increased use. To date, the Commission has yet to open a proceeding specifically implementing SB 1369. Including green electrolytic hydrogen in IRP modeling as a storage resource would be a meaningful step toward fulfilling this requirement of the law.

The legislature also sought to clarify this year, with the introduction of SB 1122, that green electrolytic hydrogen ought to be considered an eligible zero carbon resource for electricity generation. While the COVID-19 crisis has limited the legislature's capacity to take up new bills this year, the PUC can, and we believe ought to, take this signal to move ahead and act on its own to implement this provision, in order to achieve a balanced portfolio of zero carbon resources that ensures system reliability and enables integration of high penetrations of variable renewables up to 100% of retail sales, and potentially beyond. This would be in line with the Executive Order and ARB efforts to advance carbon neutrality economy wide.

B. Green electrolytic hydrogen is the most scalable, geographically flexible long duration storage option and more cost effective than lithium ion batteries at longer durations.

Because it is not subject to drought conditions or as many geographical constraints as pumped hydro, electrolytic hydrogen is particularly suitable for seasonal storage. As mentioned in our Opening Comments on the *Proposed Decision on the 2019-2020 Resource Portfolios to Inform Integrated Resource Plans and Transmission Planning*, this is reflected in a report by DNV GL that identifies compressed hydrogen using subsurface storage (salt caverns and depleted

hydrocarbon fields) as the most cost effective solution for seasonal storage in a zero carbon electricity system that relies largely on variable solar and wind.[2] Numerous other researchers encourage hydrogen storage as an important resource in a high renewable generation energy future, such as UCI, which finds that the capacity for hydrogen storage in the current California gas system dwarfs other storage solutions,[3] and a recently released report by the bank HSBC advocates for hydrogen storage to manage curtailment, as variable renewable generation becomes an increasing issue.[4] Recent analysis by E3 and Mitsubishi Hitachi Power Systems (MHPS) likewise shows that hydrogen storage is the clear solution over lithium ion batteries for inter-day and long duration use (see figure below).



C. By including hydrogen as a storage and electricity generation in IRP modeling, the PUC would be responding to rising energy sector interest in investing in renewable hydrogen solutions to decarbonize the electricity sector while maintaining system reliability.

Additional variable renewable generation, which will be needed to achieve state policy targets and which is part of the PUC's proposed integrated resource planning, risks not being financeable without electrolytic hydrogen as a storage resource. As renewable generation grows

[2] *The Promise of Seasonal Storage*, DNV GL, March 2020 https://www.dnvgl.com/publications/the-promise-of-seasonal-storage-168761?utm_campaign=EN_ADV_GLOB_20Q1_PROM_STOR_Seasonal%20Storage%20Report%20Launch&utm_medium=email&utm_source=Eloqua

[3] Slide 15 https://www.californiahydrogen.org/wp-content/uploads/2018/11/20181106-ESNA-CHBC-HES-Workshop_Brouwer.pdf

[4] https://www.gbm.hsbc.com/insights/global-research/renewables-can-make-hydrogen-green

to fulfill requirements mandated by SB 100 and potentially to meet carbon neutrality goals beyond that, curtailment will become an ever greater challenge. To address this challenge and ensure projects are financeable, renewable electricity developers are increasingly seeking to couple their projects with electrolytic hydrogen to ensure economic viability. Around the world, large scale electrolytic hydrogen projects are pairing with dedicated new large-scale renewable development, such as the Gigastack project, which is coupling offshore wind with the world's first 100 MW electrolyzers to help achieve the UK's greenhouse gas emissions target.[5]

Other recent developments closer to home that demonstrate growing interest in scaling hydrogen solutions as a decarbonized electricity sector resource include:

- Advancement of the 840 MW Intermountain Power Project, which seeks to convert a coal power facility in Utah to 100% renewable hydrogen incrementally by 2045 to bring zero carbon power to Los Angeles, using a large Utah salt cavern to store hydrogen that can be drawn from as needed.[6]
- Nearly half of a recent $64 million funding round by US Department of Energy's H2@Scale project focused on electrolysis and hydrogen storage technology.[7]

III. Conclusion

The CHBC thanks the Commission for their consideration and looks forward to working together to facilitate adoption of a broad range of renewable gases in California, including renewable hydrogen and renewable methane derived from renewable hydrogen.

Respectfully submitted, **Dated: June 15, 2020**

William Zobel
Executive Director
California Hydrogen Business Council

[5] https://www.itm-power.com/news/industrial-scale-renewable-hydrogen-project-advances-to-next-phase
[6] https://www.power-eng.com/2020/03/10/mhps-wins-ccgt-award-for-utah-coal-gas-hydrogen-long-term-transition-project/#gref
[7] https://www.energy.gov/eere/articles/energy-department-announces-64m-advance-h2scale-new-markets