

DOCKETED	
Docket Number:	21-ESR-01
Project Title:	Energy System Reliability
TN #:	248828
Document Title:	Comments from California Hydrogen Business Council
Description:	N/A
Filer:	System
Organization:	California Hydrogen Business Council
Submitter Role:	Public
Submission Date:	2/16/2023 5:14:52 PM
Docketed Date:	2/16/2023

*Comment Received From: California Hydrogen Business Council
Submitted On: 2/16/2023
Docket Number: 21-ESR-01*

21-ESR-01 California Hydrogen Business Council Comments

Additional submitted attachment is included below.



Hydrogen Means Business in California!

18847 Via Sereno
Yorba Linda, CA 92886
Phone: (310) 455-6095 | Fax: (202) 223-5537
info@californiahydrogen.org | www.californiahydrogen.org

California Energy Commission
715 P Street
Sacramento, CA 95814

February 16, 2023

RE: 21-ESR-01, "Draft Clean Energy Reliability Investment Plan Report"

Platinum Members
Avantus
Ballard Power Systems
BayoTech
Cummins
Mitsubishi Power Americas
Pacific Gas & Electric
Plug Power
San Diego Gas & Electric
Southern California Gas Company
Gold Members
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Black & Veatch
Bloom Energy
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Sumitomo Electric
Sunline Transit
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I. INTRODUCTION

The California Hydrogen Business Council (CHBC), a trade association made of over 130 companies and agencies involved in the business of hydrogen, is appreciative of the opportunity to comment on the Draft Clean Energy Reliability Investment Plan. We are encouraged by CEC's prioritization of scaling resources with investment funds over the next three years and we respectfully recommend the consideration of hydrogen powered through fuel cells linear generators as a deployable solution to gaps in the state's Demand Response (DR) and Distributed Energy Resources (DER). We submit the following comments on the draft investment plan.

II. COMMENTS

a. Demand Side Resources:

The CHBC is supportive of the proposed areas of funding for strengthening the State's DR and DER resources. Specifically, the CHBC supports funding prioritization for scaling microgrid-sized electrolyzers to provide around-the-clock clean energy. Electrolyzers have been deployed successfully within telecommunications, government communications, security, and transportation communications operations for backup power in grid-

connected locations.¹ Making electrolyzers more accessible by investing in scaling the market will ensure this technology is more readily available for deployment when the grid needs it most. Pairing electrolyzers with existing demand side resources like batteries and small-scale solar will make for a more resilient grid at times of peak usage and extreme weather events. Finally, the Draft Plan should consider adding fuel cell electric vehicles (FCEVs) to the demand side resources that are relied on for bi-directional charging, while both the battery electric vehicles (BEVs) and FCEVs bi-directional capabilities are still being researched and tested.

b. Supply Side Resources

The CHBC agrees with the Draft Plan that more investment in a diverse supply side resource portfolio is needed and believes hydrogen technologies like fuel cells and linear generators are imperative to the State's resiliency, especially when co-located where load growth occurs. A co-located deployment of fuel cells and linear generators avoids line losses, transformer losses, or other conversion/inversion losses. On average between 2017 and 2021, 5 percent of energy sold through the U.S. was lost in the transmission and distribution system², but generating power onsite eliminates these losses. In addition, most DERs, including fuel cells and linear generators, generate direct current power³, the same type of power that a battery uses to charge. Systems can be engineered to allow direct current charging of vehicles to avoid conversion/inversion losses. In comparison, grid power is delivered as an alternating current that would need to be converted to direct current, with associated losses that can add up to an additional 10 percent loss⁴.

¹ Blanchard. "Smart Energy Solutions Using Fuel Cells." ReliOn. (2011). Available at: https://www.plugpower.com/wp-content/uploads/2015/05/Intelec2011_ReliOn_P081_IEEE.pdf.

² U.S. Energy Information Administration. "How much electricity is lost in electricity transmission and distribution in the United States?" Available at: <https://www.eia.gov/tools/faqs/faq.php?id=105&t=3>.

³ Fuel cells and Linear Generators creating direct current power: <https://www.energy.gov/eere/fuelcells/fuel-cell-systems#:~:text=Fuel%20cells%20produce%20electricity%20in,both%20directions%20on%20alternating%20cycles>; <https://www.mainspringenergy.com/technology/>.

⁴ Apostolaki-Iosifidou, E., Codani, P., Kempton, W., Measurement of power loss during electric vehicle charging and discharging, *Energy*, Volume 127, Pages 730-742, 15 May 2017.

Another benefit of fuel cells and linear generators is long-duration energy storage potential. The Draft Plan does not identify hydrogen as a form of long-duration energy storage, while stating the need for “non-lithium ion storage⁵.” Recently passed AB 1369 (Skinner, 2018)⁶, codified in California Public Utilities Code Section 400.3⁷, requires the Energy Commission to consider hydrogen an eligible form of energy storage. The CHBC encourages the Energy Commission to amend the Draft Plan to include hydrogen storage, paired with fuel cells and linear generators as a deployment-ready supply-side energy storage resource.

Due to the historical federal investment in the hydrogen economy, the Department of Energy’s (DOE) Hydrogen Shot that will reduce the cost of hydrogen to \$1 per kilogram by 2030⁸, hydrogen technologies like fuel cells and linear generators are being produced for scale. Utility scale fuel cells and linear generators will prop up the State’s grid by utilizing hydrogen in the amounts of megawatts⁹ so long as they are eligible and included in the State’s funding and deployment plans. It is critical to build up the capacity market for hydrogen technologies by ensuring parity between all supply-side resources by matching

⁵ Draft Clean Energy Reliability Investment Plan, page 8.

⁶ SB 1369 (Skinner, 2018). Available at:

https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1369.

⁷ CA Pub Util Code Section 400.3 (2018). Available at: <https://law.justia.com/codes/california/2018/code-puc/division-1/part-1/chapter-2.3/article-17/section-400.3/>.

⁸ Office of Energy Efficiency and Renewable Energy. “Hydrogen Shot.” Available at:

<https://www.energy.gov/eere/fuelcells/hydrogen-shot>.

⁹ CHBC Member Companies Utilizing Hydrogen at Scale: Nel Hydrogen, <https://nelhydrogen.com/press-release/nel-asa-ready-to-step-up-production-capacity/>; Bloom Energy, <https://fuelcellsworks.com/news/bloom-energy-inaugurates-high-volume-electrolyzer-production-line/>; Linde, <https://www.linde.com/news-media/press-releases/2022/linde-to-increase-green-hydrogen-production-in-the-united-states#:~:text=Woking%2C%20UK%2C%20September%208%2C,in%20Niagara%20Falls%2C%20New%20York;Mainspring,https://www.prnewswire.com/news-releases/mainspring-closes-series-e-at-290-million-301626840.html>; Plug Power, <https://www.datacenterfrontier.com/design/article/11427183/rethinking-the-data-center-hydrogen-backup-is-latest-microsoft-moonshot>.



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price signals across batteries and “alternative commercial technologies¹⁰” like fuel cells and linear generators.

III. CONCLUSION

The CHBC appreciates the opportunity to provide a response to the Draft Clean Energy Reliability Investment Plan. We respectfully request your consideration of our comments.

Sincerely,

A handwritten signature in black ink, appearing to read "Sara Fitzsimon", is written over a horizontal line.

Sara Fitzsimon, J.D.
Policy Director
California Hydrogen Business Council

¹⁰ Draft Clean Energy Reliability Investment Plan, page 8.