BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIF

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07/30/24
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Application of Southern California Gas Company (U 904 G), San Diego Gas & Electric Company (U 902 G), Pacific Gas and Electric Company (U 39 G), and Southwest Gas Corporation (U 905 G) to Establish Hydrogen Blending Demonstration Projects.	A.22-09-006 (Filed September 8, 2022)

RESPONSE OF THE CALIFORNIA HYDROGEN BUSINESS COUNCIL ON THE JOINT MOTION TO DISMISS THE JOINT AMENDED APPLICATION OF SOUTHERN CALIFORNIA GAS COMPANY, SAN DIEGO GAS & ELECTRIC COMPANY, PACIFIC GAS AND ELECTRIC COMPANY, AND SOUTHWEST GAS CORPORATION TO ESTABLISH HYDROGEN BLENDING DEMONSTRATION PROJECTS

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July 30, 2024

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

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I. Introduction

Pursuant to Rule 11.1(e) of the California Public Utilities Commission's ("Commission" or "CPUC") Rules of Practice and Procedure, the California Hydrogen Business Council (CHBC)[1] responds to the Environmental Defense Fund ("EDF"), Sierra Club, Utility Consumers' Action Network ("UCAN"), and Climate Action Campaign (collectively, "Joint Intervenors") Motion to Dismiss ("Motion") the Joint Amended Application of Southern California Gas Company, San Diego Gas & Electric Company, Pacific Gas and Electric Company, and Southwest Gas Corporation (collectively, the "Joint Utilities") to Establish Hydrogen Blending Demonstration Projects ("Application"), filed on March 1, 2024.

The CHBC opposes the Motion and supports the Joint Utilities' Application to demonstrate live hydrogen blending projects and establish a safe threshold for blending hydrogen, progressing the clean energy transition in the state of California toward deeper decarbonization.

II. Discussion

The Intervenors argue that hydrogen blending is not a viable decarbonization strategy at scale. The CHBC submits that rather than use only electrons or molecules to meet our decarbonization

[1] The CHBC is comprised of 120 companies, agencies, and individuals involved in the business of hydrogen. Our mission is to educate the public on the substantial benefits of hydrogen and to develop and advance policy positions that support the commercialization of hydrogen in the energy and transportation sectors to achieve California's climate, air quality, and decarbonization goals. CHBC Members are listed here: https://members.californiahydrogen.org/directory.

targets, we must use both electrons **and** molecules for our energy demands. Hydrogen is a key enabler of electrification and clean fuels, as it is an energy source that can be produced cleanly and with little to no emissions and on a large scale.

The Commission began consideration of hydrogen blending in its first rulemaking on biomethane in February 2013 (R.13-02-008). The subsequent opening of Phase 4 in the assigned Commissioner's November 2019 Scoping Memo addressed the need to establish standards for injection of renewable hydrogen into gas pipelines (Phase 4B).

In December 2022, the Commission directed the Joint Utilities to perform pilots so that they could investigate the safe use of hydrogen on California-specific infrastructure and inform on a statewide hydrogen injection standard (Decision 22-12-057). In July of 2022, the University of California Riverside filed the Commission-sponsored Hydrogen Blending Impacts Study ("Study"). The Study concludes, "Blending hydrogen into the natural gas pipeline networks is an important approach toward decarbonizing the grid, lowering greenhouse gas emissions, and advancing the development of a hydrogen economy."[2] The Study also concluded "…additional examination is needed into blending hydrogen into the gas system to ensure its safety in California. The Study finds that it is critical to conduct real-world demonstrations of hydrogen under safe and controlled conditions…"[3] Then-Commissioner Clifford Rechtschaffen stated, "This Study provides additional insight into the possibilities and limits of California's pipeline infrastructure as we explore options for supplying zero-carbon energy to hard to decarbonize applications."[4] The Study addresses different aspects related to hydrogen blending at a small scale in a laboratory setting, including safety, material degradation, and leakage rates. The Study's laboratory scale results points to potential compatibility of hydrogen-natural gas blends equal to or below 5% by volume in both transmission and distribution grids. Supporting information is reported in the Study and cited from many large-scale distribution demonstration projects in Europe, which have found an acceptable level of hydrogen injection at a volume

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[2] Miroslav Penchev, Taehoon Lim, Michael Todd, Oren Lever, Ernest Lever, Suveen Mathaudhu, Alfredo Martinez Morales, and Arun S.K. Raju*. 2022. Hydrogen Blending Impacts Study Final Report. Agreement Number: 19NS1662. Available at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M493/K760/493760600.PDF. See p. 111.

[3] See CPUC Press Release, *CPUC Issues Independent Study on Injecting Hydrogen Into Natural Gas Systems*, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M496/K285/496285890.PDF. See p. 2.

[4] *Id.*

fraction of 10%. However, large-scale demonstrations on both the transmission and distribution systems are still needed in North America to provide crucial operational data reflecting the conditions, regulations, integrity management practices, and procurement standards.

In further response to the viability of hydrogen as a decarbonization strategy, the CHBC would like to remind the Commission of the results of previous real-world demonstrations of hydrogen blending. It is important to now conduct demonstrations to blend hydrogen into the specific California gas system and establish safe thresholds.

Illustrative of the ability to blend hydrogen into the natural gas supply without negative consequence, Keele University in the United Kingdom blended 20% by volume with fossil gas in a pilot over an 18-month period in 2019. After extensive laboratory testing and piloting on the effects of hydrogen blends in home appliances, businesses, and existing gas infrastructure, the results of the pilot concluded that a hydrogen blend of 20% by volume did not negatively impact the network pipes, boilers, hobs, cookers, or meters in this study.[5] Due to the success at Keele University, a larger project was deployed in Winlaton, near Gateshead in 2021 over the course of ten months. This project powered over 668 homes, a school, businesses, and a church with a 20% hydrogen blend by volume, all while the Healthy and Safety Executive (UK) checked for health and safety issues. The results of this project were also successful, illustrating the safety of blending hydrogen at 20% by volume. [6]

In Hawai'i, operating experience validates the feasibility of deploying hydrogen-natural-gas blends. Hawai'i Gas has safely operated with a gas supply naturally containing 15% hydrogen by volume in their existing natural gas pipeline network since 1974.[7] In neither the UK nor Hawaii, have any of the purported risks put forth in the Motion to Dismiss come to fruition.

The California Air Resources Board's 2022 Scoping Plan Update calls for 20% hydrogen blending in the pipeline, and an overall increase of about 1,700 times the amount of current hydrogen supply to reach California's carbon neutrality goal. [8] The Scoping Plan specifically

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[5] See HyDeploy Project Phases, Phase 1: https://hydeploy.co.uk/project-phases/.

[6] *Id.*, Phase 2: https://hydeploy.co.uk/project-phases/.

[7] See Hawai'i Gas: Hydrogen. Available at: https://www.hawaiigas.com/sustainability/hydrogen.

[8] California Air Resources Board, *2022 Scoping Plan for Achieving Carbon Neutrality* (December 2022). Available at: https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf. See pp. 78, 8.

states requirements for renewable hydrogen blended in pipelines to displace fossil gas at 7% energy (~20% by volume), ramping up between 2030 and 2040, and dedicated hydrogen pipelines constructed to serve certain industrial clusters in the 2030s.[9] The benefits of blending hydrogen into the gas system exceed just the greenhouse gas emission reductions required to meet the 7% target. Hydrogen blending also creates market development of clean hydrogen in California, by furthering the production of hydrogen for markets such as transportation, goods movement and heavy industry, and enabling the movement of this hydrogen around the state to meet the needs of diverse off takers. Blending hydrogen into the gas system itself serves as a large offtake of hydrogen from local producers.

The five pilot studies as proposed in the Joint Utilities' Application are differentiated and complementary, and in totality can illustrate the overall impact of hydrogen on the California system. The proposed pilots also build off prior research and provide proof of concept. Citing the sheer volume of gas sold in the state, a 20% hydrogen blend can create material emissions reductions.

A recent U.S. Department of Energy ("DOE") report states: "Initiatives are underway to explore blending hydrogen into existing pipeline networks. This includes blending hydrogen into domestic natural gas pipelines at up to 20% by volume (2–7% content by energy density), with a small number of demonstration projects up to 30%."[10] Further, "When blending >5 – 10% hydrogen, appliances connected to the pipeline may have to be qualified or converted to the hydrogen blend, a challenging transitional effort (note that Hawai'i blends as high as ~15% without retrofits of end-use appliances)."[11] The CSA Group (previously called the Canadian Standards Association), who certify many household appliances, have recently tested blends up to 15% with space and water heating appliances, as well as furnaces, and found that they do not significantly affect the operation or performance.[12]

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[9] *Id.*, p. 78.

[10] U.S. DOE, *Pathways to Commercial Liftoff: Clean Hydrogen* (March 2023). Available at: https://liftoff.energy.gov/wp-content/uploads/2023/05/20230523-Pathways-to-Commercial-Liftoff-Clean-Hydrogen.pdf. See p. 16.

[11] *Id.*

[12] CSA Group, *Appliance and Equipment Performance with Hydrogen-Enriched Natural Gases* (May 2021). Available at: https://www.csagroup.org/wp-content/uploads/CSA-Group-Research-Appliance-and-Equipment-Performance-with-Hydrogen-Enriched-Natural-Gases.pdf. See p. 5.

In considering affordability, we should support ways to minimize costs by utilizing the existing gas system and pipeline infrastructure. By decarbonizing the pipeline with hydrogen, prospective costs that would require additional investment in new infrastructure can be avoided, thereby reducing decarbonization costs to ratepayers.

The HyBlend project launched in 2020 through DOE includes "several projects with national laboratories and over 30 industry partners focused on materials compatibility, cost and emissions analysis of blending, underground storage of hydrogen blends, hydrogen appliances, and low-NO_x hydrogen turbines. Ongoing and future R&D under the HyBlend initiative will be coordinated with related efforts worldwide (e.g., through data sharing, round robin testing, and information exchange) …Future work, which will be done in collaboration across agencies and states, will enable the development of injection standards for blending hydrogen into natural gas pipelines used in high temperature heat applications—including the upper blend limits for hydrogen." [13] In the section, "Actions to support clean hydrogen use and broader market adoption," the *U.S. National Clean Hydrogen Strategy Roadmap* calls for the development of national guidance for hydrogen blending limits in the 2026-2029 timeframe.[14] The Joint Utilities' Amended Application to Establish Hydrogen Blending Demonstration Projects is therefore extremely timely. Should these projects be delayed, California will only prolong its understanding of hydrogen in its gas network and delay its ability to utilize this critical decarbonization tool in the state. Even the federal government agrees the time to address safe blending in the pipeline is now. California must advance this blending application to gain the technical knowledge the State requires and allow the related hydrogen policy issues to be addressed in a separate long-term gas planning proceeding.

III. Conclusion

The CHBC thanks the Commission for their consideration of this response and requests a timely decision to proceed with the demonstrations as detailed in the Application. The Motion to Dismiss creates an unnecessary and unfounded delay when data collection and knowledge are needed in the near-term to develop the safety and operational requirements associated with pipeline blending in California. These demonstration projects were directed to the utilities

[13] *U.S. National Clean Hydrogen Strategy and Roadmap*. Available at: https://www.hydrogen.energy.gov/docs/hydrogenprogramlibraries/pdfs/us-national-clean-hydrogen-strategy-roadmap.pdf?sfvrsn=c425b44f_5. See p. 31.

[14] *Id.*, p. 71.

through the CPUC's own directive. Approval of these pilot projects is needed as soon as possible to both advance this proceeding and because predictions are that it will take four to ten additional years to yield the results of the pilots, which will in turn inform on blending and a future hydrogen injection standard.

Respectfully submitted, **Dated: July 30, 2024**

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