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Ms. Rajinder Sahota
Deputy Executive Officer – Climate Change and Research
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Submitted via electronic mail to hydrogen@arb.ca.gov

RE: SDG&E Comments on Senate Bill (SB) 1075 Joint Agency Kickoff Workshop

Dear Ms. Sahota:

San Diego Gas & Electric Company (SDG&E) appreciates the opportunity to provide feedback on the September 5, 2023, Senate Bill (SB) 1075 Joint Agency Kickoff Workshop.

Among other important directives, SB 1075 requires the Joint Agencies – consisting of the California Air Resources Board (CARB), California Public Utilities Commission (CPUC), and California Energy Commission (CEC) – to produce a comprehensive report on hydrogen, its various applications, and its role in facilitating attainment of California's climate, energy, and environmental goals.

The results of the modeling in the 2021 Joint Agency SB 100 Report[1] and CARB's 2022 Scoping Plan Update (Scoping Plan)[2] identify a clear need for unprecedented investments in new energy infrastructure to support California's clean energy and climate goals. A diverse set of resources – including clean fuels and hydrogen – is essential to achieving reliable, resilient, and affordable decarbonization.[3]

As noted in CARB's staff presentation during the workshop, the Scoping Plan specifically outlined an estimated 1700x increase in hydrogen supply needed in 2045 as compared to amounts available in 2022.[4] Holistically understanding the role clean and renewable hydrogen will play in a net-zero carbon future will enable the Joint Agencies to develop

[1] *2021 SB 100 Joint Agency Report*, published March 15, 2021, available at: https://www.energy.ca.gov/publications/2021/2021-sb-100-joint-agency-report-achieving-100-percent-clean-electricity.
[2] California Air Resources Board *2022 Scoping Plan for Achieving Carbon Neutrality*, available at: https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf.
[3] SDG&E's *The Path to Net Zero: A Decarbonization Roadmap*, available at: netzero2.pdf (sdge.com)
[4] *See* Slide 11 of CARB staff's SB 1075 Joint Agency Kickoff Workshop: https://ww2.arb.ca.gov/sites/default/files/2023-09/sb-1075-workshop-090523-presentation-carb.pdf.

the clear policy signals needed to facilitate market growth for this critical resource. The SB 1075 report will substantially influence California's ability to establish an investment-ready landscape for hydrogen infrastructure development.

The SB 1075 report development process should delve deeply into analyzing hydrogen use cases, potential market scale, and associated emissions and costs. Evaluating the full spectrum of hydrogen considerations required under SB 1075 will provide necessary context for multisectoral needs of energy, transportation, and industry throughout the entire lifecycle of hydrogen resource development. Insights gained from this report will allow the State to fully evaluate the usefulness and affordability of hydrogen across sectors, especially amid an era of increased climate variability.

SDG&E respectfully offers the following feedback for consideration throughout the SB 1075 development process:

I. State agencies should align on and maintain technology-agnostic and production-pathway-neutral definitions of eligible hydrogen resources, focusing on carbon intensity.

Establishing thoughtful definitions is of paramount importance. Doing so will reduce uncertainty and encourage timely industry investment and action. Definitions should remain technology agnostic and production pathway neutral. As modeled by the federal definition of clean hydrogen – which is based on carbon intensity scores – California definitions should also focus on well-to-gate carbon intensity, rather than production pathways, given that decarbonization is the ultimate goal.

Specifically, SDG&E shares the following recommendations for definitions impacting the power sector:

- Hydrogen-fueled dispatchable electric power generation from eligible renewable hydrogen resources should be included as eligible within the Renewables Portfolio Standard for the SB 1075 analysis.
- "Clean hydrogen" should be made consistent with the Federal definition and should be categorized as a Zero-Carbon Resource.[5]
- Definitions should enable California power generators to use hydrogen that is sourced from out of state and piped to their facility; this is a critical factor in establishing market certainty and bounding analyses.

Regarding hydrogen production pathways, SB 1075 requires "an analysis of the life-cycle greenhouse gas emissions from various forms of hydrogen, including green hydrogen, production." SDG&E agrees that this analysis is necessary and argues that carbon intensity should be a key factor in designing California's hydrogen economy. SDG&E supports the Joint Agency efforts to evaluate the full range of feedstocks and pathways for hydrogen production and dispatch, and notes that new technologies and pathways that have not yet been commercialized may be on the horizon.

[5] As used here, the term clean hydrogen is consistent with the federal definition in 42 USC 16166.

II. The Joint Agencies should develop an analysis of hydrogen storage and transmission options that would enable hydrogen delivery to the power sector and beyond.

The Scoping Plan identified a need for over 9 gigawatts of hydrogen-based power generation by 2045. It is very likely that the power sector will require dedicated hydrogen pipelines to support the transmission and storage of hydrogen from hydrogen production sites to electric generators, just as it does today with natural gas.

Recently, CEC staff highlighted critical spatial restrictions that will limit the ability to produce and store hydrogen onsite at power generation facilities.[6] Further, U.S. Department of Energy (DOE) has identified that "for the clean hydrogen economy to reach its full potential we need open access infrastructure," and that "[o]pen access infrastructure would help to drive a competitive market by helping producers and off-takers, both small and large, to access the advantages of infrastructure scale including via pipeline delivery and salt cavern storage."[7]

Incorporating an analysis of feasible options for hydrogen transmission and storage would be helpful in understanding the costs and benefits of trucking-in hydrogen compared to establishing an open-access, common carrier, dedicated hydrogen pipeline network. Such an analysis should consider the economic costs, community and labor impacts, and associated emissions and environmental impacts.

III. Exploring opportunities for streamlined regulatory and permitting processes will be important for timely development of clean and renewable hydrogen infrastructure to support decarbonization goals.

Investments into hydrogen production, delivery, and utilization need to be made now to address multi-year horizons for project planning, permitting, and construction as we approach 2035 and 2045. Early investments made today are poised to benefit from historic federal incentives for hydrogen that can reduce the total cost of these decarbonization strategies borne by Californians.

The energy transition takes time, and permitting of new energy projects can be a lengthy and challenging process in California. The Joint Agencies should consider policy and process improvements that help California reach its carbon neutrality goals ahead of target by streamlining the permitting of hydrogen projects, which the Joint Agencies have determined to be a necessary part of our decarbonized energy portfolio.[8]

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[6] *See* CEC *Hydrogen Analysis for Electricity Generation in the 2023 IEPR* presentation from September 8, 2023, available at: https://efiling.energy.ca.gov/GetDocument.aspx?tn=252210&DocumentContentId=87216.
[7] See Pathways to Commercial Liftoff: Fireside Chat and Clean Hydrogen Deep-Dive Video, Department of Energy, for more information see minute 34 available at: https://www.youtube.com/watch?v=3i7qZfJ5G9Q.
[8] *See* 2022 Scoping Plan for Achieving Carbon Neutrality, CARB, November 16, 2022, available at: https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf. *See also* SB 100 Joint Agency Report, CEC, September 2021, available at: https://www.energy.ca.gov/sb100.

Actions to streamline the CPUC's permitting process for hydrogen infrastructure and implementing timetables for reviewing applications to construct this infrastructure would support a faster pace of development while ensuring that appropriate ratepayer protections are maintained. In evaluating potential changes, SDG&E urges the Joint Agencies to consider whether considering legislative changes may provide greater regulatory flexibility.

A clear and efficient permitting process will demonstrate to prospective market participants the State's commitment to growing hydrogen as a key resource for decarbonization. As well, it supports California's efforts to advance one of the nation's first hydrogen hubs, consistent with the ARCHES application to the DOE.[9]

IV. Hydrogen's ability to be stored and dispatched to support a highly intermittent, renewables-based grid makes it an ideal resource pairing for our "new normal" climate.

Hydrogen-based electricity generation can provide valuable support to an intermittent renewables-based grid. Climate change is driving erratic weather, which in turn drives erratic energy usage. Our "new normal" of unpredictable weather and shifting patterns is helping drive the need for reliable and dispatchable resources like hydrogen. As a dispatchable fuel, hydrogen can close the gap for days, weeks, and even months when intermittent renewables production and shorter duration energy storage such as batteries cannot keep up with energy demand. At the end of the day, storage is not generation.

V. CARB should work with a comprehensive set of industry, engineering and scientific community stakeholders to evaluate the magnitude of hydrogen leakage concerns for new, purpose-built hydrogen infrastructure serving the energy sector.

During the CEC's September 8th, 2023, Integrated Energy Policy Report Workshop on the Potential Growth of Hydrogen (IEPR Workshop), discussion surrounding the potential hydrogen of leakage and its climate impacts emerged.

SDG&E believes evaluation of actual leakage on new, purpose built, hydrogen systems will reveal that the leakage rates modeled by certain parties are overestimated, leading to misleading conclusions about the significance of atmospheric impact of errant hydrogen molecules. For example, experts at the National Oceanic and Atmospheric Administration (NOAA) Geophysical Fluid Dynamics Laboratory and the Université Paris-Saclay find that "a green hydrogen economy is beneficial in terms of mitigated carbon dioxide emissions for all policy-relevant time-horizons and leakage rates."[10]

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[9] In addition, note that to assist state and local permitting officials address applications for proposed hydrogen fueling stations and other hydrogen and fuel cell projects, DOE developed permitting tools that help identify model codes and standards related to hydrogen work. *See* "H2 Tools," U.S. Department of Energy (DOE), in collaboration with National Renewable Energy Laboratory (NREL) and Pacific Northwest National Lab (PNNL), available at https://h2tools.org/codes-standards/codes-standards-permitting-tools.

[10] Hauglustaine, D., Paulot, F., Collins, W. *et al.* Climate benefit of a future hydrogen economy. *Commun Earth Environ* **3**, 295 (2022). https://doi.org/10.1038/s43247-022-00626-z.

On the CEC's IEPR Workshop panel, "Potential Adoption of Hydrogen in Decarbonizing the Transportation Sector," panelists emphasized that leakage rates of any significance would not be tolerated by industry from either a safety or cost standpoint.[11] SDG&E agrees with this statement.

SDG&E recommends that the Joint Agencies work with diverse experts to study and evaluate pipeline and equipment leakage rates for new, purpose-built hydrogen systems as they are constructed in our state. In addition to investigating leakage rates, this analysis should include exploration of monitoring.

Conclusion

SB 1075 provided an important framework to facilitate the development of California's hydrogen economy. SDG&E looks forward to continued engagement with the Joint Agencies in this proceeding, as well as others such as the SB 100, Integrated Energy Policy Report, and efforts underway on the Hydrogen Market Development Strategy.

SDG&E staff welcome the opportunity to discuss our work in the hydrogen space with agency staff. If you have any questions, please do not hesitate to contact me.

Sincerely,

Sarah M. Taheri
Regulatory Affairs Manager
San Diego Gas & Electric Company

[11] IEPR Commissioner Workshop on the Potential Growth of Hydrogen Recording, CEC, September 8, 2023, available at: https://www.energy.ca.gov/event/workshop/2023-09/iepr-commissioner-workshop-potential-growth-hydrogen.