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Rajinder Sahota
Deputy Executive Officer – Climate Change and Research
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

Subject: Comments on Senate Bill 1075: Joint Agency Kickoff Workshop

Dear Ms. Sahota:

Southern California Gas Company (SoCalGas) appreciates the opportunity to provide public comments on the Senate Bill (SB) 1075 Joint Agency Kickoff Workshop.¹ Establishing a robust, fair and transparent market structure is of crucial importance for broad and affordable adoption of hydrogen to achieve the State’s greenhouse gas emission reduction mandates. The SB 1075 process is well suited to address these critical issues. Setting clear signals, establishing policy, and providing direction to the hydrogen market serves the public interest to help achieve carbon neutrality in California and beyond. The U.S. Department of Energy (DOE), the California Legislature, the California Public Utilities Commission (CPUC), the California Air Resources Board (CARB), the California Energy Commission (CEC), and other State agencies have clearly and repeatedly identified hydrogen as a key part of the solution to achieving carbon neutrality.² With Governor Gavin Newsom’s steadfast vision and his directive to the Governor’s Office of Business and Economic Development (GO-Biz) to develop California’s Hydrogen Market

¹ For purposes of SB 1075, the Joint Agencies include the California Air Resources Board (CARB), the California Energy Commission (CEC), and the California Public Utilities Commission (CPUC). The Workshop also included input from the Governor’s Office of Business & Economic Development (GO-Biz).

² The CPUC is considering the development of pilot projects to evaluate standard for the safe injection of clean renewable hydrogen into California’s common carrier pipeline system (CPUC Decision No. D.22-12-057, 2022 Cal. PUC LEXIS 558) and the Commission recently authorized SoCalGas to proceed with an initial phase of feasibility studies for a clean hydrogen transmission pipeline (D.22-12-055, 2022 Cal. PUC LEXIS 548).

The 2022 Scoping Plan Update notes, “This Scoping Plan also calls for accelerating the transition from combustion of fossil fuels to hydrogen.” CARB, *Scoping Plan Update*, December 2022, p.55. It later points out that, “Hydrogen produced from renewable resources and renewable feedstocks can serve a dual role as a low-carbon fuel for existing combustion turbines or fuel cells, and as energy storage for later use.” *Id.* at 204.

Development Strategy, “California is all in on clean, renewable hydrogen – an essential aspect of how we’ll power our future and cut pollution.”³

The Joint Agencies have provided leadership that promotes collaboration with key stakeholders on the future of hydrogen. It was encouraging that the recent workshop discussed the potential for hydrogen to decarbonize the economy, while providing a comprehensive overview of hydrogen opportunities occurring at the federal and state level, as well as by the private sector. As shown by slide 17 of CARB’s presentation,⁴ Senate Bill 1075 requires that the report include extensive analysis by CARB and other agencies regarding a variety of hydrogen topics and themes. The required analyses would benefit from stakeholders’ feedback [to reflect various perspectives and expertise on how to promote the development of hydrogen in the California economy]. We respectfully request that CARB provide more details on upcoming regulatory engagement, particularly how the analyses will be developed and will incorporate key stakeholder input.

SoCalGas provides the following comments on several fundamental issues in the SB 1075 analysis to catalyze the development of a robust hydrogen market: (1) provide clear regulatory support, oversight, and market signals for hydrogen; (2) establish a clear and consistent hydrogen definition; (3) establish a holistic land-use planning process for streamlined development of hydrogen infrastructure; (4) promote a just transition for the existing workforce; (5) utilize renewable energy that would otherwise be curtailed to produce hydrogen as seasonal energy storage to meet electricity demand; and (6) consider the benefits of hydrogen blending for decarbonization and market development.

(1) Clear regulatory support, oversight and market signals are critical to developing hydrogen’s role in California’s energy future.

Just as the once-tiny solar energy market needed support from clear regulations and strategic incentives to achieve its rapid growth, today’s nascent hydrogen market and its continued development would likewise benefit from greater market and regulatory certainty. The SB 1075 process can provide policy and economic signals to current and future market participants that hydrogen can be used across broad sectors of our economy. Hydrogen’s multi-sector solutions require developing and deploying hydrogen transmission, distribution and storage networks to connect producers and end-users. As indicated in CARB’s presentation, achieving SB 32’s 2030 greenhouse gas (GHG) emission reduction target requires a “462x increase in renewable hydrogen” and achieving carbon neutrality requires deployment “1,700x current hydrogen supply.”^{5,6}

³ “Governor Newsom Announces New Strategy to Develop a Hydrogen Economy of the Future”, State of California, August 8, 2023, for more information see <https://www.gov.ca.gov/2023/08/08/governor-newsom-announces-new-strategy-to-develop-a-hydrogen-economy-of-the-future/>.

⁴ SB 1075: Joint Agency Kickoff Workshop presentation, CARB, September 5, 2023, for more details see <https://ww2.arb.ca.gov/sites/default/files/2023-09/sb-1075-workshop-090523-presentation-carb.pdf>.

⁵ *Id.* at slides 5 and 11.

⁶ 2022 Scoping Plan for Achieving Carbon Neutrality, CARB, November 16, 2022, p. 9, available at: https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf.

Through the SB 1075 process, the Joint Agencies should align with policies that support the development of an open-access, common carrier hydrogen network. The 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

During the CEC’s Integrated Energy Policy Report (IEPR) Workshop (IEPR Workshop) on hydrogen’s potential growth in California, CEC Commissioner Andrew McAllister raised questions regarding which regulatory approach would be most appropriate for the developing hydrogen market. It was suggested that as market structure develops and as types and channels of off takers emerge, these factors would influence policies concerning the regulatory model for hydrogen.⁸ We offer some initial considerations.

Scaling up hydrogen production and its delivery to a broad range of end-users can establish decarbonization pathways for the most difficult-to-decarbonize sectors of the economy like transportation, hard-to-electrify industrial, and power generation. The SB 1075 process can bring into focus strategies that bolster hydrogen supply and delivery to these sectors and support the development and commercialization of hydrogen end-use technologies such as fuel cells and turbines. For example, the DOE recently released a request for proposal to seek an independent entity to administer a demand-side initiative working in collaboration with selected Regional Clean Hydrogen Hub grantees to help develop hydrogen offtake opportunities.⁹ To the extent co-location of production and end-use may not be practical or feasible, transport and delivery is a critical hydrogen market element to connect hydrogen supply and demand.

In addition, investing in “clean firm power” (e.g., dispatchable generation resources) is necessary to support electric system reliability, and we encourage the Joint Agencies to support such investments. Examples of clean firm power include hydrogen fuel cells and hydrogen combustion turbines, natural gas generation with carbon capture and storage, and geothermal power.¹⁰ Through the Scoping Plan, CARB identified that approximately 9 gigawatts (GW) of hydrogen combustion

⁷ “Pathways to Commercial Liftoff: Fireside Chat and Clean Hydrogen Deep-Dive,” Department of Energy, March 23, 2023, at 34:00, available at: <https://www.youtube.com/watch?v=3i7qZfJ5G9Q>.

⁸ 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>.

⁹ “U.S. Department of Energy Seeks Independent Entity for New Demand-Side Initiative to Accelerate Clean Hydrogen Economy”, DOE, September 14, 2023, available at: <https://www.energy.gov/oced/articles/us-department-energy-seeks-independent-entity-new-demand-side-initiative-accelerate>. See also “Biden Harris Administration to Jumpstart Clean Hydrogen Economy with New Initiative to Provide Market Certainty and Unlock Private Investment”, DOE, July 5, 2023, available at: <https://www.energy.gov/articles/biden-harris-administration-jumpstart-clean-hydrogen-economy-new-initiative-provide-market>.

¹⁰ 2022 Scoping Plan for Achieving Carbon Neutrality, CARB, December 2022, p. 203, available at: <https://ww2.arb.ca.gov/sites/default/files/2023-04/2022-sp.pdf>.

capacity would be needed to meet 2045 targets.¹¹ Independent third-party modeling analysis has also shown the need and value of clean firm power to maintain reliability in an increasingly decarbonized future.¹²

This is consistent with SoCalGas' analysis in *The Evolution of Clean Fuels in California* which found that deployment of clean fuels, like hydrogen, to support a reliable electric sector can catalyze clean fuels adoption in other hard-to-abate sectors of the economy by leveraging the build out of shared clean fuels infrastructure. The modeling results indicated that while more battery, solar, and wind resources will be needed, clean firm generation is critical to balancing the grid and preventing service disruptions with its unique ability to follow energy consumption fluctuations.¹³ Relatedly, during the recent SB 100 kickoff workshop, CARB Chair Liane Randolph posed questions on the importance of electric system reliability such as whether historical planning efforts are sufficient for the levels of electrification the state seeks. And due to impacts of climate change whether there is a need for more energy infrastructure than what is planned for today, especially in vulnerable communities.¹⁴

Multiple analyses point to the need for clean firm power and the Joint Agencies should explore the use of combustion as a dispatchable clean firm power resource. Use of clean and renewable hydrogen in the power generation sector supports energy system reliability but also can help achieve significant air quality and GHG emissions reductions benefits. In addition, scaling up the use of clean and renewable hydrogen in power generation will facilitate its adoption in a number of hard-to-electrify sectors, such as the industrial and mobility sectors. Delivery of clean and renewable hydrogen through dedicated, open access, common carrier pipelines is crucial to meeting the demand.

¹¹ *Ibid.*

¹² "California Needs Clean Firm Power, and So Does the Rest of the World", Environmental Defense Fund (EDF), Clean Air Task Force, Harvard Center for the Environment, p. 2, available at: <https://www.edf.org/sites/default/files/documents/SB100%20clean%20firm%20power%20report%20plus%20SI.pdf>.

¹³ SoCalGas' July 2023 *The Evolution of Clean Fuels in California* Reliability Analysis, available at <https://issuu.com/stfrd/docs/cleanfuelsreliabilityreportjuly23?fr=sNDA4OTYwNzQ4NTk>, reveals how clean fuels like clean hydrogen and renewable natural gas (RNG) offer a solution to keep the electric grid reliable as California scales up intermittent renewable resources and electric demand. The Analysis expands on the company's [2021 Clean Fuels Study \(CFS\)](#) finding that infrastructure development for the delivery of clean fuels like hydrogen could support critical power generation and drive further adoption of clean fuels solutions for other hard-to-electrify sectors in California. The Reliability Analysis specifically modeled the High Clean Fuels Scenario, which was a scenario designed to understand the impact of high reliance on clean fuels for decarbonization. It is assumed in this scenario that drop-in fuels would help to decarbonize the system.

¹⁴ SB 100 Kickoff Workshop Recording, CEC, August 22, 2023, at 3:18:00 available at: <https://www.energy.ca.gov/event/workshop/2023-08/senate-bill-100-kickoff-workshop>.

(2) Establishing clear and consistent definitions of hydrogen to be used in funding opportunities, procurement, and modeling efforts will help set boundaries and drive the market forward.

SoCalGas recommends that the Joint Agencies work to establish clear definitions of hydrogen to help provide market certainty. Without clear guidance, open-ended or undefined terms could create regulatory and market uncertainty as to whether these technologies will be included as eligible resources. SoCalGas recommends that power generation fueled by hydrogen be expressly categorized as a renewable resource that is included in the Renewable Portfolio Standard for the SB 1075 analysis. In the SB 1075 analyses, clean hydrogen should also be categorized as a zero-carbon resource.¹⁵ Alignment of clean fuels and carbon management, including in terminology and potential pathways, must run in parallel with other state planning efforts. The SB 1075 forum is the appropriate venue to define the use cases for hydrogen. This effort will provide valuable inputs which can form the basis of recommendations to the legislature, integrated into Senate Bill 100 modeling, and employed in developing infrastructure for clean fuels for hard-to-electrify sectors—while maintaining eligibility for federal incentives.

(3) An essential part of energy planning, especially for new energy resources, is efficient permitting and holistic land-use planning with stakeholder engagement.

As government agencies have identified in the past, an efficient, streamlined permitting process is crucial for energy planning. Streamlined permitting supports more rapid integration of renewable resources into California’s energy system to meet SB 100 and Scoping Plan targets. It also supports a smoother phase out of heavy-duty diesel trucks, in line with CARB’s Advanced Clean Fleets rule and transportation decarbonization objectives.

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 determined¹⁶ to be a necessary part of our decarbonized energy portfolio.

Further, 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, SoCalGas urges the Joint Agencies to consider where legislative changes may help by offering additional 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. It also supports the state’s efforts to

¹⁵ As used here, the term clean hydrogen is consistent with the federal definition in 42 USC 16166.

¹⁶ 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>.

advance one of the nation’s first hydrogen hubs, consistent with the ARCHES application to the DOE.¹⁷

Broad stakeholder engagement in establishing a process and path forward will support successful and effective outcomes. For example, working groups like the Desert Renewable Energy Conservation Plan and the Renewable Energy Transmission Initiative, which were led by state and federal governments with Tribal and local government representatives, including stakeholders such as developers, utilities, environmental groups, and community-based organizations, demonstrate how such inclusive land use planning can streamline permitting efforts and achieve positive outcomes for important clean energy developments. Hydrogen infrastructure development would benefit from a similar joint stakeholder, government-led process to manage land use associated with production, delivery corridors, storage, processing, and end-use.

(4) Developing the energy workforce of the future to construct, install, and maintain hydrogen infrastructure is a key priority.

SoCalGas is pleased to see that consultation with the California Development Board and labor and workforce organizations will be part of the SB 1075 process. Estimates show that a mature domestic hydrogen market could deliver approximately \$140 billion per year in revenue and support 700,000 jobs nationally by 2030.¹⁸ SoCalGas encourages the Joint Agencies to include gas utilities in the workforce development consultation process, as SoCalGas is already evaluating workforce planning and training as part of Phase I of its Angeles Link Project.

(5) Renewable energy that would otherwise be curtailed can be utilized to produce hydrogen that serves as seasonal energy storage to meet electricity demand.

During the CEC’s IEPR Workshop, CEC staff presented preliminary analysis on the amount of renewable capacity needed to produce hydrogen that found “1 megawatt (MW) of renewable power produces enough hydrogen to replace only 0.142 MW of natural gas combined cycle (NGCC) power,” resulting in a seven times difference in capacity needed. However, this analysis should be supplemented to consider the role that hydrogen can play in utilizing otherwise curtailed renewable energy.

Another consequence of higher levels of intermittent renewable power is higher levels of renewable power that must be curtailed. Figure 1 below shows CAISO’s total monthly wind and solar curtailment for 2014-2023. As renewable capacity in the state grows, so does the amount of

¹⁷ 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>.

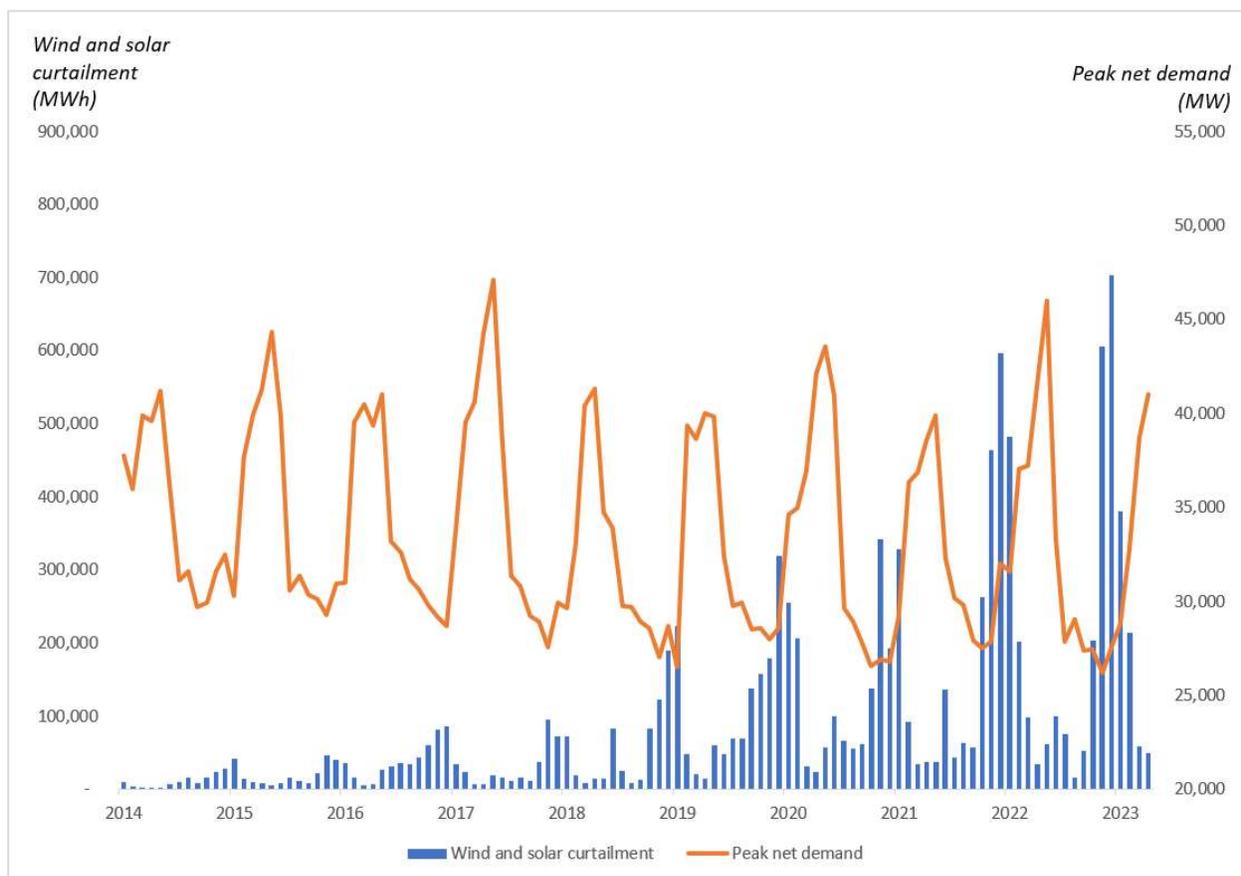
¹⁸ “Hub Hopefuls: US policy spurs the clean hydrogen transition”, S&P Global Market Intelligence, June 12, 2023, for more information see <https://www.spglobal.com/marketintelligence/en/news-insights/latest-news-headlines/hub-hopefuls-us-policy-spurs-the-clean-hydrogen-transition-76141821>.

curtailed power. Peak curtailment typically occurs during mild, sunny days in spring months, such as March or April.

Failing to store or utilize this Springtime curtailed power is akin to a 0 percent efficiency or reducing 1 MW of renewable power to 0 MWs. Instead, converting otherwise curtailed energy to hydrogen will result in retaining 0.142 MW that can be saved for utilization during future high demand days or months of low renewable production. Of the high demand days, the annual peak net demand tends to occur during the peak heat season in the late summer months. Hydrogen created from excess renewable energy that would have otherwise been curtailed can be a seasonal energy storage resource able to better match supply to meet demand at a later time. California's transition toward utilization of higher levels of renewable energy is anticipated to result in steeper evening ramps and greater net peak demand on hot summer evenings and during the winter season. This suggests there will be a critical need for seasonal and long-duration energy storage resources such as hydrogen, in addition to battery storage, as California reaches its carbon neutrality goals.¹⁹

¹⁹ Part of SB 1075 requires that CARB and CAISO analyzing how curtailed electric generation can be better utilized to help meet state goals to produce green hydrogen. See requirement 4.

Figure 1: CAISO data on wind and solar curtailment and net demand²⁰



(6) Hydrogen blending offers the potential for growing the nascent hydrogen market while reducing carbon.

If addressed and implemented properly, blending hydrogen into the existing gas system can serve as a tool to reduce costs for hydrogen through delivery at scale, decarbonize our existing means of energy delivery, provide new opportunities for our workforce, and support energy reliability. Decarbonizing the economy is a complex challenge that will require a multi-faceted approach. The CPUC mandated that SoCalGas and California’s other gas investor-owned utilities (gas IOUs) file applications proposing hydrogen blending pilot programs,²¹ the objective of which is to eventually enable the use of hydrogen blending as an additional decarbonization tool to achieve carbon neutrality, while supporting reliability and resiliency of the energy sector. The UC Riverside’s

²⁰ CAISO data on wind and solar curtailment and net demand, available at: <http://www.caiso.com/informed/Pages/ManagingOversupply.aspx#dailyCurtailment>.

²¹ D.22-12-057, OP 7 at 68-69. The Projects’ objective is to gather key technical, operational, and safety information to support the development of such a standard of up to 20% hydrogen. The Projects’ results will contribute to a broader evaluation framework for hydrogen blending in California’s gas infrastructure as an additional decarbonization tool to complement electrification.

Hydrogen Blending Impacts Study, sponsored by the CPUC, found that “[h]ydrogen blending into California’s natural gas pipeline infrastructure can help accelerate the transition towards the use of clean hydrogen as a fuel and energy storage medium, and help the state meet a number of climate and air quality goals.”²² However, the recommendations of UC Riverside’s study also note that “there are knowledge gaps in several areas, including those that cannot be addressed through modeling or laboratory scale experimental work, and it is critical to conduct real world demonstration of hydrogen blending under safe and controlled conditions.”²³ Therefore, the gas IOUs are proposing a variety of live hydrogen blending pilot projects that will better inform some of these knowledge gaps, and could set California on a path towards a statewide hydrogen injection standard.²⁴

This is a pivotal time in the energy transition space and joint agency planning efforts like SB 1075 are critical to building a policy environment that is supportive of a developing hydrogen market. CARB’s leadership in this space is needed to evaluate the complementary pathways that can decarbonize the California economy, which can help determine how California will lead the nation and global markets in the hydrogen sector. We look forward to continuing to actively engage with the Joint Agencies and stakeholders throughout this process.

Respectfully,

/s/ Kevin Barker

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²² CPUC Final Report, Hydrogen Blending Impacts Study (prepared by UC Riverside), July 18, 2022, p. 4 and 114, available at <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M493/K760/493760600.PDF>.

²³ *Id.*

²⁴ A.22-09-006, Assigned Commissioner’s Scoping Memorandum and Ruling (filed March 3, 2023) at 7 (ruling that that the Joint IOUs must meet and confer and coordinate a comprehensive joint amended application of all four utilities proposing hydrogen blending pilot projects “to be filed in the instant proceeding docket, to the extent possible.”)