BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

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CALIFORNIA HYDROGEN BUSINESS COUNCIL REPLY BRIEF REGARDING THE APPLICATION OF SOUTHERN CALIFORNIA GAS COMPANY (U 904 G) FOR AUTHORIZATION TO IMPLEMENT REVENUE REQUIREMENT FOR COSTS TO ENABLE COMMENCEMENT OF PHASE 2A ACTIVITIES FOR ANGELES LINK

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The California Hydrogen Business Council (CHBC) submits this Reply Brief regarding the Application of Southern California Gas Company (SoCalGas) for Authorization to Implement Revenue Requirement for Costs to Enable Commencement of Phase 2 Activities for Angeles Link. CHBC appreciates the opportunity to comment on this Application as a party to the proceeding.

CHBC is the longest established and largest hydrogen trade association in the United States, comprised of approximately 90 companies, agencies, and individuals

involved in the business of hydrogen.[1] CHBC members represent all sectors of hydrogen and the supply chain across its entire economic ecosystem in California, from production to delivery to storage and end use. Our mission is to inform policymakers and stakeholders on the substantial benefits of hydrogen and support the commercialization of hydrogen and fuel cells in the energy and transportation sectors to achieve California's climate, air quality, and decarbonization goals.

CHBC submits these comments pursuant to the July 31 Assigned Commissioner's Scoping Memo and Ruling in the proceeding. This testimony will focus on one of the Phase 2A issues raised in Commissioner Reynolds' memo, Issue 4, regarding appropriateness of ratepayer cost responsibility.

I. Investments in an Angeles Link pipeline would have broad public benefit

CHBC notes that the main contentions made in our Opening Brief remain the case: that investments in an Angeles Link pipeline would have broad public benefit, and because the project has broad public benefit, it is appropriate to have SoCalGas customers bear the costs requested in the application.

The Angeles Link pipeline would have the capacity to deliver up to 1.5 million metric tons of hydrogen per year to SoCalGas territory in Southern California. There are many potential off-takers for this hydrogen, including transit agencies using hydrogen powered buses, such as Foothill Transit in West Covina and Sunline Transit in Thousand Palms. The Ports of Los Angeles and Long Beach also would be sites for end use of hydrogen to power drayage trucks and forklifts, with the potential to power oceangoing vessels, shore power, and trucks that move freight in and out of the ports. Angeles Link could supply hydrogen refueling stations for light-duty cars and medium-duty and heavy-duty trucks, as well as southern California power generation plants, adding decarbonized resilience power to the state's energy system.

[1] See a complete list of CHBC members at https://members.californiahydrogen.org/directory.

Having a robust supply of hydrogen delivered by Angeles Link would contribute to the hydrogen cost reduction, which is the primary barrier to hydrogen's adoption currently. Cost reduction can unlock hydrogen potential for broad environmental, energy, and economic benefits.

II. Hydrogen has many benefits compared to an energy grid that electrifies everything

Broadly speaking, there are two paths to decarbonize the energy grid. One is to "electrify everything" and power electricity via solar, wind, nuclear, geothermal, and hydropower resources. The other path is to electrify many aspects of the grid but to also allow for sufficient gaseous molecules to power the grid, while "decarbonizing" those molecules. Hydrogen fits into the latter path as a way to decarbonize molecules. This discussion will compare a strategy of "electrifying everything" to one that includes hydrogen as a part of the solution.

a. There are technical barriers to a strategy of electrifying everything

Barriers to building high-voltage transmission lines threaten to fundamentally constrain electrification of the economy. Studies from the National Renewable Energy Laboratory in collaboration with researchers at Princeton University find that a national "high renewables scenario" in which the economy is electrified and relies upon clean, renewable energy, will require a two- to five-fold increase in capacity of the transmission system.[2] Without such an expansion in transmission, it will be impossible to transport electricity from sites of production to population centers.[3]

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[2] Noah Mitchell-Ward, "To Enable the Clean Energy Future, Electric Transmission Planning Needs an Upgrade," Yale Environmental Review, (March 2022), https://environment-review.yale.edu/enable-clean-energy-future-electric-transmission-planning-needs-upgrade

[3] Mitchell-Ward.

California will require an additional 7-8 GW of capacity per year to meet its decarbonization targets.[4] California Independent System Operator's Transmission Development forum indicated that, on average, the time between transmission line approval and the beginning of construction is 7+ years.[5] The time from application to project completion can take upwards of a decade, a challenge that threatens the entirety of California's clean electricity goals.[6]

In addition, expanding high-voltage transmission lines requires a substantial number of new transformers. Some predictions indicate the United States could require an increased transformer supply of 260% by 2050 in order to electrify the economy; however, delivery of a new transformer ordered today could take up to three years due to supply chain challenges.[7]

This analysis defeats the premise posited by UCAN in their Opening Brief, who prefer electrification as "more cost-effective and faster."[8]

b. Relying on solely electricity makes the energy system vulnerable to price spikes

Electrification relies upon power sources such as wind, solar, and hydropower, each of which are inherently intermittent. Furthermore, each of these sources is particularly vulnerable to fluctuations under different weather conditions.[9] These

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[4] Vivian Yang, "Transmission Is Holding up California's Clean Energy Transition (Part 1 of 3)," The Equation, (June 2024), https://blog.ucs.org/vivian-yang/transmission-is-holding-up-californias-clean-energy-transition-part-1-of-3/

[5] Yang.

[6] Yang.

[7] Herman K. Trabish, "Transformer supply bottleneck threatens power system stability as load grows," Utility Dive, (February 2025), https://www.utilitydive.com/news/electric-transformer-shortage-nrel-niac/738947/

[8] Opening Brief of the Utility Consumers Action Network, September 3, 2025, at page 14. https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M578/K795/578795933.PDF

[9] Montel Team, "How to manage price volatility in energy markets," Montel, (September 2024), https://montel.energy/resources/blog/effective-strategies-for-managing-price-volatility-in-energy-markets

generation capacity limitations pose dangers to grid reliability as it is difficult to both prevent and predict supply shortfalls that can lead to outages. Supply restrictions also contribute to electricity price spikes that directly harm consumers.

A 2021 study published in *Nature* analyzed 39 years of hourly reanalysis data to evaluate the ability of solar and wind resources to meet demand across 42 countries. The researchers concluded that even assuming perfect transmission and annual generation precisely equals annual demand, consumers could expect 72-91% of demand to be met.[10] Thus, even in electricity systems which meet 90% of demand, consumers are left with hundreds of hours of unmet demand annually.[11]

Hydrogen energy can contribute to the resolution of these supply shortfalls. Broadly speaking, diversification of electricity sources is the best way to hedge against supply volatility.[12] Hydrogen specifically is a solution to grid reliability concerns. Clean hydrogen can support firm generation while addressing short-duration ramping and grid services.[13]

UCAN argues for electrification, which relies on the idea that investments in energy storage options, such as grid-scale batteries, is a better solution than further investment in hydrogen. However, studies indicate there are many advantages of relying on hydrogen energy as opposed to batteries. First, hydrogen energy has been found to have a higher Energy Stored on Investment ratio, which describes the ratio of electrical energy returned by the device over its lifetime compared to the electrical-equivalent

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[10] Dan Tong et al., "Geophysical constraints on the reliability of solar and wind power worldwide," Nature Communications 12, (October 2021): 1-12, https://www.nature.com/articles/s41467-021-26355-z

[11] Tong et al., 1, 6.

[12] Montel Team.

[13] Wood Mackenzie, "Angeles Link Phase 1 – High-Level Economic Analysis and Cost Effectiveness," SoCal Gas, (December 2024), https://www.socalgas.com/sites/default/files/alproject/Angeles-Link-Phase-1-Final-High-Level-Economic-Analysis-&-Cost-Effectiveness.pdf.

energy required to build the device.[14] In other words, hydrogen energy makes more efficient use of manufacturing energy inputs than batteries.[15] Secondly, while batteries have a high round-trip efficiency, hydrogen provides a similar overall energy return and its efficiency will likely increase as electrolyzer and fuel cell performance improves.[16] Overall, hydrogen is a superior option for grid storage, reliability, and electricity prices.

A system that includes hydrogen reduces costs overall compared to an all-electric system, as shown by a study published in *One Earth* in 2024, cited in our Opening Brief.[17] Using an advanced computational model, researchers concluded hydrogen deployment can reduce overall energy decarbonization costs by 15-22%.[18]

c. Some sectors of the economy are hard to electrify

Hydrogen can meet California's clean energy needs by decarbonizing sectors that are hard to electrify. Cement, concrete, aviation, marine applications, medium- and heavy-duty transportation, and manufacturing all have shown advantages for hydrogen solutions over electrification.

d. Building Angeles Link would have further societal benefits

Concurrent with the greenhouse gas benefits of hydrogen are its localized air quality benefits. This benefit has become increasingly important with recent changes to federal support for emission reduction policy and programs, including the decision by California to withdraw waiver requests from the federal EPA for some emissions programs. Hydrogen can be used to displace diesel as a fuel for heavy duty trucking, transit buses,

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[14] Matthew A. Pellow et al., "Hydrogen or batteries for grid storage? A net energy analysis," Energy & Environmental Science 7, (2015), https://pubs.rsc.org/en/content/articlelanding/2015/ee/c4ee04041d

[15] Pellow et al.

[16] Pellow et al.

[17] Paul Wolfram et al., "The hydrogen economy can reduce costs of climate change mitigation by up to 22%," One Earth 7, no. 5 (May 2024): 885-895, https://www.sciencedirect.com/science/article/pii/S2590332224002021#sec2

[18] Wolfram et al., 886.

powering locomotives, and drayage trucks used at ports. Each of these applications would displace diesel fuel, which has significant NOx and Particulate Matter emissions associated with it. Hydrogen is the favored solution to heavy duty applications as it is more energy dense than batteries and has a longer range for similarly-sized power packs.

Building Angeles Link would also have job creation benefits and help transition the oil and gas labor force. Many labor groups support hydrogen energy to transition to a low-carbon economy. Yvonne Wheeler, President of the Los Angeles County Federation of Labor, says clean hydrogen represents "real and meaningful opportunities" for skilled workers in California's existing energy sector to participate in the transition.[19] Chris Hannan, President of the State Building and Construction Trades Council of California, declared hydrogen "replacement work" because it is an "industrial process that still uses highly skilled construction workers."[20]

Electrification, on the other hand, demands a more challenging transition for workers as the same gas infrastructure, knowledge, and skills will not transfer to a newly electrified economy.

III. SoCalGas's proposal is crucial to achieving hydrogen's broad benefits

The Angeles Link project is the largest proposed dedicated hydrogen pipeline in California. Its construction would increase manifold hydrogen production and hydrogen offtake in SoCalGas territory. This would reduce the cost of hydrogen, making it economical to use hydrogen in the hard-to-electrify applications cited above.

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[19] Molly Weedn, "Labor Unions Unite in Support of a Hydrogen Hub in California," ARCHES, (April 2023), https://archesh2.org/labor-unions-unite-in-support-of-a-hydrogen-hub-in-california/

[20] International Trade Union Confederation.

A study of the Angeles Link project finds construction of a new 450-mile pipeline for transport of clean renewable hydrogen would be the most cost-effective means of delivering hydrogen at-scale to Central and Southern California.[21]

IV. As the project will have broad public benefits, it is appropriate to allocate its cost across a broad spectrum of customer classes

As a common carrier pipeline, the Angeles Link project will have the broad public benefits outlined above, including greenhouse gas emission reduction, air pollution reduction in local communities, and job creation. As these benefits will be distributed broadly, it is appropriate to allocate the costs of the Phase 2 activities across a broad spectrum of customer classes. If it becomes clear that the project only benefits one set of customer classes, the Commission can recharacterize who will bear the cost in a later ruling in the process.

Intervenors who object to application of costs across all existing natural gas customers do not dispute the broad environmental and economic benefits that Angeles Link could bring the region. Environmental Defense Fund, for example, simply states the pipeline only benefits "hard to decarbonize" applications,[22] ignoring that even only deploying in some applications can have widespread air quality, climate and job benefits. They also do not address the ability of further supply to bring down the cost of hydrogen, which benefits many end uses. And while TURN cites multiple examples of how to apply costs across various classes,[23] they do not show this application does not potentially help all customer classes. As such, CHBC still finds it appropriate to distribute costs among existing SoCalGas ratepayers, for the reasons stated above.

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[21] Wood Mackenzie, "Angeles Link Phase 1 – High-Level Economic Analysis and Cost Effectiveness," SoCal Gas, (December 2024), https://www.socalgas.com/sites/default/files/alproject/Angeles-Link-Phase-1-Final-High-Level-Economic-Analysis-&-Cost-Effectiveness.pdf

[22] Environmental Defense Fund Opening Brief on Phase 2a Issues, September 3, 2025, A.24-12-011, at page 13. https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M579/K066/579066941.PDF

[23] TURN Opening Brief on Phase 2a Issues, September 3, 2025, A.24-12-011, at page 25. https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M579/K066/579066210.PDF

V. Conclusion

The CHBC continues its strong support for the SoCalGas Phase 2 Angeles Link Application and appreciates the opportunity to participate in this proceeding. Thank you for your consideration of this response.

DATED: October 17, 2025 Respectfully submitted,

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