Application: A.24-12-XXX
Exhibit No.:
Witness: Maryam Brown

PREPARED DIRECT TESTIMONY OF
MARYAM BROWN
ON BEHALF OF
SOUTHERN CALIFORNIA GAS COMPANY

(CHAPTER 1 - POLICY)

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

December 20, 2024

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PREPARED DIRECT TESTIMONY OF
MARYAM BROWN
(POLICY)

I. INTRODUCTION AND OVERVIEW OF REQUEST

My name is Maryam S. Brown, and I am the President of Southern California Gas Company (SoCalGas or Company). My testimony supports the Application for Authorization to Implement Revenue Requirement for Costs to Enable Commencement of Phase 2 Activities for Angeles Link (Application). The Application asks the Commission to authorize SoCalGas to implement a revenue requirement for forecasted costs of executing Phase 2 activities and create a new two-way balancing account effective as of the date of the Application to track actual and authorized costs for refund to customers or further review in the event actual costs are less than or exceed the authorized forecast, respectively. As described in the Testimonies of Amy Kitson and Brian Walker, in Phase 2, SoCalGas proposes to (i) identify a preferred system route; (ii) conduct refined and additional analyses (including refined system design, safety, environmental, and related work) to advance Angeles Link to a 30% engineering design; (iii) develop a Class 3 estimate; (iv) conduct programmatic activities (e.g., project governance, workforce, training, and risk management plans, affordability considerations and economic analyses); and (v) continue engaging with stakeholders and communities. In this testimony, I explain why advancing to Phase 2 is justified now and why authorizing implementation of a revenue requirement for forecasted costs to conduct Phase 2 activities is warranted.

Decision (D.) 22-12-055 (Phase 1 Decision) declared that "it serves the public interest for SoCalGas to perform feasibility studies on the Project immediately."[1] The Phase 1 Decision therefore authorized SoCalGas to record the costs of certain feasibility studies for, and other activities associated with, Angeles Link to the Angeles Link Memorandum Account (ALMA). Among other supporting reasons, the Phase 1 Decision cited the Infrastructure Investment and Jobs Act (IIJA), which appropriated $8 billion to develop regional clean hydrogen hubs across America.[2] Accordingly, the Phase 1 Decision directed SoCalGas to join the Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES) in support of the State of California's

[1] Phase 1 Decision at 16.

[2] *Id.* at 2.

application for federal funding for a California hydrogen hub (California Hydrogen Hub).[3] The Phase 1 Decision also acknowledged that Angeles Link "could help position California to receive federal funding provided through the IIJA."[4]

SoCalGas has now fully complied with all of these directives, with the results supporting advancing Angeles Link to Phase 2. As described in the Testimony of Neil Navin, SoCalGas executed the studies and activities enumerated in the Phase 1 Decision which collectively demonstrate that Angeles Link is viable, technically feasible, cost effective, and can provide multiple benefits. SoCalGas joined ARCHES in support of its application to the U.S. Department of Energy (DOE) for the California Hydrogen Hub, a network of clean hydrogen producers, consumers, and connective infrastructure to build and expand clean renewable hydrogen infrastructure across California. ARCHES' application included Angeles Link, detailing the San Joaquin Valley and Lancaster segments (Hub Segments), to transport hydrogen within the Hub. That application was selected by DOE after a competitive process and resulted in ARCHES signing a Cooperative Agreement with DOE for the California Hydrogen Hub to receive up to $1.2 billion in federal funding. The State's support for clean renewable hydrogen, as set forth in the Governor's Office of Business and Economic Development's (GO-Biz) December 2023 framework for the California Hydrogen Market Development Strategy,[5] coupled with the California Hydrogen Hub's selection to receive federal funds portends an important ramp-up for California's hydrogen economy, and the connective infrastructure must be in place to meet that moment. Indeed, Angeles Link is an integral part of the California Hydrogen Hub and will in the near term provide a foundation for California's hydrogen economy and also meet longer-term demand through 2045 to help achieve the decarbonization goals of the State of California. DOE's funding for the California Hydrogen Hub is contingent on certain project milestones being met in accordance with a set timeline and, as described by Mr. Navin, SoCalGas understands ARCHES envisions facilities and infrastructure—including portions of Angeles Link—to begin being operational by December 31, 2033. Accordingly, SoCalGas aims

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[3] *Id.* at 2, 33, 68 (Conclusion of Law (COL) 12.

[4] *Id.* at 62 (Finding of Fact (FOF) 10).

[5] GO-Biz, *California Hydrogen Market Development Strategy Framing Document* (December 2023), *available at*: https://business.ca.gov/wp-content/uploads/2023/12/H2-Strategy-Framing-Doc-12-26-23.pdf.

to align timing expectations and sharing of other relevant market, community, or technical information with ARCHES to support the California Hydrogen Hub to best leverage federal funds for the benefit of all Californians and unlock the hydrogen economy. As further detailed in the Testimony of Mr. Navin, to best position SoCalGas and California to meet DOE's and ARCHES' timing expectations for the California Hydrogen Hub to be operational, Phase 2 activities should be commenced promptly.

DOE has recognized that pipelines are the most affordable means to transport hydrogen at scale,[6] and ARCHES has stated that a "connective infrastructure that is open to all is critical for the efficient movement of hydrogen within the ecosystem from production to end use."[7] Angeles Link would serve as a key "first mover" open-access[8] clean renewable hydrogen transportation pipeline system dedicated to public use, providing the connective infrastructure and certainty that hydrogen producers and end users need to invest in clean renewable hydrogen and enable its use at scale.

Advancing Angeles Link by conducting Phase 2 activities could support California's clean energy goals and the pursuit of many benefits for all SoCalGas customers and the communities SoCalGas serves. Angeles Link could support the State's decarbonization efforts, including by supporting the reliability and resiliency of California's electric grid—at a time when demand for electricity is increasing. Along with other clean energy projects and reliability efforts, such as those being evaluated in the Senate Bill (SB) 380 proceeding (I.17-02-002), Angeles Link would also provide a clean alternative fuel that could alleviate natural gas demand in the Los Angeles Basin, facilitating reduced reliance on the Aliso Canyon natural gas storage facility while maintaining energy and electric reliability for the region.[9] If constructed, Angeles

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[6] DOE – Alternative Fuels Data Center, *Hydrogen Production and Distribution, available at:* https://afdc.energy.gov/fuels/hydrogen_production.html.

[7] ARCHES H2, Technical Submission to DOE (April 2023) at 28, *available at*: https://archesh2.org/wp-content/uploads/2024/08/ARCHES-Technical-Volume-Redacted.pdf.

[8] Consistent with Public Utilities Code § 784, SoCalGas proposes to provide "nondiscriminatory open access to its gas pipeline system [Angeles Link] to any party for the purposes of physically interconnecting with the gas pipeline system and effectuating the delivery of gas," subject to compliance with Commission-approved pipeline access rules and clean renewable hydrogen standards.

[9] *See* Investigation (I.) 17-02-002, Order Instituting Investigation pursuant to Senate Bill 380 to determine the feasibility of minimizing or eliminating the use of the Aliso Canyon natural gas storage

Link could also bring benefits to existing ratepayers, future customers, and numerous California communities, including enhanced energy system reliability and resiliency, reduced greenhouse gas (GHG) emissions, improved air quality and related public health benefits, job creation, and economic opportunities. The development process for Angeles Link, including Phase 2, would provide opportunities for stakeholders and communities to engage in planning at the early stages of project siting and design—well before the public is generally even made aware of a contemplated project. This transparency would extend even beyond the Commission's regulatory process; if constructed, Angeles Link would be subject to Commission oversight and rate regulation—unlike private merchant pipelines.

As set forth in the Testimonies of Ms. Kitson and Mr. Walker, SoCalGas has prepared a detailed Phase 2 cost forecast based on planned Phase 2 activities for Commission review and approval as part of this Application. In order to promote fairness to the utility and the affordability of Phase 2 costs, and in light of the benefits to all SoCalGas ratepayers, the Application requests that (a) the forecasted costs for Phase 2 activities be broadly allocated across all ratepayers, and (b) the Commission authorize implementation of a revenue requirement to recover those forecasted costs to smooth any increases in rates over time and save ratepayers an estimated $31 million in accrued interest. Based on the Framework for Affordability Considerations (Affordability Framework) discussed in the Testimony of Mr. Navin, and as further described in the Testimony of Ms. Kitson, SoCalGas will continue to work with relevant stakeholders and explore pathways to promote affordability for its ratepayers in Phase 2 and beyond.

II. PROCEEDING TO PHASE 2 WOULD ADVANCE PURSUIT OF ANGELES LINK'S MANY BENEFITS AND SUPPORT THE AFFORDABILITY OF THE CLEAN ENERGY TRANSITION

The Phase 1 Decision found that authorizing a memorandum account to record costs for Phase 1 of Angeles Link was in the public interest for numerous reasons, and that the benefits of clean renewable hydrogen could accrue not only to direct end users, but more broadly to the State, communities in SoCalGas's service territory, and all SoCalGas ratepayers:

facility located in the County of Los Angeles while still maintaining energy and electric reliability for the region.

- "The Angeles Link Project has the potential to bring public interest benefits to the state and especially the Los Angeles area, because clean renewable hydrogen has the potential to decarbonize the state's and the Los Angeles Basin's energy use and bring economic opportunities and new jobs to the Los Angeles region."[10]
- "The findings from numerous studies demonstrate that clean renewable hydrogen is a potential solution to help decarbonize the state's and the Los Angeles Basin's energy use because it is one of the only few viable carbon-free energy alternatives for hard-to-electrify industries, electric generation, and the heavy-duty transportation sector."[11]
- "The data and analyses that SoCalGas plans to share with stakeholders resulting from its Phase One studies should be beneficial to the development of the clean renewable hydrogen industry and thus serve the public interest."[12]
- "Investing in the Angeles Link Project serves the public interest by potentially bringing hydrogen at scale to lower the costs of hydrogen and creating economic opportunities and new jobs."[13]
- "SoCalGas' commitment to engage and consult with stakeholders representing a diverse set of interests through the [Planning Advisory Group] serves the public interest, because it not only provides transparency of the planning process, but also ensures that all interests affected by the Project are considered in the planning process."[14]
- "The Angeles Link Project could help position California to receive federal funding provided through the IIJA."[15]

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[10] Phase 1 Decision at 61 (FOF 1).

[11] *Id.* at 61-62 (FOF 2).

[12] *Id.* at 62 (FOF 7). *See also, id.* at 58 (having SoCalGas's Phase 1 studies available to the public "will benefit both the public and parties interested in the emerging clean renewable hydrogen marketplace.").

[13] *Id.* at 62 (FOF 3).

[14] *Id.* at 62 (FOF 6).

[15] *Id.* at 62 (FOF 10).

Angeles Link also has the potential to bring benefits in the form of enhanced energy system reliability and resiliency, as detailed below and in the Testimony of Josh Schellenberg; significantly reduced greenhouse gas (GHG) emissions, as discussed in the Testimony of Mr. Navin; improved air quality that can lead to public health benefits, as discussed in the Testimony of Dr. Sonja Sax; and job creation and economic opportunity benefits, as discussed by Mr. Navin. One of the public interest benefits identified in the Phase 1 Decision has already been realized: Angeles Link was part of the application that positioned the California Hydrogen Hub to finalize an agreement with DOE to receive federal funding up to $1.2 billion—the first in the nation.

In addition to those benefits, as noted in the Testimony of Ms. Kitson, SoCalGas remains committed to stakeholder engagement and would continue and expand the Planning Advisory Group (PAG) to include more diverse stakeholders along preferred routes and convene public meetings to receive input during Phase 2 activities. Through this enhanced process, stakeholders will have a forum to be heard so their feedback can be integrated into Angeles Link's planning, as appropriate. To the best of my knowledge, this early stakeholder engagement approach that allows for input from diverse viewpoints at the beginning of the development process is unprecedented for a California investor-owned utility. Stakeholders have been included early and alongside the utility's internal planning, even at the early feasibility stage due to the "first-mover" nature of Angeles Link. The stakeholder engagement process SoCalGas utilized in Phase 1 enhanced the development process: timely hearing the perspectives of members with specific areas of focus during Phase 1 strengthened SoCalGas's overall understanding of Angeles Link and will facilitate the planning and development of a clean energy project that is appropriately responsive to community needs and concerns.

Finally, Angeles Link can promote the affordability of the clean energy transition. The State expects hydrogen to play a key role in decarbonizing California's energy system while maintaining energy reliability. Consistent with the findings of the High-Level Economic Analysis and Cost Effectiveness study described by Mr. Navin, DOE recognizes that pipelines are the most affordable way to transport hydrogen at scale. Angeles Link can meet the need to affordably transport clean renewable hydrogen.

A. Angeles Link Could Promote Achieving California's Decarbonization Goals

California's energy transition is driven by its adoption of some of the most advanced climate policies in our nation, aiming to achieve carbon neutrality by 2045 and significantly reduce GHGs. While California's annual GHG emissions have continued to trend downward over the last two decades, the rate of reduction has slowed in recent years,[16] and there are still significant strides to be made. Achieving further reductions, *affordably*, will become increasingly challenging as the State targets deeper cuts, particularly the need to reduce emissions from hard-to-electrify sectors such as power generation, heavy-duty transportation, and industrial. These sectors made up more than half of the State's GHG inventory from 2000-2022.[17] In its 2022 Integrated Energy Policy Report (IEPR) Update, "CEC staff identified hard-to-electrify industrial processes, transportation, and grid reliability as key areas with a high potential for increased use of low-carbon hydrogen made directly from renewable resources."[18] While the State is developing its Hydrogen Market Development Strategy pursuant to Governor Newsom's direction, it has released a framework which identifies as its North Star the goal to "leverage clean, renewable hydrogen to decarbonize the state's transportation, energy, and industrial sectors."[19] As discussed by Mr. Navin, the Phase 1 studies show that Angeles Link could support the State in meeting its ambitious goals. Pipeline transportation systems, such as Angeles Link as envisioned, will be the most efficient, reliable, and affordable open-access solution to deliver large volumes of clean renewable hydrogen as California's hydrogen economy grows and will be essential to delivering low-cost clean renewable hydrogen from local

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[16] California Energy Commission (CEC), *Updated emissions data show overall downward trend continuing*, *available at:* https://ww2.arb.ca.gov/news/updated-emissions-data-show-overall-downward-trend-continuing.

[17] CEC, *Current California GHG Emission Inventory Data*, *available at:* https://ww2.arb.ca.gov/ghg-inventory-data.

[18] CEC, *Final 2022 Integrated Energy Policy Report Update* (February 2023) at 8, *available at:* https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2022-integrated-energy-policy-report-update.

[19] California Business and Economic Development (GO-Biz), *California Hydrogen Market Development Strategy – Objectives & Public Engagement* (December 2023) at 2, *available at:* https://business.ca.gov/wp-content/uploads/2023/12/H2-Strategy-Framing-Doc-12-26-23.pdf.

and regional producers to multiple off-takers in the transportation, industrial, and electric generation sectors. Each sector is discussed below.[20]

Angeles Link could also support the State's objective of reducing reliance on Aliso Canyon while preserving energy reliability and affordability. Decreasing demand for natural gas by offering clean renewable hydrogen via Angeles Link could, in conjunction with other future clean energy projects and reliability efforts, reduce reliance on the Aliso Canyon natural gas storage facility. As such, Angeles Link supports the Commission's objectives as a complementary physical solution that could provide an alternative clean fuel to support firm, dispatchable electricity generation in the Los Angeles Basin.

Most importantly, Angeles Link can support the State's decarbonization goals *safely*. As discussed by Mr. Navin, the Phase 1 Evaluation of Applicable Safety Requirements, which was peer-reviewed by the Center for Hydrogen Safety's Hydrogen Safety Panel, demonstrates that Angeles Link can be safely designed, constructed, operated, and maintained, and that SoCalGas is well-positioned to refine its existing operations and maintenance procedures and safety practices to support Angeles Link. The CEC has recognized: "Hydrogen pipelines have operated safely, and construction of additional dedicated hydrogen pipelines in California is being considered for select locations where several large users are clustered such as ports, power plants, and industrial facilities. The United States Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) has regulated the safety of transporting hydrogen gas by pipeline since 1970."[21] Safety would continue to be foundational to all the Phase 2 activities described in the Testimonies of Ms. Kitson and Mr. Walker.

1. Power Generation Sector

SB 100 (2018) established California's goal to have a zero-carbon electric grid by 2045.[22] At the same time, the demand for electricity is expected to grow rapidly as the State

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[20] Please refer to the Testimony of Mr. Navin for additional detail on the Phase 1 evaluation of potential demand for clean renewable hydrogen in SoCalGas's service territory, which included consideration of each of these three sectors.

[21] *See* CEC, *2023 Integrated Energy Policy Report* (February 2024) at 70, *available at*: https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2023-integrated-energy-policy-report.

[22] SB 100 (De León, 2018), *available at:* https://legiscan.com/CA/text/SB100/id/1819458.

decarbonizes and increasingly electrifies.[23] The State recognizes that its existing electricity supply and infrastructure portfolio is not sufficient to meet that demand. Governor Gavin Newsom released *Building the Electricity Grid of the Future: California's Clean Energy Transition Plan*, which acknowledges that the modern electrical grid needs, among other things, clean hydrogen[24] and formed ARCHES to pursue unlocking California's hydrogen economy in light of these needs.[25] The 2021 SB 100 Joint Agency Report projected the State will need 148 gigawatts (GW) of new clean energy resources by 2045, more than four times the 35 GW that were available in 2022.[26] These forecasted increases in demand coincide with the State's mandates that 100% of retail sales of electricity come from renewable and zero-carbon resources by 2045, with interim benchmarks of 60% by 2030, 90% by 2035, and 95% by 2045.[27] In the

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[23] *See* CEC, *2023 Integrated Energy Policy Report* (February 2024) at 129-130*, available at*: https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2023-integrated-energy-policy-report.

[24] State of California – Office of Governor Gavin Newsom, *Building the Electricity Grid of the Future: California's Clean Energy Transition Plan* (May 2023) at 6, *available at:* https://www.gov.ca.gov/wp-content/uploads/2023/05/CAEnergyTransitionPlan.pdf ("We will not be able to build a reliable, clean electric grid using solar and wind energy alone. California needs more diverse clean energy resources – including batteries, clean hydrogen, and long-duration storage - and a wide range of technologies and resources to meet the unprecedented growth in demand for electricity at all hours of the day and different times of year."); *see also, id*. at 4 ("to reach our ultimate goal of 100% clean electricity by 2045, we need to build more clean energy, faster" and "To provide 100% clean electricity, current studies show California will need to build an additional 148,000 MW of clean energy resources by 2045").

[25] GO-Biz, *California Launches Statewide Alliance to Establish Federally Co-Funded Hydrogen Hub* (October 6, 2022), *available at:* https://business.ca.gov/california-launches-statewide-alliance-to-establish-federally-co-founded-hydrogen-hub/; *see also,* ARCHES H2, *Meet ARCHES* (October 2023), *available at:* https://archesh2.org/wp-content/uploads/2023/10/Meet-Arches_October-2023.pdf ("As we continue to transition to more electric technologies, the demand on electricity will only continue to increase. Supplementing our existing power portfolio with clean hydrogen will ensure that the energy sectors employ both electrons and molecules to enable us to reliably decarbonize all sectors of the economy, while maintaining economic leadership and advancing environmental, health and social justice objectives.").

[26] State of California – Office of Governor Gavin Newsom, *Governor Newsom Updates the Roadmap to California's Clean Energy Future* (May 25, 2023), *available at:* https://www.gov.ca.gov/2023/05/25/governor-newsom-updates-the-roadmap-to-californias-clean-energy-future/.

[27] SB 100 (De León, 2018), *available at:* https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB100; SB 1020 (Laird, 2022), *available at:* https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB1020.

L.A. Basin, ARCHES member Los Angeles Department of Water and Power (LADWP) has even more ambitious goals, targeting supplying 100% renewable energy by 2035.[28]

The intermittent nature of weather-dependent renewable electricity generation, coupled with fluctuations in daily and seasonal energy demand, necessitates firm dispatchable power generation. Today, that reliability need is served by natural gas.[29] In order to decarbonize while supporting growing demand for electricity, clean firm power (e.g., clean alternative fuels) will be needed. CARB describes the critical role clean renewable hydrogen can play in providing incremental clean firm capacity to support electric reliability and help decarbonize the existing power generation fleet.[30] The 2022 CARB Scoping Plan notes an additional benefit: hydrogen can be stored for later use when renewable energy generation is low, thereby serving as a form of energy storage.[31] Accordingly, CARB identifies the need for approximately 4 GW of hydrogen combustion capacity in 2035, and 9 GW to meet 2045 demand targets.[32]

The CEC concurs, noting in its 2022 IEPR Update, "Low-carbon hydrogen can play an important role in helping achieve 100 percent renewable electricity by supporting grid reliability. As intermittent renewable resources such as wind and solar become a larger proportion of grid-connected resources, ramping needs will increase, and hydrogen has the potential to help support grid reliability through repowering targeted ramping resources running off fossil gas with low-carbon hydrogen made from renewable resources."[33] In its Final 2023 IEPR, the CEC points to economies of scale and notes that, "[f]or applications that require large volumes of clean and

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[28] NREL, *LA100: The Los Angeles 100% Renewable Energy Study and Equity Strategies*, *available at:* https://www.nrel.gov/analysis/los-angeles-100-percent-renewable-study.html.

[29] CARB recognizes that both historically and currently, the gas system provides an essential service to support the reliability of the electric system as a greater base of renewables is integrated. Further, as more renewable power enters the system, 75% of the flexible capacity for grid reliability is provided by gas-fueled power plants. CARB, *2022 Scoping Plan for Achieving Carbon Neutrality* (November 16, 2022) at 204, *available at:* https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf.

[30] *Id.* at 203-204.

[31] *Id.* at 204.

[32] *Id*. at 203-204.

[33] CEC, *Final 2022 Integrated Energy Policy Report Update* (February 2023) at 108, *available at:* https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2022-integrated-energy-policy-report-update.

renewable hydrogen such as use in electric power plants, delivery by pipeline may be the most feasible delivery pathway."[34]

For hydrogen to play a significant role in the electric generation sector, however, and to expand its utilization to meet substantial and fluctuating demand, it is essential to establish the infrastructure to deliver the required volumes of clean renewable hydrogen to support the reliability and resiliency of the electric grid, and to invest in that network now. Indeed, in ARCHES' application to DOE, ARCHES stated that a "connective hydrogen pipeline network" that is open to all is "critical" to achieving the California Hydrogen Hub's goal of supplying hydrogen to the power sector.[35] ARCHES' application to DOE contemplates approximately 165 miles of connective hydrogen pipelines in Central and Southern California—most of which is Angeles Link—and recognizes that additional pipeline capacity and build-out is expected to be added in the future.[36] Proceeding to Phase 2 promptly would help support developing this necessary connective infrastructure to achieve the State's goals.[37]

2. Transportation Sector

As one of the State's strategies to reduce GHG and criteria air pollutant emissions from the transportation sector, the State has committed to phase out internal combustion engines. The State has adopted a number of regulations that are designed to create a market for zero-emission vehicles (ZEV) to ensure that consumers have ZEV options and requiring fleet operators to adopt ZEVs. Hydrogen can both serve as an alternative clean fuel source for hydrogen fuel cell electric vehicles in the transportation sector, particularly for medium- and heavy-duty vehicles, and, as described above, support the reliability of the electric grid as more battery electric vehicles require charging to hit the road. Infrastructure to transport clean renewable hydrogen will be necessary to support this transition.

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[34] CEC, *2023 Integrated Energy Policy Report* (February 2024) at 69, *available at*: https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2023-integrated-energy-policy-report.

[35] ARCHES, *Technical Submission to DOE* (April 2023) at 20, 28, *available at*: https://archesh2.org/wp-content/uploads/2024/08/ARCHES-Technical-Volume-Redacted.pdf; *see also, id.* at 28 ("A connective infrastructure that is open to all is critical for the efficient movement of hydrogen within the ecosystem from production to end use.").

[36] *Id*. at 28-29.

[37] The costs of electric service disruptions are described in the Testimony of Josh Schellenberg.

3. Industrial Sector

California is the largest economy in the U.S.[38] and the fifth-largest economy in the world.[39] It is the largest manufacturing employment state in the country,[40] with manufacturers accounting for over $394 billion in 2021, or more than 12% of the total output in the State, and employing 7.5% of its workforce.[41, 42] Clean renewable hydrogen could allow the State to meet its decarbonization goals while supporting its economic status and keeping industry in California. CEC's Staff Report on SB 643 cites industrial processes among the top prospects for hydrogen to pursue decarbonization goals: "Grid reliability and hard-to-electrify sectors such as MDHD on-road transportation, off-road applications including non-road sectors such as aviation, rail, maritime, and industrial processes are areas with a high potential for increased use of low-carbon or clean hydrogen."[43]

As California looks to find additional decarbonization strategies, it can look to its large industrial base, whose size and diversity of end users in a wide range of industrial applications, such as metals, food and beverage, stone, glass, and cement, aerospace and defense, chemicals, and refineries, provide many opportunities.[44] Approximately 23% of the State's GHG emissions come from industrial activity in Central and Southern California.[45] California cannot fully decarbonize without having a viable strategy for the industrial sector. Several environmental and

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[38] State of California – Office of Governor Gavin Newsom, *California's economy leads the nation* (July 15, 2024), *available at:* https://www.gov.ca.gov/2024/07/15/californias-economy-leads-the-nation/.

[39] State of California – Office of Governor Gavin Newsom, *California Remains the World's 5th Largest Economy* (April 2024), *available at:* https://www.gov.ca.gov/2024/04/16/california-remains-the-worlds-5th-largest-economy/.

[40] U.S. Bureau of Labor Statistics, *2023 Quarterly Census of Employment and Wages*, *available at:* https://www.bls.gov/cew/publications/employment-and-wages-annual-averages/2023/.

[41] National Association of Manufacturers (NAM), *California Manufacturing Facts, available at:* https://nam.org/state-manufacturing-data/2022-california-manufacturing-facts/.

[42] *Id.*

[43] CEC, *Final* Staff *Report SB 643 Clean Hydrogen Production and Refueling Infrastructure for MDHD FCEVs and Off-Road Applications* (January 24, 2024), *available at:* https://www.energy.ca.gov/publications/2023/senate-bill-643-clean-hydrogen-fuel-production-and-refueling-infrastructure.

[44] *See* Angeles Link Phase 1 Demand Report (Demand Study).

[45] California Air Resources Board, *Current California GHG Emission Inventory Data*, *available at:* https://ww2.arb.ca.gov/ghg-inventory-data

environmental justice groups concurred in their 2023 comments to CARB, urging that the agencies draft an SB 1075 report that "prioritizes early green hydrogen deployment in sectors that have no known path to electrification, like feedstock use for industry."[46] Although the State has not yet adopted significant policies to decarbonize the industrial sector, aside from the cap-and-trade program and laws affecting only specific industries such as SB 596 for the cement industry, the potential for clean renewable hydrogen delivery through pipeline systems like Angeles Link would allow for deeper decarbonization of the industrial sector that could enable the State to fulfill its net-zero goals.[47]

B. Improved Air Quality and Related Benefits

Not only can hydrogen support the State's decarbonization goals by bolstering the electric grid as end uses increasingly electrify; it can also serve as a clean energy solution where electrification is not viable. Thus, Angeles Link could support electrification and, for uses that are difficult to electrify, it could deliver an alternative clean fuel. Replacing natural gas and diesel end uses with clean renewable hydrogen would enable reductions of GHG, nitrogen oxide (NOx)—a known precursor to ozone—and fine particulate matter ($PM_{2.5}$) emissions. As discussed in the Testimony of Dr. Sax, NOx and $PM_{2.5}$ reductions would provide improved air quality, which concomitantly can yield significant public health benefits, especially in communities near heavily trafficked transportation corridors that are disproportionately impacted by poor air quality—such as the South Coast and San Joaquin Valley air basins, which are in extreme non-attainment for certain health-based National Ambient Air Quality Standards. The Phase 1 studies' findings regarding the significant GHG reductions and additional criteria air pollutant reduction benefits that could result from Angeles Link are described by Mr. Navin. Continuing to advance and refine engineering design and other activities in Phase 2, as described

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[46] *See,* Air Resources Board (ARB), Joint Comments – SB 1075 Report: Hydrogen Development, Deployment, and Use: September 5 Kickoff Workshop on behalf of Climate Center, Asian Pacific Environmental Network, Earthjustice, Greenlining Institute, Center for Biological Diversity, Center on Race, Poverty & the Environment, and Sierra Club-California (September 19, 2023), *available at:* https://ww2.arb.ca.gov/system/files/webform/public_comments/5756/SB%201075%20Implementation%20Report%20-%20Joint%20Comments%209-19-23.pdf.

[47] SoCalGas's *The Role of Clean Fuels and Gas Infrastructure in Achieving California's Net Zero Climate Goal* also discusses the role decarbonized hydrogen can play in the industrial sector as well as the important role of regulation in driving affordability. *Available at:* https://www.socalgas.com/sites/default/files/2021-10/SCG_Whitepaper_Full-Report.pdf.

further in the Testimonies of Ms. Kitson and Mr. Walker, could bring these benefits one step closer to fruition.

ARCHES, too, has identified immediate and significant environmental and public health benefits associated with the California Hydrogen Hub, including billions of dollars of savings in health costs and significant reductions in NOx, $PM_{10,}$ and $PM_{2.5}$.[48] ARCHES has also recognized that clean renewable hydrogen will "accelerate health and economic benefits to frontline communities that historically have been impacted by heavy industry and goods transportation while helping to attain ambient air quality standards across California."[49] Governor Newsom has also acknowledged the health benefits of including clean renewable hydrogen in the State's energy portfolio: "We're going to use clean, renewable hydrogen to power our ports and public transportation—getting people and goods where they need to go, just without the local air pollution."[50]

C. Job Creation Benefits

Adoption of clean renewable hydrogen presents an opportunity to create new jobs, including for skilled energy industry workers to "transition to new renewable clean hydrogen jobs requiring similar capabilities."[51] As described further by Mr. Navin, Angeles Link is expected to result in the creation of thousands of jobs. Based on current assumptions, it is estimated that the construction of Angeles Link alone could result in 53,000 direct construction-related jobs generated at peak, which could be increased to 75,000 jobs at peak if indirect and induced impacts are considered.[52] While the analysis does not specifically identify union jobs, it

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[48] ARCHES H2, *ARCHES Community Benefits Plan* (November 2023) at 1, *available at:* https://archesh2.org/wp-content/uploads/2023/11/ARCHES_CB_PROPOSAL_for-release.pdf.

[49] ARCHES H2, *White Paper Overview* at 7 (2024), *available at*: https://archesh2.org/wp-content/uploads/2024/08/ARCHES-White-Papers-Overview-8.8.24.pdf.

[50] State of California – Office of Governor Gavin Newsom, *California launches world-leading Hydrogen Hub* (July 17, 2024), *available at:* https://www.gov.ca.gov/2024/07/17/california-launches-world-leading-hydrogen-hub/.

[51] ARCHES H2, *White Paper Overview* at 7 (2024), *available at*: https://archesh2.org/wp-content/uploads/2024/08/ARCHES-White-Papers-Overview-8.8.24.pdf.

[52] Direct construction-related jobs are those specific to the actual construction and administration of the construction of Angeles Link, such as laborers. Indirect and induced impacts refer to jobs and economic output deriving from Angeles Link's construction needs and direct job creation.

is relevant to note that in excess of 90% of the construction workforce on an upcoming SoCalGas infrastructure project is expected to be union represented.

Similarly, ARCHES has estimated that the California Hydrogen Hub will result in over 200,000 new jobs.[53] These new jobs include opportunities as operations, architectural, and engineering managers; health and safety professionals; and social and community service workers.[54] ARCHES further expects creation of new jobs including power plant operators, mechanics, installers and repairers, and supervisors, as well as an increase in occupations such as water treatment operators, inspectors, truck drivers, sales representatives, clerks, laborers, and movers.[55] As noted above, Angeles Link is an integral part of the California Hydrogen Hub and could support this growing hydrogen economy.

D. Stakeholders Benefit from SoCalGas's Commitment to a Transparent Development Process

The Phase 1 Decision recognized that "SoCalGas' commitment to engage and consult with stakeholders representing a diverse set of interests through the PAG serves the public interest, because it not only provides transparency of the planning process, but also ensures that all interests affected by the Project are considered in the planning process."[56] In accordance with the Phase 1 Decision, SoCalGas formed the Planning Advisory Group (PAG), composed of representatives from industry, labor, academia, tribal governments, and environmental organizations, and a Community Based Organization Stakeholder Group (CBOSG), composed of community-based organizations, in the stakeholder engagement process and developed a compensation plan for non-profit organizations. The Phase 1 Decision required SoCalGas to conduct at least quarterly meetings; however, in response to stakeholder requests for increased opportunities for engagement, and to keep stakeholders informed throughout the process and allow time to consider, respond to, and incorporate their feedback as appropriate, SoCalGas increased the frequency of stakeholder meetings and extended the Phase 1 schedule to allow for

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[53] ARCHES H2, *ARCHES Community Benefits Plan* (November 2023) at 1, *available at:* https://archesh2.org/wp-content/uploads/2023/11/ARCHES_CB_PROPOSAL_for-release.pdf.

[54] *Id.* at 8.

[55] *Id.* ARCHES anticipates, on average, these positions will earn $85,554 - $145,600 annually based on expected hourly wages in 2030 of $41 - $70.

[56] Phase 1 Decision at 62 (FOF 6).

additional engagement. SoCalGas ultimately held 27 meetings and workshops with the PAG and CBOSG, as well as over 30 one-on-one meetings with PAG and CBOSG members to solicit their feedback on the Phase 1 feasibility studies and PAG and CBOSG process. I personally participated in several of these meetings given their critical importance to our efforts to have a transparent and inclusive process.

The Angeles Link stakeholder engagement process has been pivotal in providing SoCalGas with valuable insights and establishing the foundation for a community-centric approach to tackling environmental justice concerns within the development framework for Angeles Link. Because the varied members have specific areas of focus, they offered perspectives that enhanced SoCalGas's overall planning of Angeles Link and strategies to address its possible impacts. Through this engagement process, SoCalGas gained a deeper understanding of community needs, concerns, and priorities related to Angeles Link, such as workforce development, improved air quality, and economic advancement opportunities. The Phase 1 stakeholder engagement process established productive working relationships with stakeholders and furnished valuable feedback for the Phase 1 studies, as further detailed by Mr. Navin. For example, as Mr. Navin describes, based on PAG and CBOSG feedback, SoCalGas had the Phase 1 Evaluation of Applicable Safety Requirements peer-reviewed by the Center for Hydrogen Safety's Hydrogen Safety Panel. SoCalGas proposes to continue and enhance this transparent stakeholder engagement process throughout Phase 2, as described by Ms. Kitson.

SoCalGas's stakeholder engagement efforts have also emphasized the inclusion of disadvantaged communities and environmental justice concerns. The Phase 1 stakeholder engagement process allowed for input on impacts important to these communities. SoCalGas heard these concerns and incorporated them into the Phase 1 work as appropriate. For example, based on feedback to minimize impacts on disadvantaged communities, SoCalGas added a route variation for further consideration in Phase 2 along with the four potential directional route configurations to reduce the extent of the pipeline route located in disadvantaged communities.

Furthermore, SoCalGas developed a community-focused Environmental Social Justice Community Engagement Plan (ESJ Plan), in response to and with stakeholder feedback. The ESJ Plan identifies engagement approaches or mechanisms recommended by CBOSG members for SoCalGas to draw upon in Phase 2 to support ESJ community stakeholder engagement efforts. This ESJ Plan includes an ESJ community screening assessment (ESJ Screening), which

provides baseline disadvantaged community (DAC) designation information and other demographic information for the potential preferred routes identified in Phase 1. The ESJ Plan with ESJ Screening support the Commission's directive to mitigate and address impacts to DACs.[57] SoCalGas looks forward to implementing the ESJ Plan in Phase 2 to further gather feedback from communities historically overlooked in typical project development processes, aiming to minimize and address potential impacts on their communities.

DOE requires each regional hydrogen hub to implement community benefit plans.[58] The overarching Community Benefits Plan for the California Hydrogen Hub is intended to "1) creat[e] cleaner communities by focusing on key hard-to-abate sectors in impacted communities, 2) ensur[e] stakeholder engagement at all levels, equipping and empowering residents to determine the best ways to benefit their communities, [and] 3) work[] collaboratively with labor to ensure a well-trained, diverse, local H2 workforce with good, green careers."[59] ARCHES notes its "plan is supported by $150M for community benefits plus $229M for workforce development and community education."[60] While SoCalGas is not bound by the DOE requirement because it is not accepting federal funds, as explained below, SoCalGas would support implementing community benefits. If SoCalGas files a future application for a Certificate of Public Convenience and Necessity (CPCN) for Angeles Link, SoCalGas would also seek Commission authorization to allocate funds for community benefits to be identified at that time.

E. Angeles Link and Its Utility Model Could Promote the Affordability of the Clean Energy Transition

As described in the Angeles Link Phase 1 Framework for Affordability Considerations, the State recognizes that statewide decarbonization will require significant investment. Various studies indicate that the development and integration of clean firm power technologies –

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[57] *Id.* at 76 (OP 6(l)).

[58] DOE, *Funding Opportunity Announcement (FOA) Number DE-FOA-0002779* (September 22, 2022) at 11, 47-48, *available at:* https://oced-exchange.energy.gov/FileContent.aspx?FileID=40a1ff87-622d-4ef5-8d7c-89bfe089fd11.

[59] ARCHES H2, *ARCHES Community Benefits Plan* (November 2023) at 1, *available at:* https://archesh2.org/wp-content/uploads/2023/11/ARCHES_CB_PROPOSAL_for-release.pdf.

[60] *Id.*

including clean renewable hydrogen – is the most cost-effective option for achieving the State's goals at scale. As noted above, DOE has recognized that pipelines are the most affordable means to transport hydrogen at scale.[61] Clean renewable hydrogen transported by pipeline can be an efficient means of decarbonization. Clean renewable hydrogen has several key attributes that are not offered by other decarbonization modalities: it can serve as a clean alternative fuel to replace the use of natural gas and diesel in the hard-to-electrify power generation, transportation, and industrial sectors; it can support electrification and renewable energy expansion by providing clean firm dispatchable power; and it can avoid the inefficient curtailment of renewable energy by storing it for later use. In other words, investing in a pipeline system transporting clean renewable hydrogen could efficiently support multiple decarbonization pathways, thereby promoting affordability. Utility-owned and operated pipelines can play an important role in advancing the energy transition and a hydrogen ecosystem with affordability considerations in mind.

The investor-owned utility model promotes affordability, and the Commission's regulatory framework allows opportunities for stakeholders to work together to promote and prioritize affordability. Regulated utilities are required to operate with transparency to foster public trust and accountability, with oversight from the Commission to ensure that the costs associated with new infrastructure development and the rates charged for hydrogen transportation are just and reasonable. The Commission would carefully evaluate any revenue requirement for the costs of the project as part of a potential future CPCN proceeding, and the Commission and stakeholders would be involved in related rate design and cost allocation proceedings. The Commission also would have to approve any hydrogen tariff developed in the future, which would provide transparent rates and terms of service. To the extent applicable, utilities also offer customer assistance programs for low-income core customers, which are designed to promote and protect affordability. For all these reasons, the regulated utility model for hydrogen transportation, i.e., a non-discriminatory clean hydrogen pipeline dedicated to public use—like Angeles Link—allows for prioritization of affordability considerations with appropriate oversight.

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[61] DOE – Alternative Fuels Data Center, *Hydrogen Production and Distribution, available at:* https://afdc.energy.gov/fuels/hydrogen_production.html.

As described in the Testimony of Nasim Ahmed and Michael W. Foster, SoCalGas proposes a cost recovery mechanism for Phase 2 activities designed to promote affordability. First, SoCalGas proposes that rate recovery be spread broadly across all ratepayers because of the widespread benefits, both direct and indirect, that could result from advancing the study and design of Angeles Link. Second, SoCalGas proposes to implement a revenue requirement based on forecasted operating and maintenance (O&M) costs following a Commission decision. Authorizing both of these components results in actual cost savings to ratepayers, including an estimated $31 million in saved interest alone, while minimizing the burden on any one class of customer, consistent with the broad benefits to existing ratepayers, future customers, and numerous communities of proceeding to Phase 2 to advance Angeles Link. Of course, before any revenue requirement is implemented, the Commission would have to determine that the Phase 2 cost forecast presented in the Application meets the Commission's standard of reasonableness. SoCalGas proposes this cost recovery mechanism for Phase 2 activities and recognizes that a different approach may be warranted and/or necessary for further activities.

1. SoCalGas Will Continue to Address Affordability in Phase 2 and Beyond With the Commission and Stakeholders

As discussed by Mr. Navin, the Phase 1 Affordability Framework describes the estimated costs of California's energy transition and, with the input of stakeholders, sets forth a number of options available to further promote the affordability of Angeles Link, similar to ideas being explored by the State and stakeholders for other decarbonization solutions. Some potential options would require legislative action at the state or federal level, and many entail working with the Commission and other stakeholders.

As described by Ms. Kitson, Phase 2 includes exploring and, as authorized by the Commission and/or legislative action, pursuing appropriate activities identified in the Affordability Framework in order to best promote the affordability of Angeles Link. During and after Phase 2, SoCalGas will continue to solicit the input of stakeholders and seek Commission approval of relevant tariffs and future cost allocation and rate design that considers affordability along with the benefits Angeles Link provides, including advancing the State's decarbonization goals, strengthening energy system reliability and resiliency, and providing air quality and related benefits. SoCalGas also plans to continue to evaluate rate and bill impacts in accordance with the Commission's affordability metrics and would utilize existing and/or future

Commission-approved rate assistance programs to help further minimize rate impacts on low-income households. We look forward to working towards an affordable path to decarbonization.

2. Broad Socialization of Phase 2 Costs Across Ratepayer Beneficiaries Promotes Affordability

The benefits described in the Testimonies of Messrs. Navin and Schellenberg and Dr. Sax would apply broadly to all ratepayers, and thus all ratepayers benefit from SoCalGas pursuing Phase 2 activities. Accordingly, as described by Messrs. Ahmed and Foster, SoCalGas proposes to allocate the costs of Phase 2 to all ratepayers using the equal cents per therm (ECPT) methodology, which has been previously authorized by the Commission for activities that result in societal benefits. This methodology reduces the burden on any one class of customer and recognizes the benefits that all customers are expected to obtain from the Phase 2 activities. Illustrative rate impacts are further described by Messrs. Ahmed and Foster: accounting for $31 million in savings based on authorizing a revenue requirement, the average residential customer bill could increase an average of approximately $12.60 over the course of 3 years—or an average of about $0.35 per monthly bill during that period. To contextualize the potential rate impact, the Public Purpose Program Surcharge (PPPS) for the average residential customer would be about $190 over the same 3-year period at current PPPS levels, or about $5.28 per monthly bill during that period—about 15.5 times higher than the expected impact from Phase 2 activities[62].

Broad cost allocation is appropriate here given the numerous societal benefits that accrue from proceeding with Phase 2 planning now, including that Angeles Link would ultimately serve as a key "first mover" non-discriminatory open access clean renewable hydrogen transportation project dedicated to public use, providing the infrastructure for California's hydrogen economy and the certainty that both producers and end users would need to invest in clean renewable hydrogen in large volumes, which in turn promotes affordability by reducing the cost of hydrogen. With the Commission's leadership, ensuring timely and broad recovery for the early development costs of a first-mover project serving the public interest by targeting the hard-to-electrify sectors will help to spur the hydrogen economy for the benefit of both ratepayers and

[62] *See* SoCalGas Advice Letter 6216-G for Public Purposes Program Surcharges, *available at* https://tariffsprd.socalgas.com/view/filing/?utilId=SCG&bookId=GAS&flngKey=4636&flngId=6216-G&flngStatusCd=Approved.

California as a whole, allowing others to join in the network as the economy matures and scales over time, while ensuring that affordability remains top of mind.

Broad cost allocation for Phase 2 studies would serve to facilitate and encourage utility investment in first-of-their-kind decarbonization infrastructure projects like Angeles Link while also staying true to cost-allocation principles based on benefits to be realized by all ratepayers.

3. Authorizing a Balancing Account and Revenue Requirement Supports Affordability

As detailed by Messrs. Ahmed and Foster, SoCalGas requests authorization to create a two-way, interest-bearing balancing account effective as of the date of this Application and implement a revenue requirement based on its forecasted costs for Phase 2 activities. Authorizing a revenue requirement promotes fairness to both SoCalGas and ratepayers, minimizes costs incurred by ratepayers, and promotes rate stability. Ratepayers would experience reduced costs stemming from the various financial benefits associated with a revenue requirement, including: (1) reduction in interest paid on balances of accumulated costs if they were to be recorded and later subject to an after-the-fact reasonableness review; (2) the expected positive impact from credit rating agencies' assessment of SoCalGas's financial health; and (3) the impact to SoCalGas's annual cash flow operation.

As illustrated by Messrs. Ahmed and Foster, ratepayers avoid interest costs—estimated to be $31 million—if a revenue requirement is authorized based on the forecast provided by Ms. Kitson and Mr. Walker. Additionally, implementing a revenue requirement stabilizes customer rates by spreading the recovery of Phase 2 costs over time as the costs are incurred. This approach helps mitigate potential bill volatility that could arise from implementing all Phase 2 costs, following a reasonableness review, at one time. Concurrent cost recovery also contributes to improved utility cash flow and reduces financing costs, which also benefit ratepayers. In addition, mitigating the risk of under-collection supports SoCalGas's creditworthiness, thus minimizing adverse impacts on its ability to secure financing at reasonable cost. Accordingly, authorizing a revenue requirement based on an authorized forecast fosters financial resilience and reinforces regulatory measures aimed at promoting economic viability and consumer protection. Implementing a forecast revenue requirement also allows SoCalGas to maintain adequate and timely cash flow to fund the work needed to develop Angeles Link in alignment

with DOE's and ARCHES's timeline. SoCalGas appreciates the Commission's support to best position it to meet those goals.

A two-way balancing account, with costs incurred above the forecast subject to a reasonableness review in a standalone application, general rate case, or other appropriate proceeding, is fair to both ratepayers and the utility because it reimburses the utility for its actual costs and ratepayers are not required to pay any more than those actual costs. If SoCalGas spends less than the amount authorized by the Commission for Phase 2 activities, ratepayers will be refunded in an equal amount. If the costs of executing Phase 2 activities exceed the amount authorized, SoCalGas would have to establish the reasonableness of those costs consistent with the Commission's standards before recovering them from ratepayers. All Phase 2 activities proposed by Ms. Kitson and Mr. Walker are O&M expenses, and thus reflect the expected cost to SoCalGas without any return on investment.

Finally, SoCalGas's request that the balancing account be authorized effective as of the date of the Application is also designed to save ratepayers money and promote fairness to the utility by allowing it to be compensated for necessary work. In order to be best positioned to meet ARCHES' timeline for operation of the California Hydrogen Hub, it is important that SoCalGas hit the ground running as soon as the Commission grants the Application. Accordingly, as described in the Testimony of Brian Walker, SoCalGas expects to conduct certain contracting activities while this proceeding is pending that will allow SoCalGas to commence Phase 2 activities promptly upon receiving a decision in this proceeding, which SoCalGas respectfully requests by December 2025. Doing so not only supports meeting the schedule, but also saves ratepayers money – about $5 million, as described by Mr. Walker.

F. The Phase 1 Decision Directed SoCalGas to Support ARCHES' Application to Bring Benefits to California.

Angeles Link presents an historic opportunity. On February 17, 2022, SoCalGas filed an application for authorization to record costs to a memorandum account to study and develop Angeles Link.[63] That application was filed just three months after the IIJA was passed on

[63] *See* A.22-02-007, Application of Southern California Gas Company for Authority to Establish a Memorandum Account for the Angeles Link Project (February 17, 2022), *available at:* https://www.socalgas.com/sites/default/files/A22-02-SOCALGAS-Angeles_Link_Memorandum_Account_Application.pdf.

November 15, 2021, which allocated federal funding to kickstart a national network of clean hydrogen producers, consumers, and connective infrastructure.[64]

The Phase 1 Decision recognized that Angeles Link could "help position California to receive federal funding through the [IIJA], which is providing $8 billion to fund the development of four regional clean hydrogen hubs."[65] Accordingly, the Phase 1 Decision directed SoCalGas to, among other things, join ARCHES in support of the State of California's application for federal funding made available through the IIJA.[66] ARCHES, co-founded by the Governor's Office of Business and Economic Development (GO-Biz), is "California's designated U. S. Department of Energy hydrogen hub, established to accelerate the deployment of renewable, clean hydrogen projects and infrastructure to advance a zero-carbon economy."[67] SoCalGas coordinated with ARCHES throughout the development of ARCHES' application, and Angeles Link was included in ARCHES' application to DOE as part of the proposed California Hydrogen Hub. The success the Phase 1 Decision envisioned has been realized: on October 13, 2023, while the studies and stakeholder activities authorized by the Phase 1 Decision were already underway, the DOE announced that the California Hydrogen Hub was one of seven hubs selected to advance to funding award negotiations out of over thirty applications from across the country;[68] and on July 17, 2024, ARCHES announced that it was the first to sign a landmark agreement to receive up to $1.2 billion in federal funds to support the California Hydrogen Hub.

These momentous developments for California also necessitate prompt action by the Commission in approving this Application. As explained by Mr. Navin, DOE funding is contingent on the California Hydrogen Hub meeting milestones in accordance with a set

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64 IIJA, Pub. L. 117-58, § 40314 (Additional clean hydrogen programs); *see also,* DOE – Office of Clean Energy Demonstrations, *Regional Clean Hydrogen Hubs Selections for Award Negotiations*, *available at:* https://www.energy.gov/oced/regional-clean-hydrogen-hubs-selections-award-negotiations.

65 Phase 1 Decision at 2.

66 *Id.*

67 ARCHES H2, *Meet ARCHES* (October 2023), *available at:* https://archesh2.org/wp-content/uploads/2023/10/Meet-Arches_October-2023.pdf (internal parentheticals omitted).

68 ARCHES H2, *California Wins up to $1.2 Billion from Feds for Hydrogen* (October 20, 2023), *available at:* https://archesh2.org/california-wins-up-to-1-2-billion-from-feds-for-hydrogen/.

timeline,[69] and ARCHES envisions facilities and infrastructure—including portions of Angeles Link—to begin being operational by December 31, 2033. For SoCalGas to be best positioned to have Angeles Link meet that goal, SoCalGas must commence Phase 2 activities promptly.

The California Hydrogen Hub is intended to be a network of hydrogen producers, end users, and transportation infrastructure to jumpstart California's hydrogen market, contributing to the broader federal objective of laying the groundwork for a national clean hydrogen network. In particular, the California Hydrogen Hub is "anticipated to develop major development clusters around Los Angeles and the Bay Area and extend into the Central Valley, Inland Empire, and other regions with heavy transportation corridors and ports to facilitate goods movement and ensure California maintains its position as a powerhouse in the global economy."[70] Further, the California Hydrogen Hub "will provide a blueprint for decarbonizing public transportation, heavy duty trucking, and port operations—key emissions drivers in the state and sources of air pollution that are among the hardest to decarbonize."[71]

Angeles Link is an integral part of this vision. This is because an open-access non-discriminatory pipeline transportation system dedicated to public use will facilitate the delivery of large volumes of clean renewable hydrogen in Central and Southern California, including into the Los Angeles Basin, consistent with SoCalGas's and ARCHES' demand projections through 2045. According to DOE, hydrogen pipelines are the lowest-cost alternative for delivering large volumes of gaseous hydrogen over long distances.[72] To unlock the true potential of hydrogen,

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[69] DOE, *Funding Opportunity Announcement (FOA) Number DE-FOA-0002779* (September 22, 2022) at 22-23, 110-111, *available at:* https://oced-exchange.energy.gov/FileContent.aspx?FileID=40a1ff87-622d-4ef5-8d7c-89bfe089fd11.

[70] ARCHES H2, *Meet ARCHES* (October 2023), *available at:* https://archesh2.org/wp-content/uploads/2023/10/Meet-Arches_October-2023.pdf.

[71] DOE – Office of Clean Energy Demonstrations, *California Hydrogen Hub (ARCHES)*, *available at:* https://www.energy.gov/oced/california-hydrogen-hub-arches.

[72] DOE, *Pathways to Commercial Liftoff: Clean Hydrogen* (March 2023) at 15 *available at:* https://liftoff.energy.gov/wp-content/uploads/2023/03/20230320-Liftoff-Clean-H2-vPUB.pdf (noting that "[d]edicated hydrogen pipeline transport" has "[t]he lowest levelized cost at high volumes (50+ [tons per day]) and long distances due to low opex costs"); *see, id.* at 14 ("[p]ipelines are the preferred solution at large volumes, but will likely not be needed until ~2030 when offtake scales"); *id*. at 16 ("[d]edicated hydrogen pipelines can move large volumes over long distances to achieve economies of scale").

there is additional recognition that "pipelines are the economic solution at large volumes, and will be needed when off-take scales beyond co-located production."[73]

SoCalGas is not accepting federal funding from the IIJA because the costs of complying with federal standards for receipt of such funds would far exceed the amount offered and thus would not be in the best interests of our ratepayers. Nevertheless, Angeles Link remains an integral part the California Hydrogen Hub, and it is needed both to support the California Hydrogen Hub in the near term and to lay the foundation for California's hydrogen economy and meet longer-term demand through 2045 to help achieve the State's decarbonization goals and deliver the public interest benefits described above.

The Commission took an important first step in the Phase 1 Decision by authorizing SoCalGas to record costs associated with studying the feasibility of Angeles Link and ordering SoCalGas to support the State in its efforts to obtain federal funding for the benefit of California. Since then, several key developments have occurred, which support the Commission taking the next step: supporting SoCalGas in promptly proceeding to Phase 2, bringing Angeles Link and its substantial benefits closer to realization:

- The California Hydrogen Hub was selected to receive up to $1.2 billion dollars, resulting in a $12.6 billion public-private investment that will spur California's hydrogen economy.
- The State released its framework for the California Hydrogen Market Development Strategy, which recognizes that "we have well over $50 billion worth of proposed clean, renewable hydrogen projects in California—solely based on what was submitted to ARCHES last year. While this interest is significant, more opportunities exist, especially if California fosters an environment where clean, renewable hydrogen projects become part of a larger 'eco system' that creates tens of thousands of family-supporting jobs building, operating, and maintaining this system."[74]

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[73] DOE, *Pathways to Commercial Liftoff – Clean Hydrogen* (March 2023) at 12 , *available at:* https://liftoff.energy.gov/wp-content/uploads/2023/05/20230321-H2-Pathways-to-Commercial-Liftoff-Webinar-vF_web.pdf

[74] GO-Biz, *California Hydrogen Market Development Strategy – Objectives & Public Engagement* (December 2023) at 1, *available at:* https://business.ca.gov/wp-content/uploads/2023/12/H2-Strategy-

- The Legislature passed SB 1420, which allows streamlined permitting for hydrogen production projects.
- Regarding Angeles Link specifically, Phase 1 studies show that Angeles Link, inclusive of the Hub Segments, is feasible and warrants further analysis and development.

All these developments—and more—have now occurred, and all of them support promptly proceeding to Phase 2 activities with an appropriate revenue requirement.

III. CONCLUSION

Angeles Link is expected to play a prominent role in supporting the development of California's hydrogen economy. Connective pipeline infrastructure—like Angeles Link—is essential to support the creation and use of clean renewable hydrogen efficiently, safely, reliably, and affordably, and also to scale in order to help meet SoCalGas's projected demand for its service territory by 2045. To help meet these needs and accommodate development timelines, prompt and decisive action by the Commission on this Application is essential.

A non-discriminatory pipeline delivery system dedicated to public use will, consistent with California's hydrogen strategy, encourage continued investments in clean renewable hydrogen and development of the State's hydrogen economy, particularly by future producers and end users who could take advantage of an open-access pipeline system. As discussed in the Testimonies of Dr. Sax and Mr. Schellenberg, these benefits increase as the hydrogen economy continues to scale. Building and maintaining a robust, utility-owned open access clean renewable hydrogen transportation system that is subject to Commission oversight and all that entails—e.g., transparency, stakeholder feedback, community engagement, alignment with State policy, ratepayer protections, affordability considerations, support for at-scale development—is essential both to provide market certainty and affordably serve the demand for clean renewable hydrogen as it grows over time.

Framing-Doc-12-26-23.pdf. The framework also recognizes that clean renewable hydrogen "complements electrification efforts by helping the state to fully address difficult-to-decarbonize sectors of our state economy, including, but not limited to transportation, power generation and storage, shipping, ports, aviation, fertilizer production, and heavy industry."

California is a leader in clean energy policies and is setting the pathway for others. The Governor's Office has recognized that investments in hydrogen "will support customer electric bill affordability by advancing commercialization, and scaling the deployment, of promising technologies."[75] Development of and investment in a robust hydrogen market will depend on economies of scale and strong policy frameworks. Federal and state support for ARCHES, the California Hydrogen Hub, and a national network of hydrogen hubs would help mitigate challenges to the development of the hydrogen economy, and decisive action by regulators effectuating the State's policies can help even further. Building the necessary infrastructure for the hydrogen economy, such as Angeles Link, is critically important. As Mr. Navin notes, projects of this scale are time-intensive and require a long lead time, particularly for permitting. Thus, it is critically important to advance to Phase 2 activities for Angeles Link in a timely fashion.

This concludes my prepared direct testimony.

[75] State of California – Office of Governor Gavin Newsom, *Building the Electricity Grid of the Future: California's Clean Energy Transition Plan* (May 2023) at 20, *available at:* https://www.gov.ca.gov/wp-content/uploads/2023/05/CAEnergyTransitionPlan.pdf.

IV. WITNESS QUALIFICATIONS

My name is Maryam S. Brown. My business address is 555 West 5th Street, Los Angeles, California, 90013. For the past five years, I have been the President of SoCalGas. Prior to joining SoCalGas, I was the Vice President of Federal Government Affairs for Sempra. I began working at Sempra in 2016. I have over 25 years of experience in the energy industry across engineering, legal, policy, and regulatory roles. I have a Bachelor of Science degree in mechanical engineering from Louisiana State University, and I also received my Juris Doctorate from Louisiana State University. I have previously appeared before the California Public Utilities Commission.