Angeles Link – Phase 1

Quarterly Report (Q1 2024)

For the period of January 1, 2024 through March 31, 2024

June 2024

TABLE OF CONTENTS

I. BACKGROUND

On December 15, 2022, the California Public Utilities Commission (CPUC) adopted Decision (D.) 22-12-055 (Decision) authorizing the establishment of SoCalGas's Angeles Link Memorandum Account (Memorandum Account) to track costs for advancing the first phase of the Angeles Link Project (Project). SoCalGas established the Memorandum Account on December 21, 2022.

The objective of the proposed Project is to develop a non-discriminatory pipeline system that is dedicated to public use to transport clean renewable hydrogen[1] from regional third-party production and storage sites to end users in Central and Southern California, including the Los Angeles Basin. The CPUC recognized clean renewable hydrogen "has the potential to decarbonize the state and the Los Angeles Basin's energy future and bring economic opportunities and new jobs to the region."[2]

To increase transparency and gain valuable feedback, SoCalGas proposed in its Memorandum Account Application for Angeles Link to submit interim reports to the CPUC and the public regarding Project status and updates. Pursuant to Ordering Paragraph (OP) 3(h) of the Decision,[3] SoCalGas hereby submits this Quarterly Report, for the period January 1, 2024, through March 31, 2024 (Q1-2024). In compliance with the Decision, this report is also served on the service list for the Angeles Link proceeding (A.22-02-007) and is publicly available at: https://www.socalgas.com/sustainability/hydrogen/angeles-link.

II. PLANNING ADVISORY GROUP AND COMMUNITY BASED ORGANIZATION STAKEHOLDER GROUP ACTIVITY SUMMARY

During this reporting period, in compliance with the Decision's directive to conduct quarterly stakeholder engagement meetings, two Planning Advisory Group (PAG) meetings (one quarterly and one workshop) and one Community Based Organization Stakeholder Group (CBOSG) quarterly meeting were held. In addition, through February and March 2024, the Angeles Link team extended invitations to all members of the CBOSG for 1-on-1 meetings. These meetings aimed to deepen our connection with our community-based organizations (CBOs) and the communities they serve, gather feedback on the stakeholder process, and address any questions in a more focused setting. Meetings were held in-person at CBO offices, in their service area(s), and virtually over Zoom. These meetings are discussed below.

---

1 Per the Decision (D.22-12-055) at 9, "clean renewable hydrogen" is defined as hydrogen produced with a carbon intensity equal to or less than four kilograms of carbon dioxide-equivalent produced on a lifecycle basis per kilogram and does not use any fossil fuel in its production process.

2 D.22-12-055 at 2.

3 *Id.* at 74-75.

February 2024 Workshop

SoCalGas hosted one PAG workshop on February 15, where SoCalGas provided an update on Alliance for Renewable Clean Hydrogen Energy Systems (ARCHES) efforts and a preview of preliminary findings for the Water Resources Evaluation and Hydrogen Leakage Assessment.

March 2024 Quarterly Meetings

SoCalGas hosted two quarterly meetings (one PAG and one CBOSG) in the month of March. At the March 4 CBOSG and March 5 PAG quarterly meetings, SoCalGas provided a preview of the preliminary findings for Routing/Configuration Analysis, Plan for Applicable Safety Requirements, and Workforce Planning and Training Evaluation. As part of the meetings, SoCalGas also shared that a portion of the second quarterly CBOSG meeting would be dedicated to effective approaches and structure around Community Benefits Plans, with an opportunity for stakeholders to share ideas around structure of future plans for consideration in subsequent project phases.

One-on-One CBO Engagement Meetings

SoCalGas remains committed to engaging with all current Angeles Link CBOSG members in the manner that suits them and their organization. Based upon stakeholder feedback received in 2023, CBOSG members expressed interest in more one-on-one opportunities with SoCalGas as opposed to larger technical-based meetings and workshops. SoCalGas met with 16 out of the 29 participating CBO organizations, either virtually or in person. The information below provides meeting goals, outcomes, and CBOSG participants, and feedback themes covered. One-on-one meeting opportunities will remain available throughout the stakeholder process for organizations that did not have the opportunity to meet with SoCalGas and would like to do so.

Goals for Engagement with CBOs

1. Build a deeper understanding of each CBOSG member and their organization's mission.
2. Identify pathways to facilitate more effective feedback from CBOSG members to continuously improve quarterly meetings.
3. Provide a familiar space for CBOSG members to ask questions in a one-on-one setting.
4. Meet with CBOSG members at their facilities or within their service territory.
5. Foster stronger connections, trust, and open communication channels with CBOSG members, encouraging active involvement and feedback.

One-on-One Engagement Meeting Outcomes

- Enhanced understanding of community needs and CBOSG initiatives.
- Identified areas of improvement in stakeholder feedback process. communication channels, and meeting content and structure.
- Strengthened relationships with CBOs.
- Identified potential areas for collaboration.
- Increased trust and transparency between CBOs and the SoCalGas Angeles Link team.

Participating CBOSG Organizations	CBOSG Feedback Themes
• Soledad Enrichment Action (SEA) • Coalition for Responsible Community Development (CRCD) • Breathe Southern California • California Greenworks • Chinatown Service Center • Go Green Initiative • Little Tokyo Community Council • Mexican American Opportunity Foundation • Nature for All • Parents, Educators/Teachers, and Students in Action (PESA) • Watts/Century Latino Organization • Southside Coalition of Community Health Centers • Climate Action Campaign • Faith and Community Empowerment (FACE) • Reimagine LA Foundation • Southeast Rio Vista YMCA	• Some stakeholders prefer smaller, focused meetings over large ones. • Some find the technical aspects of the project challenging, and suggested simplifying materials. • The incorporation of small break-out sessions and simplifying information through topic worksheets was appreciated. • Stakeholders remain committed to the stakeholder engagement process and continuing participation. • Feedback on meeting structure to provide higher-level summaries and improve CBOSG engagement. • Environmental justice concerns were raised, particularly regarding potential preferred proposed routes.

Note: SoCalGas invited all CBOSG members to engage one-on-one, with the goal, of meeting with every CBOSG member. However, not all CBOSG members were able to accommodate a one-on-one meeting due to limited bandwidth or schedule constraints.

Draft Report & Preliminary Findings

SoCalGas provided Preliminary Findings for four of the Angeles Link Phase 1 studies, specifically: Greenhouse Gas (GHG) Emissions Evaluation, Hydrogen Leakage Assessment, Nitrogen Oxide (NOx) and other Air Emissions Assessment, and Water Resource Evaluation. Additionally, SoCalGas provided the Demand Study Draft Report. The draft report and preliminary findings are provided in Appendix 1. Comment letters are provided in Appendix 2 and SoCalGas responses to comment letters are provided in Appendix 3.

Table 1: Index of Commenters during Q1 2024		
Comment Letter	**Date of Letter**	**Commenter**
Demand Study Draft Report Commenters (Comment Period January – February 23, 2024)		
1	February 23	Environmental Defense Fund (EDF) & Natural Resources Defense Council (NRDC)
2	February 23	Public Advocates Office (CalPA)
3	February 26[4]	The Utility Consumers' Action Network (UCAN)
Preliminary Data and Findings (NOx, GHG, Leakage, and Water) (Comment Period March 2024)		
4	March 29	Air Products
5	March 29	Communities for a Better Environment (CBE)
6	April 5	CBE
7	March 1	EDF
8	March 28	EDF
9	March 29	Food and Water Watch (FWW)
10	March 25	Protect Playa Now (PPN)
11	March 28	PPN
12	March 29	Physicians for Social Responsibility – LA (PSR-LA)

[4] UCAN comment letter was received after the close of the comment period, which closed on February 23, 2024.

III. COMMENTS AND RESPONSES TO STAKEHOLDER FEEDBACK

In compliance with D.22-12-015, Ordering Paragraph (OP) 3(h), SoCalGas solicited feedback from the PAG and CBOSG, summarized that feedback in this Quarterly Report, attached written comments submitted through the dedicated Angeles Link feedback email address (Appendix 2 - PAG/CBOSG Written Comments), and provided responses to comments (Appendix 3 - SoCalGas Responses to Comments). SoCalGas appreciates the continued engagement of the PAG and CBOSG throughout the stakeholder engagement process and the continued active participation in the stakeholder workshops and meetings. Phase 1 studies progression is an iterative process and the feedback and insights provided by members of the PAG and CBOSG at various junctures are considered as the studies advance.

SoCalGas received PAG and CBOSG member input verbally, through in-person and virtual attendee comments/discussions at workshops or via Zoom, or in writing through email. Feedback was often relayed as part of a PAG/CBOSG discussion, and, in many cases, responses were provided in real time. As noted above, formal written communications have been included as Appendix 2 and SoCalGas provided responses to written comments in Appendix 3. Meeting participants are included in Appendix 4 - Attendee list for PAG and CBOSG meetings, as well as those invited who were not in attendance. For additional details on verbal feedback and meeting discussions, please refer to court reporter transcripts of all first quarter meetings (Appendix 5 - Transcripts). CBOSG and PAG meeting materials are provided in Appendices 6 and 7, respectively. Links to PAG and CBOSG meeting recordings are made available in Appendix 8, and summaries of CBOSG and PAG stakeholder meetings are made available in Appendix 9 and 10, respectively.

Summary of General Comments

This summary provides an overview of key topics that were raised during the meetings and workshops and in written comments during the Q1 2024 period, as well as a summary response to those key topics. General responses, referred to as “global responses” together with detailed responses to all written comments received during the Q1 2024 period are included in Appendix 3.

Hydrogen Demand

Among other things, the three comment letters received from PAG members on the Angeles Link Demand Draft Report (Demand Study) state the projections of future demand for clean renewable hydrogen in SoCalGas's service territory contained in the Demand Study may be too high and do not adequately account for the current and projected cost of clean renewable hydrogen.

SoCalGas’s Demand Study projections were based on independently developed assumptions and analysis of potential hydrogen uptake in the SoCalGas service territory. When looking at these projections holistically, the Demand Study’s conclusions are near or within the range of recently released projections of hydrogen demand in California. While there may be differences in the amount of clean renewable hydrogen demand projected in all the referenced studies, there is consensus among agencies and researchers that projected demand exists in the power, mobility, and industrial sectors, that demand in those sectors is expected to grow over the next two decades, and that additional analysis is needed to better forecast what demand will be.

While, the Demand and High-Level Economics and Cost Effectiveness Studies do not intend to address market driven commodity-based hydrogen price forecasts, SoCalGas is evaluating the levelized cost of delivered hydrogen (LCOH) associated with potential configurations of Angeles Link in the Phase 1 High-Level Economics and Cost Effectiveness Study, and then comparing it to other clean renewable hydrogen alternatives and non-hydrogen alternatives. Analysis of price elasticity of hydrogen demand will be included in a future phase of Angeles Link planning.

Stakeholder Engagement Process

PAG and CBOSG members stated concerns with the stakeholder engagement process in comment letters. Specifically, regarding transparency of information, in certain cases too much information which can make it difficult for members to review and comment on materials, fast-paced nature of Phase 1, and not having adequate tribal representation in its PAG and CBOSG.

SoCalGas has been transparent and inclusive in the development of its Angeles Link feasibility studies in Phase 1. The purpose in forming a PAG and CBOSG was to be transparent and inclusive in the early development of the Angeles Link. Including a broad range of stakeholders in its PAG and CBOSG, including those opposed to the project, this early and at this level in the process is unprecedented for SoCalGas.

SoCalGas understands it has held over two dozen meetings with the PAG and CBOSG since March of 2023 and that some parties may find the process to be fast paced. SoCalGas's Phase 1 application stated that the process would be completed in approximately 12-18 months and is working diligently to comply with its deliverables on time and on budget. SoCalGas intended to meet with its PAG and CBOSG once a quarter but agreed to meet more often via workshops in response to PAG and CBOSG feedback.

SoCalGas also understands it has shared a lot of detailed information with its PAG and CBOSG members as the studies unfold. We have done so to be transparent and inclusive and seek feedback from stakeholders on the scope, approach, and findings along the way. In order to make information more accessible and easier to comment for the PAG and CBOSG, SoCalGas has presented Preliminary Data and Findings in a new format moving forward. SoCalGas will also continue to make all available information accessible to members in its Living Library. SoCalGas will continue to work with its PAG and CBOSG to determine the appropriate meeting cadence and identify various ways (e.g. verbally, written, etc.) for members to review and provide feedback on studies and process.

SoCalGas has three CBOSG members who represent tribal communities. In response to PAG and CBOSG feedback, SoCalGas has also reached out to other organizations who represent tribal communities in Los Angeles and Central Valley and will extend opportunities for them to join the PAG and/or CBOSG in this phase or subsequent phases of the project.

In addition to quarterly meetings and supplemental workshops, SoCalGas Angeles Link directors, subject matter experts, and project managers continually make themselves available for one-on-one meetings with stakeholders seeking specific answers or more detailed information not presented in a formal meeting. As communicated to PAG and CBOSG members, this opportunity is extended to all stakeholders on an on-going basis throughout the duration of the project, and many stakeholders have engaged with SoCalGas in these smaller briefings. Whether resulting in a small briefing or not, SoCalGas also contacts stakeholders who request additional information during meetings to confirm they have their question answered or concern addressed.

Indirect GHG, NOx, and Emissions/Leakage

Commenters questioned potential exclusion(s) of certain emissions impacts in the GHG Emissions, Hydrogen Leakage, and NOx studies. Specifically, estimates of lifecycle emissions that would include emissions from water conveyance and biomass gasification were not included in the GHG or NOx studies. Commenters assert that the assessments without full lifecycle emissions may underestimate the GHG emissions arising from third-party hydrogen production processes, such as steam methane reforming and biomass gasification. Commenters also noted the absence of volumetric leakage estimates in the Leakage Preliminary Data & Findings document and the absence of potential impacts to climate change in the Greenhouse Gas Preliminary Data & Findings document associated with hydrogen leakage. Lifecycle assessments rely on a level of detail that is beyond the scope of this feasibility study and have therefore not been included. In response to stakeholder concerns regarding leakage estimates, the Hydrogen Leakage Assessment Study Draft Report (issued to PAG/CBO in May 29) now includes a preliminary high-level range of estimates of the potential for leakage associated with Angeles Link infrastructure and third-party producers and storage. The Greenhouse Gas Emissions Evaluation Study Draft Report will include a preliminary high-level estimate of the impact to anticipated GHG emissions reductions. The supplemental analysis will appear in Appendix B of the Draft GHG Study Report.

Water Resources and Hydrogen Production

Commenters expressed concerns related to water availability and potential environmental impacts associated with water supply development for clean renewable hydrogen production. Commenters also expressed concerns related to local water impacts and potential impacts on affordability associated with water supply development for production. Commenters also stated potential greenhouse gas emissions from water conveyance and treatment for clean renewable hydrogen production should be evaluated.

SoCalGas recognizes the concerns related to water availability and the potential environmental impacts associated with water supply development by third-party producers for clean renewable hydrogen production. The Water Resources Evaluation evaluates water availability for clean renewable hydrogen production by identifying potential water sources third party producers may pursue and quantifies the water needed for third-party clean renewable hydrogen production. The Water Resources Evaluation concludes that the quantity of water needed to produce the volume of clean renewable hydrogen that Angeles Link would transport comprises less than one percent of the total amount of water used per year in California.

SoCalGas also understands concerns around affordability related to water needed by third-party producers of clean renewable hydrogen. Local impacts associated with water supply development, including potential impacts related to affordability, were outside of the scope of the Water Resources Evaluation. SoCalGas understands water rates in California are set by public processes and are based on a variety of factors. Ultimately, third-party clean hydrogen producers will select the water sources that may supply specific production projects, and that selection may inform future rate setting of a local water agency.

In direct response to comments concerning potential GHG emissions associated with water conveyance and treatment for production, SoCalGas's Water Resources Evaluation was expanded to include a high-level analysis of potential indirect emissions from water conveyance. This qualitative analysis is in progress and will be provided to the PAG/CBOSG upon completion of the draft Water Resources Evaluation, which is anticipated to be released in summer 2024.

IV. ALLIANCE FOR RENEWABLE CLEAN HYDROGEN ENERGY SYSTEMS

ARCHES is California's public-private hydrogen hub consortium to accelerate the development and deployment of clean, renewable energy sources to reduce GHG emissions and advance to a zero-carbon economy.[5] On October 13, 2023, the U.S. Department of Energy (DOE) announced that, after a rigorous application and review process, ARCHES was one of seven hydrogen hubs selected to receive up to $1.2 billion in federal funding.[6] While certain details are confidential, ARCHES is in the negotiation stage with the DOE to secure funding and start building out the hub. DOE/ARCHES negotiations began in November 2023 and currently are expected to conclude in Q3 2024.

SoCalGas has been supportive of the State's efforts to secure federal funding for a California hydrogen hub. Consistent with D.22-12-055, SoCalGas joined ARCHES and has coordinated with ARCHES throughout the development of ARCHES's application and negotiations for federal funding.

---

[5] Regional Clean Hydrogen Hubs. Accessible at: https://www.energy.gov/oced/regional-clean-hydrogen-hubs-0

[6] California wins up to $1.2 billion from feds for hydrogen Accessible at: https://archesh2.org/california-wins-up-to-1-2-billion-from-feds-for-hydrogen/

V. PHASE 1 FEASIBILITY STUDIES UPDATE

SoCalGas is required to submit Quarterly Reports to the Commission's Deputy Executive Director for Energy and Climate Policy on the progress of the Phase 1 activities and to report any preliminary results and findings regarding the feasibility studies included in Phase 1.[7] This section provides an update on the status of the feasibility studies being undertaken in compliance with the Decision, in furtherance of the Project, and in alignment with project-specific standards adopted by the CPUC. Note that the study updates provided herein may be subject to further modification given PAG/CBOSG input and may also change based on results from other studies, and/or other variables.

Relevant Q2 updates are provided in parenthesis.

A. Market Assessment & Alternatives

Demand Study	
Overview	The Decision requires SoCalGas to identify hydrogen demand, end uses, and potential end-users (including current natural gas customers and future customers) of the Project.[8] SoCalGas is evaluating potential clean renewable hydrogen demand and assessing adoption in the Mobility, Power Generation, and Industrial sectors.
Progress Summary	Over the reporting period, SoCalGas shared the Demand Study Draft Report with the PAG and CBOSG on January 17, 2024. Feedback on the draft report was due on February 23, 2024. SoCalGas received 3 comment letters. See Appendix 3 for response to comments.

[7] D.22-12-055 at 74-75, OP 3(h).

[8] *Id.* at 75-76, OP 6 (a) and OP 6 (c).

Production Planning & Assessment	
Overview	The Decision requires SoCalGas to identify the potential sources of hydrogen generation for the Project[9] and its plans to ensure the quality of the hydrogen gas meets the clean renewable hydrogen standards.[10] SoCalGas is evaluating potential sources of clean renewable hydrogen production from renewable sources such as solar and wind, input requirements, estimated cost of production, and policies, procedures, and other methods to meet clean renewable hydrogen standards.
Progress Summary	Over the reporting period, SoCalGas continued to advance the production study. Work included continued analysis to refine estimated costs for the production zones, consideration of other Angeles Link Phase 1 studies, and the development of initial preliminary findings and content for the draft report. SoCalGas is also conducting an evaluation of potential third-party hydrogen storage technologies and siting within the Central and Southern California regions. (The preliminary findings were issued to PAG/CBOSG on April 11.)

Project Options and Alternatives	
Overview	The Decision required SoCalGas to consider and evaluate Project alternatives, including a localized hydrogen hub or other decarbonization options such as electrification.[11] SoCalGas is also required to study a localized hydrogen hub solution under the specifications required to be eligible for federal funding as part of Phase 1.[12] SoCalGas is evaluating Project options and alternatives, including other hydrogen delivery alternatives and non-hydrogen alternatives.
Progress Summary	Over the reporting period, the criteria for evaluating options and alternatives for non-hydrogen alternatives (e.g., electrification, energy efficiency, etc.) as well as other hydrogen delivery alternatives (e.g., trucking, shipping, etc.) were finalized. Evaluation of these alternatives against the criteria is currently underway. Alternatives that meet these criteria will be carried forward to the High-Level Economics and Cost Effectiveness study and the Environmental & Environmental Social Justice Analysis. (The preliminary findings were issued to PAG/CBOSG on May 21.)

High-Level Economic Analysis & Cost Effectiveness	
Overview	The Decision requires SoCalGas to evaluate the cost effectiveness of the Project against alternatives and determine a methodology to measure cost effectiveness between alternatives.[13] SoCalGas is developing methodology used to measure cost effectiveness, including gathering cost estimates, performing an economic analysis to estimate at a high level the levelized cost of clean renewable hydrogen (LCOH), and comparing the cost effectiveness of the Project against various project alternatives.
Progress Summary	Over the reporting period, further progress was made to develop a modeling framework to measure cost effectiveness of the Project and alternatives. The study includes a comparative analysis to determine the cost effectiveness of hydrogen delivery alternatives and non-hydrogen alternatives. Once the analysis is complete, the cost effectiveness results will inform the Project Options and Alternatives study, which will compare the alternatives qualitatively and quantitatively based on cost effectiveness. (The preliminary findings were issued to PAG/CBOSG on May 21.)

9 *Id.* at 75-76, OP 6 (b).
10 *Id.* at 75-76, OP 6 (j).
11 *Id.* at 75-76, OP 6 (d).
12 *Id.* at 73-74, OP 3 (c).
13 *Id.* at 75-76, OP 6 (d).

B. Regulatory, Policy & Environmental

Water Resource Evaluation	
Overview	The Decision requires SoCalGas to identify the potential sources of clean renewable hydrogen generation and water and estimate the costs of the hydrogen for the Project.[14] SoCalGas is evaluating the availability of water resources for third-party clean renewable hydrogen production in the Central and Southern California regions.
Progress Summary	Over the reporting period, SoCalGas continued to progress: (1) evaluation of potential water resources available for third-party hydrogen production; (2) cost estimates for water conveyance, acquisition, and purification; and (3) analysis of challenges and opportunities for water acquisition in Central and Southern California. On February 15, 2024, SoCalGas presented the Water Resource Evaluation Preliminary Data and Findings to the PAG. SoCalGas shared the Water Resource Evaluation Preliminary Data and Findings with PAG and CBOSG on March 1, 2024. Feedback on the Water Resource Evaluation Preliminary Data and Findings was due on March 29, 2024, and SoCalGas received 9 comment letters. See Appendix 3 for response to comments.

Hydrogen Leakage Assessment	
Overview	The Decision directs SoCalGas to assess the risks and mitigations for hydrogen leakage.[15] SoCalGas is evaluating potential hydrogen leakage associated with production, storage, and transportation of hydrogen. The assessment will also identify and evaluate potential mitigation measures.
Progress Summary	Over the reporting period, SoCalGas published the Preliminary Data and Findings document. On February 15, 2024, SoCalGas presented a preview of the Hydrogen Leakage Assessment preliminary findings to the PAG. SoCalGas shared the Hydrogen Leakage Assessment preliminary findings with PAG and CBOSG on February 28 and March 1, 2024, respectively. Feedback on the Hydrogen Leakage Assessment Preliminary Data and Findings was due on March 29, 2024, and SoCalGas received 9 comment letters. See Appendix 3 for response to comments. (SoCalGas shared the Hydrogen Leakage Assessment Draft Report with the PAG and CBOSG on May 29, 2024.)

Nitrogen Oxide (NOx) and other Air Emissions Assessment	
Overview	The Decision requires SoCalGas to assess potential NOx emissions associated with the Project, including appropriate controls to mitigate emissions.[16] SoCalGas is evaluating NOx and other air emissions associated with production, storage and transportation of hydrogen, as well as NOx emissions associated with end users. Key areas of focus include the Mobility, Power Generation, and Industrial end use sectors. SoCalGas is also identifying and evaluating potential mitigation measures.
Progress Summary	Over the reporting period, SoCalGas published the NOx Study Preliminary Data and Findings to PAG and CBOSG on February 28 and March 1, 2024, respectively. SoCalGas received feedback that a portion of the study describing reduction of NOx emissions for the mobility sector was unclear with the respect to the role clean renewable hydrogen will play in reducing emissions. As a result, SoCalGas published revised Preliminary Data and Findings on March 22 to provide clarification. (Feedback on the NOx Study Preliminary Data and Findings was due on April 5, 2024).

[14] *Id.* at 75-76, OP 6 (b).
[15] *Id.* at 75-76, OP 6 (g).
[16] *Id.* at 75-76, OP 6 (h).

Greenhouse Gas (GHG) Emissions Evaluation	
Overview	The Decision directs SoCalGas to provide the findings from Phase 1 feasibility studies demonstrating compliance with environmental laws and public policies.[17] To support evaluation of environmental laws and public policies, SoCalGas is conducting an initial evaluation of GHG reductions (net of emissions) associated with the Project. SoCalGas is also evaluating GHG emissions associated with production, storage, and transportation of hydrogen, as well as GHG emissions associated with end users. Key areas of focus include the Mobility, Power Generation, and Industrial end use sectors.
Progress Summary	Over the reporting period, SoCalGas published the Preliminary Data and Findings document, which summarized the projected overall GHG emissions reductions (end user reductions minus infrastructure emissions). The emissions information was presented for six scenarios based on conservative, moderate, and ambitious scenarios using Demand Study data evaluating the broader hydrogen market, as well as low, medium, and high anticipated Angeles Link throughput projections. SoCalGas published the GHG Evaluation Preliminary Data and Findings with PAG and CBOSG on February 28, and March 1, 2024, respectively. Feedback on the Preliminary Data and Findings was due on March 29, 2024, and SoCalGas received 6 comment letters. See Appendix 3 for response to comments.

[17] *Id.* at 75-77, OP 6 (n).

Environmental & Environmental Social Justice Analysis	
Overview	The Decision directs SoCalGas to provide the findings from Phase 1 feasibility studies demonstrating compliance with environmental law and public policies.[18] Further, the Decision directs SoCalGas to address and mitigate impacts to disadvantaged communities and other environmental justice concerns.[19] SoCalGas is conducting an initial evaluation of a clean renewable hydrogen transportation system (such as Angeles Link) compliance with environmental law and public policies, which will include an assessment of environmental impacts of project alternatives, environmental justice concerns and potential impacts to disadvantaged communities.
Progress Summary	Over the reporting period, work continued to progress for the environmental analysis, including impact evaluations for the proposed pipeline system and alternatives to the Project. Work also continued to progress on the Environmental Social Justice Community Engagement Plan being prepared in response to PAG and CBOSG feedback received in 2023. (The preliminary findings were issued to PAG/CBOSG on June 11.)

High-Level Feasibility Assessment & Permitting Analysis	
Overview	The Decision requires SoCalGas to identify and compare possible routes and configurations for the Project.[20] SoCalGas is conducting a high-level assessment of potential environmental and regulatory approvals, including federal, state, and local environmental permitting and regulatory approvals, regulatory approval timing, and environmental constraints.
Progress Summary	Over the reporting period, SoCalGas continued the process of evaluating potential environmental and regulatory approvals that could be needed for the Project at the state and federal levels. (The preliminary findings were issued to PAG/CBOSG on April 11.)

[18] *Id.* at 75-77, OP 6 (n).
[19] *Id.* at 75-77, OP 6 (l).
[20] *Id.* at 75-76, OP 6 (i).

C. Engineering Design

Preliminary Routing/Configuration Analysis with Integrated Right-of-Way and Franchise Study Information	
Overview	The Decision requires SoCalGas to identify and compare possible routes and configurations for the Project.[21] The study aims to: 1. Determine several preferred routing/configuration alternatives for the hydrogen system for Phase 1. 2. Evaluate technical considerations, and other potential geographical and urban challenges. 3. Consider existing pipeline corridors or rights-of-way, other known existing rights-of-way, franchise rights, designated federal energy corridors or rights-of-way.[22]
Progress Summary	1. Preliminary Routing: Over the reporting period, work continued to progress, including identification of routing features and the integration of information from other studies, as available. As preferred routes are developed, they will include two SoCalGas pipeline segments (one located in San Joaquin Valley and one from Lancaster to LA Basin), both of which are included in the ARCHES H2Hub Application. The engineering, environmental, and social features considered for the various routes have been defined and the results will be included in the draft report. 2. Integration of Right-of-Way Information: SoCalGas reviewed minor segment refinements, including preliminary identification of private property ownership and private rights of way of the refined segments. 3. Franchise Information Review: SoCalGas also reviewed small segment refinements to identify existing SoCalGas city and county franchise agreements. On March 4 and 5, 2024, SoCalGas presented a preview of the Preliminary Routing/Configuration Analysis with Integrated Right-of-Way and Franchise Study Information preliminary findings to CBOSG and PAG, respectively. (The preliminary findings were issued to PAG/CBOSG on April 11.)

[21] *Id.* at 75-76, OP 6 (i).

[22] Given the relationship with the routing analysis, right-of-way and franchise information will be integrated within the Routing Study.

Pipeline Sizing & Design Criteria	
Overview	The Decision requires SoCalGas to compare possible routes and configurations.[23] SoCalGas is estimating potential range of pipeline sizes for the pipeline route from production to end-use; identifying potential materials for pipeline, fittings, and differences in operational equipment; discussing pressures and maintenance operations associated with design; and evaluating compression characteristics and options.
Progress Summary	Over the reporting period, SoCalGas continued data collection and analysis from other studies (e.g., Demand Study, Production Study) to develop hydraulic modeling cases. The hydraulic models are being used to evaluate preliminary pipeline sizing pressure and flow, compression requirements, and pipeline material selection. (The preliminary findings were issued to PAG/CBOSG on May 21.)

Plan for Applicable Safety Requirements	
Overview	The Decision requires SoCalGas to evaluate safety concerns involved in pipeline transmission, storage, and transportation of hydrogen applicable to the Project.[24] SoCalGas is evaluating safety concerns and developing an assessment of applicable safety requirements for employee, contractor, system, and public safety.
Progress Summary	Over the reporting period, SoCalGas continued to assess and review applicable safety requirements to evaluate how those requirements may apply to the Project. Additionally, third-party review of this evaluation has been initiated and will be conducted by the Department of Energy (DOE) Hydrogen and Fuel Cells Technology Office's established Hydrogen Safety Panel. On March 4 and 5, 2024, SoCalGas presented on the Plan for Applicable Safety Requirements Preliminary Data and Findings to CBOSG and PAG, respectively. (The preliminary findings were issued to PAG/CBOSG on April 11.)

[23] *Id.* at 75-76, OP 6 (i).
[24] *Id.* at 75-76, OP 6 (f).

Workforce Planning & Training Evaluation	
Overview	The Decision requires SoCalGas to evaluate workforce planning and training.[25] SoCalGas is evaluating operations and maintenance protocols for utility workers regarding hydrogen infrastructure and workforce needs in terms of staging and growth for the Project.
Progress Summary	Over the reporting period, SoCalGas continued to conduct research and coordinate internal subject matter expertise to evaluate potential planning and workforce training applicable to the Project, which includes a preliminary assessment of jobs created. On March 4 and 5, 2024, SoCalGas presented on the Workforce Planning & Training Evaluation Preliminary Data and Findings to CBOSG and PAG, respectively. (The preliminary findings were issued to PAG/CBOSG on April 11.)

VI. APPENDIX

1. Draft Reports and Preliminary Findings
2. PAG/CBOSG Written Comments
3. SoCalGas Responses to Comments
4. Attendee List for Planning Advisory Group and Community Based Organization Stakeholder Group Meetings and Workshop, Including Those Invited
5. Meeting Transcripts
6. CBOSG Meeting Materials
7. PAG Meeting Materials
8. Link to PAG and CBOSG Meeting Recordings
9. Summary of CBOSG Stakeholder Meeting
10. Summary of PAG Meetings

[25] *Id.* at 75-76, OP 6 (e).