BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

FILED
05/04/26
04:59 PM
A2209006

Application of Southern California Gas Company (U904G), San Diego Gas & Electric Company (U902), Pacific Gas and Electric (U39G) and Southwest Gas Corporation (U905G) to Establish Hydrogen Blending Demonstration Projects	A.22-09-006 (Filed September 8, 2022)

OPENING BRIEF OF SOUTHERN CALIFORNIA GAS COMPANY

ISMAEL BAUTISTA, JR.
AVISHA A. PATEL

Attorney for:
SOUTHERN CALIFORNIA GAS COMPANY
555 West Fifth Street, Suite 1400
Los Angeles, California 90013
Telephone: (213) 231-5978
Facsimile: (213) 629-9620
E-Mail: IBautista@SoCalGas.com

May 4, 2026

TABLE OF CONTENTS

TABLE OF AUTHORITIES

CPUC DECISIONS

RULES OF PRACTICE AND PROCEDURE

SUMMARY OF RECOMMENDATIONS

1. The Commission should approve the UCI and Orange Cove hydrogen blending demonstration projects in full.
2. The Commission should find that both projects comply with Public Utilities Code requirements and Ordering Paragraph 7 of Decision (D.) 22-12-057, are useful and well designed, and appropriately implement the Commission's directive to evaluate hydrogen blending under controlled, real-world conditions.
3. The Commission should find that SoCalGas has demonstrated by a preponderance of the evidence that the proposed projects are reasonable, prudent, safe, and aligned with Commission guidance.
4. The Commission should find that the UCI and Orange Cove Projects directly respond to the limitations identified in the UC Riverside Hydrogen Blending Impacts Study and the Hydrogen Blending Compendium Report by generating field-validated data on system impacts, end-use performance, safety, operability, and community experience.
5. The Commission should reject requests to deny, delay, or materially alter the projects based on speculative concerns.
6. The Commission should reject intervenor proposals that are unsupported by record evidence, contradict Commission findings regarding acceptable blending levels, or undermine the purpose and integrity of the demonstration projects.
7. The Commission should find that the projects' design and plans have a strong emphasis on safety and risks are appropriately managed.
8. The Commission should find that SoCalGas has incorporated conservative blend levels, system isolation, enhanced leak detection, automated shutdowns, independent safety reviews, and emergency response planning that together support risks remain extremely low and well within established safety standards.
9. The Commission should find that the projects are prudent.
10. The Commission should find that the proposed cost estimates and cost-tracking mechanisms are reasonable and recognize SoCalGas's efforts to control costs and improve affordability, and allow recovery of reasonable costs subject to customary reasonableness review.

11. The Commission should find that the projects align with California's climate and energy goals.
12. The Commission should find that the projects must proceed to generate data to inform future policy decisions.
13. The Commission should find that implementing the projects will result in useful data that can be used to evaluate whether, and under what conditions, a system-wide hydrogen injection standard may be appropriate in the future.

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

Application of Southern California Gas Company (U904G), San Diego Gas & Electric Company (U902), Pacific Gas and Electric (U39G) and Southwest Gas Corporation (U905G) to Establish Hydrogen Blending Demonstration Projects	A.22-09-006 (Filed September 8, 2022)

OPENING BRIEF OF SOUTHERN CALIFORNIA GAS COMPANY

Pursuant to Rule 13.12 of the Rules of Practice and Procedure (Rules) of the California Public Utilities Commission (Commission or CPUC), the Assigned Commissioner's Scoping Memo and Ruling issued on June 12, 2025 (Scoping Memo), and the Administrative Law Judge's (ALJ) Email Ruling Directives and Evidence for Final Briefing issued on March 9, 2026 (March 9 Ruling), Southern California Gas Company (SoCalGas) hereby submits this Opening Brief on the issues identified in the Scoping Memo.

I. INTRODUCTION

This proceeding arises from the Commission's mandate to SoCalGas, San Diego Gas & Electric Company (SDG&E), Pacific Gas and Electric Company (PG&E), and Southwest Gas Corporation (Southwest Gas) (collectively, the Joint Utilities) to propose carefully designed hydrogen blending demonstration projects that can safely, cost-effectively, and equitably inform the development of a system-wide hydrogen injection standard. The evidence presented demonstrates SoCalGas met that directive. SoCalGas proposes two hydrogen blending demonstration projects: one at the University of California, Irvine (UCI Project) and the other in the City of Orange Cove (Orange Cove Project). These project proposals are intentionally

limited, subject to rigorous monitoring, and grounded in extensive technical record evidence showing that they are prudent, safe, and aligned with California's climate and energy policy goals.

Importantly, the Commission has consistently recognized that clean, renewable hydrogen has the potential to play a role in California's long-term decarbonization strategy, while also acknowledging that valuable new insights may be gained, particularly regarding real-world system impacts, end-use performance, safety, operability, and community experience. To address gaps identified in 2022 in Decision (D.) 22-12-057, the Commission ordered the Joint Utilities to propose demonstration projects and explicitly contemplated blending levels up to 20% hydrogen by volume under controlled conditions. The UCI and Orange Cove Projects implement that guidance as intended.

The 2022 UC Riverside Hydrogen Blending Impacts Study (UC Riverside Study) and the 2025 Hydrogen Blending Compendium Report (Compendium Report) both underscore the need for real-world demonstration projects that operate under authentic field conditions using representative infrastructure and end uses. The projects proposed here do precisely that. Each project is designed to generate actionable data on leakage, materials performance, appliance operation, emissions, safety systems, and operational protocols, while employing conservative blend levels, isolation strategies, and robust monitoring and automatic shutdown systems.

The UCI Project will evaluate hydrogen blends from 5% to 20% by volume in a closed, isolated system serving a single large institutional end use with consistent load characteristics. The Orange Cove Project will evaluate blends in stages starting from 0.1% to 5% across an entire community's distribution system representative of California's distribution gas network.

Together, the projects provide complementary insights that neither project alone could deliver, enabling the Commission to assess hydrogen blending impacts across different system scales, blend levels, and customer classes.

Intervenor opposition to SoCalGas's two proposed demonstrations largely rests on speculative concerns that are either directly rebutted by the evidentiary record or addressed through the projects' layered safety, monitoring, and community engagement frameworks. Critically, no party has shown that the projects fail to comply with Commission directives or applicable safety standards. Nor has any party offered a credible alternative pathway for addressing the data gaps identified by the Commission as necessary to inform system-wide policy decisions.

As demonstrated below, SoCalGas has met its burden of proof. The UCI and Orange Cove Projects conform to all relevant regulatory requirements, are useful and well-designed, are prudent in scope and cost, adopt safety as a foundational theme, and provide tangible benefits to ratepayers, policymakers, and affected communities. Accordingly, the Commission should approve these projects.

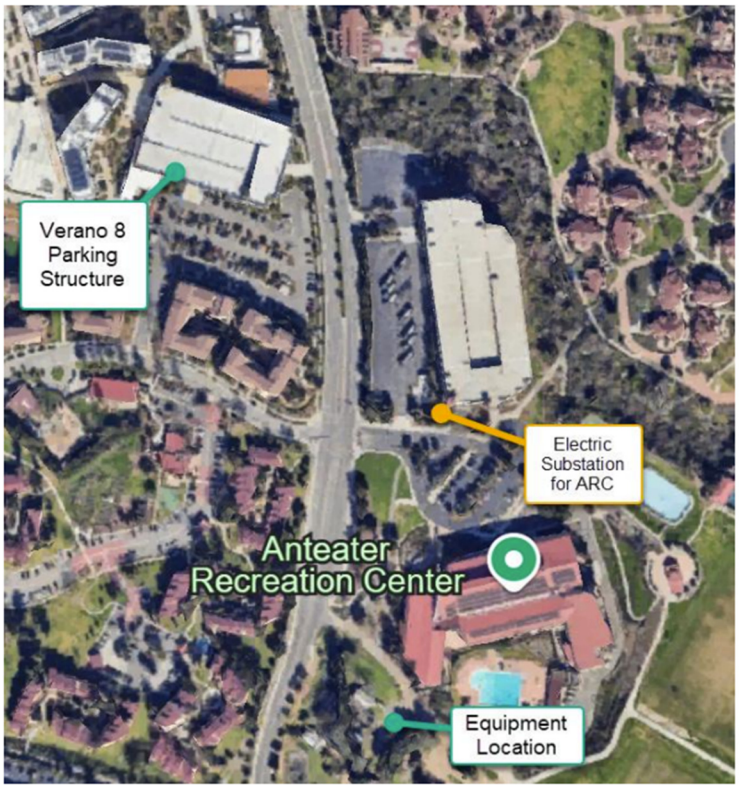
II. RELEVANT BACKGROUND

For brevity purposes, and consistent with the March 9 Ruling, SoCalGas adopts the Relevant Background section in SDG&E's Opening Brief.

III. OVERVIEW OF SOCALGAS'S PROPOSED PROJECTS

UCI Project

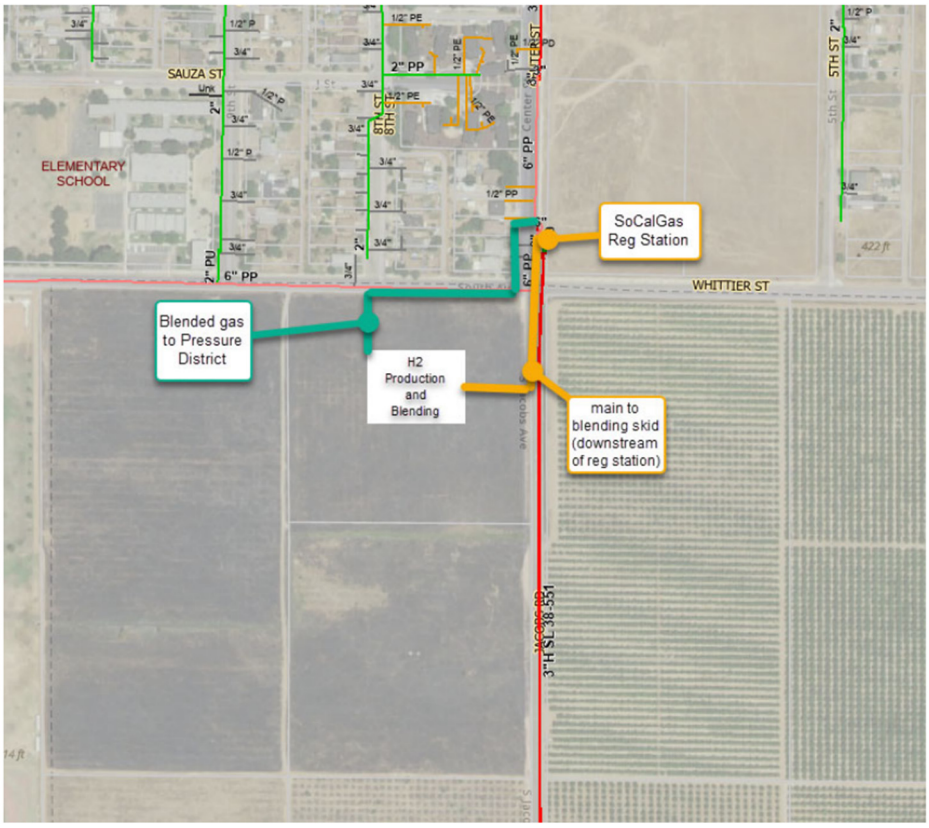
SoCalGas proposes to blend hydrogen at the University of California, Irvine's (UCI) Anteater Recreation Center (ARC), starting with a 5% and gradually increasing it to 20%.[1] The ARC is a large gymnasium and recreation complex on UCI's campus.[2] The blend will be conducted in an isolated portion of medium pressure steel and plastic distribution system for commercial equipment, such as boilers, water heaters, and cooking equipment.[3] The blending would take place over an 18-month period during which SoCalGas will collect data and evaluate seasonal demand conditions.[4] The following is a map illustrating the UCI Project's location:[5]



1 Ex. SCG-01R (Corrected Revised Testimony of Blaine Waymire (Chap. 1R)) (hereinafter Ex. SCG-01R) at 1-3.
2 *Id*. at 3.
3 *Id*. at 3.
4 *Id*. at 3-4.
5 *Id*. at 6 (Figure 2).

Orange Cove Project

SoCalGas proposes to blend hydrogen in the City of Orange Cove's distribution network, starting with 0.1% and gradually increasing in stages to 5% over an 18-month period.[6] The blend would be conducted in a medium pressure plastic and steel distribution pipeline system that serves natural gas-powered appliances in residential and commercial facilities to approximately 10,000 residents and businesses.[7] This project will offer a snapshot of how hydrogen blending could function across the broader distribution system and generate meaningful data on large-scale hydrogen blending.[8] The following is an illustration depicting the location of the hydrogen production and blending equipment:[9]



[6] Ex. SCG-02 (Rebuttal Testimony of Blaine Waymire (Chap. 2)) (hereinafter Ex. SCG-02) at 1, 4.
[7] SCG-02 at 1-2.
[8] SCG-02 at 2.
[9] SCG-02 at 7 (Figure 3).

IV. STANDARD FOR REVIEW

SoCalGas, as an applicant, has the ultimate burden of proof in this proceeding. The evidentiary standard that applies to this burden of proof is preponderance of evidence.[10] As conclusively demonstrated by the record in this proceeding and as discussed in this opening brief, SoCalGas met its burden of proof by producing evidence of the reasonableness of its requests, consisting of prepared direct and rebuttal testimony, workpapers, data request responses, and responses to ALJ rulings. Because SoCalGas met its initial burden of proof to produce sufficient evidence to establish the elements of its application, the burden of production shifted to other parties to provide evidence to support their positions.[11]

In that regard, intervenors bear a separate and distinct burden of production of evidence. If an intervenor proposes a result different from that asserted by the utility, the intervenor must go forward with evidence explaining a contrary position.[12] Only where that intervenor evidence, when weighed against the utility's showing, causes the Commission to entertain reasonable doubt does the utility fail to meet its ultimate burden. Intervenors, however, did not meet their burden, as discussed below. Accordingly, SoCalGas has met the burden of proving that the proposed projects are reasonable and that it is entitled to the relief sought in this proceeding.

---

[10] D.13-11-005 at 8.
[11] CPUC Case 24-09-006, *Presiding Officer's Decision of ALJ Rambo* at 15.
[12] D.18-10-019 at 31 (citing D.87-12-067).

V. THE UCI AND ORANGE COVE PROJECTS SHOULD BE APPROVED BECAUSE THEY MEET ALL RELEVANT REQUIREMENTS AND COMMISSION GUIDANCE

Both of SoCalGas's proposed projects meet all applicable requirements and follow Commission guidance. For ease of reference, each of the issues identified in the Scoping Memo are outlined below followed by, where appropriate, separate discussion subsections for each project.

A. SCOPING ISSUE 1: Do the pilots conform to regulatory requirements?

1. Scoping Issue 1.a: How does each pilot comply with specific requirements set forth in Public Utilities Code and D.22-12-057?

OP 7 of D.22-12-057 outlines various requirements and principles that the demonstration projects must follow and abide by. Based on the following, both the UCI and Orange Cove Projects comply with these requirements and guidance.

a. The UCI Project Complies with D.22-12-057

The UCI Project complies with OP 7a[13] of D.22-12-057 because it incorporates comprehensive safety and monitoring measures to support the integrity of University of California, Irvine's (UCI) system during hydrogen blending, including: enhanced monthly leak detection; continuous remote monitoring of hydrogen production, storage, and blending facilities; and automated shutdown protocols that isolate hydrogen production and storage equipment and revert the system to 100% natural gas if leakage in said equipment is detected.[14]

---

[13] OP 7a of D.22-12-057 states, "Ensures the long-term safety of the California pipeline, the prevention of hydrogen leakage, the inclusion of hydrogen monitoring, the consideration of the dilution rate, and the monitoring and reporting of all mechanical characteristics of hydrogen blends in the natural gas pipeline stream…"

[14] Ex. SCG-01R at 19-20.

The project would also employ a gas measurement analyzer at the blending skid and downstream gas sampling to verify hydrogen blend levels, while ongoing inspections and continuous oversight of all operational components—blending, storage, production, electrical, and water systems—promote safe and reliable performance.[15]

The UCI Project complies with OP 7b[16] because SoCalGas will isolate the pipeline system so that no hydrogen or blended gas reaches natural gas storage facilities or any electrical switching equipment.[17] To achieve this, SoCalGas will cut and cap nearby pipeline so that hydrogen blends flow only to UCI's ARC.[18] All hydrogen production, storage, and blending equipment will be located in a lot south of the ARC, away from any known electrical switching infrastructure, and any future switching equipment would be placed in unclassified areas or protected with appropriately classified enclosures in compliance with industry standards.[19] Independent risk analyses will also be conducted before project implementation to identify any unforeseen risks of hydrogen reaching storage or electrical equipment, and any such risks will be mitigated through appropriate design modifications.[20]

The UCI Project complies with OP 7c[21] because once hydrogen blending begins, SoCalGas will coordinate closely with UCI staff to confirm that all appliances and equipment are functioning properly, and will continue to monitor equipment performance throughout the

---

15 Ex. SCG-01R at 19-20.
16 OP 7b of D.22-12-057 states, "Prevents hydrogen from reaching natural gas storage areas and electrical switching equipment directly or through leakage…"
17 Ex. SCG-01R at 20-21.
18 *Id.* at 19-20.
19 *Id*. at 19-20.
20 *Id*. at 19-20.
21 Op 7c of D.22-12-057 states, "Avoids end user appliance malfunctions…"

demonstration.[22] SoCalGas will also provide operational support as needed and establish a dedicated communication channel for UCI facilities to promptly report any issues with end-use equipment.[23] Nonetheless, because research has demonstrated that common appliances such as gas stoves and gas water heaters can operate safely at blends above 20% hydrogen,[24] SoCalGas expects no issues with appliances.

The UCI Project complies with OP 7d[25] because it will evaluate hydrogen blends from 5% to 20% in an isolated system, while adhering to approved monitoring and reporting that are aligned with the UC Riverside Study.[26]

The UCI Project complies with OP 7e[27] because SoCalGas provided a Class 5 estimate for the funding necessary to complete all aspects of the UCI Project within an 18-month implementation period to account for seasonal demand.[28] The total cost estimate is $24,420,406 (unloaded direct cost estimate) with a revenue requirement of $26.8 million.[29]

---

22 Ex. SCG-01R at 21.
23 *Id*. at 21.
24 *Id*.
25 OP 7d of D.22-12-057 states, "Evaluates hydrogen injection at blends between and five percent and five to twenty percent; such evaluations must adhere to approved monitoring, reporting, and long-term impact study in accordance with the approval of the pilot project application, and must include validation programs to confirm performance…"
26 Ex. SCG-01R at 21.
27 OP 7e of D.22-12-057 states, "Specifies the amounts of funding necessary to complete all aspects of the proposal and proposes testing durations adequate to draw meaningful conclusions…"
28 Ex. SCG-01R at 22.
29 Ex. SCG-01R at 27; Ex. SCG-03 at 4.

The UCI Project complies with OP 7f[30] because it is consistent with the directed courses of action specified in D.22-12-057.[31] These include:

- **Leakage**: The project will be designed to minimize and closely monitor any potential leakage of hydrogen, methane, or hydrogen-methane blends through the use of sensors, remote alerts, and other detection systems, with hydrogen production and storage facilities maintained under continuous 24/7 monitoring.
- **Reporting**: The project will collect and analyze data, and SoCalGas will work with a selected third-party and the Joint Utilities to report on findings.
- **Heating Value**: Gas composition will be monitored both at the blending skid and downstream of the injection point, and SoCalGas will assess gas chromatographs capable of detecting hydrogen concentrations up to 20% by volume.
- **System Safety:** Various safety and alert systems, including remote monitoring and alarm capabilities, will be implemented to adhere to applicable safety requirements, and all relevant codes and standards will be followed.
- **Environmental Considerations:** The project will generate valuable information on potential carbon-reduction benefits across various hydrogen blend levels while measuring other emissions, and it will rely on solar energy to produce clean renewable hydrogen throughout its duration.
- **End-Use Emissions**: Nitrogen oxides (NOx), carbon dioxide (CO_2), carbon monoxide (CO), and oxygen will be measured from the end-use equipment to monitor the emission performance.
- **Blending limitations**: The project will assess hydrogen blending between 5% and 20% by volume in a closed, real-world system consistent with D.22-12-057 and the UC Riverside Study, using actual components of the gas distribution network.[32]

The UCI Project complies with OP 7g[33] because rigorous testing will be conducted to evaluate leakage rates, impacts on end-use appliances, and effects on the natural gas pipeline

[30] OP 7e of D.22-12-057 states, "Is consistent with all directed courses of action specified in this decision relevant to leakage, reporting, heating value, system safety, environmental considerations, end-use emissions, and all other elements enumerated in this decision…"

[31] Ex. SCG-01R at 22.

[32] *Id.* at 22-23.

[33] OP 7g of D.22-12-057 states, "Proposes rigorous testing protocols consistent with the UC Riverside Study…"

system, fittings, and other components, informed by input from industry experts.[34] SoCalGas will retain an independent third party to finalize the research plan for assessment, measurement, monitoring, and reporting, building on feedback from the technical workshop held on November 6, 2023 and the UC Riverside Study.[35]

The UCI Project complies with OP 7h[36] because SoCalGas incorporated feedback from parties and stakeholders throughout the process.[37] SoCalGas held public workshops to gather input from the broader community and collaborated closely with affected campus stakeholders so their perspectives were reflected.[38] In addition, SoCalGas will provide educational materials and host informational sessions to share updates on the technology, safety protocols, and overall progress of the project.[39] SoCalGas proposes four annual engagement meetings with community based organizations (CBO) and to compensate CBOs at $150/hour.[40]

The UCI Project complies with OP 7i[41] because the Joint Utilities propose to develop a formal methodology for conducting the Hydrogen Blending System Impact Analysis after the demonstration projects conclude.[42] The methodology would use project data to create a

---

34 Ex. SCG-01R at 23-24, Ex. 1A thereto.
35 *Id*. at 23-24, Ex. 1A thereto.
36 OP 7h of D.22-12-057 states, "Takes into account parties' comments and further stakeholder input and includes the opportunity for compensation for parties and for community-based organizations…"
37 Ex. SCG-01R at 18-19, 24.
38 *Id*. at 18-19, 24.
39 *Id*.
40 *Id.* at 19, 22.
41 OP 7i of D.22-12-057 states, "Proposes a methodology for performing a Hydrogen Blending System Impact Analysis that can ensure that any hydrogen blend will not pose a risk to the common carrier pipeline system…"
42 Ex. SCG-01R at 25.

framework so that hydrogen blends do not compromise system integrity, safety, or end-use equipment performance.[43] This methodology would mirror the structure of existing biomethane interconnection processes and include evaluating downstream systems, pipeline materials, operating pressures, system equipment, pipeline history, and end-use equipment.[44]

The UCI Project complies with OP 7j[45] because it will not use propane or any other supplemental fuel to maintain heating value during the demonstration.[46] Instead, SoCalGas will measure the composition of the blended gas both at the blending skid outlet and downstream of the injection point to identify any impacts on heating value, including at UCI's meter.[47]

The UCI Project complies with OP 7k[48] because it incorporates multiple measures to minimize leak-related safety risks.[49] It follows appropriate design, construction, and operating standards to reduce the likelihood of hydrogen leakage, supported by continuous monitoring of hydrogen storage and production facilities.[50] Throughout the demonstration, SoCalGas will increase leak-detection frequency for blended-gas lines, downstream piping, and customer

---

43 *Id*.
44 *Id*.
45 OP 7j of D.22-12-057 states, "Includes new or revised heating values and discusses whether heating values would be modified through the use of propane or other means and whether such modifications to heating value can be done safely…"
46 Ex. SCG-01R.
47 *Id*.
48 OP 7k of D.22-12-057 states, "Demonstrates the ability to reliably detect leakage of any hydrogen, methane, or hydrogen/methane blends and describes rigorous hydrogen leak testing protocols that are consistent with leak testing and reporting elements identified in the University of California at Riverside's 2022 Hydrogen Blending Impacts Study, identifies and addresses the comments presented by parties in this proceeding regarding leak issues, and identifies and addresses the comments presented by workshop stakeholders in this proceeding regarding leak issues…"
49 Ex. SCG-01R at 26.
50 *Id*.

equipment, using odorant and other reliable detection methods.[51] Instrumentation systems will track system performance, including temperature, pressure, and gas quality.[52]

The UCI Project complies with OP 7l[53] because once the projects are approved, SoCalGas will issue a request for proposal (RFP) to solicit competitive bids from independent entities to develop the required research plan.[54] Because the demonstration projects differ, multiple independent parties may ultimately be engaged.[55] As this is a pre-development phase, the costs associated with the independent research effort will be addressed and recovered after the Commission issues its decision through a designated subaccount of the proposed Hydrogen Blending Demonstration Projects Balancing Account (HBDPBA).[56]

b. The UCI Project Will Utilize Clean Renewable Hydrogen

Although not a requirement under D.22-12-057, the UCI Project proposes to use clean renewable hydrogen by using an electrolyzer powered by a solar array to generate the gas.[57] The UCI campus microgrid will serve as an alternative power source to supply the hydrogen production and blending equipment power when solar power is not available.[58] While Sierra Club and the Wild Tree Foundation question whether the UCI Project will use clean renewable

---

51 *Id*.
52 *Id*.
53 OP 7l of D.22-12-057 states, "Contains an independent research plan for assessment, measurement, monitoring, and reporting through an independent party, which must be engaged in such activities during the development, construction, operational life, and decommissioning of the pilot project."
54 Ex. SCG-01R at 26.
55 *Id*.
56 *Id*.; Ex. SCG-03 at 1.
57 Ex. SCG-01R at 9; Ex. SCG-04 (Prepared Rebuttal Testimony of Blaine Waymire) (hereinafter, "Ex. SCG-04") at BW-6.
58 *Id*.

hydrogen because it is connected to the campus microgrid that includes a combustion turbine,[59] their position is based on a misguided assumption. SoCalGas sized the solar array to fully offset the electrolyzer's electrical load, with separate metering to validate renewable generation against energy consumption.[60] Preliminary estimates show the solar array will generate more energy than the electrolyzer and auxiliary equipment consume over the 18-month period, with UC Irvine's microgrid serving as an energy balancing mechanism.[61]

c. The Orange Cove Project Complies with D.22-12-057

The Orange Cove Project abides by D.22-12-057 as well. This project complies with OP 7a of D.22-12-057 because SoCalGas will implement enhanced safety and monitoring measures, including: quarterly leak detection; continuous remote monitoring of hydrogen production, storage, and blending facilities; and automatic shutdown protocols that isolate hydrogen production and storage equipment and revert the system to 100% natural gas if an alarm is triggered or a leak is detected in such equipment.[62] Hydrogen blend levels will be verified through analyzers at the blending skid and downstream gas sampling, alongside ongoing inspections and comprehensive monitoring of mechanical, electrical, and water systems, consistent with SoCalGas's data collection plan.[63]

---

[59] Prepared Testimony of Sara Gersen on behalf of Sierra Club on the Joint Amended Application to Establish Hydrogen Blending Demonstration Projects (hereinafter "Ex. SC-01") at 196; Ex. WTF-01 (Freehling) at 9.

[60] Ex. SCG-04 at BW-6.

[61] *Id*.

[62] Ex. SCG-02 at 19-20.

[63] Ex. SCG-02 at 20, Ex. 2A thereto.

The Orange Cove Project complies with OP 7b because SoCalGas will not modify the existing pipeline system beyond installing piping to divert gas to the blending equipment and backflow prevention to prevent hydrogen from flowing upstream.[64] Hydrogen production, storage, and blending equipment will be located near the regulator station, away from natural gas storage and known electrical switching equipment, and will be designed to meet applicable safety and classification standards.[65] Independent pre-implementation risk analyses will identify any unforeseen risks, with mitigation measures incorporated into the project design as necessary.[66]

The Orange Cove Project complies with OP 7c because SoCalGas will coordinate with the Orange Cove community and business customers to review end uses and confirm that hydrogen blends will not adversely affect existing processes. SoCalGas will conduct pre-blending equipment inspections, provide the community with customer contact information for reporting issues, and work with city staff to document and address any appliance malfunctions, including providing operational support as needed once blending begins.[67] Notably, research has demonstrated that common appliances can operate safely with blends greater than 20% hydrogen. A GTI study that tested various partially premixed combustion equipment with no changes showed that heating equipment "…was successfully operated up to

[64] Ex. SCG-02 at 20-21.
[65] *Id*.
[66] *Id*.
[67] *Id*.

30% hydrogen-blended fuels."[68] Therefore, end user appliance malfunctions due to the hydrogen blend are not expected.

The Orange Cove Project complies with OP 7d because it will evaluate blends from 0.10 to 5% while adhering to approved monitoring and reporting that are in alignment with the UC Riverside Study.[69]

The Orange Cove Project complies with OP 7e because SoCalGas provided a Class 5 estimate for the funding necessary to complete all aspects of this project within an 18-month implementation period to account for seasonal demand.[70] The total cost estimate is $48,411,032 (unloaded direct cost estimate) based on a Class 5 estimate, with a corresponding revenue requirement of $53.6 million.[71,72]

---

[68] Ex. SCG-02 at 21 (*citing* Glanville, P., Fridlyand, A., Sutherland, B., Liszka, M., Zhao, Y., Bingham, L., and Jorgensen, K., Impact of Hydrogen/Natural Gas Blends on Partially Premixed Combustion Equipment: NOx Emission and Operational Performance (February 24, 2022), *available at*: https://www.mdpi.com/1996-1073/15/5/1706).

[69] Ex. SCG-02 at 21-22.

[70] *Id.* at 27.

[71] Ex. SCG-02 at 27; Ex. SCG-06 at 19. Given delays in this proceeding and the issues outlined in the Scoping Memo, SoCalGas has developed a high-level assessment of potential cost impacts, estimating a potential incremental direct increase of approximately $3-$6 million. Ex. SCG-06 at 19.

[72] The solar array and battery are estimated to cost $26.5 million. Ex. SCG-06 at 21. Also, on February 3, 2026, SoCalGas, SDG&E, and Southwest Gas filed a Petition for Modification of D.22-12-057 that proposes to eliminate the requirement to demonstrate between 0.1 – 5% hydrogen blending in the medium-pressure distribution system. If granted, the Orange Cove Project could, but need not, be authorized for compliance with D.22-12-057. *See* R.13-02-008, Petition for Modification of Decision 22-12-057 by SoCalGas, SDG&E, and Southwest Gas, *available at*: https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M597/K710/597710574.PDF. The total forecasted costs of the Orange Cove Project—$48,411,032—could be avoided and would promote affordability for ratepayers.

The Orange Cove Project complies with OP 7f because, just like the UCI Project, SoCalGas has incorporated all the directed courses of action specified in D.22-12-057 that include leakage, reporting, system safety, environmental considerations, end-use emissions, blending limitations, and additional considerations.[73]

The Orange Cove Project complies with OP 7g because the project aligns with the UC Riverside Study and D.22-12-057 and incorporates stakeholder feedback received at the November 2023 technical workshop into its data collection plans.[74] The project proposes rigorous testing to evaluate leakage rates, impacts on end-use appliances, pipelines, fittings, and other components.[75] As a pre-development effort, the Joint Utilities will engage an independent third party to finalize the research plan for assessment, monitoring, and reporting based on workshop input and the UC Riverside Study.[76]

The Orange Cove Project complies with OP 7h because SoCalGas took into account parties' comments and additional stakeholder input.[77] SoCalGas solicited public input through stakeholder workshops and worked closely with City of Orange Cove stakeholders to incorporate community feedback.[78] Although not required to do so under D.22-12-057, SoCalGas also hosted a community engagement event to discuss the demonstration, address resident questions, and will continue providing educational materials and information sessions

---

73 Ex. SCG-02 at 22-24.
74 *Id.* at 24.
75 *Id.* at 24, Ex. 2A thereto.
76 *Id.* at 24.
77 *Id.* at 24; Ex. SCG-05 at CG-2-4, 6-8.
78 *Id.* at 25.

on the technology, safety measures, and project progress.[79] SoCalGas is proposing four annual CBO engagement meetings and to compensate CBOs at $150/hr.[80]

The Orange Cove Project complies with OP 7i because, as stated above, the Joint Utilities propose to develop a formal methodology for conducting the Hydrogen Blending System Impact Analysis after the demonstration projects conclude.[81]

The Orange Cove Project complies with OP 7j because propane or other fuel will not be used to supplement heating values during the demonstration.[82] The blended gas composition will be measured at the blending skid outlet and downstream of the injection point to assess impacts on heating value, including at selected customer meters.[83]

The Orange Cove Project complies with OP 7k because it will use established design, construction, and operating standards, along with continuous monitoring and enhanced leak detection, to minimize hydrogen leak risks.[84] Measures include more frequent leak surveys of blended gas lines and customer equipment, continuous monitoring of hydrogen storage and production facilities, and instrumentation to track system performance such as temperature, pressure, and gas quality.[85]

The Orange Cove Project complies with OP 7l because, as stated above, upon project approval, the Joint Utilities will issue an RFP to competitively select an independent party or

---

79 Ex. SCG-02 at 25.
80 *Id.* at 18-19, 24-25.
81 *Id.* at 25.
82 *Id.* at 26.
83 *Id*.
84 *Id*.
85 Ex. SCG-02 at 26, Ex. A thereto.

parties to complete the research plan, with different entities engaged as appropriate for each demonstration project.[86] Because this phase is pre-development, costs associated with the independent research effort will be addressed and recovered through a subaccount after the Commission issues its decision.[87]

d. The Orange Cove Project Will Use Clean Renewable Hydrogen

Just like the UCI Project, the Orange Cove Project proposes to use clean renewable hydrogen by using an electrolyzer powered by a solar array of approximately 6.5 acres.[88] The electrolyzer will produce hydrogen using water and electricity to blend up to 5% into Orange Cove's distribution pipelines.[89] Approximately 9 MWh of battery energy storage will be installed to complement the solar generation and support hydrogen production and associated auxiliary equipment.[90] While expensive,[91] these project characteristics assure the use of clean renewable hydrogen. Any claims by intervenors that the Orange Cove Project does not use clean renewable hydrogen are simply ill-informed.

---

86 Ex. SCG-02 at 27.
87 *Id*.
88 Ex. SCG-02 at 8-9.
89 *Id*. at 8.
90 *Id.* at 9.
91 The solar array and battery are estimated to cost $26.5 million. Ex. SCG-06 at 21.

e. The Orange Cove Project Appropriately Considers the Dilution Rates of the Hydrogen Blends

Contrary to the Leadership Counsel for Justice and Accountability's (LCJA) claim,[92] the Orange Cove Project adequately considers dilution of hydrogen blends.[93] Although LCJA questions uniform mixing, the isolated single-feed system blends gas to the specified percentage at the blending skid, with continuous flow and turbulent conditions to promote uniform mixing.[94] Blend levels will be confirmed through analyzers and a third-party-developed monitoring plan, and the demonstration will specifically test and validate dilution behavior throughout the system.[95] Therefore, LCJA's concern is unfounded.

2. Scoping Issue 1.b: If there are any exemptions or waivers being requested for any pilot project, are there sufficient justification?

SoCalGas is not seeking any exemptions or waivers for the UCI Project or Orange Cove Project.

3. Scoping Issue 1.c: Does each pilot project align with broader state energy and climate goals? If so, how?

Pursuant to the March 9 Ruling, SoCalGas will not address in this brief the broad policy arguments against hydrogen blending that certain intervenors have raised in excess of this proceeding's scope. The scope of this proceeding is not to litigate whether hydrogen blending

---

92 Prepared Direct Testimony of Clayton Bodell on behalf of Leadership Counsel for Justice & Accountability and Orange Cove United (jointly, OCU/LCJA) (hereinafter Exhibit (Ex.) OCU/LCJA 2) at 1.

93 Ex. SCG-04 at BW-4.

94 *Id*. at BW-4-5.

95 *Id*.

should be considered as a matter of policy; the scope is to evaluate the consistency of the proposed projects with D.22-12-057.

CARB's 2022 Scoping Plan includes 20% blending of hydrogen into the natural gas system in its toolkit of solutions to reach carbon neutrality by 2045.[96] Accordingly, the UCI Project aligns with broader state energy and climate goals because it will demonstrate the production, blending, and usage of up to 20% clean renewable hydrogen into SoCalGas' distribution line to power a large building, *i.e.*, UCI's ARC. Similarly, the Orange Cove Project proposes demonstrating up to 5% of clean renewable hydrogen in a city's distribution system with typical end-user residential and commercial equipment found in California's gas infrastructure. Thus, both projects are prudent demonstrations that align with and could promote the state's energy and climate goals.

B. SCOPING ISSUE 2: Are the pilots useful and well designed?

1. Scoping Issue 2.a: What specific knowledge gap does each pilot project address that isn't covered in the Hydrogen Blending Impact Report and Hydrogen Blending Compendium Report? How would the findings of each pilot project complement the research summarized in those reports?

UCI Project

The UCI Project seeks to provide certain valuable insights not covered in the UC Riverside and Compendium Reports by evaluating hydrogen blending in an existing medium-pressure California pipeline under real-world conditions.[97] It will assess the

---

[96] California Air Resources Board, *2022 Scoping Plan for Achieving Carbon Neutrality* (December 2022) at 78 ("Injecting up to 20 percent hydrogen into the existing natural gas system is being explored as a transitional strategy to reduce the carbon intensity of gas used in buildings and industry.").

[97] Ex. SCG-013 at 1-2.

effectiveness of leak detection technologies, the longer-term performance of common commercial appliances, and the operation of equipment such as water heaters and boilers under California-specific climate and emissions requirements.[98] The project also seeks to inform the development of tailored operating procedures and emergency response protocols, providing field-validated operational insights beyond those available in published reports.[99]

Orange Cove Project

The Orange Cove project is expected to deliver important real-world insights into the safe, practical, and cost-effective delivery of hydrogen-blended natural gas through California's existing gas system that the UC Riverside and Compendium Reports do not address.[100] As the state's first community-scale hydrogen blending demonstration, it will validate infrastructure compatibility while generating operational experience related to system performance, maintenance, emergency response, and customer engagement.[101] The project will also provide lessons on public education and community acceptance—insights that cannot be fully captured through laboratory studies, modeling, or smaller-scale demonstrations summarized in the UC Riverside and Compendium Reports.[102]

---

98 *Id.*
99 Ex. SCG-013 at 1-2.
100 Ex. SCG-06 at 20.
101 *Id*.
102 *Id*. at 20-21.

2. Scoping Issue 2.b: How will the additional knowledge, contributed by each project, be useful to utility operators and state policy makers?

UCI Project

Information gathered within this demonstration would contribute to informing utility operators and state policymakers to determine if existing frameworks are sufficient or require modification to implement hydrogen blending at 5-20% concentrations into the gas distribution system in a safe and cost-effective manner.[103] This project has been coordinated with respect to the other Joint Utilities' projects to minimize redundancy while simultaneously gathering necessary data to support a system-wide hydrogen blending standard compatible with the varied gas system infrastructure and end-user equipment and applications.[104] The project will focus on operational data collection and validating existing research under California-specific operational conditions.[105]

Orange Cove Project

The Orange Cove Project will inform utility operators and state policymakers on whether existing regulatory and operational frameworks are adequate or need modification to prudently accommodate hydrogen blends of 0.1% to 5%.[106] It will serve as a proof of concept for the safe and cost-effective use of blended hydrogen by focusing on operational readiness, data collection, and validation of existing research within a real-world California medium-pressure pipeline system serving residential and commercial customers with varied end uses.[107] The Orange Cove

---

[103] Ex. SCG-013 at 2-3.
[104] *Id.*
[105] *Id.*
[106] Ex. SCG-011 at 2.
[107] *Id.*

demonstration is also coordinated with the other Joint Utilities' projects to minimize redundancy while collecting informative data.[108]

3. Scoping Issue 2.c: How is success defined and measured for each pilot project? How will pilot project's progress toward project success and desired outcome be reported to the Commission?

UCI Project

SoCalGas defines "success" of the UCI Project as completion of the demonstration to gain key valuable insights, producing a final report consistent with the Data Collection Plan, and maintaining ongoing stakeholder engagement within the UC Irvine community throughout the project.[109] Success will be measured by completing the project and its final report, implementing recommended practices throughout the project lifecycle, maintaining continuous community engagement, and successfully constructing, commissioning, and operating the demonstration equipment. Additional measures include providing hands-on experience for the workforce and customers, completing the approved data collection plan and gathering the required data, and sharing project insights to inform the development of a system-wide hydrogen injection standard.[110]

Orange Cove Project

SoCalGas similarly defines success of the Orange Cove Project as completion of the demonstration, producing a final report consistent with the approved Data Collection Plan, and maintaining ongoing stakeholder engagement throughout the project.[111] Success will be

[108] *Id*.
[109] Ex. SCG-04 at BW-29-30.
[110] *Id*. at BW-29-30.
[111] *Id*. at BW-30.

measured by timely construction, commissioning, and operation of the facilities; implementation of API RP 1173 Pipeline Safety Management System practices; completion of third-party–supported data collection and reporting; continued community and first-responder engagement; and dissemination of real-world findings to inform the development of a system-wide hydrogen injection standard.[112]

4. Scoping Issue 2.d: What alternative approaches or experimental sites were considered for studying the specific problem being addressed by each pilot project? Why was the specific site and experimental design chosen among the alternatives considered?

UCI Project

Before selecting the ARC as the site for the UCI Project, SoCalGas considered UCI's Mesa Arts Building, Mesa Court Housing, and other on-campus buildings.[113] Following feedback from UCI stakeholders, including students and faculty, SoCalGas and UCI decided to move the project site to the ARC.[114] This site was selected in coordination with UCI facilities based on its consistent gas load, favorable location, isolation capability, and compatible pipeline and end-use equipment.[115] Multiple equipment sites were evaluated, and the hydrogen facilities were ultimately relocated from the police campus parking lot to a site just south of the ARC.[116] These relocations demonstrate SoCalGas's commitment to earnestly consider and implement stakeholder feedback.

---

[112] *Id*. at BW-30-31.
[113] Ex. SCG-012 at 5.
[114] Ex. SCG-04 at BW-35, fn. 131 (citing UCI, *Recommendations for the Proposed "Hydrogen Blending Demonstration Project @ UCI"* (February 14, 2024) at Exhibit H).
[115] Ex. SCG-04 at BW-40.
[116] *Id*. at BW-40.

Orange Cove Project

Before selecting the Orange Cove Project, SoCalGas evaluated more than 300 pipeline areas.[117] The overall design of the blending demonstration equipment was considered specifically to the final site selected.[118] Various solar array sizes were considered to minimize space and maximize power availability for the reliable production of clean renewable hydrogen.[119] While Orange Cove representatives requested SoCalGas to consider the city hosting the project, Orange Cove was ultimately selected because it best suited these parameters.[120]

5. Scoping Issue 2.e: How will the ultimate findings from these pilot projects be documented, validated, and shared with stakeholders and the Commission?

Consistent with OP 8 of D.22-12-057, SoCalGas will retain an independent third party to review and evaluate, and document ultimate findings from, the UCI and Orange Cove Projects. The final report will be shared with the Commission and stakeholders for review and comment.

6. Scoping Issue 2.f: What would be needed to move from a pilot project to full implementation if the pilot project was successful?

If the demonstration projects are successful, the Commission would need to authorize a hydrogen injection standard for SoCalGas's distribution infrastructure. Doing so would involve updating SoCalGas's relevant tariffs, such as SoCalGas Tariff Rule 45 that currently allows up to 0.99% of hydrogen gas in biomethane with lower and upper action trigger levels at blends of

[117] Ex. SCG-011 at 5.
[118] *Id.*
[119] *Id.*
[120] *Id.*; Ex. SCG-05 at CG-4.

1% and 5%, respectively.[121] The Commission would also need to establish a procurement process for clean renewable hydrogen, similar to the RNG procurement process established in the Biomethane Rulemaking.[122]

C. SCOPING ISSUE 3: ARE THE PILOTS PRUDENT

1. Scoping Issue 3.a: What is the detailed cost breakdown for each pilot project, including equipment, monitoring, safety system, and administration?

UCI Project

The UCI Project's forecasted estimate for Phase 1 (design, construction, and commissioning) is $21,810,149, for Phase 2 (demonstration and data collection) is $468,840, for Phase 3 (decommissioning, equipment removal, and system restoration) is $2,068,408, and for Phase 4 (data analysis and dissemination) is $73,008.[123]

Orange Cove Project

The Orange Cove Project's cost estimate for Phase 1 (design, construction, and commissioning) is $45,822,648,[124] for Phase 2 (demonstration and data collection) is $571,320, for Phase 3 (decommissioning, equipment removal, and system restoration) is $1,947,056, and for Phase 4 (data analysis and dissemination) is $73,008.[125]

---

[121] SoCalGas Rule No. 45, Standard Renewable Gas Interconnection, *available at*: https://tariffsprd.socalgas.com/24c0dc8f-cc91-430c-9795-8f13c5982081.

[122] *See* D.22-02-25, OPs 1-29 at 57-63 (establishing RNG procurement program).

[123] Ex. SCG-01-WP-1R (SCG Workpaper Supporting the Revised Direct Testimony of Blaine Waymire, Ch. 1 (WP-1 Revised)) at 2-4.

[124] As noted above, the cost of the solar array and battery system compose $26.5 million of this amount.

[125] Ex. SCG-02-WP-2 (SCG Workpaper Supporting the Direct Testimony of Blaine Waymire, Ch. 2 (WP-2)) at 2-4.

2. Scoping Issue 3.b: What specific benefits will gas ratepayers receive from investment in these pilot projects?

UCI Project

Ratepayers will significantly benefit from the UCI Project because it will help inform a system-wide injection standard of up to 20% for clean renewable hydrogen into the natural gas infrastructure and advance California's understanding of how to decarbonize its existing $15 billion gas system.[126] Learnings from the this projects will inform the development of said standard and provide data on how producers can effectively interconnect to California's distribution pipeline system and how utilities can safely manage this interconnection, having done it in real-time on their system. In addition to research previously introduced, this demonstrates to ratepayers another aspect of how hydrogen blends can be safely introduced into California's natural gas infrastructure. If an injection standard is adopted, ratepayers would see benefits through widespread GHG emission reductions and increased use of renewable fuels through existing natural gas pipeline assets.[127] Because SoCalGas proposes to donate the solar array to UCI to save decommissioning costs, the UCI community will further benefit from continued use of such renewable energy equipment.[128]

Orange Cove Project

There are significant ratepayer benefits from the Orange Cove Project as well. First, the Orange Cove community will benefit from the installation of renewable energy assets, such as the solar array covering 6.5 acres translating to approximately 1.1 MW of power. The solar array

[126] Ex. SCG-04 at BW-32; Ex. SCG-013 at 8.
[127] Ex. SCG-013 at 8.
[128] Ex SCG-01R at 15.

will be coupled with a battery to create a microgrid that will serve as the primary power source for the project.[129] SoCalGas is proposing to turn over these assets to the community once the project is completed.[130]

Second, blending clean renewable hydrogen into the Orange Cove community will reduce CO_2 emissions during the project's implementation, and contribute to reduced CO_2 emissions where combustion end-use equipment is present.[131] Although research shows no adverse impacts on NOx emissions are expected, emissions will still be monitored.[132] The project's local solar array and battery storage system can reduce electric-sector emissions and improve reliability through on-site renewable power generation.[133]

The Orange Cove community will also enjoy benefits in safety and efficiency because home inspections will be offered to help verify customer appliances are operating safely and fine tune them, if necessary.[134] SoCalGas will also promote its energy efficiency and customer assistance programs to help replace outdated or inefficient appliances with new, energy efficient ones. Although LCJA notes that some of the homes surveyed have not been weatherized,[135] SoCalGas's Energy Savings Assistance Program (ESA Program) offers no-cost weatherization

[129] Ex. SCG-02 at BW-9.
[130] Ex. SCG-02 at BW-15; Ex. SCG-04 at BW-32.
[131] Ex. SCG-04 at BW-23.
[132] *Id*. at BW-23.
[133] *Id*.
[134] *Id*.
[135] Ex. OCU/LCJA 4 (Zweifler-Katz), Exhibit B.

services to qualifying customers.[136] SoCalGas will also have enhanced leak monitoring,[137] which will help promote overall safety in the community.

The Orange Cove Project would ultimately provide a real-world demonstration of hydrogen blending to help inform the development of a systemwide injection standard of up to 5% that advances California's decarbonization objectives, while efficiently leveraging the affordability of existing ratepayer investments in the natural gas system.[138]

3. Scoping Issue 3.c: What cost-sharing arrangements have been made or pursued with potential non-ratepayer beneficiaries of this research?

SoCalGas made reasonable efforts to secure state and federal funding for both the UCI and Orange Cove Projects, but found no Commission-authorized funding sources available. SoCalGas was unable to obtain support from the CEC's R&D Program because, although the CEC issued two hydrogen-blending solicitations, both focused on the power generation and industrial sectors and explicitly excluded live-pipeline blending due to the absence of a system-wide hydrogen injection standard. Federal funding was also unavailable, as programs under the Infrastructure Investment and Jobs Act of 2021 and the Inflation Reduction Act of 2022 prioritized clean hydrogen production, hydrogen hubs, carbon management, equipment manufacturing, and electrolysis efficiency.[139]

---

[136] Statewide Energy Education and Resource Guide, *Energy Assistance Program* at 2, *available at* https://www.socalgas.com/billing-payment/assistance-programs/energy-savings-assistance-program. (Several measures listed are referred to broadly as "weatherization" measures").
[137] Ex. SCG-02 at 20.
[138] Ex. SCG-011 at 7.
[139] Ex. SCG-11 at 8.

4. Scoping Issue 3.d: How will cost overruns be handled?

For both projects, costs will be recorded in the HBDPBA, and any cost overruns should be handled through the customary reasonableness review process for Commission review prior to implementation in rates.[140]

D. SCOPING ISSUE 4: Are the pilots safe?

1. Scoping Issue 4.a: What comprehensive risk assessment has been conducted (i) for each pilot project; (ii) for the specific hydrogen blend percentages attempted in each project; and (iii) for each segment of the California gas infrastructure for which the pilot project was designed?

Orange Cove Project

Contrary to LCJA's claim,[141] SoCalGas has proposed a comprehensive risk assessment for the Orange Cove Project because SoCalGas disclosed the baseline Distribution Integrity Management Program (DIMP) results for the Orange Cove system.[142] In response to Appendix B questions, SoCalGas provided its baseline DIMP results for the medium pressure distribution system.[143] SoCalGas evaluates baseline risk for asset failure of its medium pressure system as outlined in the Risk Assessment Mitigation Phase (RAMP) report with an established threshold of annual probability greater than 6 x 10-6 of a serious incident.[144]

The anticipated risk at the proposed hydrogen blending level of 0.1%-5% hydrogen by volume is extremely low.[145] This risk assessment is supported by the UC Riverside Study

---

[140] *Id.* at 16-17.
[141] Ex. OCU/LCJA 2 (Bodell) at 12.
[142] Ex. SCG-04 at BW-33.
[143] Ex. SCG-06 at 3-5.
[144] Ex. SCG-04 at BW-33.
[145] *Id.* at BW-33.

(finding that hydrogen blends of up to 5% are generally safe),[146] the Compendium Report (finding that common appliances can safely operate with blends up to 20% hydrogen),[147] the U.S. Department of Energy (determining that hydrogen is as safe as other fuels such as natural gas),[148] and the Canadian Standards Association (a leading certification body in North America confirming that existing product certifications remain valid with natural gas blends of up to 5% hydrogen).[149] Also, utilities in Hawaii, Australia, and Canada have been successfully implementing hydrogen blends of up to 15% with appliances performing safely and effectively.[150] Therefore, SoCalGas was not required to perform a comprehensive risk assessment for the Orange Cove Project, as the proposed hydrogen blending level is well within the limits supported by existing safety research and established certification standards. Blends will also be increased gradually to support safety.

Safety is foundational for SoCalGas. While the risk is low, SoCalGas proposes several measures to enhance safety and further reduce risk, such as (i) conducting odorant sampling to confirm that blending hydrogen has no impact on the efficacy of current natural gas odorant, (ii) offering hydrogen safety education for residents and first responders, (iii) offering complimentary inspections of customer end-use equipment to verify that appliances are operational and free from leaks prior to hydrogen introduction and throughout the demonstration

---

[146] Ex. SCG-07 at 4.
[147] Ex. SCG-08, Literature Review at 65-66.
[148] Ex. SCG-04 at BW-34.
[149] *Id*.
[150] Ex. SCG-06 at 11-12 (noting that since 1974 Hawai'i Gas has been successfully blending hydrogen up to 15% as part of its fuel mix, ATCO Gas began delivering a 5% blend to a subsection of the Fort Saskatchewan's natural gas distribution system, and ATCO Australia blended up to 10% renewable hydrogen into the existing natural gas distribution network).

period, (iv) performing leak surveys before, during, and after project implementation, (v) installing automatic and remote shutdown systems at the hydrogen production and blending facility to enable immediate response if an alarm is triggered or a leak is detected, and (vi) conducting operational testing of end-use equipment.[151]

SoCalGas also plans to strengthen project safety by conducting a detailed asset failure analysis for the hydrogen production and blending equipment, engaging experienced third-party engineering firms to perform safety studies, and incorporating input from internal and external experts.[152] After project authorization, SoCalGas will develop detailed engineering designs consistent with applicable safety codes and standards and use safety studies to identify and mitigate potential hazards.[153] Independent third parties will also review final designs and commissioning safety protocols in coordination with SoCalGas and local first responders prior to commissioning.[154]

Notably, SoCalGas has significant prior experience blending hydrogen into gas infrastructure. SoCalGas has successfully performed demonstration projects with hydrogen blends, providing industry knowledge on how to successfully roll out a larger scale hydrogen blending demonstration.[155]

---

[151] Ex. SCG-04 at BW-34-35.
[152] *Id*. at BW-35.
[153] *Id*.
[154] *Id*. at BW-33-34.
[155] *Id*.

UCI Project

No intervenors have questioned SoCalGas's risk assessment procedures for the UCI Project. SoCalGas proposes to perform risk assessment procedures at UCI that include (i) asset failure analysis for the hydrogen production and blending facility, (ii) independent third-party safety reviews for Process Hazard Analysis (HAZID, QRA, HAZOP) and Pre-Startup Safety Review (PSSR), (iii) coordination with UCI and local fire authorities to develop site-specific emergency protocols, and (iv) compliance with existing codes and standards intended to promote safety to guide project design.[156] It is not surprising that after reviewing and vetting SoCalGas's proposed UCI Project, a select committee of independent UCI professors in material science, civil and environmental engineering, and chemistry agreed that the project could be safely executed at UCI.[157]

2. Scoping Issue 4.b: Beyond monitoring, what automated safety systems and shutdown protocols are in place for each pilot project?

UCI Project

See Section V.A.1.a above regarding SoCalGas implementing robust safety protocols for the UCI Project.[158]

Orange Cove Project

See Section V.D.1 above regarding SoCalGas implementing vigorous safety protocols for the Orange Cove Project.[159]

---

[156] Ex. SCG-04 at BW-35-36.
[157] *Id*. at BW-36.
[158] Ex. SCG-01R at 16-17.
[159] *Id*.

Leak Survey Frequencies for Both Projects Are Adequate and Far Exceed Federal Standards

While some intervenors argue that the proposed leak survey frequency is inadequate and instead propose continuous monitoring,[160] leak survey frequency is tailored to each project's conditions and SoCalGas's proposals exceed federal requirements. For the UC Irvine project, SoCalGas proposes monthly leak surveys due to higher hydrogen blend levels (5–20%), which is at minimum twelve (12) times more frequent than required under federal regulations. Additionally, odorant will remain effective for leak detection and SoCalGas will evaluate the potential use of continuous monitoring technologies such as fiber optics.[161]

For the Orange Cove Project, SoCalGas proposes quarterly leak surveys because hydrogen blending will gradually increase from 0.1% to 5%.[162] Quarterly surveys are at least four (4) times more frequent than federal requirements.[163] Given the extensive size of the Orange Cove distribution system, monthly surveys would be impractical, and continuous monitoring would be cost-prohibitive, among other things due to the need to excavate underground pipelines for monitoring.[164] Existing pressure monitoring systems already provide real-time insight into system conditions, and research indicates that hydrogen blends up to 5% do not pose additional safety risks requiring enhanced leak detection beyond existing natural gas protocols.[165]

---

[160] CADV-01 at 1-6; Ex. OCU/LCJA 2 (Bodell) at 8; Ex. SC-02 (Brown) at 12.
[161] Ex. SCG-04 at BW-36-37.
[162] Ex. SCG-04 at BW-37.
[163] *Id*. at BW-37.
[164] *Id*.
[165] *Id*.

3. Scoping Issue 4.c: What baseline testing of infrastructure integrity has been and will be completed prior to pilot project implementation?

See Section V.D.1 above regarding baseline testing for both projects.

4. Scoping Issue 4.d: How have emergency response plans been updated specifically for hydrogen incidents at each pilot project?

For both projects, SoCalGas will implement safety protocols consistent with existing safety code and standards that will include emergency response plans.[166] These plans will be created in collaboration with independent third parties and local fire authorities.[167]

While some intervenors argue that SoCalGas does not identify its performance standard for leak detection or emergency response in the Orange Cove Project,[168] SoCalGas is proposing to conduct in-depth hazard analyses for the hydrogen production, storage, and blending facilities.[169] SoCalGas plans to enhance project safety by engaging experienced third-party engineering firms to conduct safety studies and by incorporating input from internal and external experts.[170] After approval, SoCalGas will develop detailed engineering designs consistent with applicable safety codes and standards, identify potential hazards and mitigation measures through these studies, and engage independent third parties during pre-commissioning to review final designs and commissioning safety protocols with SoCalGas and city personnel.[171]

---

166 Ex. SCG-01R at 16; Ex. SCG-02 at 16; Ex. SCG-06 at 25.
167 Ex. SCG-04 at BW-38; Ex. SCG-06 at 25.
168 Ex. OCU/LCJA 2 (Bodell) at 13.
169 Ex. SCG-06 at 15-16, 25.
170 *Id*. at 15.
171 *Id*. at 15-16.

5. Scoping Issue 4.e: What specific outreach has been conducted with communities potentially affected by each pilot project and how has informed consent been documented?

UCI Project

Although D.22-12-057 only requires the Joint Utilities to conduct a single stakeholder outreach workshop,[172] SoCalGas has far exceeded such requirement by having conducted robust outreach efforts for the UCI Project. Since 2022, SoCalGas has carried out nearly 40 outreach activities, including briefings, presentations, and tours with UCI stakeholders and local officials.[173] SoCalGas continues to collaborate with UCI under the campus's governance structure to promote oversight, student involvement, and regular reporting on the proposed project.[174] These efforts have included educational sessions, site tours such as the ARC project location and SoCalGas's H2 Innovation Experience,[175] engagements with first responders, and support for UC Irvine's public-facing information webpage.[176] The UCI Project was also evaluated by a faculty review committee, which recommended UC Irvine's participation and several steps to promote safety, transparency and accountability throughout the project's timeline; these recommendations include the formation of an Administrative Oversight Committee to independently assess the project, provide oversight, and serve as the central body for receiving and reviewing community input.[177]

---

[172] D.22-12-057, OP 11 at 71-72 (ordering the Joint Utilities to coordinate with Energy Division and "host a workshop to obtain feedback from a diverse group of stakeholders regarding how to proceed with assembling safe and meaningful pilot projects…").
[173] Ex. SCG-05 (Rebuttal Testimony of Chris Gilbride) (hereinafter, "SCG-05") at CG-6-7.
[174] Ex. SCG-05 at CG-7.
[175] SoCalGas's H2 Innovation Experience is a microgrid and home that showcases how clean renewable hydrogen can be used to power homes.
[176] *Id*. at CG-7.
[177] *Id*.

While Sierra Club claims that SoCalGas has not engaged with students, citing a single commenter at the Commission's public participation hearing (PPH) for the UCI Project, [178] this allegation lacks evidentiary value and should be considered in the appropriate context. Notably, the comment ignores the fact that SoCalGas was required to operate within UCI's governance structure limited to a student advisory committee and an administrative advisory committee.[179] SoCalGas has addressed any questions raised by these advisory committees regarding details or plans about the project and offered to meet with the student advisory committee.[180] While engagement with students has been limited to the advisory committee, SoCalGas has remained engaged by staying in close communication with UC Irvine leadership, students, faculty, elected officials, city staff, and community organizations.[181]

Further, Sierra Club's allegation that the project has not been approved by the Human Subjects Protection Committee at UCI[182] is based on a false premise because it implies that the project includes testing on humans that would necessitate approval from this committee. The UCI Project will not conduct any "tests on humans."[183]

Orange Cove Project

SoCalGas has engaged extensively with the City of Orange Cove since 2023 through proactive, ongoing coordination with city leadership, including regular touchpoints, to promote

[178] Prepared Testimony of Sara Gersen on behalf of Sierra Club on the Joint Amended Application to Establish Hydrogen Blending Demonstration Projects (hereinafter "Ex. SC-01") at 59.
[179] Ex. SCG-05 at CG-8.
[180] *Id*.
[181] Ex. SCG-05 at CG-10.
[182] Ex. SC-01 at 60.
[183] Ex. SCG-05 at CG-8.

transparency, solicit early community feedback, and build trust.[184] Drawing on its decades-long presence and established partnership in the community, SoCalGas pursued the project at the city's request to enable Orange Cove residents to participate in and benefit from the clean energy transition.[185]

SoCalGas undertook extensive, multilingual community outreach in Orange Cove, including bilingual community meetings, door-to-door engagement of approximately 2,000 homes and businesses, participation in local events, media and social media education campaigns, and briefings for community leaders and organizations.[186] SoCalGas also established dedicated communication channels and hosted tours of its H2 Innovation Experience to provide hands-on education, encourage dialogue, and solicit feedback on the proposed project.[187]

These community touchpoints and door-to-door outreach enabled SoCalGas to gather meaningful feedback, with residents expressing interest in staying informed, appreciation for SoCalGas's continued presence, and the importance of ongoing community engagement.[188] Some residents requested additional information regarding safety, appliances, and insurance.[189] To increase awareness and reduce misinformation, SoCalGas continues to provide bilingual updates through a dedicated project webpage and maintains an active presence at community events and local gatherings.[190]

---

[184] *Id.* at CG-4.
[185] *Id*. at CG-4.
[186] *Id*. at CG-4-5.
[187] *Id*. at CG-5.
[188] *Id*. at CG-5-6.
[189] *Id*. at CG-6.
[190] *Id*. at CG-6.

SoCalGas also received the explicit consent of the Orange Cove City Council to participate in this project. In March 2024, the Orange Cove City Council passed a resolution directing its administration to work towards the project's completion.[191] In July 2024, the Orange Cove City Manager sent a letter to Commissioner Houck on the city council's behalf reiterating the city's support and commitment to the project along with anticipated benefits to the community.[192]

Although Orange Cove United has argued that SoCalGas did not conduct sufficient outreach in the City of Orange Cove, it should be noted that (1) Orange Cove United's membership is limited to 24 members (as of October 17, 2025),[193] and (2) Orange Cove United was organized by its counsel of record who is a separate party in this proceeding, the LCJA.[194]

6. Scoping Issue 4.f: How does each utility plan to monitor and assess hydrogen embrittlement of the gas components within its pilot project(s)?

While LCJA contends that SoCalGas has not communicated details for plans to monitor or assess the embrittlement of steel materials in the Orange Cove Project, this is untrue.[195] For both projects, SoCalGas will monitor the impacts of hydrogen on system materials through ongoing leak surveys throughout the system.[196] If leaks are detected, affected pipeline sections or components may be isolated for additional material testing to evaluate any hydrogen-related

[191] Ex. SCG-05 at CG-6, Attachment A thereto (Resolution No. 2024-04 City of Orange Cove).
[192] Ex. SCG-05 at CG-6, Attachment B thereto.
[193] Ex. SCG-09 at 3.
[194] Ex. SCG-10 at 3-5.
[195] Ex. OCU/LCJA 2 (Bodell) at 13.
[196] Ex. SCG-02, Exhibit 2A thereto.

effects on integrity.[197] Further material testing may also be conducted if components can be removed at the conclusion of the demonstration.[198] A detailed data collection plan will be coordinated with an independent third party, which will also consider impacts to material.[199]

Furthermore, Sierra Club claims that hydrogen blending increases leak risk because hydrogen molecules are smaller,[200] but this claim overlooks research showing that hydrogen does not preferentially leak when blended with natural gas.[201] Studies indicate that hydrogen remains mixed with natural gas and does not separate to leak independently, meaning that in the absence of a natural gas leak, hydrogen is likewise not expected to leak at the blend levels proposed by SoCalGas (up to 5% in Orange Cove and up to 20% at UC Irvine).[202]

Moreover, research indicates that hydrogen-related embrittlement and accelerated fatigue crack growth are unlikely under the proposed demonstration conditions, which involve low hydrogen blend percentages and low pipeline stress.[203] While hydrogen can embrittle steel, existing literature shows that the risk increases primarily with higher hydrogen concentrations, higher pressures, and greater stress cycling.[204] In the Orange Cove Project, hydrogen blending is limited to a maximum 5%, resulting in very low hydrogen partial pressures—well below levels associated with significant embrittlement risk—especially in medium-pressure distribution and

---

197 *Id.*
198 *Id.*
199 *Id.*
200 Ex. SC-01 (Gersen) 1; Ex. EDF-01 (Colvin) at 5.
201 Ex. SCG-04 at BW-16.
202 *Id.*
203 Ex. SCG-04 at BW-16; Ex. SCG-08, Chapter Summary at 1-4.
204 Ex. SCG-04 at BW-16-17.

residential pipelines that operate at low stress and minimal pressure cycling.[205] As a result, the potential impact on pipeline integrity and fatigue crack growth is expected to be minimal.[206]

Although EDF notes that hydrogen can permeate polymer materials (e.g., plastics) more readily than natural gas,[207] this concern is based on studies examining hydrogen volumes far greater than those proposed for SoCalGas's projects.[208] While research, including the UC Riverside Study, acknowledges that hydrogen–natural gas blends may permeate polymers at slightly higher rates, it also indicates that the levels involved do not pose a safety concern.[209] Given the relatively small quantities of hydrogen planned for the UCI and Orange Cove demonstrations and the low permeation rates identified in the literature, any hydrogen lost through permeation is unlikely to cause environmental or community impacts.[210]

Further, Sierra Club and LCJA raise concerns about the use of Aldyl-A pipelines in the Orange Cove demonstration, citing the material's susceptibility to brittle-like cracking and speculating that hydrogen blending could increase leak risks. [211] However, there is no literature demonstrating negative impacts of low-level hydrogen blends on Aldyl-A, and assumptions of increased risk are unsupported.[212] Even if Aldyl-A exhibits higher permeation potential, studies show rates are extremely low and not a safety or environmental concern at hydrogen blends of

---

[205] *Id.* at BW-17.
[206] *Id.* at BW-17-18.
[207] Ex. EDF-01 (Colvin) at 5-6.
[208] Ex. SCG-04 (Waymire Rebuttal) at BW-18.
[209] *Id*. at BW-18.
[210] *Id*.
[211] Ex. SC-02 (Brown) at 14; Ex. OCU/LCJA 2 (Bodell) at 3.
[212] Ex. SCG-04 (Waymire Rebuttal) at BW-19.

5% or less.[213] The system will also operate at very low stress levels, further reducing risk, and SoCalGas already conducts annual leak surveys in Orange Cove as part of its routine asset maintenance program.[214]

E. SCOPING ISSUE 5: Are the pilots equitable and do the pilots create any positive or negative community impacts?

1. Scoping Issue 5.a: How were pilot project locations selected?

UCI Project

Although no party challenged the selection of the UCI Project site, the proposal to blend to the ARC was developed in close coordination with UCI facilities personnel and chosen based on several factors, such as the facility's consistent gas load, favorable location, and the characteristics of its pipeline components and end-use equipment.[215] Several alternative locations for the hydrogen production, compression, storage, and blending equipment were evaluated.[216] After the ARC was selected, the proposed equipment site was relocated from the police campus parking lot to a site immediately south of the ARC.[217]

Orange Cove Project

See Section V.B.4 above regarding the Orange Cove Project's site selection.[218]

---

[213] *Id.* at BW-19.
[214] *Id*. at BW-40.
[215] *Id.* at BW-40.
[216] *Id.;* Ex. SCG-012 at 5.
[217] Ex. SCG-01R at 5-7.
[218] Ex. SCG-011 at 5.

2. Scoping Issue 5.b: What measures ensure equitable distribution of risks and benefits for each project?

UCI Project

As a starting point, the risk incurred by the UCI Project is extremely low, as noted above. However, SoCalGas has proposed a series of mitigation measures before, during and after the introduction of hydrogen to the proposed system, as discussed above in Section V.D.1.[219] SoCalGas will create detailed engineering designs in accordance with existing codes and standards that promote safety and is proposing to enhance safety measures beyond what is required.[220] Therefore, given the risk evaluation and safety measures proposed, SoCalGas does not anticipate additional risks from the UC Irvine Project.

From a community impact perspective, research suggests that NOx may stay the same or decline[221] under the conditions proposed for this project, providing a local community benefit. Widespread ratepayer benefits would come in the form of data to advise the creation of an injection standard for both steel and plastic medium pressure distribution pipeline systems.

Orange Cove Project

SoCalGas plans to proactively engage Orange Cove customers to promote participation in existing customer assistance and energy efficiency programs before and during the demonstration.[222] Because Orange Cove is a CalEPA-designated Disadvantaged Community, a large share of residents are eligible for programs such as Energy Savings Assistance (ESA) and

[219] Ex. SCG-06 at 3.
[220] Ex. SCG-01R at 16-17.
[221] Ex. SCG-04 (Waymire Rebuttal) at BW-21.
[222] Ex. SCG-05 (Gilbride Rebuttal) at CG-9.

CARE, which can subsidize or fully replace aging or faulty appliances.[223] With nearly three-quarters of households eligible for ESA, this outreach approach cost-effectively improves appliance safety and efficiency while connecting eligible customers with available benefits.[224]

Although some intervenors raise concerns that older appliances in Orange Cove could be adversely affected by hydrogen blending,[225] research shows that common appliances can safely operate with hydrogen blends of up to 20%, with no evidence of negative impacts at the proposed maximum 5% blend.[226] (In fact, since 1974 Hawai'i Gas has been successfully blending hydrogen up to 15% as part of its fuel mix with appliances operating safely and effectively.)[227] At this level, the hydrogen–natural gas blend closely resembles conventional natural gas, including a nearly identical Wobbe index, supporting appliance compatibility and normal operation.[228] In addition, CSA Group has confirmed that existing appliance certifications remain valid for natural gas containing up to 5% hydrogen.[229] As noted above, to address concerns about aging or faulty appliances, SoCalGas plans to conduct customer outreach to connect eligible residents with existing assistance and energy efficiency programs that can replace unsafe or inefficient equipment, independent of the demonstration project.[230]

---

[223] *Id*. at CG-9-10.
[224] *Id*. at CG-9.
[225] Ex. OCU/LCJA 3 (Sinclair) at 8; Ex. SC-01 (Gersen) at 69-70.
[226] Ex. SCG-04 (Waymire Rebuttal) at BW-19; Ex. SCG-07 (Compendium Report) at 8.
[227] Ex. SCG-06 at 11-12.
[228] Ex. SCG-04 (Waymire Rebuttal) at BW-20.
[229] *Id.* at BW-20.
[230] *Id*. at BW-20-21.

Furthermore, some intervenors raise concerns that hydrogen blending could increase NOx emissions and worsen health impacts in an already burdened community.[231] However, existing research indicates otherwise for standard residential and commercial appliances. In California, strict NOx emission limits have driven widespread use of low-NOx, pre-mix burner technologies that lower flame temperatures through optimized air-fuel mixing.[232] Because hydrogen combustion requires less oxygen than natural gas, blending hydrogen into natural gas can create leaner combustion with excess air, reducing or stabilizing flame temperatures and thereby suppressing NOx formation.[233] As a result, studies suggest hydrogen blends up to 20% are unlikely to increase—and may actually reduce—NOx emissions in typical appliances.[234] While larger or specialized industrial equipment may require closer evaluation, NOx increases are not expected for standard appliances.[235] To confirm these findings under real-world conditions, SoCalGas plans to conduct emissions monitoring based on customer participation, with data collection coordinated with an independent third party.[236]

---

[231] Prepared Direct Testimony of Professor Alastair Charles Lewis on behalf of OCU/LCJA (hereinafter, "Ex. OCU/LCJA 1") at 3-5; Ex. OCU/LCJA 3 (Sinclair) at 5-6; Ex. OCU/LCJA 4 (Zweifler-Katz), Exhibit B; Ex. OCU/LCJA 3 (Sinclair) at 5; Ex. SC-01 (Gersen) at 72; Direct Testimony of Tyson Siegele on Hydrogen Blending Application 22-09-006 on behalf of Utility Consumers' Action Network (UCAN) (hereinafter, Ex. UCAN-01) at 15.

[232] Ex. SCG-04 (Waymire Rebuttal) at BW-21.

[233] *Id*. at BW-21-22.

[234] *Id*. at BW-21.

[235] *Id*. at BW-22.

[236] *Id*. at BW-22.

3. Scoping Issue 5.c: How were community stakeholders in each pilot project included in the planning process?

As noted above, SoCalGas included community stakeholders in the UCI Project's planning process as part of the company's robust stakeholder outreach. In fact, the UCI's Administrative Oversight Committee was charged with serving as the main body for receiving and reviewing community input.[237] As part of its duties, the UCI Student Advisory Committee engages students and shares their feedback to the Administrative Oversight Committee.[238] SoCalGas also worked closely with UCI Facilities and various leadership organizations across the campus, including Student Housing, Environment, Health & Safety, Police and Fire.[239]

As noted above in Section V.D.5, SoCalGas included community stakeholders in the Orange Cove Project's planning process.

4. Scoping Issue 5.d: What ongoing community engagement is planned during implementation of each pilot project?

While some intervenors claim a lack of a "plan" for stakeholder engagement for SoCalGas's projects,[240] SoCalGas values community input and recognizes the critical role community members play in shaping the proposed demonstration projects.[241] As to the UCI Project, SoCalGas will continue working with UCI to keep students, faculty, staff, and other

---

[237] Ex. SCG-05 at CG-9-10.
[238] *Id*.
[239] *Id*. at CG-10.
[240] Ex. SC-01 (Gersen) at 58-60; Prepared Testimony of Ariel Strauss on behalf of Small Business Utility Advocates (SUBA), Ex. SBUA-01 at 8.
[241] Ex. SCG-05 at CG-11.

stakeholders informed through campus communications and digital platforms, providing regular updates and engagement opportunities throughout the demonstration period.[242]

As to the Orange Cove Project, SoCalGas will continue working collaboratively with local and regional stakeholders, the City of Orange Cove, and community organizations to promote transparent, ongoing communication and meaningful collaboration.[243] Planned outreach efforts include community meetings and open houses, stakeholder briefings, media engagement, and continued participation in local events.[244]

5. Scoping Issue 5e: What, if any are the impacts on environmental and social justice communities, including the extent to which these pilots impact achievement of any of the nine goals of the Commission's Environmental and Social Justice Action Plan.

While the UCI community is not considered disadvantaged, it would nonetheless benefit from investment in clean energy in the form of the solar array SoCalGas is proposing to donate to UCI to save decommissioning costs.

The Orange Cove Project brings benefits to Orange Cove in the form of clean energy investments in a disadvantaged community, in alignment with the Commission's Environmental Social Justice (ESJ) Action Plan.[245] In particular, the Orange Project aligns with ESJ Action Plan Goals 2 (by increasing investment in clean energy resources), 4 (by increasing resiliency in the community through the donation of the solar array), and 5 (by providing opportunities for the community to provide input and feedback into the project and our outreach efforts).

---

[242] *Id*. at CG-11.
[243] *Id*. at CG-11.
[244] *Id*.
[245] *See* CPUC's ESJ Action Plan, *available at:* https://epicpartnership.org/resources/Strat_Goal_Kickoff_Amanda_Krantz_CPUC.pdf.

VI. CONCLUSION

SoCalGas appreciates the advancement of this proceeding and the opportunity to brief the important issues raised in the Scoping Memo.

Respectfully submitted,

By: *_/s/ Ismael Bautista, Jr._*
ISMAEL BAUTISTA, Jr.

Attorney for:
SOUTHERN CALIFORNIA GAS COMPANY
555 West Fifth Street, Suite 1400
Los Angeles, California 90013
Telephone: (213) 231-5978
Facsimile: (213) 629-9620
E-Mail: IBautista@socalgas.com

May 4, 2026