Application: A.25-12-XXX
Exhibit No.: SDGE-01
Witness: Ari Beer

# PREPARED DIRECT TESTIMONY OF

# ARI BEER

# ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

# CHAPTER 1 – POLICY

**BEFORE THE PUBLIC UTILITIES COMMISSION**
**OF THE STATE OF CALIFORNIA**


**DECEMBER 16, 2025**

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## I. PURPOSE

The purpose of my direct testimony is to provide the background, policy justification, and affordability considerations for San Diego Gas & Electric Company's ("SDG&E") Palomar Decarbonization Demonstration Project ("Project"). Specifically, this chapter: (1) provides the procedural history of the Project and describes the Project; (2) provides a design narrative for the Project including discussion on concept, purpose, and scale; (3) describes Project benefits including that the system is used and useful, reduces greenhouse gas emissions, provides significant learnings for SDG&E and others, and is helping to inform SDG&E's long term decarbonization and reliability strategy; (4) discusses how the Project is aligned with State policy; (5) describes how the Project is strategically aligned with the California Public Utility Commission's ("Commission" or "CPUC") mandate to achieve energy decarbonization and reliability; and (6) describes SDG&E's actions to reduce the cost of the Project, including securing three federal investment tax credits that will return nearly $4 million in related costs back to ratepayers.

## II. BACKGROUND

### A. Procedural Background

On May 16, 2022, SDG&E filed Application ("A.") 22-05-016, the Test Year 2024 General Rate Case Application ("2024 GRC Application") with the Commission. The application included a request for capital costs for the "Palomar Hydrogen Systems" project. The request for direct capital for the project totaled $17.5 million from 2021-2024.[1] The application stated that the project would demonstrate:

[1] A.22-05-016, Exhibit (Ex.) SDG&E-14, Prepared Direct Testimony of Daniel S. Baerman (May 2022) (Ex. SDG&E-14 (Baerman Direct)) at 15, available at https://www.sdge.com/sites/default/files/regulatory/SDGE-14_Direct_Testimony_Daniel_Baerman_%20Electric%20Generation.pdf.

> …multiple use cases of electrolytically produced hydrogen to support decarbonizing natural gas-powered plant operations. SDG&E believes that clean hydrogen will play a vital role in helping to decarbonize California's electric grid by ultimately becoming a key source of clean, firm, and dispatchable power that can support the electric system at times of low renewable production and high demand and as such has taken the necessary steps to begin understanding the many unique aspects of this resource.[2]

On December 19, 2024, the Commission voted to approve Decision ("D.") 24-12-07, "Decision Addressing the 2024 Test Year General Rate Cases of Southern California Gas Company and San Diego Gas & Electric Company," ("2024 GRC Decision"), which did not authorize funding for the "Palomar Hydrogen Systems." In the 2024 GRC Decision, the Commission acknowledged the potential for hydrogen blending with natural gas to support the transition to carbon-free electricity, finding: "Without knowing the actual cost to ratepayers, we cannot accurately judge whether the costs and scale of this pilot are just and reasonable."[3] The Commission also stated, "SDG&E may pursue building the hydrogen system at the Palomar Energy Center as a stand-alone application with more robust information, leveraging public funding sources and lowering ratepayer costs."[4]

In accordance with the 2024 GRC Decision, SDG&E is pleased to provide this standalone application seeking approval for the hydrogen systems at the Palomar Energy Center ("PEC") – now renamed the "Palomar Decarbonization Demonstration Project".[5] As directed in the 2024 GRC Decision, this standalone application provides a robust description and

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[2] A.22-05-016, Ex. SDG&E-15-R, Revised Prepared Direct Testimony of Fernando Valero (August 2022) (Ex. SDG&E-15-R (Valero Revised Direct)) at 31, available at https://www.sdge.com/sites/default/files/regulatory/SDGE-15R%20Revised%20Direct%20Testimony%20-%20Clean%20Energy%20Innovations%20-%20SDGE%20Ex%2015_1647_1648.pdf.

[3] D.24-12-074 at 404.

[4] *Id.* at 404-405.

[5] SDG&E renamed the project to emphasize its focus on demonstrating hydrogen's role in decarbonization.

explanation of the system and its operations, describes the actual costs, and explains how SDG&E successfully leveraged federal and state funding, lowered costs, and benefits provided by the Project.

**B. Project Background**

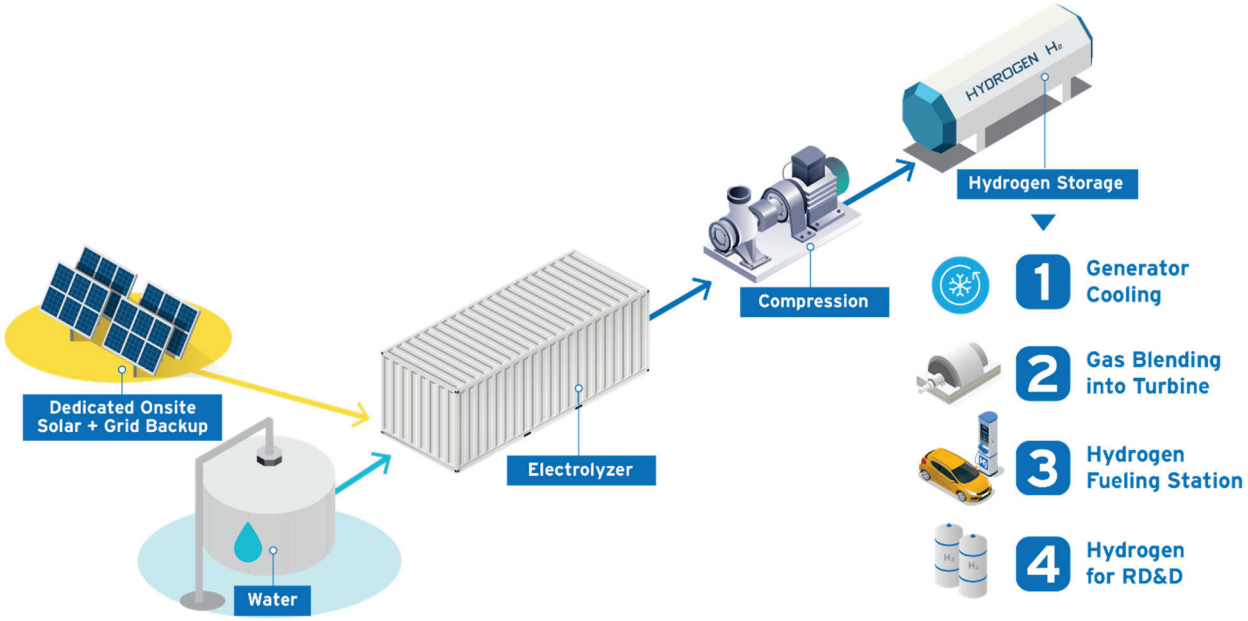
The purpose of the Project is to enable SDG&E to gain critical knowledge, expertise, and real life operational experience of clean hydrogen's role in electric system decarbonization by demonstrating a hydrogen system that was prudently sized, maximizes use cases, was used and useful, decarbonizes PEC operations, helps to inform SDG&E and others' long term electrification decarbonization and reliability strategy, and balances the needs of decarbonization and affordability.

In 2023, SDG&E successfully completed the installation and commissioning of the Project at the SDG&E owned and operated facility, PEC, which is a 588-megawatt ("MW") combined-cycle natural gas power plant in Escondido, CA. PEC has always used hydrogen gas as part of its generator cooling system, as this is a well-established cooling strategy for large generators. Prior to this demonstration, PEC relied on trucked-in "gray" hydrogen purchased from a third party that produced it via steam methane reformation of natural gas. Today, SDG&E generates its own renewable, electrolytic hydrogen onsite that has a carbon intensity ("CI") score of zero.

The Project is fully operational and demonstrates how renewable hydrogen can be utilized to support decarbonization across multiple areas of electric utility operations, including: (1) generator cooling, (2) power generation, (3) fleet vehicle fueling, and (4) additional research, demonstration, and deployment ("RD&D").

The Project is used and useful, leveraging both state and federal programs to reduce system costs. Figure 1 provides a graphical overview of the system. For technical and operational details on the Project equipment and power plant, see Chapter 2, Prepared Direct Testimony of Pooyan Kabir and Kevin Counts ("Chapter 2").

**Figure 1: Palomar Decarbonization Project at PEC**




## III. PROJECT DESIGN

SDG&E is a gas and electric investor-owned utility ("IOU") with a portfolio of four natural gas-fueled electric/power generation assets. SDG&E is responsible for meeting California's ambitious carbon reduction goals while safely and reliably generating and delivering gas and electricity to its customers. In 2023, natural gas-fired power plants provided 36.6% of California's power mix and 58.4% of SDG&E's power mix.[6] As SDG&E transitions toward the decarbonized electricity future, there are a limited number of tools available to transition off

[6] SDGE.com/bill-inserts, 2023 Power Content Label (December 2024), available at https://www.sdge.com/sites/default/files/documents/2024-12/FINAL_S2410024_PCL_Dec24_REV.pdf.

natural gas while maintaining sources of clean, firm, dispatchable power generation in the region. One such tool is replacing natural gas in turbines with a clean fuel like hydrogen. This transition can begin today via a blend of hydrogen and natural gas, with the goal of 100% hydrogen turbines in the future. Natural gas power plants using carbon-free fuels such as hydrogen provide reliable electric power generation including during periods when intermittent renewable energy sources like solar and wind are not available, or energy storage resources are depleted. This technology demonstration is essential to California's commitment to deliver 100% carbon-free electricity to its customers by 2045 as required by Senate Bill ("SB") 100.

Utilities like SDG&E build demonstration projects with a goal to showcase and validate the safety, feasibility and effectiveness of new technologies in real-world conditions. These demonstrations reduce risk by generating operational data, informing system design, and building workforce readiness. They also foster stakeholder confidence by showing tangible progress toward decarbonization goals. Importantly, utility demonstrations help align innovation with regulatory frameworks and can catalyze broader market adoption by proving viability. This Project accomplishes these goals and is enhancing plant operations with a reliable and carbon-free source of hydrogen for multiple uses. SDG&E was also able to demonstrate a practical and cost-effective approach to innovation, balancing state policy objectives and affordability by leveraging existing infrastructure, producing hydrogen onsite, and leveraging available sources of funding.

### A. Co-locating Hydrogen Production and Use

SDG&E evaluated different models for decarbonizing our service territory's energy reliability and resiliency with hydrogen, including trucking in gaseous and liquid hydrogen, importing hydrogen via dedicated pipelines, and co-locating local hydrogen production with use. For this demonstration, SDG&E pursued a project that co-located onsite production with an

established, ongoing use. Co-locating hydrogen production and use is the most feasible, practical, and cost-effective way to bring sufficient hydrogen for targeted sectors into our region in a reasonable timeframe as the broader California hydrogen market develops. For example, to support the operations of a large generator like PEC operating at full capacity with 100% hydrogen would require approximately 35 tons of hydrogen per hour. Trucking in this much liquid hydrogen would require over 180 truckfuls per day, which would not be feasible nor cost effective.[7]

A dedicated hydrogen pipeline is recognized as the most efficient method for transporting large quantities of hydrogen at scale.[8] However, planning for future dedicated hydrogen pipelines to import hydrogen into the San Diego region is complex and involves long lead times for infrastructure that is not yet in development, making it an impractical option for a demonstration project.

Therefore, after evaluating the alternatives, SDG&E determined that the most practical, flexible, and cost-effective approach for SDG&E's service territory in the near term was to pursue a demonstration and broader transition strategy that co-located on-site hydrogen production with multiple use cases.

### B. The Project Was Designed to Demonstrate Multiple Use Cases

The Project is used and useful, providing benefits through four distinct use cases:

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[7] Calculation: [(35 tons/hr*24hr)÷(4.6 tons/truck)]=183 trucks/day. Assumes transport trailer with capacity of 4.6 tons liquid H2 per truck. *See* Chart Inc., Liquid Hydrogen Transport System, LH2 Transport Trailer, available at https://files.chartindustries.com/LH2TransportTrailerSpecSheetST18600H.pdf.

[8] U.S. Department of Energy, U.S. National Clean Hydrogen Strategy and Roadmap, (June 2023) , available at https://www.hydrogen.energy.gov/docs/hydrogenprogramlibraries/pdfs/us-national-clean-hydrogen-strategy-roadmap.pdf.

1. **Generator Cooling**: PEC was designed to use hydrogen gas to cool the two combustion turbine generators and the steam turbine generator. A primary use of the hydrogen produced on site is to displace trucked-in hydrogen required for generator cooling. See Chapter 2, Section II(A.5) for details.
2. **Power Generation**: Moving beyond widespread commercial practices and demonstrating additional uses of hydrogen known to decarbonize the power sector, the hydrogen produced by the Project will allow hydrogen blending to reduce carbon emissions related to power generation, a key step to decarbonizing California and reaching state goals. PEC blends around 400 kilograms of hydrogen with natural gas per month, at up to 2% by volume. See Chapter 2, Section I and Section II(A.6) for details.
3. **Fleet Vehicle Fueling**: The hydrogen produced also supports ancillary operational needs of the staff at PEC by providing reliable, clean fueling for SDG&E hydrogen fuel cell fleet vehicles. See Chapter 2, Section II(A.7) for details.
4. **Research & Development:** The hydrogen produced by the Project may support further research and development, including for SDG&E's "Renewable Mobile Nanogrid for Climate Resiliency" ("Nanogrid"). The Nanogrid and associated hydrogen export panel at PEC is funded through the Electric Program Investment Charge ("EPIC"), by California utility customers under the auspices of the Commission and is not included as a cost in this application.[9]

[9] CA.Gov, EPIC Database, SDG&E EPIC-4 Project 5 - Renewable Mobile Nanogrid for Climate Resiliency (October 21, 2025), available at https://database.epicpartnership.org/project/135075.

### C. Deploying Electrolytic Hydrogen

When SDG&E first proposed this Project in 2021, electrolysis was the most favorable technology for several reasons. First, renewable hydrogen generated by electrolysis meets many of the objectives shared by environmental stakeholders. In D.22-12-057, after substantial feedback from intervenors, the Commission adopted an interim definition for *clean renewable hydrogen*: '"Hydrogen which is produced through a process that results in a lifecycle (*i.e.,* well-to-gate) GHG emissions rate of not greater than 4 kilograms of CO2e per kilogram of hydrogen produced and does not use fossil fuel as either a feedstock or production energy source.'"[10] The electrolytic hydrogen used in this demonstration meets that definition.

Second, electrolytic hydrogen was favored due to its commercial availability and the general consensus that it had the ability to scale to generate abundant, affordable, and reliable clean hydrogen within the decade. This idea was promoted by the US Department of Energy, which in June 2021 established the "Hydrogen Shot" as the first goal of its Energy Earthshots Initiative. The Hydrogen Shot goal sought to reduce the cost of clean hydrogen production to $1/kilogram by 2031. Respected energy market research providers like BloombergNEF made the goals of Hydrogen Shot seem in reach, with reporting in 2020 stating:

> The cost of alkaline electrolyzers made in North America and Europe fell 40% between 2014 and 2019, and Chinese made systems are already up to 80% cheaper than those made in the west. If electrolyzer manufacturing can scale up, and costs continue to fall, then our calculations suggest renewable hydrogen could be produced for $0.8 to $1.6/kg in most parts of the world before 2050, with costs between $2.75-$1.25 by 2030.[11]

[10] D.22-12-057 at 48.

[11] BloombergNEF, Hydrogen Economy Outlook, Key Messages (March 30, 2020) at 2, available at https://data.bloomberglp.com/professional/sites/24/BNEF-Hydrogen-Economy-Outlook-_Key-Messages.pdf.

SDG&E made a reasonable decision to pursue electrolytic hydrogen when the Project commenced, and electrolyzer operations to date have been successful and reliable. The hydrogen produced will be used in a variety of applications and will continue to demonstrate the role hydrogen and other clean fuels will play in decarbonizing California's energy consumption. SDG&E will continue to monitor the electrolyzer market, as well as assess the other scalable, cost-competitive, low-carbon and renewable hydrogen generation technologies that could be adopted in the future.

### D. Project Size and Scale

SDG&E built the Project at a modest scale, yet in such a way that would maximize utility, learnings, and demonstrate use-case flexibility. SDG&E sought to build a true commercial demonstration project, as opposed to a pilot, avoiding a larger, more complex project that would add execution and cost risk. See Chapter 2 for details on the equipment sizing and hydrogen production.

## IV. PROJECT BENEFITS

### A. The Project has Enabled SDG&E to Gain Experience on a Critical Clean Energy Technology

This Project allows SDG&E to gain experience and understanding with a fuel that is considered critical to decarbonizing dispatchable, firm power generation: renewable hydrogen. Hydrogen has been identified as an important tool to displace fossil fuel use. The California Energy Commission is actively analyzing hydrogen as a firm, zero-carbon resource,[12] with

[12] CEC, SB 423 Emerging Renewable and Firm Zero-Carbon Resources Report: Assessment of Firm Zero-Carbon Resources to Support a Clean, Reliable, and Resilient California Grid (Updated, May 28, 2025) available https://www.energy.ca.gov/publications/2024/sb-423-emerging-renewable-and-firm-zero-carbon-resources-report-assessment-firm.

hydrogen explicitly included in the state's set of firm resources.[13] The learnings that SDG&E has gained, and will continue to gain, include but are not limited to: (1) hydrogen generation, including the design, construction, operation, and maintenance requirements for local production of hydrogen co-located with end use; (2) hydrogen use, including monitoring and measuring of hydrogen natural gas blend's behavior and impact on turbines and emissions; (3) the design, operation and maintenance of hydrogen equipment such as electrolyzer, blending skids, compressors and storage systems; how to integrate hydrogen into various use cases to replace fossil fuels; and (4) how to scale the use of hydrogen in the future to support the broader power generation fleet.

The Project has enabled SDG&E to gain valuable operational, technical, and strategic insights into hydrogen systems for power generation. The Project has supported and will continue to support SDG&E's knowledge and experience in a variety of specific areas, including engineering, system design, codes and standards, controls, valves, piping, venting, safety requirements, hazards, material specifications, best practices, risk management, metering, performance data on gas turbine efficiency with blended gas, emissions data, developing asset operation and maintenance strategies, developing and publishing standard operating procedures, training staff, labor, and first responders, and developing asset management requirements and protocols. More information on these areas of learning can be found in Chapter 2.

This Project is the first of its kind in the United States, and to SDG&E's knowledge, PEC is also the only combined cycle natural gas power plant in California using hydrogen as an ongoing fuel source (i.e., not a test fuel source) as of this filing. When the Project was undertaken in 2021, SDG&E had 24 years left (or six General Rate Case cycles) to transition its

[13] CEC, SB 423 Firm Zero-carbon Resources Update (July 29, 2025), available at https://efiling.energy.ca.gov/GetDocument.aspx?tn=265043.

infrastructure to meet the state's 2045 requirement of 100% clean energy. Given the scale and cost of the challenge, and the fact that energy infrastructure requires very long lead times, starting with a modest, used and useful demonstration that could inform a broader decarbonization strategy aligns with SDG&E's focus on reliability, safety, and affordability.

### B. SDG&E is Sharing its Learnings with California and Beyond

Since the completion of the Project in 2023, SDG&E has made a concerted effort to share its learnings and demonstrate the role that hydrogen can play in decarbonizing power generation. Examples of outreach include facility tours for other electric and gas utilities, such as Pacific Gas & Electric Company ("PG&E"), Southern California Gas Company ("SoCalGas"), Southern California Edison Company ("SCE") and Los Angeles Department of Water and Power; public agencies such as the Port of San Diego and North County Transit District; faculty and staff from California public universities; a local Tribal government; elected officials; and many others. SDG&E is committed to offering tours and sharing learnings to relevant stakeholders to educate them on the role hydrogen can play in reliable and decarbonized energy systems.

SDG&E is also collaborating with faculty at the University of California Irvine Combustion Laboratory to develop a data collection framework for the hydrogen blending aspect of the Project, including emissions and system performance. The goal is to collect and disseminate meaningful data and compare results with other projects that use blended hydrogen for power generation.

### C. The Project Reduces Greenhouse Gas Emissions

The Project reduces greenhouse gas emissions ("GHGs") for all SDG&E customers. Details and calculations are included in Chapter 2.

### D. The Project Informs SDG&E's Decarbonization and Reliability Strategy

The Project is helping to inform SDG&E's capital planning around managing and potentially transitioning its gas fleet to clean energy. A summary of SDG&E's current fleet of gas-powered plants is included below in Table 1. Much of its gas fleet is nearing the end of its depreciable life. The three power plants located in California are considered local, "in basin" resources for SDG&E. SDG&E is actively assessing plans for these assets. Additionally, in the 2024 GRC Application, SDG&E stated for Desert Star Energy Center in Nevada that it is exploring "alternatives to convert the plant to a clean dispatchable resource," which includes the potential to adopt clean fuel such as hydrogen.[14]

**Table 1: SDG&E's current utility-owned fleet of gas-powered plants:**

| Plant Name | Plant Capacity (MW) | Plant Location | Planned Retirement Year |
|---|---|---|---|
| Palomar Energy Center | 588 | Escondido, CA | 2037 |
| Desert Star Energy Center | 495 | Boulder City, NV | 2027 |
| Miramar Energy Center | 92 | San Diego, CA | 2032 |
| Cuyamaca Energy Center | 45 | El Cajon, CA | 2027 |

Projects like this are necessary for the future availability of decarbonized local energy generation that can be dependable and rapidly dispatched to respond to demand for energy in SDG&E's service area, required to maintain the resilience and reliability of the region's electrical power grid. With the implementation of expanded renewable generation resources, improvements to transmission assets, increased energy storage, and other grid enhancements, dispatchable firm hydrogen generation may complement these resources by providing grid reliability for times of the year when renewable production is low, storage is depleted, and

[14] A.22-05-016, Ex. SDG&E-14 (Baerman Direct) at 3, n.1.

demand is high. Furthermore, the most recent 2026-2027 Transmission Planning Process model includes ~25 GW of retained gas-fired generation.[15] Displacing a material amount of natural gas with a clean firm fuel, such as hydrogen, will be needed to reach California's emissions goals and maintain electric grid reliability.

SDG&E must comply with various requirements, such as following the Renewable Portfolio Standard ("RPS"), ensuring Resource Adequacy ("RA"), and GHG reduction requirements, and cannot rely solely on intermittent renewables coupled with storage. It must also plan for decarbonized firm capacity. SDG&E's 2022 Integrated Resource Planning ("IRP") shows that significant procurement will be needed to meet state goals and reliability. SDG&E's 2022 IRP does not assume retirement of its gas fleet, meaning that SDG&E's procurement needs would be even higher if it were to rely solely on renewables and storage resources.

Clean firm generation projects that seemed secure one year ago now face substantial headwinds, including the repeal of federal clean energy investment tax credits, unpredictable tariffs, and capricious federal permitting pauses or repeals. For example, three geothermal projects in California asked the California Energy Commission ("CEC") to suspend their application ["paused indefinitely"][16] due to challenges related to procurement, offtake, transmission interconnection studies, and permitting timelines.[17] Repowering existing gas power

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[15] *See* CPUC.CA.GOV, R.25-06-019, 26-27 Transmission Planning Process RESOLVE Modeling Results (September 30, 2025), available at https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2024-2026-irp-cycle-events-and-materials/assumptions-for-the-2026-2027-tpp/ruling_26-27_tpp_results.pdf.

[16] CalCCA, Salton Sea Projects Paused Despite Appetite for Geothermal Energy, available at https://cal-cca.org/salton-sea-projects-paused-despite-appetite-for-geothermal-energy/.

[17] NBC Palm Springs, Developer Suspends 3 New Geothermal Plants Near the Salton Sea (February 13 2025) available at https://www.nbcpalmsprings.com/2025/02/13/developer-suspends-3-new-geothermal-plants-near-the-salton-sea.

plants reduces some of the risk facing new projects since they are already connected to transmission and may not have the same permitting hurdles.

Given the uncertainty of markets right now, and the energy affordability challenges in the state, the best strategy is to hedge, seek technology neutrality, and be agile. Hydrogen may help SDG&E accomplish both its clean portfolio and affordability targets.

## V. DECARBONIZATION WITH RENEWABLE HYDROGEN IS SUPPORTED BY CALIFORNIA POLICY

The State of California has expressed significant interest in and adopted policies and programs promoting renewable hydrogen for use in decarbonizing various energy intensive, hard-to-electrify sectors of the economy, and especially for power generation. California Governor Gavin Newsom has declared, "California is all in on clean, renewable hydrogen – an essential aspect of how we'll power our future and cut pollution."[18] SDG&E's Project is aligned with California's statutory GHG emissions reductions created by SB 38, SB 100, Assembly Bill ("AB") 1279, SB 1020,[19] and others. Additionally, the Project is aligned with numerous state public policies, orders, and programs that support the role of renewable hydrogen in decarbonizing California's grid; a selection of very relevant policies, orders, and programs is highlighted in this section.

[18] Office of Governor Gavin Newsom, Governor Newsom Announces New Strategy to Develop a Hydrogen Economy of the Future (August 8, 2023), available at https://www.gov.ca.gov/2023/08/08/governor-newsom-announces-new-strategy-to-develop-a-hydrogen-economy-of-the-future/.

[19] SB 100 (2018): Mandates 100% renewable and zero-carbon electricity for retail sales by 2045; AB 1279 (2022): Establishes a statewide goal for carbon neutrality as soon as possible, but no later than 2045, requiring 85% reduction from 1990 levels; SB 1020 (2022): Accelerates SB 100, setting targets for 90% clean electricity by 2035, 95% by 2040, and 100% by 2045; SB 32 (2016) & Beyond: Set earlier GHG reduction targets (40% below 1990 levels by 2030).

### 1. California Legislature

- **SB 1075**: Directs the California Air Resources Board ("CARB"), in consultation with Commission and CEC, to consider the role of green hydrogen in decarbonization strategies.[20]
- **SB 423**: Requires the CEC to incorporate firm zero-carbon resources into its Integrated Energy Policy Reports, stating, "Several promising zero-carbon resources are emerging, which can provide firm baseload or firm flexible electricity, including green electrolytic hydrogen…"[21]
- **AB 209**: Among other programs, establishes the Clean Hydrogen Program to fund demonstration projects using renewable hydrogen.[22]
- **SB 1420**: Streamlines permitting for non-fossil derived hydrogen production and storage facilities under CEQA.[23]
- **AB 8**: Requires the development of at least 100 publicly available hydrogen fueling stations.[24]

### 2. Governor's Office

- Critically advanced and enabled California to be named a US Hydrogen Hub and receive up to $1.2 Billion in federal funding for renewable hydrogen systems under the Alliance

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[20] SB-1075 Hydrogen: green hydrogen: emissions of greenhouse gases.(2021-2022) Skinner, available at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220SB1075.

[21] SB-423 Energy: firm zero-carbon resources. (2021-2022) available at https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB423.

[22] AB-209 Energy and climate change. (2021-2022) available at https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220AB209.

[23] SB-1420 Hydrogen production facilities: certification and environmental review.(2023-2024) Available at https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202320240SB1420.

[24] AB-8. Hydrogen Refueling Network. 2012, available at http://www.leginfo.ca.gov/pub/13-14/bill/asm/ab_0001-0050/ab_8_bill_20130903_amended_sen_v96.html.

for Renewable Clean Hydrogen Energy Systems ("ARCHES"); the Governor's Office of Business and Economic Development ("GO-Biz") holds a "Founding Member" seat on the ARCHES Board.[25],[26]

- Directed GO-Biz to develop California's Hydrogen Market Development Strategy, employing an all-of-government approach to building up California's clean, renewable hydrogen market.[27]

### 3. California Air Resources Board

- **2022 Scoping Plan for Achieving Carbon Neutrality:** Outlines a path to achieve targets for carbon neutrality and reduce anthropogenic GHG emissions by 85% below 1990 levels by 2045, as directed by AB 1279.[28] The 2022 Scoping Plan projects that 9,000 MW of hydrogen combustion turbines will be needed by 2045.[29]
- **Low Carbon Fueling Standard Credits for Hydrogen Refueling Infrastructure:** The CARB Low Carbon Fueling Standard ("LCFS") program is a market-based regulatory initiative established under AB 32 to reduce the carbon intensity of transportation fuels and encourage the use of cleaner alternatives, including hydrogen. If participants sell low-carbon fuels, they generate LCFS credits. If they sell high-

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[25] California Governor's Office of Business and Economic Development (GO-Biz), California Formally Announces Intention to Create a Renewable Hydrogen Hub (May 18, 2022), available at https://business.ca.gov/california-formally-announces-intention-to-create-a-renewable-hydrogen-hub/.

[26] ARCHES Board, (Accessed August 27, 2025) available at https://archesh2.org/arches-board/.

[27] Office of Governor Gavin Newsom, Governor Newsom Announces New Strategy to Develop a Hydrogen Economy of the Future (August 8, 2023), available at, https://www.gov.ca.gov/2023/08/08/governor-newsom-announces-new-strategy-to-develop-a-hydrogen-economy-of-the-future/.

[28] CARB, 2022 Scoping Plan for Achieving Carbon Neutrality (November 16, 2022) at 1, available at https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp_1.pdf.

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

carbon fuels, they generate deficits and must buy credits to offset them. Credit prices fluctuate in response to market dynamics. While most LCFS credits are based on the volume of fuel dispensed, in 2019 CARB established the Hydrogen Refueling Infrastructure ("HRI") program, a capacity-based credit for hydrogen fueling stations.[30] Credits are calculated as the difference between station capacity and the actual fuel dispensed, thereby incentivizing early investment in hydrogen stations even when utilization is low.[31]

#### 4. California Energy Commission

- **Clean Hydrogen Program**: Established under AB 209, provides financial incentives to in-state projects that demonstrate or scale the production, processing, delivery, storage, or end use of clean hydrogen derived from eligible renewable energy resources.[32]
- The CEC administers the **Clean Transportation Program** to support the deployment of hydrogen fuel cell electric vehicles ("FCEVs").[33] The Clean Transportation Program has allocated approximately $234 million for light-duty hydrogen infrastructure through Fiscal Year 2023-2024.[34]

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30 California Code of Regulations, Title 17 Section 95486.2, available at https://www.law.cornell.edu/regulations/california/17-CCR-95486.2.

31 CARB, LCFS ZEV Infrastructure Crediting, (Retrieved August 27, 2025) available at https://ww2.arb.ca.gov/resources/documents/lcfs-zev-infrastructure-crediting.

32 California Energy Commission, Clean Hydrogen Program, available at https://www.energy.ca.gov/programs-and-topics/programs/clean-hydrogen-program.

33 CEC, Hydrogen Vehicles & Refueling Infrastructure, available at https://www.energy.ca.gov/programs-and-topics/programs/clean-transportation-program/clean-transportation-funding-areas-1.

34 CEC, Joint Agency Staff Report on Assembly Bill 126: 2024 Annual Assessment of the Hydrogen Refueling Network in California (Updated, June 30, 2025) at iii, available at

- **Hydrogen Network Assessment (Assembly Bill 126)**: Pursuant to AB 126, the CEC and the CARB jointly assess the capacity, coverage, and reliability of California's hydrogen refueling network. These assessments inform infrastructure planning and investment strategies.

## VI. THE PROJECT IS A STRATEGIC FIT WITH THE COMMISSION'S RELIABILITY AND DECARBONIZATION MANDATE

Over the course of the next 20 years, California's electric grid is facing a staggering and paradoxical challenge: Tripling electric generation capacity, while requiring that 100 percent of electricity retail sales and state loads are from renewable and zero-carbon resources.[35] It is the legal obligation of the Commission to ensure that California's electricity system is both reliable and decarbonized. [36,37] California needs an 'all of the above' approach, including clean firm dispatchable resources using clean fuel like hydrogen to achieve its goals. Through many proceedings and decisions, the Commission has expressed interest in the role of renewable hydrogen to support decarbonization broadly and of the power sector specifically, but has yet to make bold investments. The Commission has a huge and time sensitive opportunity to make California a leader in clean hydrogen for decarbonized energy systems, which will be necessary to address reliability issues. Hydrogen technology for power generation today is proven and is

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https://www.energy.ca.gov/publications/2025/joint-agency-staff-report-assembly-bill-126-2024-annual-assessment-hydrogen.

[35] CEC, 2021 SB 100 Joint Agency Report Summary Achieving 100% Clean Electricity in California: An Initial Assessment, (Updated, September 3, 2021) at 10, available at https://www.energy.ca.gov/publications/2021/2021-sb-100-joint-agency-report-achieving-100-percent-clean-electricity.

[36] Public Utilities Code Section 932, available at https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PUC&sectionNum=932.

[37] Public Utilities Code Sections 2771-2775.7, available at https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?division=1.&chapter=4.5.&part=2.&lawCode=PUC.

being invested in, demonstrated, and used across the US in states like Utah, Georgia and New York, and around the world in countries like Germany, Belgium, France, Spain, Japan and China.

The Commission funded a study, the CPUC IRP Zero-Carbon Technology Assessment, ("Assessment") that "explores zero-carbon firm capacity generation technologies that could support California's efforts to decarbonize its electricity grid but have not yet reached full commercialization."[38] The Assessment was published in 2022, and included hydrogen as a promising zero carbon firm capacity resource, finding, "these fuels [hydrogen and synthetic natural gas] could potentially be used in much of the existing fossil-fuel power generation equipment, either directly (in the case of SNG) or in retrofitted equipment (in the case of hydrogen). This has the potential to reduce stranded thermal generator costs and may mitigate aversion to adopting new, untested technologies from the electric power generation sector."[39]

California will require daring vision and significant investments (as California has successfully accomplished with previous clean energy technologies) to go from functionally zero (0) MW of hydrogen combustion turbine capacity in 2025 to CARB's projected requirement of 9,000 MW by 2045.[40] This Project is a modest demonstration of the kind of investment the Commission should be supporting to meet 2045 goals.

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[38] CPUC IRP Zero-Carbon Technology Assessment: Final Report (September 2022) at 10, available at https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2022-irp-cycle-events-and-materials/cpuc-irp-zero-carbon-technology-assessment.pdf.

[39] *Id.* at 42.

[40] CARB 2022 Scoping Plan projects need for 9 GW of clean firm dispatchable generation with hydrogen. *See supra,* n.28.

### A. The Commission and IOUs have a Track record of Successfully Adopting New Technologies

The Commission has already established a successful track record of boldly championing clean energy investments, including the RPS and energy storage capacity. The initial implementation of the RPS began in 2004, with incremental targets increasing overtime. The RPS has achieved a monumental and remarkable technological shift in how the California grid is powered. For example, the amount of grid connected solar PV in the state has grown from 2 MW in 2004 to over 22,000 MW in 2024,[41] and total solar installations – including small scale, rooftop, and other behind the meter installations – have reached over 52,000 MW.[42] Likewise, battery energy storage in California has increased from <1 MW installed in 2007 to 15,763 MW as of April 2025.[43] Today, California boasts one of the cleanest grids of any state, but it did not occur by chance; rather it was through long-term and conscientious planning, and a lead time of 26 years. The Commission already knows how to fundamentally reshape California's generation mix- it can now exercise that ability to invest in carbon-free, firm dispatchable power with clean hydrogen.

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[41] California Energy Commission, Installed In-State Electric Generation Capacity by Fuel Type, available at https://www.energy.ca.gov/media/3757.

[42] *See* SEIA, California State Solar Overview, available at https://seia.org/state-solar-policy/california-solar/.

[43] *See* California Energy Commission, California Energy Storage System Survey, available at https://www.energy.ca.gov/data-reports/energy-almanac/california-electricity-data/california-energy-storage-system-survey.

**Figure 2: Commission Approved IOU Capacity Additions (MW) 2003-2023**[44]

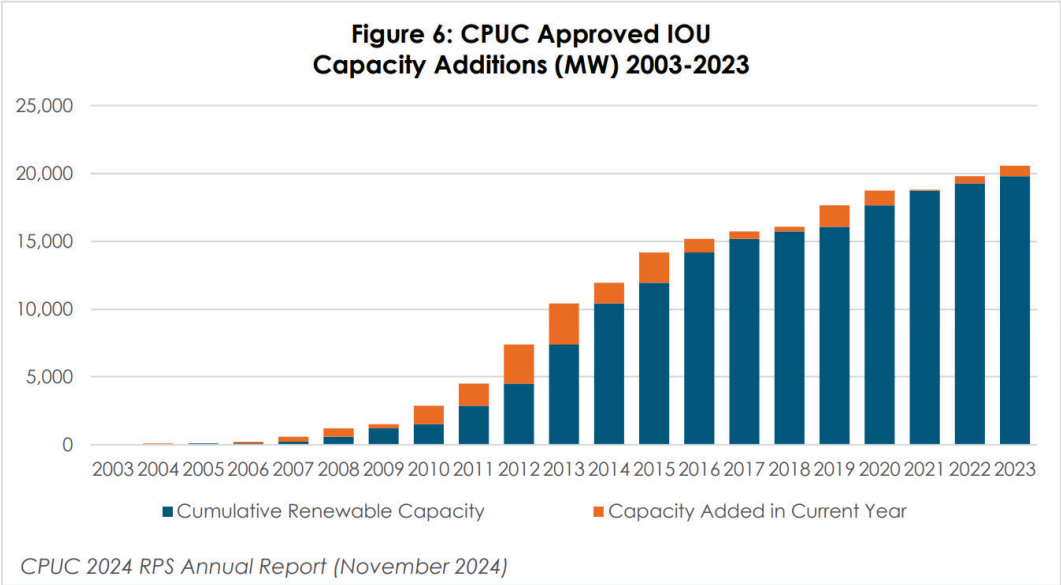


*Figure 6: CPUC Approved IOU Capacity Additions (MW) 2003-2023*
*Data Source: CPUC RPS Database, September 2024*

In 2023 the Commission approved the first significant hydrogen project after it directed PG&E to develop a clean substation microgrid project for Public Safety Power Shutoff ("PSPS") mitigation.[45] PG&E selected the Calistoga substation, which frequently experiences PSPS events, and proposed a 48-hour backup microgrid system that combines battery energy storage and hydrogen fuel cells. The Calistoga project was approved in 2023 via Resolution E-5261, noting its ability to reduce harmful air pollutants by replacing diesel generators. The pilot can deliver 8.5 MW of capacity and 293 MWh of energy.[46] The system relies on hydrogen for its very long duration. Unlike the Project proposed in this Application that produces renewable

[44] CPUC, 2024 California Renewables Portfolio Standard Annual Report (November 2024) at 24, Figure 6, available at https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/office-of-governmental-affairs-division/reports/2024-california-renewables-portfolio-standard-rps-annual-report.pdf.

[45] D.21-01-018, Appendix at A-4. available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M361/K442/361442167.PDF.

[46] Resolution E-5261 (April 27, 2023) at 3, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M507/K896/507896518.PDF.

hydrogen onsite and in California, the Calistoga project relies on liquid hydrogen that has been trucked over 2,800 miles from the state of Georgia.[47]

The Calistoga project is significant for several reasons. First, it marks the CPUC's first funded deployment of hydrogen to enable reliable power generation. Second, it sets a precedent for integrating hydrogen into utility-scale resilience strategies. Third, the Commission allowed "PG&E to pursue novel projects as long as PG&E uses its judgment to reject projects that it deems technologically infeasible," empowering the IOU to make the best technology decision for its customers as to how to support grid reliability, which in this case, was hydrogen. [48]

### B. Hydrogen in Planning and Procurement

The IRP proceeding is the Commission's long-term planning framework to ensure California's electric grid remains reliable while meeting greenhouse gas reduction targets. The IRP proceeding has periodically recognized and even advocated for hydrogen's potential to support grid decarbonization. In 2021, Commissioner Rechtschaffen issued an Alternate Proposed Decision in the Decision Requiring Procurement to Address Mid-Term Reliability (2023-2026) proceeding, which would have authorized procurement by the IOUs of an additional 300 MW of eligible fossil-fueled resources that commit to using specified portions of green hydrogen fuel throughout the contract term.[49] Ultimately, the Commission excluded hydrogen from the eligible resource mix for mid-term reliability procurement.

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[47] Canary Medica, This hydrogen microgrid is the first of its kind. Is it a good idea? (August, 11, 2025), available at https://www.canarymedia.com/articles/hydrogen/hydrogen-microgrid-calistoga-energy-vault-plug-power-pg-e.

[48] Resolution E-5261 (April 27, 2023) at 8, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M507/K896/507896518.PDF.

[49] R.20-05-003, Alternate Proposed Decision Requiring Procurement to Address Mid-Term Reliability (2023-2026) (May 21, 2021) at 3, available at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M385/K026/385026495.PDF.

Later that year, the Administrative Law Judge issued a ruling proposing hydrogen integration into the Preferred System Plan, envisioning a transition from blended to 100% renewable hydrogen over the contract term. This ruling,

> proposes that to the extent the Commission ultimately orders procurement of resources fueled by natural gas, some percentage of the facilities be required to use a blend of renewable hydrogen at the beginning of the contract term, increasing the blend to 100 percent by the end of the contract period, or sooner. The objective would be to help support a transition toward greater use of renewable hydrogen to replace natural gas.[50]

These actions signal an evolving policy interest in hydrogen as a clean firm resource, even as formal procurement pathways remain under development.

Furthermore, The Reliable and Clean Power Procurement Program ("RCPPP") is a proposed long-term procurement framework within the IRP that seeks to improve the process for load-serving entities to procure their share of the resources needed to meet electric system reliability and GHG reduction goals at least cost. RCPPP proposes allowing non-renewable clean energy technologies (i.e., zero-carbon or GHG-free resources) that can help meet California's reliability and decarbonization goals but may not qualify under the traditional RPS be eligible to meet SB 100 and SB 1020 compliance under their proposed "Clean Energy Standard," which introduces a new compliance instrument called Zero Emission Credits ("ZECs").[51] As SDG&E noted in its Opening Comments to the RCPPP Staff Proposal, "facilities that employ hydrogen, and any new clean technologies that may be designed in the future should be eligible. In addition to being technology-neutral, eligibility criteria should be designed to encourage development of

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[50] R.20-05-003, Administrative Law Judge's Ruling Seeking Comments on Proposed Preferred System Plan (August 17, 2021) at 41, available at https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan-irp-ltpp/2019-2020-irp-events-and-materials/ruling_proposed-psp.pdf.

[51] CPUC, Reliable and Clean Power Procurement Program (August 22, 2025), available at https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-power-procurement/long-term-procurement-planning/the-reliable-and-clean-power-procurement-program.

new resources by all capable market participants, including the IOUs."[52] Hydrogen resources that meet the federal definition of "clean" are technology and feedstock neutral, support affordability, and should be ZEC-eligible.

### C. Long-Term Gas Planning Rulemaking

The October 4, 2024 Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and Long-Term Gas System Planning by the Commission stated that, "the primary purpose of gas transition planning is to facilitate decarbonization."[53] As three State agencies—the Commission, CEC, and CARB, acknowledged in the 2024 Joint Agency Staff Paper: Progress Toward a Gas Transition, "Today, fossil gas is a key pillar of the State's energy system. In fact, the State consumes about 2,131 trillion British thermal units ("BTU") of fossil gas per year, more than twice the 904 trillion BTU it consumes in electricity."[54] The 2024 Joint Agency Staff Paper: Progress Towards a Gas Transition, recognizes that low Application -carbon fuels [such as hydrogen] "can be a complementary pathway to electrification and may be particularly useful for electric generation."[55]

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[52] R.20-05-003, Opening Comments of SDG&E on Administrative Law Judge Ruling Seeking Comments on Reliable and Clean Power Procurement Program Staff Proposal (July 15, 2025) at 53, available at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M573/K513/573513387.PDF.

[53] R.24-09-012, Order Instituting Rulemaking to Establish Policies, Processes, and Rules to Ensure Safe and Reliable Gas Systems in California and Long-Term Gas System Planning (October 4, 2024) at 2, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M542/K029/542029029.PDF.

[54] *Id.,* Attachment A, Joint Agency Staff Gas Transition White Paper (February 22, 2024) at 7 (citation omitted), available at https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M525/K660/525660391.PDF.

[55] *Id.* at 14.

### D. Policy Support for Hydrogen

In the 2024 GRC, SDG&E requested funding for three light duty and three medium duty hydrogen fuel cell electric vehicles ("HFCEVs") for its fleet. SDG&E argued, "Hydrogen transportation requires hydrogen fueling stations. It is still early days for the adoption of medium and heavy-duty FCEVs adoption, especially in San Diego County. To support the procurement of zero-emission hydrogen FCEVs (Fuel Cell Electric Vehicle), we will also need reliable fueling dedicated to our fleet in a location that meets our operational requirements."[56]

In the 2024 GRC Decision, the Commission approved SDG&E's HFCEV request to acquire HFCEVs, stating, "we are supportive of this limited request since SDG&E is leaning towards medium- and heavy-duty hydrogen vehicles, where interest in market growth is more likely to be achieved over the upcoming years. Granting $0.026 million in O&M costs for these pilot vehicles is reasonable."[57] SDG&E has not yet purchased the medium-duty HFCEVs because they are not yet widely available on the market. However, once they are purchased, SDG&E expects to be able to fuel them using hydrogen produced by the Project.

In May 2022, when the 2024 GRC Application request was filed, San Diego County had only one operational public hydrogen station for light-duty vehicles, located in Del Mar. Subsequently, the Del Mar station closed, and another one opened. Today, there is still just one public-facing hydrogen fueling station, now located at 5494 Mission Center Drive, San Diego,

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[56] A.22-05-016, Ex. SDG&E-23, Prepared Direct Testimony of Dale Tattersall (May 2022) at 41, available at https://www.sdge.com/sites/default/files/regulatory/SDGE-23_Direct_Testimony_Tattersall_SDGE_Real_Estate_Facility_Operations.pdf.

[57] D.24-12-074 at 591, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M550/K485/550485071.pdf.

CA.[58] There are challenges to relying on this station, namely that public stations have been plagued by unpredictable downtimes and availability constraints, and the fact that it is nearly 30 miles away from PEC. These limitations compromise fleet readiness and emergency response capabilities. Unfortunately, the public fueling infrastructure in our region remains insufficient to meet SDG&E's operational needs; SDG&E's dedicated hydrogen fueling station at PEC is necessary to ensure operational reliability of its authorized hydrogen fuel cell fleet vehicles.

The Commission has also supported RD&D initiatives for hydrogen related to both gas and electric infrastructure. On the electric side, EPIC is the commission's primary RD&D program that drives investment in new and emerging energy technologies and solutions that provide benefits to Californians. Recently, the Commission adopted "Achieving 100 Percent Net-Zero Carbon Emissions and the Coordinated Role of Gas" as one of the strategic goals of its EPIC program.[59] While not prescribed for EPIC-5, the CEC and the Commission's own Staff Proposal both recommended research to address gaps related to clean renewable hydrogen, including costs.[60,61]

On the gas side, in 2022, the Commission directed SDG&E, SoCalGas, PG&E, and Southwest Gas Corporation to propose pilot programs to test hydrogen blending in natural gas;

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[58] California Energy Commission, Joint Agency Staff Report on Assembly Bill 126: 2024 Annual Assessment of the Hydrogen Refueling Network in California (Updated, June 30, 2025) at 22, available at https://www.energy.ca.gov/publications/2025/joint-agency-staff-report-assembly-bill-126-2024-annual-assessment-hydrogen.

[59] D.24-03-007 at 2, available at https://www.sdge.com/sites/default/files/2024-03-007%20EPIC%205%20Stragetic%20Goals.pdf.

[60] *Id.* at 20 and 22.

[61] R.19-10-005, Administrative Law Judge's Ruling Requesting Comments on Staff Proposal (November 20, 2023), Attachment B, Staff Proposal and Request for Input on Strategic Goals for Electric Program Investment Charge (EPIC) Program, available at: https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M520/K913/520913382.PDF.

that proceeding is still underway.[62] In 2023, Resolution G-3601 authorized SoCalGas to include hydrogen-related projects in its RD&D program, as long as the hydrogen used complies with the definition of "clean renewable hydrogen" adopted in D.22-12-057.[63] The resolution further directed SoCalGas to demonstrate that any system inspection or monitoring projects funded related to hydrogen blending are complementary to, and not duplicative of, the hydrogen pilots ordered in D.22-12-057.[64]

This demonstration Project is a valuable addition to the body of knowledge that can help inform the state's decarbonization strategy, and it can play an important role to support other state-funded clean energy RD&D projects by providing a source of local, renewable hydrogen. Since the Commission has expressed a preference for RD&D projects to use "clean renewable hydrogen" which is difficult to source in the San Diego region, SDG&E believes this Project is well positioned to support other local projects by supplying them with eligible hydrogen. In May 2025, SDG&E submitted revised testimony that proposes using the hydrogen generated at PEC to support its hydrogen blending pilot project.[65] Additionally, SDG&E sees potential to use this Project to support other initiatives, such as CEC EPIC programs and hydrogen fuel projects with public transit agencies in our region.

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62 D.22-12-057, Ordering Paragraph 7 at 68-70.

63 Resolution G-3601 (December 4, 2023) at 23, available at https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M521/K196/521196139.PDF.

64 *Id.* at 25.

65 Refer to Workpaper (WP)-1 - Direct Capital Cost Details, filed concurrently with Prepared Direct Testimony of Pooyan Kabir and Kevin Counts (Chapter 2). *See also* A.22-09-004, Ex. SDG&E-3R Revised Prepared Direct Testimony of Pooyan Kabir (May 28, 2025) at 3, available at https://www.sdge.com/sites/default/files/regulatory/FINAL%20A22-09-006%20SDGE%20Ch3R_Revised%20Testimony%20TechnicalPresentation_DemonstractionProject.pdf.

## VII. AFFORDABILITY CONSIDERATIONS

As stated in the 2024 GRC Decision, "[S]tate policy to combat climate is more complex… there are other competing considerations, such as cost-effectiveness and affordability."[66] The 2024 GRC Decision also noted, "We are currently facing a unique situation where we must balance affordability in rates, achieve our decarbonization goals, and test technological advancements for regulated monopolies. To navigate this complex situation, we need to come up with creative solutions, such as leveraging public-private investments or federal funding."[67]

SDG&E appreciates this direction from the Commission and has made significant efforts to enhance the affordability of the project. First, SDG&E developed and sized the Project to maximize learnings and decarbonization by supporting four unique end uses of renewable hydrogen. Second, from a cost perspective, SDG&E carried out the project prudently. Despite headwinds of inflation and supply chain issues, SDG&E was able to build the Project on budget of the original GRC cost forecast with less than one percent deviation overall. See WP-1 for details.[68] Third, SDG&E has secured and continues to find additional public funding sources to reduce costs to customers that were not included in the 2024 GRC Application due to timing issues.

SDG&E's cost reduction efforts include: (1) leveraging three different federal income tax credits to recover $3.9 MM for ratepayers; (2) leveraging EPIC funding for an improvement that enabled SDG&E to add a fourth use case to the demonstration; (3) reducing the cost request of

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66 D.24-12-074 at 203.

67 *Id.* at 406.

68 Refer to WP-1 - Direct Capital Cost Details, filed concurrently with Prepared Direct Testimony of Pooyan Kabir and Kevin Counts (Chapter 2).

SDG&E's proposed blending pilot in A.22-09-006 by using hydrogen produced at PEC in lieu of an additional, dedicated electrolyzer for that RD&D pilot; (4) positioning the project to potentially generate revenue by enrolling the fueling station into the CARB LCFS HRI program; and (5) offsetting costs and potentially generating revenue through the generation, retirement, and/or sale of RECs created by the PV system. Because the project has the potential to be revenue-generating, SDG&E requests a two-way balancing account. See Chapter 4, Direct Testimony of Eric Dalton, for details.

### A. Cost Savings Achieved via Federal Tax Credits

SDG&E secured three federal investment tax credits ("ITCs") for the Project for the 2023 tax year. This included a solar tax credit in the amount of $0.5 MM, an energy storage tax credit in the amount of $1.2 MM, and a hydrogen tax credit in the amount of $2.1 MM.[69] Combined, these credits represent a total of $3.9 MM in tax credits that will be returned to SDG&E ratepayers, representing a ~22% reduction of direct cost for the project.

The federal Clean Hydrogen Production Tax Credit ("45V") is relatively new, complex, and merits a discussion.[70] Section 45V of the Inflation Reduction Act established the first federal tax credit for the production of clean hydrogen, aiming to accelerate deployment of low-carbon hydrogen production technologies. To qualify, produced hydrogen must have an CI score of no more than 4 kg $CO_2e$ per kg of hydrogen. The credit ranges from $0.60 to $3.00 per kilogram, depending on the CI and whether the project meets prevailing wage and apprenticeship requirements, among other factors. This tiered structure incentivizes the cleanest production methods, with the highest credit available ($3/kg) for projects with a CI score of zero (0). The

[69] Please see discussion of the 2023 tax return, Direct Testimony of Lauren Saket (SDGE-05).

[70] Internal Revenue Code (IRC) Section 45V.

production tax credit ("PTC") lasts for ten years,[71] meaning if a project was placed into service in 2023, generated 1,000 kg of hydrogen annually, and met the full requirements, the project would be eligible to receive $3,000 in tax credits each year for ten years, or a total of $30,000 between 2023 and 2033.

45V also allows producers to take an ITC on the project in lieu of the PTC.[72] The maximum allowable value of the ITC for this project was 30% of eligible project costs including equipment and labor, as well as the other requirements needed for 45V already discussed. SDG&E's Project met the requirements to get the full credit amount for both the PTC and the ITC. SDG&E performed an analysis to determine whether the ITC or the PTC would generate more value for ratepayers. SDG&E's analysis considered the expected volume of hydrogen to be generated annually, the cost of the hydrogen production portion of the Project, the annual cost of third party verification, and other factors. Based on the analysis, SDG&E found that the ITC generated more value for ratepayers over the lifetime of the project than the PTC, and therefore pursued the ITC option. Changes to federal clean energy tax credits in the One Big Beautiful Bill Act ("OBBBA") passed in July 2025 do not impact the credits related to the Project, as they were taken on Sempra's 2023 tax return and the OBBBA changes are prospective.[73]

SDG&E underwent significant accounting, legal, and verification efforts to achieve the hydrogen ITC. Normally, an energy project would be designed from the beginning to meet the

[71] IRC Section 45V(a)(1).

[72] IRC Section 48(a)(15).

[73] The One, Big, Beautiful Bill Act of 2025 has a significant effect on federal taxes, credits and deductions. It was signed into law on July 4, 2025.

tax credit rules. In the case of this Project, the 45V final guidance was published one month *after* the project went into service.[74]

A complete discussion of the ratepayer savings achieved via tax credits and tax credit treatment can be found in Chapter 5, Direct Testimony of Lauren Saket.

**B. Cost Savings Achieved by Enrolling Solar in WREGIS**

To achieve 45V eligibility for a grid-connected electrolyzer, a hydrogen producer must demonstrate the use of clean energy and "incremental" clean energy with RECs. SDG&E registered the dedicated PV system it installed as part of this project as a generating unit within the Western Renewable Energy Generation Information System ("WREGIS"), an independent REC tracking system for the Western Interconnection territory. Enrolling the PV in WREGIS allows SDG&E to retire its own RECs instead of purchasing them from the marketplace.

SDG&E generates RECs for every MWh of solar it produces at PEC. On an annual basis, SDG&E evaluates how much total electricity the electrolyzer has used, and retires an equivalent amount of the RECs it produced. Should SDG&E generate more RECs than was required to offset the electrolyzer for a given year, SDG&E can either use those RECs in future years toward its overall RPS obligations, or sell them on the market to generate revenues. SDG&E cannot bank leftover RECs to offset future use of the electrolyzer as the IRS has an annual matching requirement.

Had SDG&E not registered the PV into WREGIS, SDG&E would have had to buy 45V eligible RECs on the market, despite having installed the custom solar. The market price

[74] Pilot was placed into service in November 2023. The US Treasury Department and Internal Revenue Service published Guidance on the Hydrogen PTC on December 22, 2023. Available at https://www.irs.gov/newsroom/treasury-irs-issue-guidance-on-the-tax-credit-for-the-production-of-clean-hydrogen.

benchmark to purchase RPS eligible RECS for 2025 are forecast at $71.24.[75] Therefore, registering the solar as a generating unit and retiring its own RECs enables SDG&E to save nearly $24,000 annually in operating costs should the electrolyzer use equal solar production.[76] This potential revenue is not included in the revenue requirement presented in Chapter 3, Direct Testimony of Michael R. Woodruff ("Chapter 3").

### C. Cost Savings Achieved by Leveraging EPIC Funding

The Project was originally designed and constructed only to release hydrogen externally via the fueling dispenser to HFCEV; the dispenser is not compatible with fueling conventional gaseous hydrogen storage tanks. See Chapter 2 Sec II(7) and (8) for details.

In 2025, SDG&E identified a need for hydrogen in conventional tanks to support long duration deployment testing of the Nanogrid under EPIC-4.[77] Today, small scale deliveries of renewable hydrogen in the San Diego area are challenging to source, creating significant logistical hurdles for the Nanogrid project. SDG&E leveraged its EPIC budget to add a hydrogen export panel to the Project, enabling the Nanogrid to have a reliable, local source of renewable hydrogen for all of its testing needs. Now that the Project can export hydrogen to tanks, it opens up opportunities for regional RD&D efforts to benefit by sourcing local, renewable hydrogen from PEC.

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[75] CPUC, Market Price Benchmark 2024 Errata, available at https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/community-choice-aggregation-and-direct-access/2024-market-price-benchmarks--errata-20241005.pd.

[76] Calculation: Assume 335 MWh solar/year*$71.24=$23,869.

[77] CA.Gov, EPIC Database, SDG&E EPIC-4 Project 5 - Renewable Mobile Nanogrid for Climate Resiliency (October 21, 2025), available at https://database.epicpartnership.org/project/135075.

### D. Cost Savings for SDG&E's Proposed Hydrogen Blending Application Project

On May 28, 2025, SDG&E submitted revised testimony in A.22-09-006 to relocate its proposed Hydrogen Blending project from a local university campus onto SDG&E's own property. As part of the relocation, SDG&E removed the electrolyzer from that project. Instead, SDG&E proposed sourcing hydrogen from the Palomar Decarbonization Demonstration Project, since SDG&E's existing electrolyzer at PEC has sufficient capacity to support the Blending project. SDG&E estimates saving $2.3 million in cost for its proposed project in A.22-09-006 by exporting hydrogen from PEC in lieu of deploying an additional, dedicated electrolyzer for the blending pilot.[78]

### E. Revenues May be Generated via CARB LCFS Program

SDG&E has applied to CARB to enroll the hydrogen fueling station at PEC into the LCFS Zero Emission Vehicle ("ZEV") Refueling Infrastructure program. SDG&E will work with CARB to evaluate whether the program can generate revenues for the Project that will exceed the ZEV refueling infrastructure program participation costs. If SDG&E determines the revenues will reasonably exceed the costs of an application and verification, then it will enroll the fueling station into the program. This potential revenue is not included in the revenue requirement presented in Chapter 3.

### F. The Cost of Inaction

Delaying decarbonization efforts today risks greater costs in the future, even if these costs are difficult to quantify. The energy transition must strike a balance between affordability and

[78] A.22-09-004, Ex. SDG&E-3R Revised Prepared Direct Testimony of Pooyan Kabir (May 28, 2025) at 3, available at https://www.sdge.com/sites/default/files/regulatory/FINAL%20A22-09-006%20SDGE%20Ch3R_Revised%20Testimony%20TechnicalPresentation_DemonstractionProject.pdf.

decarbonization. Costs can be mitigated by repurposing and reusing existing infrastructure as possible; however, demonstrations are necessary to determine what can be repurposed, and at what cost.

Maintaining and retrofitting current assets is crucial for maintaining affordability and preserving jobs in the energy sector. By learning now, at smaller scale using relatively small amounts of capital, SDG&E informs decarbonization, resiliency, and reliability efforts prudently, and proactively. Not conducting small-scale hydrogen demonstration projects risks missing SB 100's firm-capacity option, raising affordability pressures, and slowing CPUC standard-setting. Running our targeted Project now aligns with SB 100's timelines and AB 1020's ratepayer-benefit intent, and it preserves the lowest-cost retrofit path to decarbonize existing gas fleets. Demonstration project data on hydrogen blending will help elucidate operating limits, reliability, and emissions impacts for a pathway to prolong the lifetime of existing generation assets already paid for while meeting SB 100 goals. Demonstration projects allow SDG&E to collect the very data the Commission asked for and will enable and inform standards, permitting, and possible pathways to scale-up at power plants.

SDG&E cannot sit on the sidelines for the next ten to twenty plus years and then suddenly expect our employees, vendors, contractors, supply chains, and assets to be experienced and ready to meet the 2035, 2040 and 2045 deadlines of SB 100 and SB 1020,[79] while also meeting our requirement to serve safe, reliable, affordable energy. Learning by doing today with this relatively smaller scale demonstration helps SDG&E de-risk future strategic decarbonization

[79] SB 100, Sections 1(b) & 5, codified at Cal. Pub. Util. Code Section 454.53(a), available at https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB100; SB 1020 (2022), Section 4, codified at Pub. Util. Code Section 454.53(a), available at https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=202120220SB1020.

investment decisions for its gas assets.

## VIII. CONCLUSION AND SUMMARY

The Palomar Decarbonization Demonstration Project is a prudent, forward-looking demonstration that delivers measurable benefits to SDG&E's customers today while preparing California's electric system for the decarbonization challenges of tomorrow. The Project is physically in service, fully operational, and already delivering value by supporting core power plant operations as well as by reducing greenhouse gas emissions, enhancing reliability, and generating critical learnings that will inform future planning and procurement decisions.

This Project demonstrates that renewable hydrogen can be safely and effectively integrated into existing power generation operations. It has enabled SDG&E to gain hands-on experience with hydrogen production, blending, and use—experience that is essential as California moves toward its 2045 clean energy goals. The data and learnings developed by this Project can be shared with the Commission and other parties to further the state's body of knowledge and understanding of the technology's performance and costs.

Importantly, SDG&E has acted on the Commission's concerns regarding Project affordability as stated in the 2024 GRC Decision. SDG&E reduced the Project's cost burden on ratepayers by securing nearly $4 million in federal tax credits, leveraging EPIC funding, and positioning the Project to potentially generate revenue through the LCFS Hydrogen Refueling Infrastructure program and REC sales. These efforts reflect SDG&E's commitment to affordability, innovation, and responsible stewardship of ratepayer funds.

The Commission has long recognized the importance of early investment in clean energy technologies. Just as it did with investments in solar, wind, and storage, the Commission now has

the opportunity to support a foundational hydrogen project that is aligned with state policy, technically sound, and financially responsible.

For these reasons, SDG&E respectfully requests that the Commission approve funding for the Palomar Decarbonization Demonstration Project. Doing so will not only support California's clean energy and reliability mandates, but also ensure that the state's utilities are prepared to lead the transition to a decarbonized electric grid.

This concludes my prepared direct testimony.

## IX. STATEMENT OF QUALIFICATIONS

My name is Ari Beer. My business address is 8306 Century Park Court, San Diego, CA, 92123. My title is Advanced Clean Technology Development Manager. I have served in this role since August 2022. Prior to this role, I have held numerous positions in SDG&E and other Sempra companies. I hold a Bachelor of Science degree in Applied Economics and Math from Cornell University and a Master of Business Administration from Quantic School of Business & Technology.

I have previously provided direct testimony as SDG&E's risk witness in the 2022 and 2023 Cost of Capital Proceedings.