

Docket No.: A.25-12-009

Exhibit No.: UCAN-02

Date: September 28, 2026

Witness: Tyson Siegele

**PREPARED REBUTTAL TESTIMONY OF TYSON SIEGELE
ON BEHALF OF THE UTILITY CONSUMERS' ACTION NETWORK
ON THE APPLICATION OF SAN DIEGO GAS & ELECTRIC COMPANY FOR
APPROVAL OF PALOMAR DECARBONIZATION DEMONSTRATION PROJECT**

Table of Contents

1. INTRODUCTION	1
2. ISSUE 1 – THE PROJECT PRODUCES NO INFORMATION THAT IS UNIQUE OR NEEDED	2
2.1. The Project is not unique.	2
2.2. Project increases emissions, making the Project harmful rather than beneficial.	2
2.3. The Project was not needed to determine the harms of hydrogen blending.	3
3. ISSUE 2 – PROJECT COSTS AND REVENUE REQUIREMENT	5
3.1. SDG&E has not provided costs by Project component.	5
3.2. Utility-scale solar pricing is the appropriate point of comparison for evaluating the Project’s solar array price.	6
3.3. The Project fails the pillar of hourly matching.	7
3.4. Issue 2(a) – Allocation between bundled and unbundled customers	7
3.5. Issue 2(c) – Leveraging public funding sources	8
4. ISSUE 3 – THERE ARE NO ENVIRONMENTAL BENEFITS FROM BLENDING HYDROGEN AT PALOMAR ENERGY CENTER.	10
5. ISSUE 4 – NO GREENHOUSE GAS EMISSIONS ARE AVOIDED	11
6. ISSUE 5 – THE COST OF THE PROJECT RELATIVE TO ITS VALUE IS NOT JUST AND REASONABLE	13
6.1. The scalability shortfall is a function of the site.	13
6.2. The cost of the hydrogen this Project produces is far outside any published benchmark.	15
7. ISSUE 6 – A TWO-WAY BALANCING ACCOUNT IS NOT THE APPROPRIATE MECHANISM	15
7.1. Issue 6(a) – Distribution versus generation rates	15
7.2. Issue 6(b) – Vintaging	17
8. ISSUE 7 – ENVIRONMENTAL AND SOCIAL JUSTICE	17
9. CONCLUSION	21

1 **1. INTRODUCTION**

2 My name is Tyson Siegle. I am the founder and principal consultant of Clean Energy
3 Strategies LLC, and I submitted prepared direct testimony in this proceeding on behalf of the
4 Utility Consumers’ Action Network on August 21, 2026. My qualifications are set out in that
5 testimony and are not repeated here.¹

6 This rebuttal testimony responds to the prepared direct testimony served on August 21,
7 2026 by the California Environmental Justice Alliance (“CEJA”), the Public Advocates Office
8 (“Cal Advocates”), The Utility Reform Network (“TURN”), and San Diego Community Power
9 and Clean Energy Alliance (“SD CCAs”). It does not respond to San Diego Gas & Electric
10 Company’s (“SDG&E”) prepared direct testimony of December 16, 2025, which I addressed in
11 my opening testimony.

12 I organize this testimony by the scoping issues - in the order the Scoping Memo states
13 them. On most issues the other parties and I agree. I depart from other parties in three places.
14 First, the SD CCAs’ witness inaccurately accepts that the Project produces “clean hydrogen” and
15 delivers greenhouse gas reductions;² moreover, the Commission has already stated that SDG&E
16 may not make that claim.³ Second, the SD CCAs’ witness asks the Commission to assign these
17 costs to the 2027 vintage.⁴ However, no vintage needs to be established, because no costs should
18 be recovered.⁵ Third, I disagree with the suggestion that the limited size of the on-site solar array
19 is the Project’s binding constraint. The binding constraint is unavailable storage.⁶

¹ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 12.

² A.25-12-009, Prepared Direct Testimony of Anthony M. Georgis on Behalf of San Diego Community Power and Clean Energy Alliance (August 21, 2026), p. 3, (“By applying the renewable energy credits (“REC”) generated by the PV system to the electricity used for hydrogen production, SDG&E can produce clean hydrogen.”).

³ D.24-12-074, Decision Authorizing San Diego Gas & Electric Company’s and Southern California Gas Company’s Test Year 2024 General Rate Case Revenue Requirements (December 19, 2024), p. 406.

⁴ A.25-12-009, Prepared Direct Testimony of Anthony M. Georgis on Behalf of San Diego Community Power and Clean Energy Alliance (August 21, 2026), p. 13.

⁵ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 9.6.

⁶ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 3.4.

1 **2. ISSUE 1 – THE PROJECT PRODUCES NO INFORMATION THAT IS UNIQUE OR**
2 **NEEDED**

3 *Scoping Issue 1: How does the Project serve the public interest? Is the*
4 *Project designed to produce operational, safety, emissions,*
5 *decarbonization, environmental, cost, and/or scalability information that is*
6 *(a) unique from other research and pilots on this topic and (b) needed to*
7 *evaluate whether renewable hydrogen can contribute to California’s clean*
8 *energy resource strategy?*

9 **2.1. The Project is not unique.**

10 Cal Advocates concludes that eight of the twelve categories of “learning” SDG&E claims
11 – engineering, codes and standards, valves, piping, venting, safety requirements, material
12 specifications, and metering – are general fields that are not novel to entities already working
13 with hydrogen, and that the third-party engineers and vendors SDG&E retained already
14 possessed that knowledge.⁷ I agree.

15 Ten months before it filed this Application, SDG&E co-filed a Commission-ordered
16 report stating that power plants “can operate on up to 5% hydrogen blends in their existing
17 configuration.”⁸ And General Electric, the manufacturer of the Palomar turbines, published in
18 2019 that hydrogen was blended at five percent by volume into four GE 7FA gas turbines at the
19 Dow Plaquemine plant beginning in 2010.⁹ SDG&E has had that paper since January 2020.
20 Palomar blends two percent. The information SDG&E says can only be obtained by doing had
21 been obtained, published, and filed with this Commission before the Application was filed.¹⁰

22 **2.2. Project increases emissions, making the Project harmful rather than beneficial.**

23 CEJA’s witness concludes that reducing carbon dioxide emissions from one turbine by
24 0.617 percent is not a viable approach to decarbonization. I agree with that conclusion, and I

⁷ A.25-12-009, Prepared Testimony of the Public Advocates Office (August 21, 2026), pp. 5-7.

⁸ R.13-02-008, Notice of Filing of Joint Utilities’ Hydrogen Blending Compendium Report (February 14, 2025), Attachment 3, Literature Review Chapter Summaries – Prepared by the Joint Utilities, p. 14.

⁹ Exh. UCAN-05-H: General Electric, Power to Gas: Hydrogen for Power Generation (February 2019), GEA33861, p. 13, produced in A.25-12-009, SDG&E Sixth Supplemental Response to UCAN Data Request 01, Question 33 (August 13, 2026).

¹⁰ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Sections 4.1.1 and 4.1.3.

1 reached the same 0.617 percent figure in my opening testimony.¹¹ However, that reduction is
2 *only at the point of combustion.*

3 The disagreement between the parties and SDG&E is not, however, about whether the
4 reduction is small. It is about whether there is a reduction. The hydrogen at Palomar is made
5 from electricity. According to SDG&E, routing electricity through hydrogen and back into a
6 turbine returns approximately one-third of what went in. The electricity consumed to make the
7 hydrogen would have displaced more emissions had it been delivered to the grid. The Project
8 therefore increases greenhouse gas emissions relative to the alternative of doing nothing or the
9 alternative of storing renewable electricity in batteries.¹²

10 Customers should not pay for a carbon emissions increase.

11 **2.3. The Project was not needed to determine the harms of hydrogen blending.**

12 SDG&E asks the Commission to treat this Project as the source of learnings “that can
13 only be obtained by doing.” That framing fails on its own terms because the central findings in
14 this proceeding are the product of arithmetic performed on publicly available data. Calculation,
15 not construction, produces each of the following:

- 16 • Carbon emissions increase with hydrogen blending, because the alternative use of the
17 renewable electricity is to supply it to the grid.¹³
- 18 • Carbon emissions increase because approximately two-thirds of the electricity is
19 destroyed in the round-trip power-to-hydrogen-to-power conversion.¹⁴
- 20 • Carbon emissions increase further when the electrolyzer is not configured for hourly
21 matching to renewable generation.¹⁵

¹¹ A.25-12-009, Prepared Testimony of Sara Gersen on Behalf of the California Environmental Justice Alliance (August 21, 2026), Section II; A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Sections 3.2 and 6.1.

¹² A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Sections 3.3, 7.1 and 7.4.

¹³ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 7.4.

¹⁴ Exh. UCAN-03: A.25-12-009, SDG&E Response to UCAN Data Request 01, Question 32 (June 19, 2026).

¹⁵ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Sections 5.2.2 and 7.3.

- 1 • Hydrogen combusted for electricity is a storage option, not a clean energy option, and the
2 Project site can store only approximately 27 seconds of the Palomar Energy Center’s 588
3 megawatt output.¹⁶
- 4 • SDG&E states that the site cannot accommodate additional storage,¹⁷ which establishes
5 that 27 seconds of storage is the upper bound of the storage available at this site.
- 6 • SDG&E admits that it has no viable path to a plant-scale hydrogen supply at this site.¹⁸
- 7 • There is no viable hydrogen storage option in California; the nearest suitable geology is
8 approximately 700 miles away in Delta, Utah.¹⁹
- 9 • There is no viable option for cost-effective hydrogen supply to this site, even before
10 accounting for the cost of out-of-state storage and the pipeline that would be required to
11 deliver from it.²⁰
- 12 • The large-scale production of green hydrogen costs approximately twelve times the five-
13 year average price of natural gas.²¹
- 14 • Hydrogen is not needed to decarbonize the electric system. A California load serving
15 entity (“LSE”) reached 100 percent carbon-neutral electricity in 2021 without it, and
16 modeling by the Commission’s Integrated Resource Planning (“IRP”) consultant
17 demonstrates cost-effective decarbonization without hydrogen-fired turbines.²²

18 Through desktop research, every one of those findings was available to SDG&E before it
19 broke ground. None of them required a demonstration project, and none of them required
20 ratepayers to spend \$31.1 million.

¹⁶ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 3.3.1.

¹⁷ Exh. UCAN-06: A.25-12-009, SDG&E Response to UCAN Data Request 01, Question 47, Supplemental Response (June 29, 2026), Palomar Energy Center Tour Guide, Frequently Asked Questions, (“Electrolyzer can produce 500kg, why not store more? Space and budget constraints.”); see also A.25-12-009, Prepared Direct Testimony of Pooyan Kabir and Kevin Counts (December 16, 2025), p. PK_KC-5.

¹⁸ A.25-12-009, Prepared Direct Testimony of Ari Beer (December 16, 2025), p. AB-6 and n.7, (operating the Palomar Energy Center at full capacity on 100% hydrogen would require “over 180 truckfuls per day, which would not be feasible nor cost effective”).

¹⁹ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 3.4.

²⁰ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 3.5.1.

²¹ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 3.5.4.

²² A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Sections 4.2.4 and 4.2.5.

3. ISSUE 2 – PROJECT COSTS AND REVENUE REQUIREMENT

Scoping Issue 2: What are the Project costs and the associated revenue requirement? (a) How will ratepayer costs be allocated between bundled and unbundled customers? (b) How and where are the federal Investment Tax Credits accounted for in the revenue requirement estimates? (c) Does the Project sufficiently leverage public funding sources?

3.1. SDG&E has not provided costs by Project component.

Cal Advocates concludes that SDG&E provides only aggregate capital and operations and maintenance costs, that it does not identify the costs associated with individual Project components, and that the Commission therefore cannot weigh the benefits of any component against its costs.²³ TURN’s witness reproduces SDG&E workpaper Table WP1-C, which assigns costs to categories.²⁴ However, that table also does not separate out the Project’s fueling station costs from other costs. Cal Advocates’ analysis is accurate.²⁵

Table WP1-C places the electrolyzer, the hydrogen storage, the fueling station and the compressor together in a single “H2 Vendor Package” line of \$6.14 million. It does not separate them. Beyond that line, every other item in every other category of the table – government payments and permits, service vehicle and equipment rental, engineering services, construction services, contractor services, consultant services, other services, and materials – could contain costs attributable to the vehicle fueling portion of the Project. The only line items that may not contain vehicle fueling costs are the blending skid and analyzer, and the switchgear.

Cal Advocates’ analysis is corroborated by SDG&E’s own admission in discovery to CEJA, which I quoted in my opening testimony: the “project was built as a system, and services are all performed for the project as a whole and cannot separate them according to sub-systems.”²⁶ My analysis aligns with Cal Advocates’ analysis. Intervenors and SDG&E agree that

²³ A.25-12-009, Prepared Testimony of the Public Advocates Office (August 21, 2026), p. 3.

²⁴ A.25-12-009, Prepared Testimony of William A. Monsen on Behalf of The Utility Reform Network, Exh. TURN-1 (August 21, 2026, errata September 23, 2026), Figure 3, reproducing SDG&E Table WP1-C, Capital Cost Details (Unloaded).

²⁵ Ibid., (the “H2 Vendor Package: Electrolyzer, Storage, Fueling Station, and Compressor” appears as a single \$6.14 million line item).

²⁶ A.25-12-009, SDG&E Response to CEJA Data Request 03, Question 7(c)-(f) (August 14, 2026), (“Project was built as a system, and services are all performed for the project as a whole and cannot separate them according to sub-systems.”); A.25-12-009, Prepared Direct Testimony of Tyson Siegele on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 2.4.

1 vehicle fueling costs cannot be disaggregated. For that reason, the Commission cannot approve
2 any part of this Application without also approving recovery of the hydrogen fueling station
3 costs that it has already disallowed.²⁷

4 **3.2. Utility-scale solar pricing is the appropriate point of comparison for evaluating**
5 **the Project's solar array price.**

6 TURN's witness finds the installed cost of the solar element to be \$6.40 per watt and
7 concludes that it is far more expensive than any of his comparison points. In my opening
8 testimony I also found that the Project's solar array is unjustifiably expensive. On any
9 benchmark provided by me or by TURN's witness, including the most generous ones (i.e.,
10 residential solar prices), the Project's array costs far above market prices.^{28, 29} However, I
11 disagree that residential or commercial solar prices are reasonable points of comparison. The
12 array should be measured against the most cost-effective means of obtaining the same kilowatt-
13 hours for the same purpose, which is single-axis tracking, utility scale solar array. SDG&E was
14 not confined to an on-site 274 kW array.

15 SDG&E could have built, or contracted for, a utility-scale solar facility and assigned a
16 portion of its output – or all of the output – to offset the electricity the Project consumes. So long
17 as that facility was in the same region as the Project, was newly built, and was matched hourly to
18 electrolyzer operation, it would satisfy the three pillars of clean hydrogen production:
19 regionality, additionality and temporality.

20 The on-site array does not satisfy the three pillars of clean hydrogen, because it is not
21 matched hourly. SDG&E therefore paid approximately \$6 per watt for an array that fails the test
22 against which the hydrogen production tax credit will be measured, when a utility-scale
23 alternative costing a fraction as much would still have satisfied the regionality component. The
24 decision to co-locate the array did not provide value or meet compliance requirements.

²⁷ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 2.4.

²⁸ A.25-12-009, Prepared Testimony of William A. Monsen on Behalf of The Utility Reform Network, Exh. TURN-1 (August 21, 2026, errata September 23, 2026), Section IV.C.1, p. 38.

²⁹ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 5.1.

1 **3.3. The Project fails the pillar of hourly matching.**

2 TURN's witness came to the same conclusion I did, that generation from the solar
3 element has not been coincident with hydrogen production on an hourly basis, or even on a
4 monthly basis. In addition, TURN noted that beginning in 2030 approximately \$2.1 million of
5 the hydrogen investment tax credit becomes subject to hourly temporal matching requirements
6 evidenced through Energy Attribute Certificates, for which SDG&E has budgeted nothing.³⁰ In
7 my opening testimony I found that there was not a single hour in which the Project's solar output
8 reached the electrolyzer's rated draw.³¹ My testimony and TURN's testimony show that
9 SDG&E's hourly matching fails in multiple ways.

10 The hourly matching failure is perhaps why SDG&E refused to produce hourly data
11 when UCAN requested it. When UCAN asked SDG&E to produce hourly electrolyzer and solar
12 data, SDG&E responded twice without supplying it.³² Regardless of SDG&E's data response
13 shortfall, SDG&E cannot demonstrate the hourly coincidence its tax credit will require because
14 there were several months in which SDG&E's solar failed to match electrolyzer use. That on its
15 own demonstrates failure.

16 **3.4. Issue 2(a) – Allocation between bundled and unbundled customers**

17 SDG&E's vintaging methodology would assign this Project to the vintage of the Palomar
18 Energy Center, which is 2004, and recover its costs from every customer who has departed
19 bundled service since that date.³³ SDG&E did not conceive of this Project until approximately
20 2021 and did not complete it until 2023. Moreover, the Commission denied the project in a 2024
21 decision. In this proceeding SDG&E failed to meet the Commission's requirements for
22 submitting a revised application. Unless the Commission approves some portion of costs, there is

³⁰ A.25-12-009, Prepared Testimony of William A. Monsen on Behalf of The Utility Reform Network, Exh. TURN-1 (August 21, 2026, errata September 23, 2026), Section IV.D.

³¹ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 5.2.2.

³² Exh. UCAN-03: A.25-12-009, SDG&E Response to UCAN Data Request 01, Question 6, which requested the Project's solar array energy production and the Project's electrolyzer electricity use on an hourly basis. SDG&E's original response stated that it would address the question in a supplemental response. Its June 29, 2026 supplemental response produced a spreadsheet described as containing "the requested data" that reports daily rather than hourly values, and for 2025 only. SDG&E produced hourly values in response to Question 4, which sought hourly solar production alone.

³³ A.25-12-009, Prepared Direct Testimony of Anthony M. Georgis on Behalf of San Diego Community Power and Clean Energy Alliance (August 21, 2026), p. 10, citing SDG&E responses to SD CCA Data Requests 1.03 and 1.04.

1 nothing to recover. If recovery is approved from bundled customers, that recovery should start no
2 sooner than the date of approval. Moreover, SDG&E customers who left SDG&E generation
3 service prior to 2021 made no commitment to an experiment that had not been imagined. I agree
4 with SD CCAs that assigning a 2023 asset to a 2004 vintage would be unreasonable.³⁴

5 There is a prior problem, however, which the vintaging discussion obscures. The Project
6 increases the cost of electricity and it increases greenhouse gas emissions. Those are harms to
7 both bundled and unbundled customers. This is therefore not a question of allocating a benefit
8 among customer groups. It is a question of allocating a harm. Harming ratepayers is not just and
9 reasonable, and the costs of that harm should not be assigned to any ratepayer.

10 SDG&E also never obtained Commission authorization for this Project, much less any
11 consent from unbundled customers or the community choice aggregators that serve them. At a
12 minimum, SDG&E should be barred from charging unbundled customers for an unnecessary
13 experiment in which they had no voice.

14 My opening testimony addressed vintaging directly. I concluded that Project costs should
15 not be approved, and that for that reason the Commission does not need to establish a vintage,
16 which would apply only to approved costs recovered through generation rates. After reviewing
17 the SD CCA testimony, I still hold that position.³⁵ These costs should not be assigned to any
18 vintage because they should not be recovered. The funds were used to procure and operate
19 infrastructure that produces demonstrable harm to customers: emissions from burning hydrogen,
20 and the destruction of renewable energy. The outcome was a foregone conclusion that could
21 have been confirmed with calculations before the Project was built. A vintage assignment
22 presupposes that there are recoverable costs to assign. In this case, there are no recoverable costs.

23 **3.5. Issue 2(c) – Leveraging public funding sources**

24 CEJA’s witness argues that SDG&E’s inability to attract private funding is itself
25 evidence about the commercial prospects of the approach, reasoning from the California Energy

³⁴ A.25-12-009, Prepared Direct Testimony of Anthony M. Georgis on Behalf of San Diego Community Power and Clean Energy Alliance (August 21, 2026), pp. 9-10.

³⁵ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 9.6.

1 Commission’s use of match-funding requirements as a market signal. I agree, and financial
2 analyses below support that conclusion.³⁶

3 Michael Cembalest, Chairman of Market and Investment Strategy for J.P. Morgan Asset
4 & Wealth Management, published an assessment of the hydrogen market in March 2025.³⁷ He
5 reports that quarterly mentions of hydrogen project delays or cancellations in news reports and
6 company disclosures have increased every year since 2020, more than doubled between the
7 beginning of 2024 and the beginning of 2025, and writes that “many hydrogen projects are being
8 fried (terminated) since the energy math didn’t work.”³⁸

9 The offtake figures in that assessment are more telling than the cancellation counts. Of
10 green hydrogen projects scheduled for completion by 2030, only 12 percent have identified an
11 offtake agreement at all.³⁹ Of the volume covered by those agreements, only 11 percent is under
12 binding contract.⁴⁰ The result is that just one percent of all projected green hydrogen production
13 has a binding offtake agreement.⁴¹ The industry has failed to find customers.⁴²

14 Investors reached the same conclusion. Mr. Cembalest reports that investors in hydrogen
15 companies “have been completely fried as well,” and the three hydrogen indices he presents lost
16 approximately 20 to 90 percent of their value between 2021 and 2024, while a global equity
17 index grew by approximately 35 percent over the same period.⁴³

18 It is unlikely that SDG&E failed to find private partners because it failed to look. It is
19 more likely that partners were unavailable because multiple turbine-based hydrogen blending

³⁶ A.25-12-009, Prepared Testimony of Sara Gersen on Behalf of the California Environmental Justice Alliance (August 21, 2026), Section II.

³⁷ Michael Cembalest, J.P. Morgan Asset & Wealth Management, Eye on the Market Annual Energy Paper, “Heliocentrism – Objects may be further away than they appear” (March 2025), <https://assets.jpmprivatebank.com/content/dam/jpm-pb-aem/global/en/documents/eotm/heliocentrism.pdf>.

³⁸ Heliocentrism, p. 45.

³⁹ Heliocentrism, p. 46.

⁴⁰ Ibid.

⁴¹ Ibid.

⁴² Heliocentrism, p. 46.

⁴³ Heliocentrism, p. 48 and chart “Hydrogen indices total return.”

1 pilots of this kind were already underway,⁴⁴ hydrogen blending is a poor use of hydrogen,⁴⁵ and
2 because hydrogen is a more expensive and less efficient way to store renewable energy than
3 other storage methods.⁴⁶

4 **4. ISSUE 3 – THERE ARE NO ENVIRONMENTAL BENEFITS FROM BLENDING**
5 **HYDROGEN AT PALOMAR ENERGY CENTER.**

6 *Scoping Issue 3: What are the environmental benefits of blending hydrogen*
7 *with methane for this Project?*

8 The SD CCAs’ witness describes the output of the Project as “clean hydrogen” and
9 accepts that by applying the renewable energy credits generated by the photovoltaic system to
10 the electricity used for hydrogen production, SDG&E “can produce clean hydrogen.”⁴⁷ He
11 further states that the Project reduces greenhouse gas emissions at the Palomar Energy Center
12 and that those reductions benefit bundled customers.⁴⁸ As I detailed in my opening testimony and
13 discuss further below, SD CCA’s conclusions are inaccurate.

14 In denying this Project in SDG&E’s 2024 general rate case, the Commission stated that
15 generating hydrogen using solar energy and electricity from the grid “does not fully account for
16 the environmental impact of emissions when solar energy is unavailable,” and that under Public
17 Utilities Code Section 398.4(k)(3) SDG&E “may not make any clean energy or GHG claims for
18 the hydrogen produced at Palomar using grid or fossil energy that only becomes ‘green’ due to
19 the separate purchase of unbundled RECs.”⁴⁹ That is precisely the mechanism that SDG&E uses
20 in the Project application to claim its project provides carbon-free energy.⁵⁰

⁴⁴ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 4.1.2, Table 3.

⁴⁵ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 4.2.1.

⁴⁶ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Sections 3.3 and 4.2.5.

⁴⁷ A.25-12-009, Prepared Direct Testimony of Anthony M. Georgis on Behalf of San Diego Community Power and Clean Energy Alliance (August 21, 2026), p. 3.

⁴⁸ A.25-12-009, Prepared Direct Testimony of Anthony M. Georgis on Behalf of San Diego Community Power and Clean Energy Alliance (August 21, 2026), p. 5.

⁴⁹ D.24-12-074, Decision Authorizing San Diego Gas & Electric Company’s and Southern California Gas Company’s Test Year 2024 General Rate Case Revenue Requirements (December 19, 2024), p. 406.

⁵⁰ D.24-12-074, Decision Authorizing San Diego Gas & Electric Company’s and Southern California Gas Company’s Test Year 2024 General Rate Case Revenue Requirements (December 19, 2024), p. 406.

1 My opening testimony establishes that hydrogen combusted for electricity is a storage
2 medium rather than a source of energy,⁵¹ and that the way SDG&E stores electricity increases
3 rather than decreases emissions.⁵²

4 SDG&E calculates the round-trip efficiency of its own Project at 32%,⁵³ which means the
5 process destroys approximately two-thirds of the renewable energy that is delivered to the
6 Project. Lithium-ion battery storage returns approximately 90 percent, consuming only 10% in
7 its roundtrip through storage. Every kilowatt-hour of electricity that emerges from the hydrogen
8 pathway represents approximately three kilowatt-hours of clean electricity that customers could
9 have used had the electricity *not* been routed through hydrogen.⁵⁴

10 The Project produces no environmental benefit, and therefore no environmental benefit
11 that can justify assigning these costs to any customer.

12 **5. ISSUE 4 – NO GREENHOUSE GAS EMISSIONS ARE AVOIDED**

13 *Scoping Issue 4: How many greenhouse gas emissions are likely to be*
14 *avoided by this Project?*

15 The answer is none. No greenhouse gas emissions are avoided by this Project. The
16 Project increases emissions. My response to the SD CCAs' contrary characterization is set out
17 under Issue 3 and is not repeated here.

18 TURN's witness supplies corroboration of my opening testimony that the solar array does
19 not power the electrolyzer. He finds that beginning in 2030 approximately \$2.1 million of the
20 hydrogen investment tax credit becomes subject to the temporal matching requirements of the
21 three pillars through Energy Attribute Certificates on an hourly basis, and that generation from
22 the solar element has not been coincident with hydrogen production on an hourly basis or even
23 on a monthly basis.⁵⁵ SDG&E has included no cost for compliance or for certificate purchases in

⁵¹ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 3.3.

⁵² A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Sections 3.3 and 7.1.

⁵³ Exh. UCAN-03: A.25-12-009, SDG&E Response to UCAN Data Request 01, Question 32 (June 19, 2026).

⁵⁴ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 3.3.

⁵⁵ A.25-12-009, Prepared Testimony of William A. Monsen on Behalf of The Utility Reform Network, Exh. TURN-1 (August 21, 2026, errata September 23, 2026), Section IV.D.

1 its estimates. My opening testimony shows that not a single hour of output from the Project's
2 solar array has reached the electrolyzer's maximum electricity draw.⁵⁶

3 CEJA cites SDG&E's filing with the California Energy Commission estimating indirect
4 greenhouse gas emissions from electricity used to operate the electrolyzer at approximately
5 2,724 metric tons of carbon dioxide equivalent per year,⁵⁷ while SDG&E assumes a carbon
6 intensity of zero in this proceeding.⁵⁸ The 2,724 metric ton figure is larger than the net increase
7 of approximately 76 tonnes I calculated for 2025.⁵⁹ However, the difference is not a conflict.

8 In my opening testimony I calculated the emissions increase in the most conservative
9 way available, which produced a net emissions increase of at least 76 tonnes. That calculation
10 assumed 100 percent renewable energy use. If electrolyzer operation is not time-matched hourly
11 to renewable generation, emissions increase above that figure.⁶⁰ Emissions also increase with
12 every additional kilogram of hydrogen produced. Several assumptions are required to determine
13 emissions, and different assumptions produce different magnitudes. What my own calculation
14 establishes is the floor: even assuming optimal coordination and strict adherence to the three
15 pillars, hydrogen-fired generation at Palomar increases emissions compared with delivering the
16 same renewable energy directly to the grid or storing it in batteries.⁶¹ As my opening testimony
17 demonstrated, and other Parties' corroborate, there is no set of assumptions under which burning
18 hydrogen at the Palomar Energy Center reduces carbon emissions.⁶²

⁵⁶ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Sections 5.2.2 and 7.3.

⁵⁷ A.25-12-009, Prepared Testimony of Sara Gersen on Behalf of the California Environmental Justice Alliance (August 21, 2026), Section VI.

⁵⁸ A.25-12-009, SDG&E Response to CEJA Data Request 03, Questions 4, 5(b), 5(c) and 6 (August 14, 2026), ("SDG&E assumed the carbon intensity of zero for hydrogen"); A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 7.3.

⁵⁹ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 7.4.

⁶⁰ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 7.3.

⁶¹ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 7.4.

⁶² A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 7.4.

1 **6. ISSUE 5 – THE COST OF THE PROJECT RELATIVE TO ITS VALUE IS NOT**
2 **JUST AND REASONABLE**

3 *Scoping Issue 5: Is the cost of the Project to ratepayers relative to its value*
4 *just and reasonable?*

5 SDG&E has failed to demonstrate any value. I and the other witnesses in this proceeding
6 have calculated the harms the Project creates. There are no benefits to measure against the costs;
7 there are only harms. A utility may not recover from its customers the cost of harms visited upon
8 them.

9 **6.1. The scalability shortfall is a function of the site.**

10 CEJA's witness and I both establish that the site was too small to accommodate even the
11 full scale of the pilot SDG&E proposed.⁶³

12 I disagree, however, with some parties' suggestions that on-site solar production is the
13 constraint. Solar generation does not have to occur at the plant. It has only to be available within
14 the load pocket to satisfy the three pillars. The real constraint is storage. Even the least expensive
15 form of hydrogen storage is not cost-effective, and the nearest suitable geology is in Utah.⁶⁴

16 If hydrogen were an efficient storage medium rather than one that destroys two-thirds of
17 the renewable energy it receives, the hydrogen would need to be produced on site (to avoid
18 costly trucking operations) and stored on site (to ensure fuel for the turbines when called upon).
19 The storage capacity of this site-constrained pilot holds approximately 27 seconds of electricity
20 at full Palomar Energy Center output.⁶⁵ By comparison, four-hour battery storage is classified as
21 short-duration storage. SDG&E claims a grid-reliability role for hydrogen generation without
22 stating any storage duration.⁶⁶ The Commission's Energy Division defines long-duration storage

⁶³ A.25-12-009, Prepared Testimony of Sara Gersen on Behalf of the California Environmental Justice Alliance (August 21, 2026), p. 3; A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Sections 3.4.1 and 8.2.

⁶⁴ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 3.4.

⁶⁵ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 3.3.1.

⁶⁶ A.25-12-009, Prepared Direct Testimony of Ari Beer (December 16, 2025), p. AB-12, ("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 demand is high").

as twelve-hour duration or greater.⁶⁷ To qualify as long-duration storage for 100% of the Palomar Energy Center, SDG&E would have to:

- build hydrogen storage capable of holding approximately 1,600 times more hydrogen than it installed for the Project;
- build electrolyzer capacity sufficient to fill that storage;
- do both at a lower cost than other forms of twelve-hour storage available today;
- upgrade the Palomar Energy Center to operate on 100 percent hydrogen;
- further upgrade the facility to eliminate the increase in NOx emissions that would result from combusting 100 percent hydrogen;⁶⁸ and
- obtain approvals to install 1,600 times more storage of hydrogen, a highly combustible gas, on a 20-acre site.⁶⁹

Those requirements are not feasible.

One point of clarification. My opening testimony used 272 kilograms as the storage quantity, which is the larger of the two figures SDG&E reports;⁷⁰ Cal Advocates and CEJA use the 250 kilogram figure that also appears in SDG&E’s testimony and tour guide.⁷¹ Using the larger figure makes my calculations conservative. However, Cal Advocates’ use of 250 kilograms is also reasonable because that storage capacity was also reported by SDG&E.⁷²

⁶⁷ R.25-06-019, IRP, 2024 – 2026 Integrated Resource Planning (IRP) Inputs and Assumptions at 107, February 2026, (“The 2024-2026 IRP cycle introduces new generic long-duration energy storage (LDES) archetypes as proposed new candidate resources in the RESOLVE optimization. Three technologies with durations of 12, 24, and 100 hours are represented.”), https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/energy-division/documents/integrated-resource-plan-and-long-term-procurement-plan/2024-2026-irp-cycle-events-and-materials/2025_inputs_and_assumptions_report_20260210.pdf

⁶⁸ General Electric, Hydrogen as a fuel for gas turbines (September 2021), p. 7, (turbines capable of 100% hydrogen operation “usually have very high flame temperatures as well as high NOx emissions”).

⁶⁹ A.25-12-009, Prepared Testimony of Sara Gersen on Behalf of the California Environmental Justice Alliance (August 21, 2026), p. 3.

⁷⁰ A.25-12-009, Prepared Direct Testimony of Pooyan Kabir and Kevin Counts (December 16, 2025), p. PK_KC-9.

⁷¹ A.25-12-009, Prepared Direct Testimony of Pooyan Kabir and Kevin Counts (December 16, 2025), p. PK_KC-4; A.25-12-009, Prepared Testimony of the Public Advocates Office (August 21, 2026), p. 10.

⁷² A.25-12-009, Prepared Testimony of the Public Advocates Office (August 21, 2026), p. 10; A.25-12-009, Prepared Direct Testimony of Tyson Siegele on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 3.3.1.

1 **6.2. The cost of the hydrogen this Project produces is far outside any published**
2 **benchmark.**

3 The J.P. Morgan assessment discussed under Issue 2(c) also reports levelized costs of
4 hydrogen production for 2025 across twelve countries. Grey hydrogen is less expensive than
5 green hydrogen in all twelve.⁷³ Green hydrogen exceeds \$6 per kilogram in nine of the twelve
6 and falls between \$6 and \$8.50 per kilogram in eight.⁷⁴ These figures confirm that the \$6 per
7 kilogram estimate I used in my opening testimony, drawn from the Department of Energy, is
8 conservative rather than aggressive.⁷⁵ While TURN's witness establishes the cost of hydrogen
9 produced by the project is not reasonable,⁷⁶ I have provided data showing that the Commission
10 can also find that even the least-cost, largest scale, clean hydrogens projects in the world are not
11 cost effective compared to alternative renewable energy storage options. And, for that reason,
12 find that the Project was always going to be a poor use of funds.

13 **7. ISSUE 6 – A TWO-WAY BALANCING ACCOUNT IS NOT THE APPROPRIATE**
14 **MECHANISM**

15 *Scoping Issue 6: If found just and reasonable, is a two-way balancing*
16 *account the appropriate ratemaking mechanism for cost recovery? If not,*
17 *what ratemaking mechanism is more appropriate and why?*

18 **7.1. Issue 6(a) – Distribution versus generation rates**

19 The SD CCAs' witness recommends assigning the entire incremental revenue
20 requirement to generation for vintaging purposes, reasoning that the roughly six percent of
21 hydrogen used for fleet vehicle fueling is a distribution rather than a generation purpose, and that
22 separating six percent would require the breakout and separate functionalization of a miniscule
23 portion of the revenue requirement.⁷⁷

⁷³ Heliocentrism, p. 46, chart "Levelized cost of green hydrogen, 2025."

⁷⁴ Ibid.

⁷⁵ Heliocentrism, p. 46, chart "Levelized cost of green hydrogen, 2025"; A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 3.5.1.

⁷⁶ A.25-12-009, Prepared Testimony of William A. Monsen on Behalf of The Utility Reform Network, Exh. TURN-1 (August 21, 2026, errata September 23, 2026), Tables 4-5, pp. 30-32.

⁷⁷ A.25-12-009, Prepared Direct Testimony of Anthony M. Georgis on Behalf of San Diego Community Power and Clean Energy Alliance (August 21, 2026), pp. 13-14.

1 I begin with the SD CCA witness's acknowledgement. He agrees that vehicle fueling is a
2 distribution-function purpose, not a generation-function purpose. That is the same conclusion the
3 Commission reached when it denied the hydrogen fueling station costs in D.24-12-074.⁷⁸

4 The six percent figure is also understated because it is drawn from 2025 alone. SDG&E's
5 response to UCAN Data Request 01, Question 38 reports hydrogen use by end use for each year
6 of Project operations.⁷⁹ In 2024, fleet vehicle fueling consumed 253.151 kilograms, which was
7 100 percent of the hydrogen the Project put to any use that year. In 2025 it consumed 256.035
8 kilograms of 4,279.315 kilograms, or approximately 6 percent. Through May 31, 2026 it
9 consumed 101 kilograms of 338 kilograms, or approximately 30 percent.⁸⁰ Across all periods
10 reported, fleet vehicle fueling accounts for 610.186 kilograms of 4,870.466 kilograms, or
11 approximately 12.5 percent of all hydrogen the Project has used.⁸¹

12 The more fundamental answer is that the size of the fueling share does not matter,
13 because the costs cannot be separated. As I noted under Issue 2 above, the fueling station sits
14 inside an undifferentiated \$6.14 million equipment line, and costs attributable to vehicle fueling
15 could appear in nearly every other line of SDG&E's capital workpaper. The Commission has
16 already denied recovery of the hydrogen fueling station.⁸² Because those denied costs cannot be
17 separated from the balance of the request, the appropriate outcome is not to assign them to the
18 generation function for administrative convenience. It is to deny recovery of the Project's costs
19 in full.

20 However, even if costs could be separated, electricity is a better vehicle fuel than
21 hydrogen, which bears on whether any part of this investment serves customers. Hydrogen fuel is
22 more expensive than electricity. Hydrogen vehicles are more expensive than electric vehicles.
23 Electric vehicle charging infrastructure is widespread and affordable, while hydrogen fueling
24 infrastructure is sparse and expensive. Grid electricity in California is more than 60 percent

⁷⁸ D.24-12-074, Decision Authorizing San Diego Gas & Electric Company's and Southern California Gas Company's Test Year 2024 General Rate Case Revenue Requirements (December 19, 2024), p. 394.

⁷⁹ Exh. UCAN-03: A.25-12-009, SDG&E Response to UCAN Data Request 01, Question 38 (June 19, 2026).

⁸⁰ Ibid.

⁸¹ Exh. UCAN-03: A.25-12-009, SDG&E Response to UCAN Data Request 01, Question 38 (June 19, 2026).

⁸² D.24-12-074, Decision Authorizing San Diego Gas & Electric Company's and Southern California Gas Company's Test Year 2024 General Rate Case Revenue Requirements (December 19, 2024), p. 394.

1 carbon-free and grows cleaner each year, while hydrogen dispensed in California is required to
2 be only one-third renewable, and that share is, in most cases, satisfied through certificate
3 accounting rather than green hydrogen. And electric vehicles are substantially more energy
4 efficient than hydrogen fuel cell vehicles, so the cleaner fuel also travels farther per unit of
5 energy.⁸³ These facts show that hydrogen fuel cell vehicles are a poor use case for hydrogen.
6 SDG&E has failed to provide any documentation regarding use cases for on-road transportation
7 that can only be served by hydrogen-fueled vehicles. Further, I do not believe that such
8 documentation exists.

9 **7.2. Issue 6(b) – Vintaging**

10 My response on vintaging is set out under Issue 2(a) above and is not repeated here.

11 **8. ISSUE 7 – ENVIRONMENTAL AND SOCIAL JUSTICE**

12 *Scoping Issue 7: What, if any, are the impacts on environmental and social*
13 *justice communities, including the extent to which the Proposed Project*
14 *impacts the achievement of any of the nine goals of the Commission’s*
15 *Environmental and Social Justice Action Plan?*

16 CEJA’s witness addresses this issue through Goal #2 of the Environmental and Social
17 Justice Action Plan, which directs the Commission to increase investment in clean energy
18 resources benefiting environmental and social justice communities, particularly to improve local
19 air quality and public health, and identifies the risk that a \$31.1 million commitment crowds out
20 research and development spending on zero-emission technologies that could help the San Diego
21 air basin attain health-based air quality standards.⁸⁴ My opening testimony addressed the same
22 issue through affordability⁸⁵. The two showings are complementary, and together they cover the
23 ESJ issue that SDG&E did not address in its application.⁸⁶

⁸³ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 3.5.2.

⁸⁴ A.25-12-009, Prepared Testimony of Sara Gersen on Behalf of the California Environmental Justice Alliance (August 21, 2026), Section IV.

⁸⁵ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 10.2.

⁸⁶ A.25-12-009, Prepared Testimony of Sara Gersen on Behalf of the California Environmental Justice Alliance (August 21, 2026), Section IV; A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers’ Action Network (August 21, 2026), Section 10.2.

1 I agree with CEJA’s conclusion regarding NOx emissions. There is significant evidence
2 that blending hydrogen with natural gas will increase NOx emissions during combustion in
3 turbines manufactured by General Electric (“GE”). One example of such evidence is a GE
4 whitepaper in which GE states that its turbines capable of 100% hydrogen fuel operations
5 “usually have very high flame temperatures as well as high NOx emissions.”⁸⁷ Increases of NOx
6 emissions are to be avoided according to Public Utilities Code §454.52(a)(1)(I) which requires
7 the Commission to “[m]inimize localized air pollutants and other greenhouse gas emissions...”⁸⁸
8 NOx is an air pollutant and reacts in the atmosphere to create ozone (O3).⁸⁹ Tropospheric ozone
9 is an air pollutant, composes the primary constituent of smog, and exposes large segments of the
10 population to unhealthy air quality that fails to meet National Ambient Air Quality Standards.⁹⁰

11 SoCalGas, SDG&E’s sister company, has acknowledged that a byproduct of hydrogen
12 combustion is an increase in NOx emissions:

13 SoCalGas acknowledges that while hydrogen does not release any CO2
14 emissions, hydrogen combustion (including specifically that associated with
15 electric generation) may result in criteria air pollutant emissions,
16 particularly NOx. We are confident that as existing and emerging
17 technologies that reduce NOx emissions advance, SoCalGas’s electric
18 generating unit customers using green hydrogen will be able to decrease
19 their NOx emissions and stay well within permit conditions, and we will
20 support those efforts.⁹¹

21
22 SoCalGas’s claim is that power plant operators can modify equipment and operations of
23 equipment to meet NOx emissions standards as emerging technologies advance. However, in this
24 proceeding regarding the Palomar project, SDG&E is the plant owner and operator, and it states
25 that there were “no physical changes to the power generation equipment... or emissions control
26 systems.”⁹² SDG&E further stated that:

⁸⁷ General Electric, Hydrogen as a fuel for Gas Turbines, p. 7, https://www.gevernova.com/content/dam/gepower-new/global/en_US/downloads/gas-new-site/future-of-energy/hydrogen-fuel-for-gas-turbines-gea34979.pdf.

⁸⁸ California Public Utilities Code §454.52(a)(1)(I).

⁸⁹ U.S. Environmental Protection Agency (“EPA”) Technical Bulletin Nitrogen Oxides (NOx), Why and How They Are Controlled (November 1999).

⁹⁰ *Ibid.*

⁹¹ A.22-02-007, Southern California Gas Company (U904g) Opening Brief, p. 58, <https://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=496525574>.

⁹² A.25-12-009, Prepared Direct Testimony of Pooyan Kabir and Kevin Counts (December 16, 2025), p. PK_KC-13.

1 The Project did not require any modifications to the existing emissions or
2 operating limits in the Permits to Operate, including related to NOx. At a
3 2% blend, hydrogen has a negligible effect on the NOx produced in
4 combustion. Additionally, the existing SCR units and oxidation catalysts
5 maintain compliance with the current emissions limits even with the use of
6 a 2% hydrogen blend.⁹³

7 According to CEJA, SDG&E did not produce a NOx emissions analysis that evaluates
8 the difference in NOx emissions during blending versus non-blending hours beyond a
9 “representative sample... [that] does not constitute a comprehensive data set.”⁹⁴

10 In contrast to prior statements by SDG&E, in response to a ruling compelling SDG&E to
11 answer UCAN’s discovery request, SDG&E produced documents which revealed that it had a
12 broader understanding of hydrogen-blending NOx emissions than it had previously disclosed to
13 either UCAN or CEJA.⁹⁵

14 SDG&E produced emails from its engineers and from GE that provided the following
15 information. In September 2020, before the Project was designed, SDG&E’s electric generation
16 staff asked General Electric what blending hydrogen would do to emissions.⁹⁶ GE answered that
17 the maximum hydrogen blend its packages accept without retrofit is five percent;⁹⁷ that
18 maintaining the permitted NOx concentration on those units requires increasing water injection,
19 which shortens combustor life;⁹⁸ and that blending above five percent “will require modifications
20 to package.”⁹⁹ GE supplied a performance analysis across blend percentages from five to thirty-
21 five percent, stating that hydrogen “has a much greater NOx scalar, thus generating more NOx

⁹³ A.25-12-009, Prepared Direct Testimony of Pooyan Kabir and Kevin Counts (December 16, 2025), pp. PK_KC-17 to PK_KC-18.

⁹⁴ A.25-12-009, Prepared Testimony of Sara Gersen on Behalf of the California Environmental Justice Alliance (August 21, 2026), Section V; A.25-12-009, SDG&E Response to CEJA Data Request 01, Question 1(a) (June 16, 2026), (“Please note this is a representative sample of data provided in a day and does not constitute a comprehensive data set.”).

⁹⁵ Exh. UCAN-04: A.25-12-009, SDG&E Supplemental Response to UCAN Data Request 01, Question 33 (July 20, 2026); Exh. UCAN-05: A.25-12-009, SDG&E Sixth Supplemental Response to UCAN Data Request 01, Question 33 (August 13, 2026).

⁹⁶ Exh. UCAN-05-A: SDGE0000004, Daniel Baerman to Sugandi Sarosa (September 24, 2020), produced in A.25-12-009, SDG&E Sixth Supplemental Response to UCAN Data Request 01, Question 33 (August 13, 2026).

⁹⁷ Exh. UCAN-05-B: SDGE0000009, Sagar Patel, Senior Sales Manager, Aero Services, GE Gas Power (September 22, 2020), (“What is the maximum H2 fuel mix without any retrofit? 5%”).

⁹⁸ Exh. UCAN-05-B, (“in order to maintain 25ppm NOx emissions you will need to increase the water injection. This decreases the life of the combustor.”).

⁹⁹ Exh. UCAN-05-C: SDGE0000011, Sagar Patel to Sugandi Sarosa and Carl S. LaPeter (September 25, 2020).

1 relative to” natural gas.¹⁰⁰ An SDG&E plant engineer summarized the expected effect for other
2 SDG&E employees: “[a]t 5%, we can expect 10% raise in CO/NOX.”¹⁰¹

3 That analysis concerns SDG&E’s LM6000 units rather than the Frame 7FA turbines at
4 Palomar and are not a measure of Palomar’s emissions. However, the correspondence
5 demonstrates three facts. First, it shows that SDG&E knows that blending hydrogen into natural
6 gas raises emissions and that the turbine manufacturer’s whitepapers and communications with
7 SDG&E show that SDG&E had the knowledge since at least 2020, prior to the start of the
8 Project. Second, SDG&E obtained emissions analysis for hydrogen blending when it was
9 deciding whether to proceed,¹⁰² but does not appear to have obtained equivalent information for
10 the Project’s turbine into which it blends hydrogen.¹⁰³ Third, when hydrogen is blended, even at
11 low percentages, GE determined that operational changes that enable an operator to keep NOx
12 emissions under the emissions cap “decreases the life of the combustor.”¹⁰⁴ GE added that at a
13 5% blend “this impact will likely be relatively small.”¹⁰⁵ However, the negative equipment
14 impact was not disclosed in SDG&E’s Application.

15 SDG&E’s testimony asserts that “[a]t a 2% blend, hydrogen has a negligible effect on the
16 NOx produced in combustion.”¹⁰⁶ The sole authority cited for that assertion is a hydrogen co-
17 firing demonstration conducted at the New York Power Authority’s Brentwood site on a GE
18 LM6000 gas turbine.¹⁰⁷ SDG&E therefore answers the emissions question for its Frame 7FA
19 turbines by reference to a different turbine at a different utility’s facility – while asking
20 ratepayers to fund this Project on the ground that its own demonstration produces information

¹⁰⁰ Exh. UCAN-05-G: “LM6000 Hydrogen Blending Design SDG&E,” High Level Modifications slide; see also Exh. UCAN-05-D: SDGE0000013.

¹⁰¹ Exh. UCAN-05-E: SDGE0000019, Sugandi Sarosa to Daniel Baerman (September 24, 2020).

¹⁰² Exh. UCAN-05-A and Exh. UCAN-05-C.

¹⁰³ A.25-12-009, SDG&E Response to CEJA Data Request 01, Question 1(a) (June 16, 2026).

¹⁰⁴ Exh. UCAN-05-B.

¹⁰⁵ Ibid.

¹⁰⁶ A.25-12-009, Prepared Direct Testimony of Pooyan Kabir and Kevin Counts (December 16, 2025), p. PK_KC-18, lines 5-6.

¹⁰⁷ Ibid., n.20, citing LCRI, Hydrogen Cofiring Demonstration at New York Power Authority’s Brentwood Site: GE LM6000 Gas Turbine, Executive Summary at 6-7.

1 unavailable from the work of others. The Brentwood demonstration is one of the projects I
2 identified in my opening testimony as establishing that this Project is not unique.¹⁰⁸

3 In summary, SDG&E has released such minimal emissions data about its project that it
4 appears unable to verify the turbine manufacturer's NOx emissions data after three years of
5 operation. Thus, it has not produced NOx-related safety and emissions information relevant to
6 the proceeding's scope.¹⁰⁹

7 **9. CONCLUSION**

8 Parties' witnesses in A.25-12-009 align with or supplement the data and analysis that I
9 provided in opening testimony. I continue to recommend that the Commission deny the
10 Application in full; that it deny the Application on the independent ground that SDG&E has re-
11 requested hydrogen fueling station costs the Commission has already disallowed and cannot
12 separate them from the balance of the request; and that, independent of cost recovery, the
13 Commission should order SDG&E to cease blending hydrogen into the Palomar Energy Center
14 turbine.

15 This concludes my prepared rebuttal testimony.

¹⁰⁸ A.25-12-009, Prepared Direct Testimony of Tyson Siegle on Behalf of the Utility Consumers' Action Network (August 21, 2026), Section 4.1.2, Table 3.

¹⁰⁹ A.25-12-009, Prepared Testimony of Sara Gersen on Behalf of the California Environmental Justice Alliance (August 21, 2026), Section V.