Application: A.25-04-XXX
Proceeding: Microgrid Optional Tariff
Exhibit No.: SCG-02
Witness: Armando Infanzon

CHAPTER 2
PREPARED DIRECT TESTIMONY OF
ARMANDO INFANZON
ON BEHALF OF
SOUTHERN CALIFORNIA GAS COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

April 16, 2025

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DIRECT TESTIMONY OF ARMANDO INFANZON

I. PURPOSE

My name is Armando Infanzon, and I am the Director of Clean Energy Business Development for Southern California Gas Company (SoCalGas or Company). My testimony provides a detailed description of SoCalGas's proposed Microgrid Optional Tariff (MOT). This testimony includes an overview of the proposed fully elective, optional tariff, and benefits of the MOT for eligible existing and prospective non-residential customers in SoCalGas's service territory. My testimony also provides an overview of the existing microgrid market, expected outlook and market potential in SoCalGas's service territory.

SoCalGas is proposing to establish the MOT to facilitate electrification and enhance reliability and resilience, while providing energy solutions to customers and supporting decarbonization goals. SoCalGas requests Commission approval in this Application to establish the MOT in order to support the deployment of microgrid facilities which will provide:

- A solution to support new electric demand and load growth from critical market sectors
- Enhanced reliability and resilience for the electric grid and customers
- A solution that can address affordability concerns by providing more price certainty and may mitigate increases in electric ratepayer costs for new infrastructure
- Potential environmental benefits and support customer sustainability goals
- Local community benefits such as backup power for critical facilities, jobs, and air quality improvements

Microgrid facilities, both behind-the-meter[1] and off-grid,[2] can be powered by various sources, depending on the technologies installed. Some examples of technologies that may be included in these microgrids are solar power, fuel cell, linear generator, battery storage, microgrid controller, and electrolyzer. The technologies installed in each microgrid facility will

[1] Behind-the-meter microgrids refer to microgrids on the customer's side of the utility meter.

[2] Off-grid microgrids refer to microgrids that are isolated and operate independently of the electric grid.

depend on the needs of each MOT customer. A further description of many of the technologies SoCalGas plans to provide under the MOT can be found in Section III.

II. OVERVIEW OF PROPOSED MICROGRID OPTIONAL TARIFF

In this Application, SoCalGas requests Commission approval to plan, design, engineer, procure, construct, own, operate, and/or maintain microgrid facilities, both behind-the-meter and off-grid, for eligible existing and prospective customers in SoCalGas's service territory. The customer classes eligible for the MOT include non-residential, such as commercial and industrial customers, including but not limited to data centers, EV charging, airports, critical facilities such as hospitals, wastewater treatment facilities, and emergency services. The MOT is also available to serve customers for separately metered service to common facilities at residential properties (e.g., swimming pools, recreation rooms, saunas, spas, etc.)

Under the MOT, the service fee calculation charged to each customer under the tariff will be case-specific and will cover the full cost to plan, design, engineer, procure, construct, own, operate, and/or maintain the system including a return. The components of the tariff service fee will be negotiated between SoCalGas and the tariff customer, including the ownership structure. For example, if the MOT customer is the owner of the microgrid facility, the tariff service fee could include a build-and-transfer fee plus an on-going operation and maintenance service fee. Service fees paid by each customer and terms of service will be governed by a specific agreement with each tariff customer.

The MOT project costs would be recovered from the specific tariff customer with no subsidy from or business risk borne by other ratepayers. Costs of activities specific to the MOT will be charged to specific MOT internal orders. None of the incremental costs of providing service under the MOT have been included in SoCalGas's past General Rate Case (GRC) filings or will be included in future GRC filings. To the extent that resources embedded in general rates are used to support the proposed tariff service, those costs will be reimbursed to ratepayers as addressed in the Prepared Direct Testimony of Victor Garcia, Chapter III.

MOT customers will be responsible for all electric and gaseous fuel bills and associated costs, including those for electricity and gaseous fuels to operate MOT Facilities and any other required utility services (e.g. water, sewer, etc.). As the MOT customer will be the customer of record for these types of utility services, they can apply for any eligible utility tariff rates, incentives, and programs. Tariff customers will have the choice and flexibility to select and

procure the fuel type, including fuels such as clean renewable hydrogen and renewable natural gas (RNG), that best aligns with their needs, taking into account the readiness of local grid power, availability of renewable fuels currently and in the future, affordability, and sustainability objectives.

Several stakeholders have expressed support for SoCalGas to provide microgrid solutions. These stakeholders include potential customers, equipment manufacturers, and industry organizations. These support letters are included in Attachment A, attached hereto.

III. OVERVIEW OF MICROGRID FACILITIES

A. Microgrid Definition

For the purpose of this Application, it is important to define the term "microgrid," as there are various definitions developed and/or used by various entities. For the purposes of this Application, SoCalGas will utilize the microgrid definition as stated in California Public Utilities Code Section 8370(d):

> **California Public Utilities Code § 8370(d) microgrid definition:**
>
> "Microgrid" means an interconnected system of loads and energy resources, including, but not limited to, distributed energy resources, energy storage, demand response tools, or other management, forecasting, and analytical tools, appropriately sized to meet customer needs, within a clearly defined electrical boundary that can act as a single, controllable entity, and can connect to, disconnect from, or run in parallel with, larger portions of the electrical grid, or can be managed and isolated to withstand larger disturbances and maintain electrical supply to connected critical infrastructure.[3]

In addition, for purposes of this tariff application, SoCalGas proposes to expand the microgrid definition to include off-grid facilities requested by customers.

B. Microgrid Background

The term "microgrid" started being used in the late 1990's when the United States Department of Energy (DOE) initiated programs to examine grid reliability and how to

[3] Pub. Util. Code § 8370(d), *available at:* https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?lawCode=PUC&division=4.1.&title=&part=&chapter=4.5.&article=.

maximize the use of distributed generation resources to improve reliability[4] and resilience.[5] These early microgrids were fairly simple and generated power using fossil fuel-fired combined heat and power (CHP) and reciprocating engine generators.[6]

Today's microgrid facilities can be more complex and often consist of several types of technologies allowing them to generate enough energy to meet the individual needs of the customer. For example, for a customer with a significant base load,[7] the microgrid facility design will likely consist of equipment able to generate power 24/7, 365 days per year (e.g., fuel cells, linear generators). Additional equipment may be added to the microgrid to handle seasonal and/or daily peaks in energy use (e.g., solar, battery storage), as well as clean renewable hydrogen production equipment for a variety of potential end-uses (e.g., fuel cells, appliances).

Microgrid facilities can be designed to operate in various modes, including but not limited to:

i. Grid Connected Microgrids – these microgrids are physically connected to the electric grid, and can be operated in parallel to the grid or in "island mode."

ii. Off-grid microgrids – these microgrids are isolated and operate independently of the electric grid. These microgrids are not connected to the electric grid due to a lack of physical electrical infrastructure nearby or by customer choice. Off-grid microgrids can be a practical solution for remote areas or on islands that cannot connect to the electric grid.

SoCalGas has demonstrated microgrids and its components through various projects as part of other programs and its own operations. For example, the Hydrogen Innovation Experience (H2IE) in Downey, CA is an advanced microgrid that consists of solar panels,

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[4] Electric reliability refers to maintaining the delivery of power under normal operating conditions.

[5] Resilience is the "ability to prepare for and adapt to changing conditions and withstand and recover rapidly from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents." *See* the White House – President Barack Obama, *Presidential Policy Directive -- Critical Infrastructure Security and Resilience* (February 12, 2013), *available at*: https://obamawhitehouse.archives.gov/the-press-office/2013/02/12/presidential-policy-directive-critical-infrastructure-security-and-resil/.

[6] Center for Climate and Energy Solutions (C2ES), *Microgrids, available at:* https://www.c2es.org/content/microgrids/.

[7] Base load is defined as the minimum amount of electric power delivered or required over a given period of time at a steady rate. *See* U.S. Energy Information Administration (EIA), *Glossary – B, available at:* https://www.eia.gov/tools/glossary/?id=B.

lithium-ion battery system, electrolyzer, as well as a clean renewable hydrogen fuel cell, storage, and blending system. The H2IE demonstrates how clean renewable hydrogen can be utilized in various applications. For example, from a reliability and resilience perspective, H2IE utilizes a clean renewable hydrogen fuel cell to produce renewable power when solar power is not available and/or to serve peaking load. The H2IE project has been awarded several recognitions for innovation, sustainability and construction best practices.[8,9,10]

C. Microgrid Components

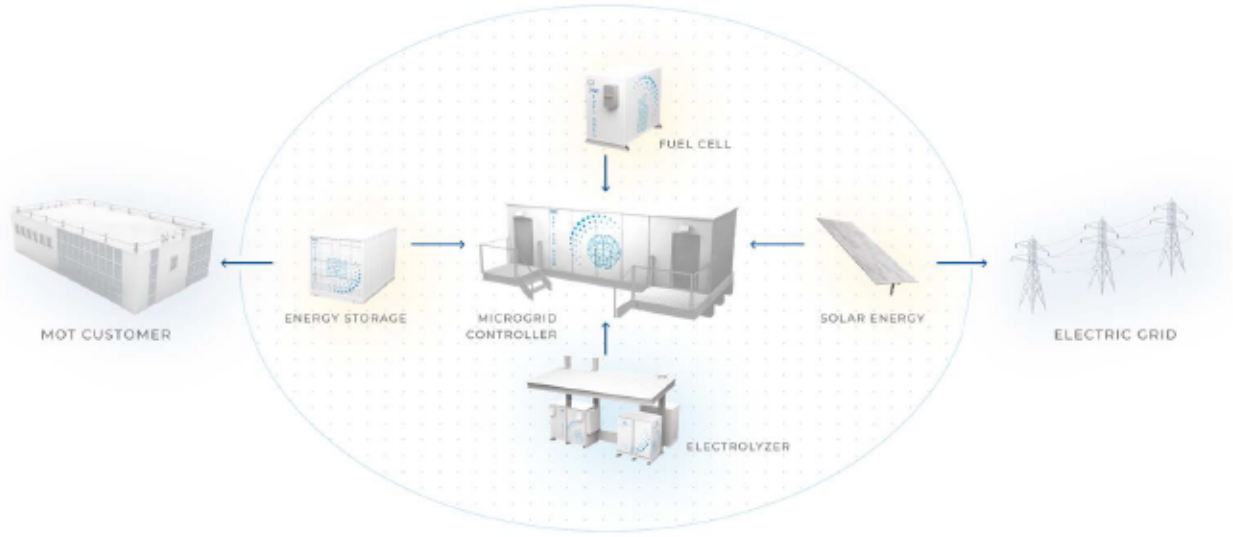
Microgrid facilities typically consist of four primary components: (1) energy generation, (2) energy storage, (3) energy management and (4) load management as demonstrated in Figure AI-1.

[8] In Fast Company Magazine, H2IE is recognized as one of the top innovated projects in the US for 2021. *See* Fast Company, *Hydrogen takes the spotlight – SoCalGas [H2] Hydrogen Home is set to revolutionize renewable energy in California* (October 21, 2021), *available at:* https://www.fastcompany.com/90688524/hydrogen-takes-the-spotlight.

[9] In Engineering News Record Magazine, H2IE received the Award of Merit for best energy/industrial construction project in the Southern California region in 2023. *See* ENRWest, *ENR California Announces 2023 Best Projects Winners* (July 28, 2023), *available at:* https://www.enr.com/blogs/12-california-views/post/56860-enr-california-announces-2023-best-projects-winners.

[10] Leadership in Energy and Environmental (LEED) Certification, H2IE obtained the highest-level certification (Platinum).

Figure AI-1: Microgrid Facility Components



Each of these components work closely together to manage energy in a reliable and efficient manner. The following sections provide further details of each of the primary components of microgrid facilities.

1 Energy Generation

Energy Generation is the process of converting and/or processing resources to generate energy. Common energy generation technologies include but are not limited to the following:

i. Sb n Energy

Solar technologies use the sun to produce renewable energy. One of the more common solar technologies is Photovoltaics (PV) Systems, which converts sunlight directly into electricity. This conversion happens in a solar cell, which is typically a semiconductor device.

ii. Fuel Cell

A fuel cell is a device that generates electricity through an electrochemical reaction, not combustion. In a fuel cell, hydrogen and oxygen are combined to generate electricity, heat, and water.[11] Fuel cells operate using hydrogen produced from various technologies and sources, including and not limited to: clean renewable hydrogen that is produced onsite using electrolysis,

[11] Fuel Cell and Hydrogen Energy Association (FCHEA), *Fuel Cell Basics*, *available at:* https://fchea.org/learning-center/fuel-cell-basics/.

clean renewable hydrogen stored onsite, or an integrated gas reformer. The most common types of fuel cells are: solid oxide, proton exchange, phosphoric acid, and molten carbonate fuel cells.

iii. Linear Generator

A linear generator uses a low-temperature, non-combustion reaction of air and a gaseous fuel to drive magnets through copper coils to efficiently produce electricity with near-zero nitrogen oxides (NOx) emissions and with fuel flexibility.[12]

iv. Electrolyzer

An electrolyzer takes electrical power from an energy source (e.g., solar, fuel cell, etc.) and uses water to produce clean renewable hydrogen and oxygen through a chemical reaction called electrolysis.[13] Common electrolyzer technologies include but are not limited to the following:

a. Polymer Electrolyte Membrane (PEM) Electrolyzer

A polymer electrolyte membrane (PEM) electrolyzer uses a proton exchange membrane to split water molecules into hydrogen and oxygen through the process of electrolysis, essentially producing clean renewable hydrogen fuel by applying electricity to water.

b. Solid Oxide Electrolyzer

Solid Oxide Electrolyzer is a device that uses electricity to split water into hydrogen and oxygen by employing a solid ceramic membrane as the electrolyte essentially producing clean renewable hydrogen through a process called solid oxide electrolysis.

c. Alkaline Electrolyzer

An Alkaline Electrolyzer is a device that uses an alkaline solution (like potassium hydroxide) as an electrolyte to split water molecules into hydrogen and oxygen gas through the

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[12] California Energy Commission (CEC), *High-efficiency and Ultra-low Emissions Linear Generator Demonstration Project in Southern California* (May 2024) at 1, *available at:* https://www.energy.ca.gov/sites/default/files/2024-05/CEC-500-2024-037.pdf.

[13] UC Berkley Law, *Supercharging Electrolyzers: Boosting Zero-Emission Hydrogen Production and Deployment in California* (December 2022), *available at:* https://www.law.berkeley.edu/research/clee/research/climate/climate-change-and-business-research-initiative/supercharging-electrolyzers/.

process of electrolysis, essentially producing clean renewable hydrogen by applying electricity to water in an alkaline environment.

2. Energy Storage

Energy Storage can be utilized to capture energy when energy demand is less than energy generation for use at a later time. The type of storage will depend on the type of energy being generated, such as electricity and/or gaseous fuel, as well as the size and footprint of the available area in the microgrid. Potential energy storage components for the MOT include but are not limited to the following technologies:

i. Battery Energy Storage System (BESS)

A BESS[14] is an electrochemical device that charges (or collects energy) from the grid or a power generator and then discharges that energy at a later time to provide electricity or other grid services when needed. The most commonly used BESS technology is lithium-ion batteries.[15] Lithium-ion batteries are preferred because they offer a long-life span, high energy density, and efficient performance during charging and discharging.[16]

ii. Clean Renewable Hydrogen Storage

Vessels or other types of storage located onsite store clean renewable hydrogen to provide energy to microgrid components and other gas equipment when the electrolyzer is not producing clean renewable hydrogen.

3. Energy Management

The primary component of the Energy Management System[17] is the microgrid control system, whose primary role is to orchestrate all microgrid energy generation and energy storage components to balance sources and uses of energy. For example, the microgrid control system

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[14] CEC, *Energy Storage Targets - Publicly Owned Utilities - AB 2514*, *available at:* https://www.energy.ca.gov/data-reports/reports/energy-storage-targets-publicly-owned-utilities.

[15] EIA, *Most utility-scale batteries in the United States are made of lithium-ion* (October 30, 2019), *available at:* https://www.eia.gov/todayinenergy/detail.php?id=41813.

[16] Colite Technologies, *Top 7 Benefits and the Impact of Battery Energy Storage Systems* (November 4, 2024), *available at:* https://colitetech.com/blog/benefits-and-impact-of-battery-energy-storage/.

[17] National Renewable Energy Laboratory (NREL), *An Innovative Energy Management System for Microgrids with Multiple Grid-Forming Inverters* (July 2024) at 1, *available at:* https://www.nrel.gov/docs/fy24osti/88118.pdf.

continuously monitors the energy generation and energy storage components to automatically adjust the output energy sources like solar panels or generators to maintain a stable power supply, and seamlessly disconnect and connect to the grid when necessary.

4. Load Management

Microgrids facilities are designed to support customer energy needs based on factors including, but not limited to: daily load profile, seasonal variations, location, weather, extreme climate events, and electric grid conditions. Load management is a key component of the microgrid facilities that heavily interact with energy management systems. It is essential to continuously maintain the balance of generation versus load – in other words, the electricity being produced should be in balance with the electricity that is needed. Load management is the main driver for the microgrid seamlessly running the various components and effectively meeting the demands and needs of the customer.

In addition to the aforementioned four primary components, microgrid facilities may also include:

i. Blending Skid: a blending skid is a technology that is used to mix different types of gaseous fuels.

ii. Safety and Monitoring Systems: microgrid facilities include multiple safeguards to protect human life, property and the environment from potential process deviations or equipment failures. These safety and monitoring system safeguards include but are not limited to fire detectors, gas detectors, process measurements, and pressure safety valves.

IV. MICROGRID MARKET: CURRENT, OUTLOOK, AND POTENTIAL

Over the past five years the microgrid market in both the United States and California has seen steady growth, driven by the increasing need for energy reliability and resilience, more price certainty, and supporting sustainability goals. Technology advancements and the increasing availability of technologies have made microgrids more viable over time, while on-going government policies and support is needed to promote market expansion. These underscore the feasibility and benefits of microgrids. As customers work towards energizing new electric load, enhancing reliability and resilience, addressing affordability concerns, and achieving

sustainability goals, the microgrid market presents significant opportunities and is positioned for continued expansion in the coming years.

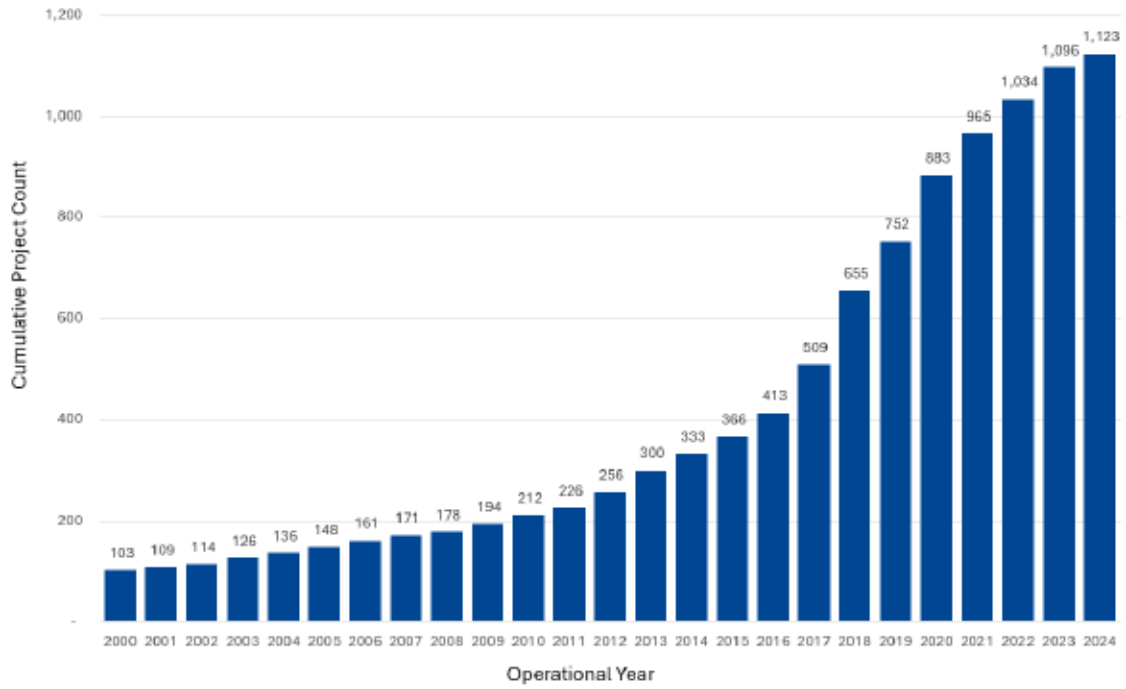
A. Current State of Microgrid Market

1. United States

According to the DOE Microgrid Installation Database,[18] the deployment of microgrids in the United States has grown steadily since 2000. As shown in Figures AI-2 and AI-3, there are over 1,100 microgrids facilities in the United States with a total installed capacity of over 5.3 GW as of October 2024. The microgrid installed capacity has grown at a compound annual growth rate (CAGR) of 5.9% in the past ten years.

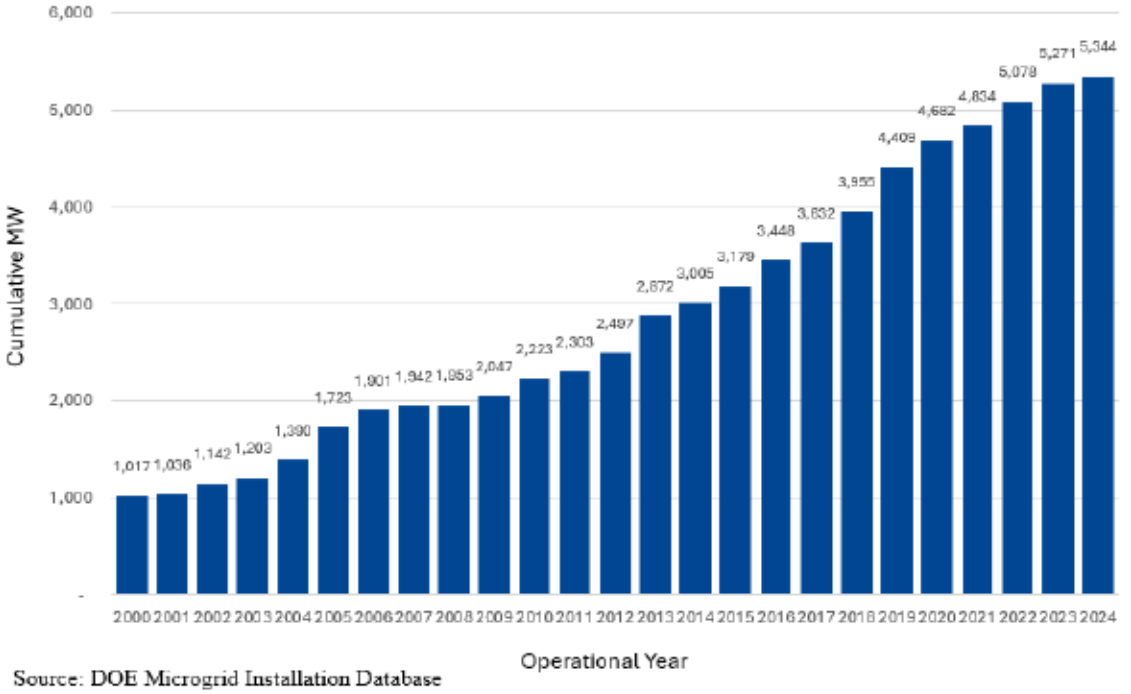
[18] DOE Combined Heat and Power and Microgrid Installation Databases, *Microgrid Installation, available at:* https://doe.icfwebservices.com/microgrid.

Figure AI-2: United States Microgrid Facilities Count by Year



Source: DOE Microgrid Installation Database
Note: The data for 2024 is as of October 22, 2024.

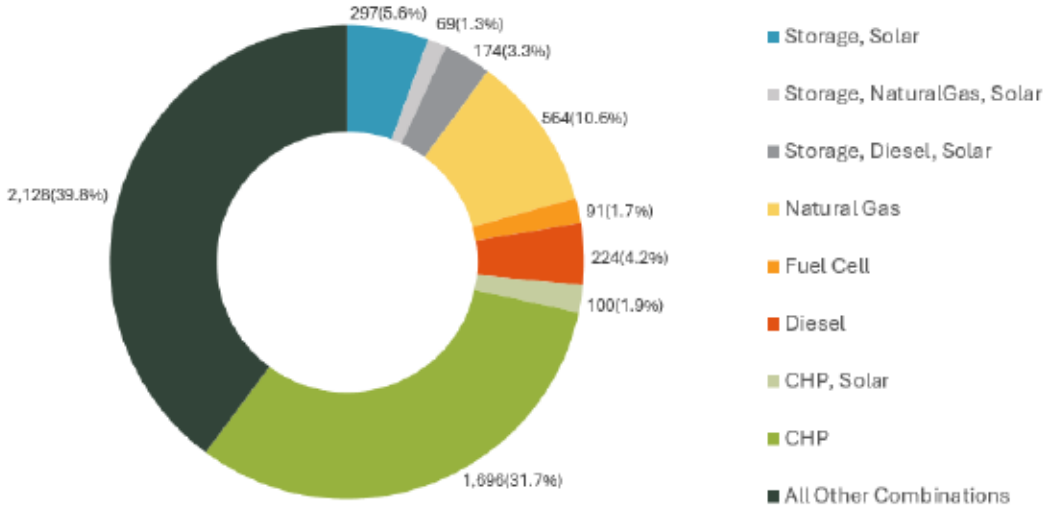
Figure AI-3: United States Microgrid Facilities Installed Capacity by Year



Source: DOE Microgrid Installation Database
Note: The data for 2024 is as of October 22, 2024.

Approximately 50% of microgrid installed capacity in the U.S. includes technologies that utilize natural gas, such as CHP and fuel cell, as shown in Figure AI-4. California leads the U.S. for fuel cell installed capacity at 45%,[19] followed by Connecticut at 18% and New York at 10%.

Figure AI-4: United States Microgrid Facilities Installed Capacity by Technology

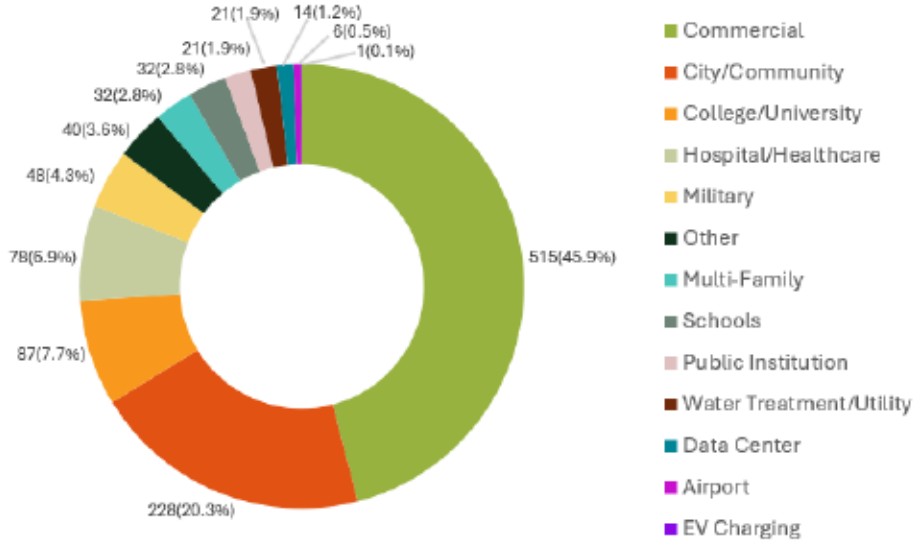


Source: DOE Microgrid Installation Database (as of October 22, 2024)

Additionally, as shown in Figures AI-5 and AI-6, the commercial segment leads the market at 515 microgrid facilities with an installed capacity of 725 MW, representing an average of 1.4 MW per facility. City and community microgrids represent the second largest customer segment at 228 microgrid facilities with an installed capacity of 1,346 MW, representing an average of 5.9 MW per facility. College and university microgrids represent the third largest customer segment at 87 microgrid facilities with an installed capacity of 1,325 MW, representing an average of 15.2 MW per facility. The aforementioned three customer segments account for over 70% of total microgrid facilities in the U.S. and over 60% of total installed capacity in the U.S.

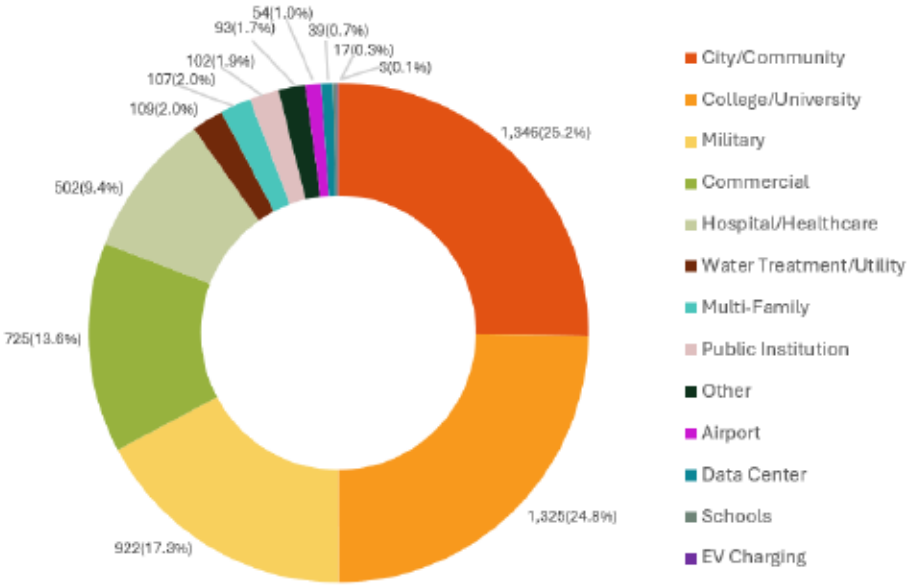
[19] There is additional fuel cell installed capacity in the "All Other Combinations" category (installed with other technologies), resulting in approximately 114 MW of fuel cell installed capacity in the US.

Figure AI-5: United States Microgrid Facilities Count by Customer Segment



Source: DOE Microgrid Installation Database (as of October 22, 2024)

Figure AI-6: United States Microgrid Facilities Installed Capacity by Customer Segment

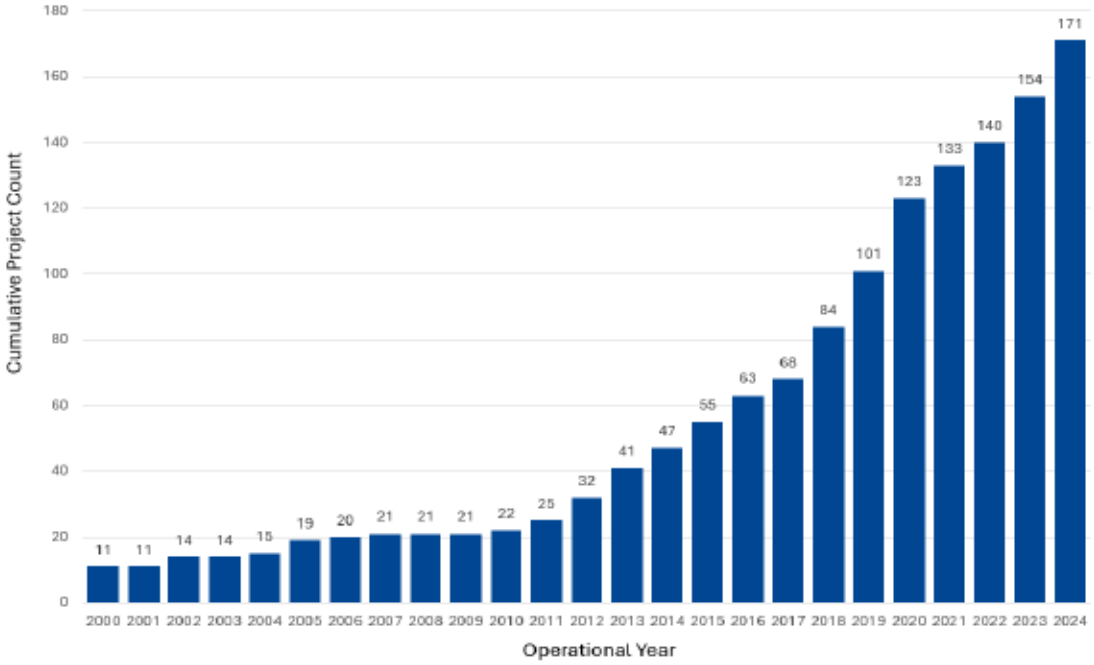


Source: DOE Microgrid Installation Database (as of October 22, 2024)

2. California

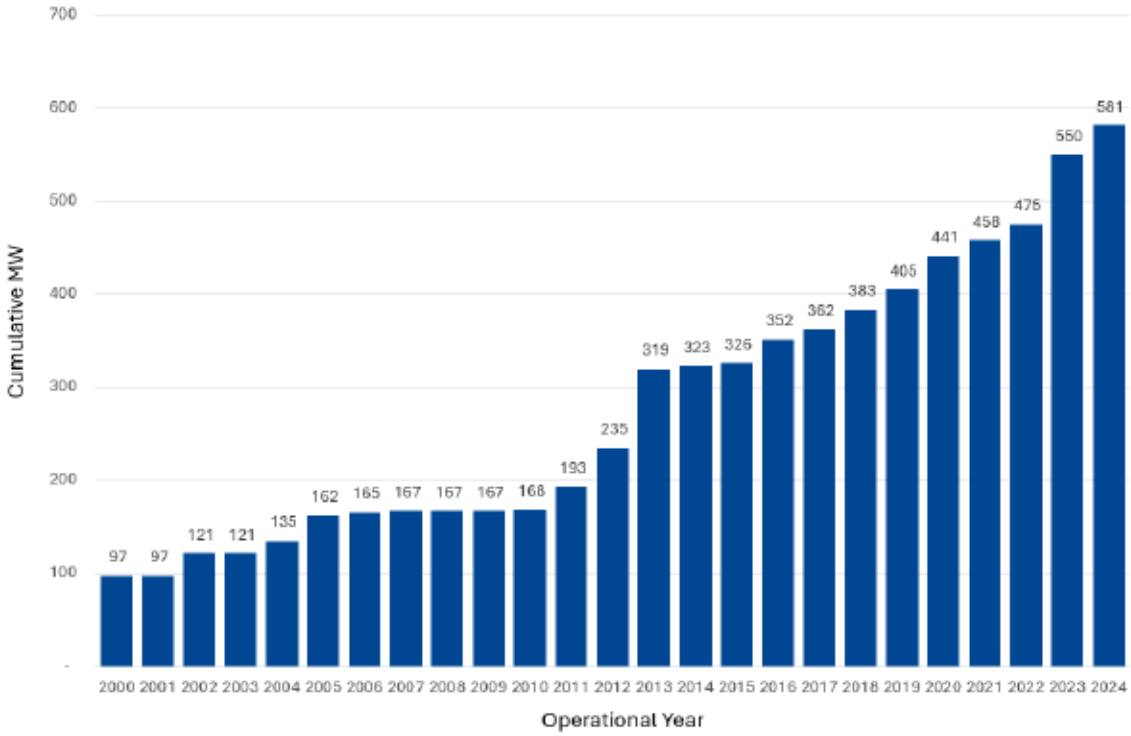
The deployment of microgrids in California has also experienced steady growth since 2000, as shown in Figures AI-7 and AI-8. California ranks second in the nation behind Texas with 171 microgrid facilities with current total installed capacity of 581 MW. Within SoCalGas's service territory, there are approximately 54 microgrid facilities with an approximate current total installed capacity of 277 MW. The microgrid installed capacity in California has grown at a compound annual growth rate of 6.1% in the past ten years.

Figure AI-7: California Microgrid Facilities Count by Year



Source: DOE Microgrid Installation Database
Note: The data for 2024 is as of October 22, 2024.

Figure AI-8: California Microgrid Facilities Installed Capacity by Year

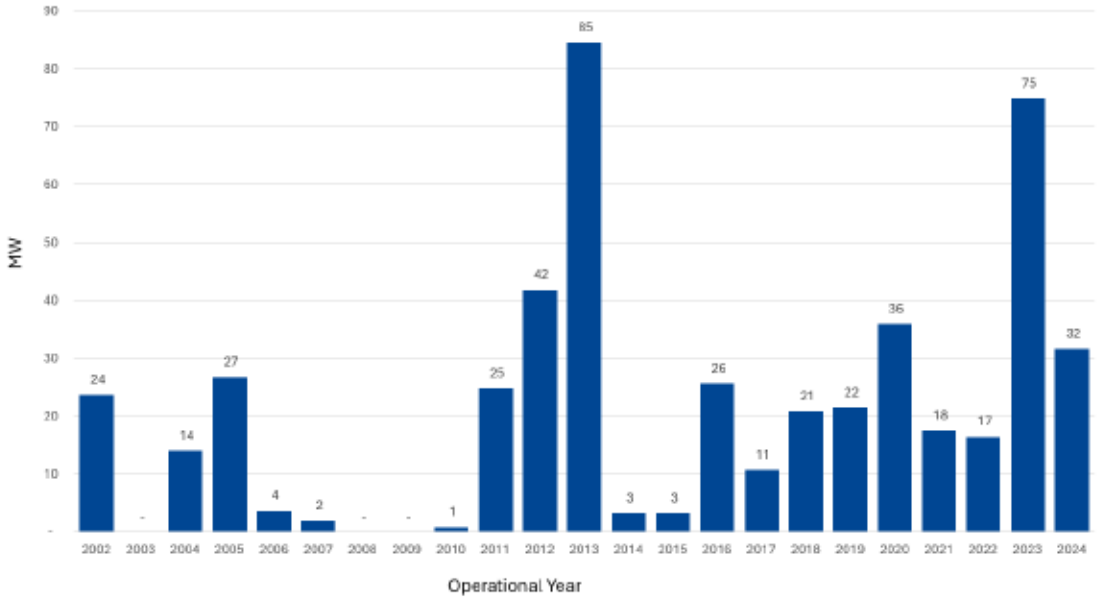


Source: DOE Microgrid Installation Database
Note: The data for 2024 is as of October 22, 2024.

Since 2012, four major microgrids[20] have been deployed across the college/university, city/community, and military segments, with a total combined installed capacity of 150 MW. These microgrids were installed in 2012, 2013, and 2023 and Figure AI-9 illustrates the spikes in the installed capacity attributed to these microgrids. Together, they represent 26% of the current installed capacity and 2% of the total number of microgrids in operation. Their deployment has had a significant impact on the overall growth of installed capacity.

[20] The four major microgrids are: UC Irvine Microgrid (26 MW), UC San Diego Microgrid (38 MW), Borrego Springs Microgrid (31 MW), and JFTB Joint Forces Training Base Los Alamitos (55 MW).

Figure AI-9: California Microgrid Facilities Annual Installed Capacity[21]

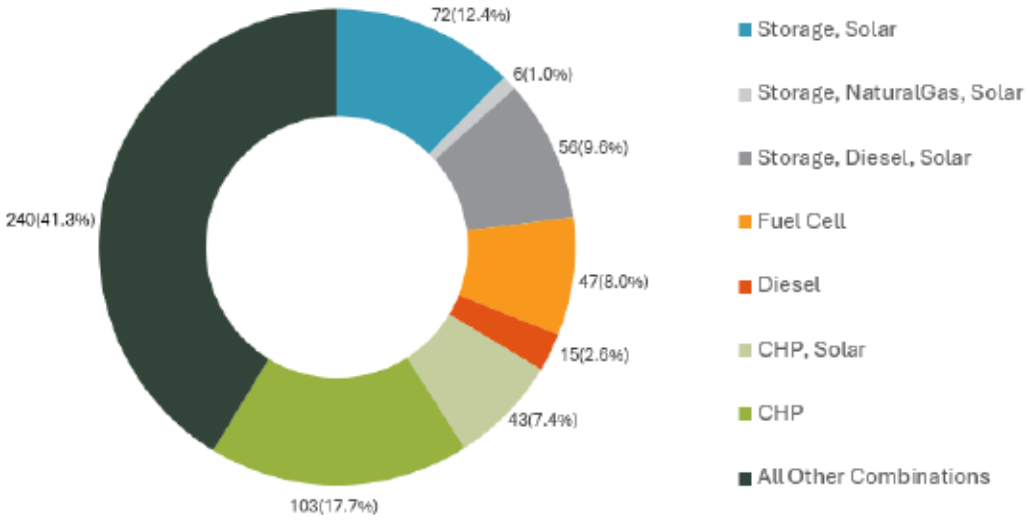


Source: DOE Microgrid Installation Database
Note: The data for 2024 is as of October 22, 2024.

In California, the leading grouped technologies are solar & storage and fuel cell as a result of the State's support for clean technologies as shown in Figure AI-10 (e.g., the Self-Generation Incentive Program). Over 30% of microgrid installed capacity in California includes technologies that utilize natural gas, such as CHP and fuel cells.

[21] Figure AI-9 shows an installed capacity of 32 MW in 2024 and Figure AI-8 shows an incremental installed capacity of 31 MW between 2023 and 2024. The 1 MW difference is due to rounding to the nearest whole number.

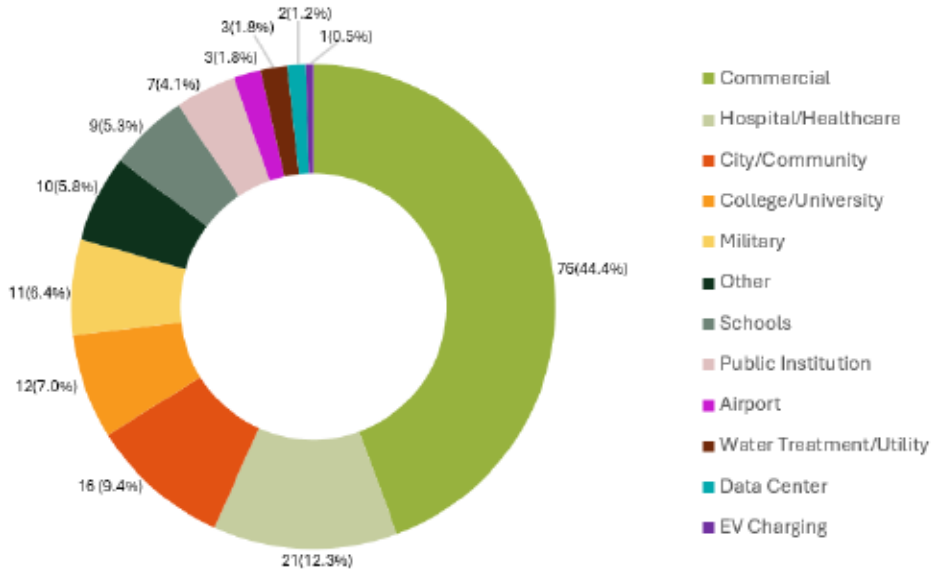
Figure AI-10: California Microgrid Facilities Installed Capacity by Technology



Source: DOE Microgrid Installation Database (as of October 22, 2024)

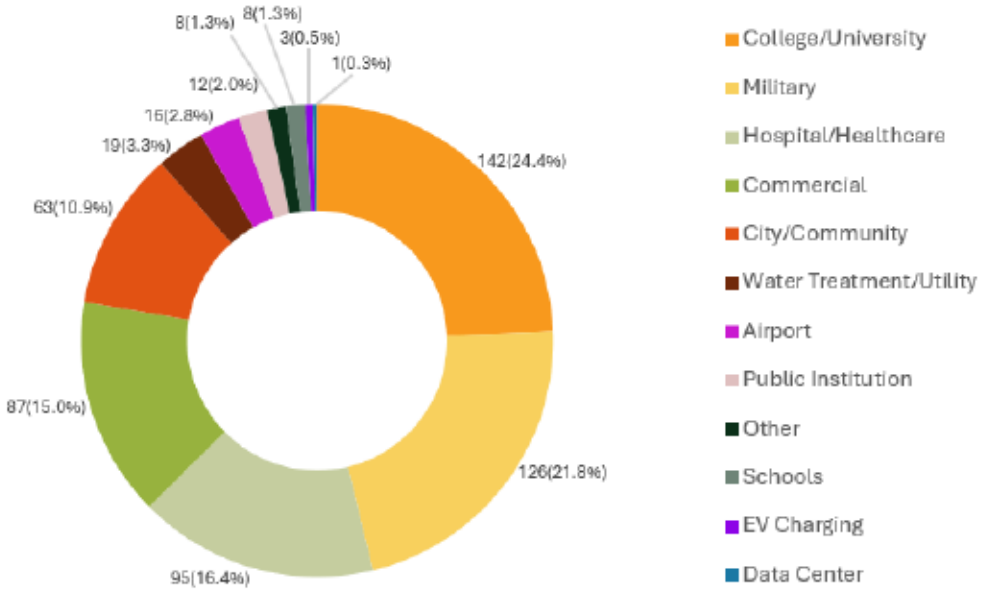
Figures AI-11 and AI-12 show that the commercial segment leads the market at 76 microgrid facilities with an installed capacity of 87 MW, representing an average of 1.1 MW per facility. Hospital/Healthcare microgrids represent the second largest customer segment at 21 microgrid facilities with an installed capacity of 95 MW, representing an average of 4.5 MW per facility. City/Community microgrids represent the third largest customer segment at 16 microgrid facilities with an installed capacity of 63 MW, representing an average of 3.9 MW per facility. The aforementioned three customer segments account for over 60% of total microgrids facilities in California and over 40% of total installed capacity in California.

Figure AI-11: California Microgrid Facilities Count by Customer Segment



Source: DOE Microgrid Installation Database (as of October 22, 2024)

Figure AI-12: California Microgrid Facilities Installed Capacity by Customer Segment



Source: DOE Microgrid Installation Database (as of October 22, 2024)

B. Market Outlook

The microgrid market in the United States and California is poised for significant growth, driven by new electric demand and load growth, enhanced reliability and resilience efforts, and the need to provide solutions to address affordability concerns, while also supporting customers' sustainability goals. According to several industry reports, the estimated microgrid market CAGR in the United States ranges between 15% to 22% from the near term up to 2030. Based on this estimated range, the U.S. microgrid installed capacity of 5.3 GW could expand to 11 GW to 14 GW in the next five years.

Based on the aforementioned estimated range of 15% to 22%, the California microgrid installed capacity of 581 MW could expand to 1.2 GW to 1.6 GW in the next five years. The increasing demand for electric capacity from data centers, along with broader electrification efforts, will help drive the development of microgrids in California. Two of the market segments forecasted to have substantial growth are data centers and transportation electrification, driving significant increases in energy demand in the near term.

On February 26, 2025, the CEC hosted a workshop focused on California's economic outlook as part of the 2025 Integrated Energy Policy Report (IEPR) proceeding. During the workshop, Southern California Edison (SCE) presented a forecast for data centers in their service territory, detailing planned projects and customer inquiries. Their forecast includes an incremental demand of 200 MW between 2025 and 2028, and an incremental demand of 400 MW between 2029 and 2035.[22]

In addition, electrifying the transportation segment in California requires significant capacity to develop electric vehicle charging infrastructure. Despite California withdrawing its request for a waiver and authorization for the Advanced Clean Fleets (ACF) Regulation, the state and local government fleets portion remains unaffected[23] and electric municipalities are supporting the charging infrastructure build-out. For example, as part of the LA100 study,[24] Los

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[22] Refer to the 2025 SCE Data Center Forecast Presentation at IEPR Commissioner Workshop on California's Economic Outlook: CEC, *SCE Data Center Forecast* (February 25, 2025), *available at:* https://efiling.energy.ca.gov/GetDocument.aspx?tn=261975&DocumentContentId=98465.

[23] Refer to the ACF Waiver Update, CEC, *Advanced Clean Fleets, available at:* https://ww2.arb.ca.gov/our-work/programs/advanced-clean-fleets.

[24] Los Angeles Department of Water and Power, *LA100 Bi-Annual Report Card*, *available at:* https://clkrep.lacity.org/onlinedocs/2021/21-0352_MISC_10-11-24.pdf.

Angeles Department of Water and Power set the goal of installing 120,000 charging stations by 2030, including 3,000 DC fast chargers.

C. Market Potential in SoCalGas's Service Territory

Microgrids present a promising option for customers in SoCalGas's service territory, primarily to support new electric demand and load growth from critical market sectors, provide reliability and resilience, address affordability concerns, and support sustainability goals. In late 2024, SoCalGas commissioned a microgrid market study with Verdant Associates to identify and evaluate the customer sectors and segments in SoCalGas's service territory that could benefit from having behind-the-meter microgrids. This microgrid market study was conducted to gain an understanding of the technical and serviceable addressable market for behind-the-meter microgrids in SoCalGas's service territory. For each segment with microgrid potential, Verdant Associates identified the viability of different configurations and sizes of microgrid technologies and assessed different benefits the customers may realize including reliability, resilience, and economic payback.

The results of the study indicate: 1) there is considerable untapped microgrid potential in SoCalGas's territory, 2) the microgrid potential increases significantly if the financial value of resilience is included in the economic assessment, 3) increasing the knowledge and awareness of the benefits of microgrids are necessary for adoption, and 4) additional programs, incentives, and financial mechanisms may also be needed to grow the adoption of microgrids. The microgrid market study can be found in Attachment B.

SoCalGas examined the 22 customer segments identified in the market study and grouped them into 9 customer segments to enable a direct comparison with the microgrid facility types listed in the DOE database. As provided in Table AI-1 below, the penetration rate of microgrids within SoCalGas's service territory remains low across all customer segments, with data centers having the highest penetration rate of 25% (potentially attributable to limited count). The low overall market penetration rates signal the significant untapped potential for advancing microgrids, and the MOT can play a key role in further developing this nascent market.

TABLE AI-1: California Microgrids Market Potential

Customer Segment	Microgrid Facilities in California[25]	Microgrid Facilities in SoCalGas Service Territory[26]	Market Potential in SoCalGas Service Territory[27]	Penetration Rate in SoCalGas Territory[28]
Agriculture, Forestry, Fishing and Hunting	4	1	1,851	0.1%
Data Center[29]	2	1	4	25%
Educational Services	21	6	9,156	0.1%
EV Chargers	1	1	1,713	0.1%
Health Care and Social Assistance	21	9	3,959	0.2%
Public Administration	34	12	1,858	0.6%
Utilities	3	1	260	0.4%
Commercial[30]	76	23	51,903	0.0%
Other[31]	9	-	5,410	0.0%
Total	**171**	**54**	**76,114**	

*Note: Market Potential includes financial value assigned to resilience

V. TARIFF DESIGN

The MOT is a fully elective, optional tariff service and will be independent of any other tariff or non-tariff services the customer may receive from SoCalGas (such as transportation and commodity services). Under the proposed tariff, SoCalGas and the tariff customer will have the ability to utilize and combine the various technologies described in Section III(C) to create a

[25] DOE Combined Heat and Power and Microgrid Installation Databases, *Microgrid Installation, available at:* https://doe.icfwebservices.com/microgrid.

[26] Microgrid facilities in SoCalGas service territory based on the city listed in the DOE Microgrid Installation Database.

[27] 2025 Microgrid Market Study in SoCalGas's Service Territory.

[28] Market penetration is calculated dividing number of microgrid facilities in SoCalGas's service territory by the market potential customer count in SoCalGas's service territory.

[29] Market Potential only includes existing data center facilities and does not include any future facilities to support the expected incremental growth of 200 MW by 2028 and an additional 400 MW by 2035 as provided on AI-19, *supra*.

[30] Commercial Building Type includes categories in retail trade, transportation and warehousing, information, finance and insurance, real estate rental and leasing, professional, scientific, and technical services, management of companies and enterprises, arts, entertainment, and recreation, accommodation and food services, and other services.

[31] Other Building Type includes admin. & support & waste management & remediation services, construction, mining, quarrying, and oil and gas extraction, and wholesale trade.

behind-the-meter or off-grid microgrid that will be planned, designed, engineered, procured, constructed, owned, operated and/or maintained by SoCalGas. Ownership of the microgrid facility under MOT will be negotiated between SoCalGas and the customer. Agreement to provide service is at SoCalGas's discretion and will depend on non-discriminatory factors such as safety, technical feasibility, ownership, acceptability of commercial terms, and resource availability.

SoCalGas will establish cost tracking methods and regulatory accounting treatment to appropriately track and allocate costs and associated revenues from MOT customers. Additional details regarding cost tracking and embedded resources for the MOT are discussed in the Prepared Direct Testimony of Victor Garcia (Chapter 3).

A. Eligibility and Requirements

SoCalGas will provide the MOT on a non-discriminatory basis, dependent on factors such as technical feasibility, ownership, acceptability of commercial terms, and resource availability. The MOT will be open to all existing and prospective non-residential customers and located in SoCalGas's service territory.

In addition to the aforementioned eligibility requirements, prospective MOT customers will need to comply with the following requirements, including but not limited to:[32]

- Customer shall enter into a MOT feasibility agreement[33]
- Customer shall enter into a MOT services agreement[34]
- Customer shall provide adequate assurance acceptable to SoCalGas to establish Customer's creditworthiness
- Customer shall be responsible for utility service provider tariff provisions where applicable.
- Customer shall own the energy provided to or produced from any of the MOT facilities.

[32] *See* Application Attachment A: GO-MOT Tariff Sheet for all eligibility and participation requirements.

[33] Sample agreements will be submitted for approval via advice letter 30 days after this Application is approved.

[34] *Id.*

- Customer shall be responsible for all electric and gaseous fuel bills and associated costs, including those for electricity and gaseous fuels to operate MOT Facilities and any other required utility services (e.g. – water, sewer, etc).

B. Outreach

SoCalGas plans to conduct outreach to potential MOT customers and expects potential MOT customers to have some of the following needs:

- Customers located in regions where the electric operator is unable to provide electric service in a timely manner;
- Customers located in regions with frequent or expected power outages and would benefit from the reliability and resilience provided by a microgrid;
- Customers with high energy demands located in regions with relatively high electricity rates, where a microgrid may provide economic benefits;
- Critical facilities that provide essential services to local communities.

SoCalGas will develop and use competitively neutral scripts in answering inquiries concerning the MOT. The neutral scripts will provide information regarding other service options and protect against SoCalGas gaining an unfair competitive advantage. These neutral scripts can also be utilized by other SoCalGas organizations who engage in periodic discussions with customers.

C. Tariff Execution, Delivery and Support

When a customer expresses a clear interest in the MOT, SoCalGas will begin tracking and charging costs to a MOT internal order. SoCalGas will enter into a feasibility agreement with the customer and conduct a feasibility analysis with the intent of determining the technical and economic feasibility of the design, engineering, construction, operation and/or maintenance of the facility.

Pending the outcome of the feasibility analysis, and for those customers who elect to proceed with the tariff service, SoCalGas will enter into a services agreement with the customer to plan, design, engineer, procure, construct, own, operate and/or maintain the MOT facility and charge the customer a negotiated tariff price of providing the service under the terms of the services agreement. Under the MOT, the service fee calculation charged to each customer under the tariff will be case-specific and will cover the full cost to plan, design, engineer, procure, construct, own, operate, and/or maintain the system, including a return. The service fee may also

include any additional required costs, including but not limited to, insurance, taxes, administrative expenses and decommissioning cost. The components of the tariff service fee will be negotiated between SoCalGas and the tariff customer, including the ownership structure. For example, if the MOT customer is the owner of the microgrid facility, the tariff service fee could include a build-and-transfer fee plus an on-going operation and maintenance service fee. Service fees paid by each customer and terms of service will be governed by the specific agreement with each tariff customer.

SoCalGas will work with third party contractors who have a proven track record of success and adhere to industry best practices, with strong emphasis on safety. Initially, SoCalGas will work alongside a third-party contractor to complete a feasibility study that evaluates various potential energy solutions for each MOT facility. Once the specific energy solution is mutually selected by SoCalGas and the MOT customer, SoCalGas will utilize a third-party engineering, procurement, and construction (EPC) contractor to provide a turnkey solution.

The MOT facility will be designed in compliance with all applicable federal, state, and local codes, to ensure safety, environmental protection, and operational efficiency. SoCalGas will contract with experienced contractors to incorporate applicable regulations, including those related to electrical systems, structural integrity, emissions control, and worker safety. The construction process will follow guidelines set forth by local building codes and zoning regulations, with qualified contractors executing the work to ensure high standards of quality and safety.

D. MOT Facility Maintenance

SoCalGas will maintain the MOT facility for the agreement term that is agreed to with the customer. SoCalGas intends to partner with a third-party vendor(s) to support maintenance activities and to conduct repairs and service equipment when needed, the costs of which will be included in the MOT service fee. The MOT equipment will be monitored remotely to proactively identify units that are not functioning properly and send out maintenance personnel when necessary.

The microgrid facility will also be operated in compliance with applicable laws and regulations. Routine inspections, preventive maintenance, and system upgrades will be carried out in line with any federal, state and local regulations to minimize downtime and maximize operational efficiency.

E. Regulatory Reporting

SoCalGas proposes to conduct annual reporting to the CPUC within 60 days after the close of each reporting period. Each report will contain year-to-date information. SoCalGas proposes the report contain the following information:

- Number of installations
- Total energy generated from MOT facilities (electric and gaseous)
- Total energy used/consumed by MOT facilities
- Estimated annual energy savings
- Expenditures related to tariff administration, installation and O&M

F. Customer Reporting

SoCalGas will provide reports to each MOT Tariff customer providing the energy consumed and produced on a periodic basis.

VI. CUSTOMER BENEFITS

As described in Chapter 1, the MOT not only aligns with California policy, but also provides various benefits to MOT customers. Some of these benefits include:

A. The MOT can provide a solution to support new electric demand and load growth from critical market sectors

The MOT can provide a near-term microgrid solution to energize new electric demand and support load growth from critical market sectors, providing a timely turnkey solution for on-site energy generation. Customers, such as data centers and EV charging facilities, are facing challenges to energize new electric demand because of insufficient existing capacity in the electric grid and prolonged timelines for necessary infrastructure upgrades. The MOT can play a critical role in expediting project timelines and facilitating earlier operational readiness for these customers.

B. The MOT can enhance reliability and resilience for customers

The MOT can provide a microgrid solution for customers facing or anticipating frequent electric power outages and instability during extreme weather conditions. Microgrid facilities can offer and enhance reliability and resilience benefits to customers who are frequently impacted by electric power outages. The MOT can provide these customers an on-site localized source of power that can operate independently from the electric grid. This capability is essential for many

customers, in particular critical facilities, especially during prolonged power outages due to Public Safety Power Shutoffs related to wildfire and rolling blackouts caused by extreme weather events.

C. The MOT can provide a solution that addresses customer affordability concerns by providing more price certainty

The MOT can offer customers economic benefits by providing more price certainty, potential bill savings, and business continuity during a power outage. By generating power onsite, MOT customers can reduce reliance on grid electricity, which is subject to future price uncertainty. The MOT will enable customers to gain better understanding and control of their energy costs for the duration of the MOT agreement. The combination of more price certainty, potential bill savings, and assurance of business continuity provides an attractive option for customers looking to optimize energy use and maintain operations without disruption.

D. The MOT can support customers' sustainability goals

The MOT can offer several environmental benefits by promoting the use of renewable energy sources and clean fuels such as RNG and clean renewable hydrogen. The MOT facilities will serve as a localized source of power and could displace diesel backup generators, which may provide significant local air quality benefits.

MOT customers will have the choice and flexibility to select and procure the fuel type that best aligns with their needs, taking into account the availability of clean fuels, affordability, and sustainability objectives. For instance, large energy consumers (e.g. – 10 MW heavy duty electric vehicle charging facility) who need a solution now due to lack of existing capacity of the electric grid may initially select natural gas (due to current limited availability of renewable fuels), while transitioning to cleaner fuels as they become more widely available. Alternatively, customers with near-term sustainability goals may choose a blend of gaseous fuels to produce low or even negative carbon electricity when charging electric vehicles. As an illustration, the electricity produced from a blend of 88% natural gas and 12% dairy biogas when used in a fuel cell can provide a LCFS carbon intensity just below zero.[35] This is in comparison to California grid power which has a LCFS carbon intensity of approximately 81 gCO2/MJ.[36] This can also

[35] CI for dairy biogas used in a fuel cell (ARB LCFS App # B049001).

[36] CI for CA average grid electricity (ARB LCFS App # B0533).

present a cost-effective solution for MOT customers, as the weighted cost of the blended fuel is substantially lower than procuring 100% RNG from alternative feedstocks (i.e. landfills, wastewater treatment plants).

E. The MOT can provide local community benefits such as backup power for critical facilities, jobs, and air quality improvements

The MOT can offer customers greater energy independence, reliability, and resilience. During times of power outages or grid disruptions due to extreme weather events, microgrid facilities can provide backup power to support continuation of services at critical facilities for the local community. For example, critical facilities such as emergency services, healthcare facilities, and wastewater treatment plants can continue to seamlessly operate during grid service interruptions, especially during extreme weather events.

The MOT can displace existing and avoid future deployment of diesel fueled backup generators. Diesel backup generators can emit high levels of harmful pollutants, including particulate matter, nitrous oxides and carbon monoxide, compared to the microgrid facilities proposed by the MOT. In 2021, the research firm M Cubed conducted a study examining the estimated emissions from backup generators within the Bay Area Air Quality Management District and South Coast Air Quality Management District.[37] The study estimated that diesel generators with capacities exceeding 500 horsepower emit NOx at a rate of roughly 0.011653 metric tons per megawatt-hour (MWh).[38] To provide some context, if such a diesel backup generator were to operate for four hours, it would produce more NOx than a commercially available fuel cell in the United States generates over the course of an entire year.[39] Also, when comparing the amount of NOx produced from SCE net owned generation in 2022[40] compared to

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[37] Bloom Energy, *New Study Shows a Rapid Increase of Diesel-fueled Backup Generators across California* (October 6, 2021), *available at:* https://www.bloomenergy.com/resource/new-study-shows-a-rapid-increase-of-diesel-fueled-backup-generators-across-california/.

[38] *Id.* at Table 7

[39] The NOx emissions from a fuel cell is calculated by taking the average emissions across several fuel cell manufacturers in the United States.

[40] EEI, *Electric Company ESG/Sustainability Quantitative Information for Southern California Edison* (October 23, 2023) at 2, *available at:* https://download.edison.com/406/files/20239/EIX%20ESG_Template_Version_1_Quantitative_vF%202023%2010%2023.pdf?Signature=jjGeSrDEnJVVuknwKsX6NvpKqcs=&Expires=1726516387&

a fuel cell, the SCE net owned generation results in approximately 55% more NOx on an annual basis.[41] The MOT could provide a reduction in these harmful pollutants and improve air quality for the local communities.[42]

The MOT can also support local economic growth and job creation by investing in energy infrastructure and creating new employment opportunities. Developing and operating microgrids requires a wide range of services, including planning, engineering, construction and on-going maintenance. Many of these jobs could be supported by qualified employees and contractors in the local communities.

F. The MOT can help overcome the challenges and barriers faced by customers seeking to implement a microgrid

The MOT will also address several challenges faced by customers who have an interest in leveraging microgrid facilities and may not have the capabilities to develop and deploy them. These challenges and barriers can stand in the way for timely deployment of microgrids, as noted by the "lessons learned" in the California Energy Commission's EPIC Program Research on Microgrid Projects.[43]

- Complex Planning and Design – Designing a microgrid facility involves careful consideration of load profiles, generation capacities, energy storage requirements, and control systems. It requires expertise in electrical engineering, energy management, and grid integration. The complexity of the planning and design process can pose challenges, especially for organizations lacking specialized knowledge or resources. SoCalGas will contract with third parties that are experienced in microgrid facility design and development and will use lessons learned from past projects to incorporate in MOT projects, thereby relieving the customer of these issues.

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[41] The NOx emissions from a fuel cell is calculated by taking the average emissions across several fuel cell manufacturers.

[42] SCAQMD, *Proposed Rule 1110.4 Emergency Generators* (February 14, 2024) at 11-14, *available at*: https://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/pr-1110.4/pr-1110-4-working-group-meeting_1_presentation.pdf?sfvrsn=10.

[43] CEC, *Lessons Learned from Energy Commission Microgrid Projects* at (June 2024) at 42-56, *available at:* https://www.energy.ca.gov/sites/default/files/2024-06/CEC-500-2024-067.pdf.

- Maintenance and Operational Complexity – Involve various components, including generators, renewable energy systems, energy storage systems and control systems. The on-going maintenance of all the microgrid components can be complex as all the components need to operate in synchronization. SoCalGas will work with third parties that are experienced in microgrid operation and maintenance and will use lessons learned from their past projects to incorporate best practices into MOT projects. Also, operation and maintenance personnel will be involved in the early design phases so that their input is incorporated into the microgrid design.
- Grid interconnection and regulatory hurdles – The installation of microgrids involves working closely with a variety of private and public entities, including the local electric utility, local air district, city/county department of building services, etc. Most customers are not familiar with the interconnection process with the electric utility, applying for permits with the local air district, and working with the local city/county to obtain building permits. The MOT will work closely with the customer to manage all these activities and work through any issues that may arise. The local electric utility and Authority Having Jurisdiction (AHJ) will be involved throughout the process so their input is incorporated and the various permitting processes are aligned to support optimal project installation and commissioning.
- Energy Management Complexity – Optimizing energy management within microgrids can pose a challenge. Balancing generation, storage, and consumption of electricity in real-time is complex. As discussed earlier, SoCalGas will work with third parties that are experienced in microgrid design and development and will use lessons learned from past projects to incorporate in MOT projects.

VII. CONCLUSION

For all the reasons discussed above, the MOT provides customers with several benefits such as providing a near term solution to energize new electric demand, enhance reliability and resilience, and more price certainty and affordability at no cost to other ratepayers.

This concludes my prepared direct testimony.

VIII. QUALIFICATIONS

My name is Armando Infanzon. My business address is 555 West 5th Street, Los Angeles California, 90013. I am employed by Southern California Gas Company as Director of Clean Business Development. I have been in my current position since June 2020. In my current position my responsibilities include project development of low carbon initiatives including renewable natural gas, microgrids, carbon capture, utilization and sequestration and clean transportation. I also manage the Research Development & Demonstration (RD&D) Refundable Program and the Federal Energy Retrofit Program (FERP) for SoCalGas.

Between 2011-2014, I served as Smart Grid Policy Manager for San Diego Gas and Electric (SDG&E) representing the company on regulatory and legislative issues at state and federal levels.

I have been employed by Sempra Energy, SDG&E, and/or SoCalGas since 1998 and have held various management level positions covering an array of different areas including business development, regulatory and energy policy, economic analysis, financial planning, corporate finance, and asset management. I received a bachelor's degree in accountancy from the Autonomous University of Baja California in 1997 and a master's degree in business administration from San Diego State University in 2000.

I have over 25 years of experience in electric and gas utilities and energy industries, and I have previously testified before the California Public Utilities Commission.

ATTACHMENT A

To: Southern California Gas Company

Re: Microgrid Tariff Support 4/4/2025

Amy Hill, states the following:

1. I am the Senior Manager for Utilities Infrastructure & Reliability for The Boeing Company ("Boeing").
2. Boeing is an aerospace company with facilities in California.
3. Boeing has energy needs. Because of the nature of our business, it is important that our facilities have a reliable source of power which will not be interrupted.
4. I understand that SoCalGas is seeking authority to provide microgrid services to potential customers. If SoCalGas were able to provide customized microgrid services, we would consider having them provide such services for one or more of our facilities.

Amy G. Hill
Sr. Manager, Utilities Infrastructure & Reliability
Global Real Estate & Facilities
843-743-8941

PEPPERDINE
UNIVERSITY

Senior Vice President & Chief Operating Officer
310.506.6464
24255 Pacific Coast Highway
Malibu, CA 90263

April 7, 2025

California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102

SENT VIA ELECTRONIC MESSAGE

Re: Pepperdine University – Letter of Support for SoCalGas' Microgrid Services Application

To Whom It May Concern:

My name is Nicolle Taylor, and I serve as the Senior Vice President and Chief Operating Officer of Pepperdine University. Pepperdine is an institution of higher education, located at 24255 Pacific Coast Highway in Malibu, California, committed to the highest standards of academic excellence and in preparing its students for lives of purpose, service, and leadership.

The University, which includes an array of classrooms, advanced scientific laboratories, a selection of libraries, residential housing for students, condominium complexes for employees, on-campus food service and dining locations, state-of-the-art Division 1 athletic facilities, event and conference spaces, art display and performance settings, and much more, along with a vast utility and associated infrastructure network to support it all, has dynamic energy needs. Reliable, uninterrupted power is imperative for our campus and the students we serve.

Pepperdine understands SoCalGas is seeking permission from the California Public Utilities Commission to provide customizable microgrid services to potential customers. If SoCalGas were authorized to provide such tailored services, the University would consider partnering with them to explore their implementation on its campus. In light of, among other measures, the potential redundancy, reliability, and sustainable fuel source flexibility benefits that could be realized, Pepperdine is excited to further explore this opportunity.

Pepperdine University supports SoCalGas' microgrid services application, and we are appreciative of your consideration.

Sincerely,

Nicolle Taylor
Senior Vice President and Chief Operating Officer

cc: Phil E. Phillips, Executive Vice President

TLC MODULAR USA, INC

April 9, 2025

Affidavit of Michael Amir Borochov

I, Michael Amir Borochov, hereby declare as follows:

1. I am the Chief Executive Officer (CEO) of **TLC Modular USA Inc.**
2. **TLC Modular USA Inc.** is a leading modular construction company specializing in the design, manufacturing, and installation of modular buildings. Our company is committed to innovation and sustainability, serving a diverse range of sectors including residential, commercial, and healthcare. We pride ourselves on delivering high-quality, cost-effective solutions that address the growing need for housing and infrastructure throughout the United States.
3. Due to the nature of our operations, **TLC Modular USA Inc.** has substantial energy requirements. It is critical that our facilities have access to a **reliable, uninterrupted power supply**. Meeting these energy needs is essential to the successful launch and operation of our current and future facilities.
4. I am aware that **SoCalGas** is seeking authorization to offer microgrid services to potential customers. Should SoCalGas be authorized to provide such services, **we would strongly consider utilizing their customized microgrid solutions** to support the energy needs of our facilities.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 9th day of April, 2025.

Signature: _____

Michael Amir Borochov
Chief Executive Officer
TLC Modular USA Inc.

222 N Canon Street Beverly Hills, Ca. #200 90210 (310) 933-3095
A.borochov@tlcmodularusa.com tlcmodularusa.com j.abramov@tlcmodularusa.com

VISTA METALS CORP.

April 3, 2025

To Whom it May Concern:

Vista Metals Corp. (VMC) is strongly in favor of any tariff provisions that allow for improved power resilience and reliability. SoCalGas proposed Microgrid Optional Tariff appears have the potential to offer both.

VMC operates an aluminum casting facility in Southern California. At this facility, we manufacture certain specific aluminum alloys that are used extensively in commercial and military aviation, in addition to the automotive, national defense and space industries. Without reliable power we cannot serve these important industries.

Our equipment is highly specialized and requires a reliable uninterrupted source of power. Power interruptions of more than a few hours could lead to uncontrolled molten metals solidification which in turn would damage our furnaces and reaction vessels. We find ourselves consistently worried on hot days about curtailments and on windy days about PSPS shutoff events. Having an alternative source of power in place that would allow us not to have these worries would have value.

In closing, we understand that SoCalGas is seeking authority to provide microgrid services to potential customers. If SoCalGas were able to provide microgrid services, we would consider having them provide such services to our Fontana facility.

Sincerely,

Shayne Seever
Vice President, Project Management

13425 Whittram Ave., Fontana, CA 92335 • Phone (909) 823-4278 • www.vistametals.com

NATIONAL CEMENT
National Cement Company of California, Inc.

15821 Ventura Blvd.
Suite 475
Encino, California 91436-4778
Telephone: 818-728-5200

Subject : Micro Grid Optional Tariff

Lebec, April 3rd, 2025

I, Bruno Salomon, declare as follows:

1. I am the Plant Director of the National cement Co of California, Inc. (NCCCA) Lebec Cement Plant. NCCCA owns and operates this cement plant located in Lebec, CA (kern County) and a network of Ready mix operations throughout the Los Angeles and Central Valley areas
2. NCCCA has been producing and supplying cement since 1967 to the Los Angeles and Central valley markets, in vast majority via its network of ready mix operations (LA, Bakersfield, Fresno)
3. NCCCA has particular energy needs. Because of the nature of our business, it is important that our facilities have a reliable, affordable and sustainable source of power which will not be interrupted. In addition, NCCCA, in partnership with the US Department of Energy, is currently developing a full decarbonization investment, including the construction of a First of a kind in CA carbon capture facility. Significant additional power needs must be met before the new facilities can be commissioned and operated.
4. I understand that SoCalGas is seeking authority to provide microgrid services to potential customers. If SoCalGas were able to provide customized microgrid services, we would consider having them provide such services for our facilities.

Bruno Salomon

NICHOLS FARMS
HANFORD, CA

CALIFORNIA PISTACHIOS & ALMONDS
FAMILY OWNED SINCE 1961

I, Mark Luplow, declare as follows:

1. I am the Director of Engineering and Maintenance at Nichols Farms.
2. Nichols Farms is a grower, processor, marketer and shipper of pistachios.
3. Nichols Farms has particular energy needs. Because of the nature of our business, it is important that our facility have a reliable source of power which will not be interrupted.
4. I understand that SoCalGas is seeking authority to provide microgrid services to potential customers. If SoCalGas were able to provide customized microgrid services, we would consider having them provide such services for our facility.
5. Nichols Farms participation in in such services will be contingent on the microgrids cost effectiveness.

Date: 4/2/25

Name: Mark Luplow

What Powers You

April 3, 2025

Dear Mr. Malik

Bloom Energy writes in support of SoCal Gas proposed tariff for microgrid service in California. We support the increased deployment of microgrids in California to provide timely and reliable power to residents and businesses while mitigating the risks of wildfire and public safety power shutoff events.

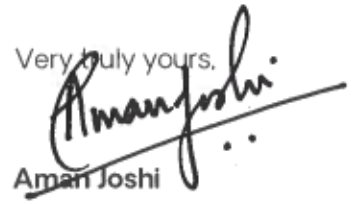
Bloom Energy is a California-based manufacturer of solid oxide fuel cell technology that utilizes an electro-chemical process to power non-combustion microgrids. Bloom Energy's solid oxide fuel cells are designed in a modular fault-tolerant format that provides mission critical reliability with no downtime for maintenance. Bloom Energy's fuel cells have proven resilient through outages caused by hurricanes, winter storms, earthquakes, forest fires, and other extreme weather and natural disasters.

California currently faces simultaneous energy challenges: an energy shortage, climate and emissions requirements, resiliency concerns, and an affordability crisis. Microgrids can play an important role by providing flexible and resilient solutions that can power critical facilities and important community assets including hospitals, telecommunications, supermarkets, data centers, and water treatment plants amongst other facilities. Microgrids offer a unique solution to compliment the existing electrical grid and provide resiliency while leveraging a wide range of complementary technologies to meet a given power requirement.

Microgrids offer a way to expand generation capacity and power end users without burdening non-participating ratepayers in the process. Despite the many benefits of microgrids, these systems can be daunting for customers to install, requiring them to engage directly with technical experts and technology providers. The involvement of a trusted energy supplier like SoCal Gas would provide customers with a relatively simple option and would greatly advance the commercialization of microgrids in California.

We fully support the proposed SoCal Gas microgrid tariff and encourage the Commission to consider and approve the proposal.

Very truly yours,



Aman Joshi
Executive Vice President, Chief Commercial Officer

Bloomenergy

Bloom Energy Corporation
4353 North First Street, San Jose, CA 95134
408 543 1500
www.bloomenergy.com

HyAxiom, Inc.
101 East River Dr.,
East Hartford, CT- 06108
T - 860 727 2200

Date: April 4, 2025

Southern California Gas Company (SoCalGas)
350 S. Grand Ave, Los Angeles, CA 90017

Re: Letter of Support, *SoCalGas*
Ref: California Advanced Microgrids

To whom it may concern:

HyAxiom, Inc. enthusiastically supports the development of advanced microgrid projects by SoCalGas targeting energy efficiency improvements, combined heat and power, and reliable alternative energy generation. This letter confirms our interest in supporting their proposed microgrid concepts, and any resulting projects that SoCalGas endeavors to deploy HyAxiom fuel cell technologies, including within both distributed energy and advanced microgrid installations in California.

HyAxiom is a member of the Doosan group, a South Korea-based conglomerate with a 125-year history focusing on global businesses in industrial and energy sectors (including the Bobcat business in the United States). Founded in 2014 following the acquisition of the assets and intellectual property of the former UTC Power (UTC Power, a division of United Technologies Corporation was known for providing fuel cells for primary power of the Apollo spacecraft command module), HyAxiom has leveraged the accumulated experience and knowhow of its employees and the more than 50 years of broad investment and development in hydrogen and fuel cell technologies to become an established global leader in providing stationary fuel cell solutions to utility and industrial end-users. HyAxiom is headquartered in East Hartford, CT and employs more than 200 people in the United States.

The HyAxiom PureCell M400 fuel cells offer significant benefits to microgrids in California, making them an ideal choice for these energy solutions. One of the primary advantages is the ability to provide reliable and continuous power, which is crucial for maintaining stability in microgrids. The HyAxiom PureCell M400 have a high per unit capacity factor, around 95%, compared to alternatives like solar or wind, which typically have capacity factors between 15-30%. This means that fuel cells can consistently generate electricity, reducing the risk of power shortages and enhancing the resilience of the microgrid. Additionally, these fuel cells have a low environmental impact, producing minimal emissions of NOx and SOx, and they can significantly reduce CO2 footprints and greenhouse gas emissions. Their compact footprint allows for flexible siting, making them suitable for various applications, from universities and high rise residential to commercial and industrial businesses. In California, where the demand for clean and efficient energy is high, our fuel cells are a valuable asset in supporting the state's ambitious environmental goals. The PureCell M400 is certified by the California Air Resources Board (CARB) pursuant to the DG Certification Regulation by Executive Order DG-047.

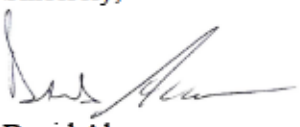
HyAxiom shares SoCalGas's commitment to developing reliable and environmentally friendly solutions for the immediate energy demands and supporting a transition to a carbon free energy future. The HyAxiom fuel cell technology is futureproof and can be readily adapted over the life of these very important microgrid applications. HyAxiom fuel cells deployed within a microgrid are important because they provide an

HyAxiom, Inc.
101 East River Dr.,
East Hartford, CT- 06108
T - 860 727 2200

immediate solution to the energy challenge and allow for a pathway for the transition to Hydrogen when it becomes available with the same fuel cell that was originally installed.

We look forward to working with SoCalGas on these projects.

Sincerely,



David Alonso
Chief Commercial Officer

Email: David.Alonso@doosan.com
Phone: 860-968-7517

April 3, 2025

To: Southern California Gas Company

Subject: Letter of Support for SoCalGas in Advancing Behind-the-Meter Microgrid Solutions in Southern California

To Whom It May Concern:

I hope this letter finds you well. I am reaching out to share insights on the growing role of microgrids in Southern California and demonstrate Mainspring Energy's support for SoCalGas in its CPUC application to further the deployment of on-premise behind-the-meter microgrids.

Mainspring Energy is at the forefront of next-generation power generation, delivering highly efficient, fuel-flexible linear generators that provide reliable, dispatchable, and sustainable energy. Our technology is designed to seamlessly integrate with renewables and grid infrastructure, helping businesses and communities enhance resilience while reducing energy costs.

Southern California faces increasing energy challenges driven by rising demand, aging grid infrastructure, and the growing frequency of extreme weather events. At the same time, policy initiatives and incentives are expanding opportunities for decentralized energy solutions, making microgrids a strategic investment for utilities, businesses, and municipalities. With the state's push toward decarbonization and grid modernization, microgrids present a unique opportunity to enhance reliability while supporting the transition to cleaner energy sources.

Microgrids offer a flexible and scalable approach to addressing Southern California's energy constraints. By integrating Mainspring's linear generators along with other renewables and energy storage technology, microgrids can help to mitigate capacity shortfalls, enhance reliability, improve affordability and strengthen resilience.

As Southern California continues to navigate complex energy challenges, microgrids developed by SoCalGas and powered by Mainspring's technology can play a crucial role in ensuring a more stable, cost-effective, and sustainable energy future. Please feel free to reach out to me should you have any questions regarding this letter of support.

Best regards,

Rick Whisman

Rick Whisman
Vice President, Sales
Mainspring Energy, Inc.
rick.whisman@mainspringenergy.com

HYLIION
1202 BMC Dr. Cedar Park, TX 78613

April 4, 2025

Mr. Armando Infanzon
Director – Clean Energy Business Development
Southern California Gas Company
555 w 5th St
Los Angeles, CA 90013

Dear Armando:

Hyliion Inc. ("Hyliion") has pioneered a transformative approach to generate clean, dispatchable, and affordable electricity through our KARNO™ Power Module. This innovative linear generator leverages advanced additive manufacturing to enable operation on diverse fuel sources while also offering superior efficiency, reduced operating costs, enhanced power density, near zero emissions, and minimized noise compared to traditional power generation technologies.

The KARNO Power Module's adaptability and efficiency makes it an ideal solution to support California's energy goals, providing a resilient power source that can adapt to varying application conditions, future fuel sources and changing environmental conditions. In addition, microgrid solutions powered by KARNO Power Modules offer numerous benefits, including increased energy security, reduced transmission losses, and ability to seamlessly integrate with and supplement renewable energy sources.

Hyliion enthusiastically supports SoCal Gas's initiative to develop microgrid solutions in California. Your extensive operational footprint is uniquely positioned to address the evolving demands of the market, and we look forward to partnering with you to quickly bring power to where it is needed most. We believe that such efforts are instrumental in achieving a more sustainable and resilient energy future. Additionally, we are open to collaborating with various other stakeholders and partners who share this common vision and leverage expertise.

Together, we can pave the way for a brighter and more sustainable future by utilizing new and advanced solutions to meet evolving energy demands efficiently and affordably.

Sincerely,

Thomas J. Healy
Founder and CEO
Hyliion Inc.

California Bioenergy LLC
500 N. Akard St.
Suite 1500
Dallas, TX 75201
Phone: 559-667-9560
www.calbioenergy.com

04/14/2025

Southern California Gas Company

Subject: *Letter of Support for SoCalGas's proposed microgrid tariff.*

To Whom It May Concern,

On behalf of California Bioenergy LLC (CalBio), I am writing to express our support for Southern California Gas Company's (SoCalGas) proposed microgrid tariff.

CalBio is a leading developer of renewable natural gas (RNG) projects from dairies. We partner with dairy farmers to capture methane emissions, convert them into carbon-negative RNG, and deliver meaningful climate and air quality benefits. Our projects support California's environmental goals and contribute to the state's leadership in clean energy innovation.

As California continues to confront grid reliability challenges, wildfire risks, and the need for localized energy resilience, microgrids present a compelling solution. These systems offer greater reliability and resiliency, can provide potential bill savings to customers, and enable additional productive use for RNG. We see microgrids as a promising end-use for RNG—especially in the applications for electric vehicle charging. Carbon negative RNG directed to clean generation technologies can achieve zero carbon intensity energy for vehicles, support local economic development and environmental sustainability.

We believe SoCalGas is well-positioned to offer microgrid services under the proposed tariff, given their expertise in energy infrastructure and commitment to supporting California's decarbonization goals. We support the development of programs like this proposed tariff that allow SoCalGas to partner with non-residential customers on custom, resilient microgrid solutions. We also see strategic value in expanding the use of RNG through microgrids beyond its current use in transportation and increasingly more into utility procurement.

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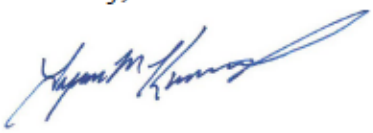
500 N. Akard St.
Suite 1500
Dallas, TX 75201
Phone: 559-667-9560
www.calbioenergy.com

We appreciate the Commission's attention to SoCalGas' proposed tariff. It represents an important step toward enhancing grid resilience and expanding the role of clean, renewable fuels in California's energy system.

Sincerely,



Ty Korenwinder
Vice President of Dairy Relations and Dairy Operations.
California Bioenergy LLC

California Hydrogen Business Council

901 H St Ste 120
#74
Sacramento, CA 95814
(310) 455-6095
www.CaliforniaHydrogen.org

Letter of Support
Southern California Gas Company
Application for Microgrid Optional Tariff Program

The California Hydrogen Business Council (CHBC) supports the application of the Southern California Gas Company (SoCalGas) in the Microgrid Optional Tariff (MOT) program to provide non-residential property owners with the benefit of microgrid service of energy. The California Hydrogen Business Council is the largest and longest-established membership-based hydrogen trade association comprised of 110 companies, agencies, and individuals involved in the business of hydrogen and fuel cells.

Microgrids offer significant flexibility to all types of customers and facility owners based on their specific energy needs. Non-combustion fuel cells – paired with storage, wind, solar, demand response, or other technologies – can serve as the backbone for microgrids that integrate numerous onsite behind-the-meter energy resources and controls. Microgrids that use fuel cell systems as baseload power can immediately disconnect from the grid and island (operate autonomously) from the larger grid when circumstances demand (e.g., during grid outages or Public Safety Power Shutoff events). The fuel cell installation innately operates as an energy management system, with critical loads for backup power already identified and immediately followed in the case of an outage. A fuel cell system can smoothly transition from grid parallel operation to fully power the load for any length of grid outage, without interruption to the customer, and to seamlessly re-connect to the utility grid network when its power is restored adding to overall system reliability.

Microgrids provide significant benefits to customers in the form of lower emissions, resilience, and the ability to island from the grid. Energy resources like microgrids with hydrogen fuel cell systems can also operate continuously, peak shave, and address capacity shortfalls while also providing backup power. Some fuel cell systems are load-following which facilitate the fuel cell system providing firm baseload power to the microgrid and providing grid services like peak shaving. There are also microgrids that can generate and store hydrogen onsite creating an even more resilient clean energy system.

Without microgrids, temporary diesel combustion generation will be used for backup power, without adding actual capacity on the grid. Further, continued installation of diesel generators for even temporary generation engenders a 20-year highly polluting generation asset, making it even more difficult to meet State, Federal, and corporate decarbonization goals.

Additionally, the continued and increased use of diesel generators results in negative air quality impacts.

With SoCalGas proposing to manage the planning, construction, and maintenance of the microgrid, the value proposition to the customer is increased. Importantly, the MOT allows for the costs of the microgrid to be recovered from the tariff customer without requiring subsidies from other ratepayers.

The CHBC therefore supports the application of SoCalGas to the MOT program to facilitate the use of microgrids to provide ratepayers with significant reliability, resilience, and environmental benefits.

Sincerely,

Katrina M. Fritz
President & Chief Executive Officer
California Hydrogen Business Council

HYDROGEN FUEL CELL PARTNERSHIP

Hydrogen Fuel Cell Partnership
3300 Industrial Blvd. Suite 200
West Sacramento, CA. 95691
916-371-2870

www.h2fcp.org | info@h2fcp.org

April 9, 2025

Dr. Yuri Freedman
Senior Director of Business Development
Southern California Gas Company
555 W. 5th Street
Los Angeles, CA 90013

Re: Contextual input on the social benefits and use cases of the proposed Microgrid Optional Tariff.

Dear Dr. Freedman:

The Hydrogen Fuel Cell Partnership (H2FCP) appreciates the opportunity to provide context on the potential use cases and broader social considerations relevant to the Microgrid Optional Tariff (MOT) being explored by Southern California Gas Company.

H2FCP is a 501(c)(3) non-profit public-private partnership that includes government agencies, vehicle manufacturers, fuel cell manufacturers, component suppliers and energy providers working together to advance the commercialization of hydrogen and fuel cell technologies. Our work focuses on facilitating the deployment of hydrogen infrastructure and vehicles to support the United States' energy, climate, and air quality goals.

From our perspective, the proposed MOT may have relevance to a variety of commercial and public sector entities seeking to address energy resiliency, operational continuity, or decarbonization targets. Facilities such as logistics hubs, public transit depots, manufacturing plants, and emergency response centers frequently evaluate microgrid options as a resource for managing local energy resources, protect against outages and meet their social responsibilities.

Some of our stakeholders have noted that clean, dispatchable technologies—such as hydrogen fuel cells—are increasingly evaluated as components of microgrid systems, especially in applications requiring 24/7 reliability, minimal emissions, and scalability. Hydrogen-based systems can complement renewable generation by offering long-duration backup power and grid-independent functionality. These characteristics may be particularly relevant to MOT-eligible customers operating in remote areas or those with critical up-time requirements, recognizing that the program would be open to all commercial, industrial and wholesale customers.

Additionally, the structure described for the MOT—where costs are recovered directly from participating customers—may offer a pathway for entities without internal technical or financial capacity to access microgrid solutions in a manageable, customized format. The concept of utility-facilitated infrastructure with customer-specific design parameters may also enable early-stage or high-impact deployments that inform best practices across industries.

H2FCP recognizes that decisions regarding program implementation and funding mechanisms rest with regulatory authorities and utility planners. We offer these observations solely to highlight the context in which microgrid options, including hydrogen-enabled systems, are being considered by stakeholders focused on clean energy and energy security.

We appreciate the opportunity to share these insights and look forward to continued dialogue on the evolving role of distributed energy solutions in California's energy landscape.

Sincerely,

David Park
Director, Industry Affairs

ATTACHMENT B

2025 MICROGRID MARKET STUDY IN SOUTHERN CALIFORNIA GAS COMPANY'S TERRITORY

Submitted to:
SoCalGas

Prepared by:
Verdant Associates, LLC

April 4, 2025

VERDANT

1 SUMMARY

Southern California Gas Company (SoCalGas) commissioned Verdant Associates to identify and evaluate the customer sectors and segments in SoCalGas's service territory that could benefit from having behind-the-meter (BTM) microgrids. This microgrid market study was conducted to gain an understanding of the technical and serviceable addressable market for behind-the-meter microgrids in SoCalGas's service territory. For each segment with microgrid potential, Verdant Associates identified the viability of different configurations and sizes of microgrid technologies and assessed different benefits the customers may realize including reliability, resilience, and economic payback. Verdant also conducted a literature review within California and the greater U.S. to better understand the types of customer segments and facility types likely to benefit from a behind-the-meter microgrid. Lastly, Verdant Associates identified barriers to microgrid installation, focusing on likely space limitations, existing systems that may limit the microgrid benefits, and permitting or regulatory requirements.

Microgrid Overview

Microgrid planning and development have grown significantly in recent years, driven by technological advances such as electrochemical batteries, rising needs for reliability and resilience, economic pressures—where outages are unaffordable for businesses like grocery stores or industrial sites—and growing demand from EV charging and data centers. The value of a microgrid depends on factors like design, purpose, and grid interaction. Islanding during outages addresses reliability and resilience needs while promoting onsite energy resources integration. Grid-connected continuous microgrids unlock even greater value by enabling customer participation in broader markets such as demand response or energy and ancillary services.

Microgrids

"…an interconnected system of loads and energy resources, including, but not limited to, distributed energy resources, energy storage, demand response tools, or other management, forecasting, and analytical tools, appropriately sized to meet customer needs, within a clearly defined electrical boundary that can act as a single, controllable entity, and can connect to, disconnect from, or run in parallel with, larger portions of the electrical grid, or can be managed and isolated to withstand larger disturbances and maintain electrical supply to connected critical infrastructure".

*Senate Bill 1339. Stern. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB1339

1.1 LITERATURE REVIEW

The Department of Energy maintains a database of microgrids throughout the U.S. which provides information on the 1) the location of the microgrid, 2) the year it went operational, 3) the type of microgrid – off-grid, grid-connected, conditional or continuous, and 4) the onsite energy resources supporting the

microgrid and the size (in MW) of those technologies, among other information.[1] Table 1-1 summarizes information from that database.

TABLE 1-1: U.S. AND CALIFORNIA MICROGRIDS

Location	Microgrid Count	Microgrid MW Capacity	Technologies Installed	Facility Types
Non-California	952	4,762	Natural gas (33%) and CHP (22%) represent the plurality of installations by project count	46% are installed in commercial facilities. This is followed by City/Community microgrids (22%) and College/University (8%). By MW capacity, City/Community (27%), College/University (27%) and Military facilities (17%) represent a plurality.
California	171	581	Solar plus storage (33%) and fuel cells (28%) represent the plurality.	44% are installed in commercial facilities. This is followed by Hospital/Healthcare microgrids (12%) and City/Community (9%). By MW capacity, College/University (24%), Military facilities (22%) and Hospital/Healthcare (16%) represent a plurality.
CA cities with SCG service	54	277	Fuel cells (29%) and storage plus solar (33%) represent the vast majority. CHP accounts for 12%.	Roughly 50% are installed in commercial facilities.* Hospitals account for 18%. Most are less than 10 MW, apart from 25-50 MW microgrids at colleges or military bases.

*Currently, there is one data center and one electric vehicle charging microgrid installed in areas where SCG provides gas service.

The technology groupings are quite diverse with Natural Gas and CHP representing pluralities outside of California. Solar plus storage and fuel cells represent the most common onsite energy resource combinations in California, with over half of California microgrids becoming operational since 2019. The use cases for microgrids are quite varied as well. Commercial facilities like offices, grocery stores, EV charging stations, data centers and schools represent individual utility customers. Universities, hospitals, airports, and military facilities represent campus or community microgrids with individual customers or multi-owner properties with contiguous sets of buildings and facilities. Microgrids are also built around critical infrastructure like wastewater treatment plants, pumping stations, and cooling centers. These provide reliability and resilience to critical infrastructure and community assets.

[1] "Combined Heat and Power and Microgrid Installation Databases", U.S. Department of Energy, https://doe.icfwebservices.com/microgrid. As of 10/22/2024.

1.2 TECHNICAL ADDRESSABLE MARKET

The technical addressable market (TAM) is an estimate of the population of buildings within the SoCalGas service territory that is technically able to install a microgrid. The development of the TAM encompasses two main tasks. Population development characterizes the population of the non-residential market in SoCalGas's territory. This step included gathering customer data from a variety of sources, including from SoCalGas, EIA Electric Industry Power Reports, California Energy Commission (CEC) Commercial Benchmarking data, among other sources. The TAM development restricted the building population to those with technical feasibility. We utilized Commercial Building Energy Consumption Survey (CBECS) and Manufacturing Energy Consumption Survey (MECS) data, as well as the CEC Commercial Benchmarking data to understand technical facility details, such as lot size, roof space, electrical consumption, and total square footage. The first step, population development, is summarized in Figure 1, and the final SoCalGas territory population is shown Table 1-2 below.

FIGURE 1: SOCALGAS TERRITORY CUSTOMER POPULATION DEVELOPMENT

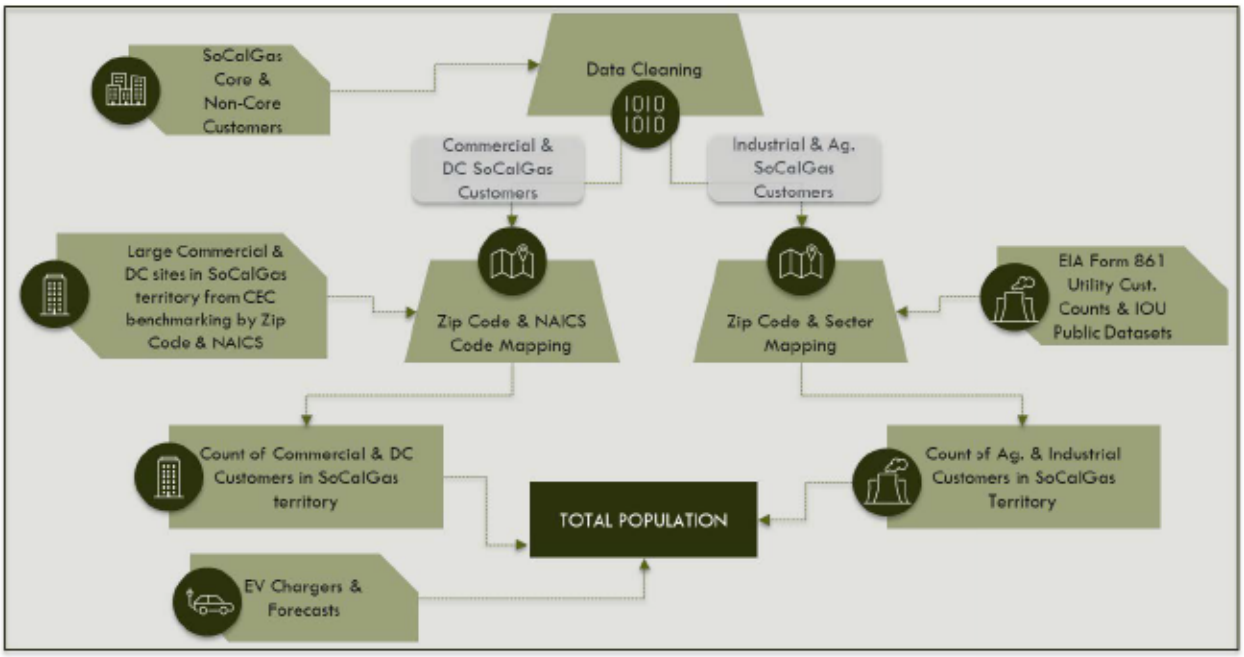


TABLE 1-2: FINAL SOCALGAS TERRITORY POPULATION

Sector	Sector Count
Commercial	159,944
Data Center	17
Industrial	16,225
Agricultural	7,398
EV Charging	6,852
Total Population	**190,436**

The TAM development process characterized two main eligibility criteria– whether the facility had a large enough roof space to accommodate solar PV and whether the facility had a large enough lot space to accommodate PV or other technologies such as fuel cells or linear generators. The available lot size and roof space was compared to the total annual electrical load of the facility to ensure that the optimal combination of generation technologies that could be installed given the available space could support the facility's entire electrical load.

The result was an electrical and natural gas usage and square footage estimate for every record in the SoCalGas dataset, a determination on whether the facility was eligible for a microgrid, and a final weight that weighted the count of SoCalGas records up to the entire SoCalGas territory. The final estimate of facilities in the TAM is approximately 185,000, indicating that most facilities in SoCalGas territory could technically support a microgrid.

1.3 SERVICEABLE ADDRESSABLE MARKET

The Serviceable Addressable Market (SAM) represents the portion of the TAM that a microgrid can cost-effectively service. NREL's REopt[2] tool is used to optimize microgrid technologies based on scenarios with varying resilience values. A key assumption is that microgrid technologies cover 50 percent of a building's load for outages of six hours or less.

1.3.1 Analytic Methodology

The analysis relies on REopt to determine the optimal mix of renewable energy, storage, and conventional generation to meet a customer's goals related to cost, resilience, and sustainability. The tool considers key inputs such as microgrid design, grid resilience planning, and emissions reduction strategies. The three

[2] The Renewable Energy Integration and Optimization tool is a technology – economic decision platform developed by the National Renewable Energy Lab (NREL) designed to identify the optimal mix of distributed energy resources to meet cost, resilience, emission, and energy goals set by the developer. https://www.nrel.gov/reopt/

key analytical aspects of the analysis include creating representative agents, quantifying the value of lost load (VoLL), and estimating the microgrid potential.

Representative agents are created for each sector, incorporating key attributes such as energy usage, load shapes, and available geographic area for microgrid deployment. Each agent represents a group of establishments, using a single energy-use profile to estimate results that are extrapolated to the group. The agents serve as proxies for real-world non-residential buildings. Each representative agent is characterized by annual energy consumption, roof and parking area, and a financial value of resilience or their VoLL. By integrating agent-specific characteristics we can develop a distribution of VoLL that reflects the variability in outage costs among different agent types. This distribution provides a more granular understanding of resilience needs, enabling better-informed decisions on microgrid deployment and energy investment strategies to minimize economic risks associated with power interruptions.

REopt uses the inputs described above to develop an economically optimized SAM for microgrids. The economic optimization in REopt requires several key financial assumptions including the cost of PV, BESS, fuel cells, and other microgrid hardware, the expected life of the microgrid, and discount and interest rates. For this study, REopt is run with and without a financial value of resilience, though incorporating a value for resilience is often critical for microgrid economic viability and sizing.

1.3.2 Results

The high level microgrid market study results include the following:

- There is considerable untapped microgrid potential in SoCalGas' territory.
- The microgrid potential grows substantially if a financial value of resilience is factored into the economic assessment.
- Many additional microgrids may be possible if customers are willing or encouraged to install systems with payback periods beyond 5 years.
- Increases in knowledge and awareness are necessary to tap into a larger share of the SAM
- Additional programs, incentives, and financial mechanisms may also be needed to grow the adoption of microgrids

Initially we estimate microgrid potential when no financial value is ascribed to resilience and we assume microgrids will only be adopted if they have a payback period less than five years. This assessment found that microgrids were economically viable in many customer segment types, with a total capacity of approximately 5,500 MW of PV and 25,700 MW of fuel cells installed across approximately 20,600 sites

(see Table 1-3 for a list of the customer segment types without a financial resilience value). For comparison purposes, the literature search found 54 existing microgrids in SoCalGas' territory (see Table 1-1 above), a small share of the economically optimized potential for microgrids.

TABLE 1-3: SERVICABLE ADDRESSABLE MARKET ESTIMATES WHEN NO FINANCIAL VALUE ASCRIBED TO RESILIENCE

Customer Segment	Total PV* (MW)	Fuel Cell (MW)	Potential Number of Microgrids
Accommodation and Food Services	169	161	324
Admin. & Support & Waste Mgmt. & Remediation Services	13	111	89
Agriculture, Forestry, Fishing and Hunting	-	-	-
Arts, Entertainment, and Recreation	-	-	-
Construction	-	-	-
Data Center	-	-	-
Educational Services	-	-	-
EV Chargers	-	-	-
Finance and Insurance	106	885	713
Health Care and Social Assistance	440	527	395
Information	33	272	219
Management of Companies and Enterprises	5	41	33
Manufacturing	-	-	-
Mining, Quarrying, and Oil and Gas Extraction	630	328	167
Other Services (except Public Administration)	348	2,909	2,343
Professional, Scientific, and Technical Services	11	89	71
Public Administration	95	796	641
Real Estate and Rental and Leasing	3,699	19,558	15,643
Retail Trade	-	-	-
Transportation and Warehousing	-	-	-
Utilities	-	-	-
Wholesale Trade	-	-	-
Total	5,548	25,676	20,638

* This reflects the total PV size. Every PV system is accompanied by a BESS, although the size of the BESS is not quantified here.

Table 1-4 presents the serviceable addressable market estimates when the microgrid optimization process is undertaken with financial value ascribed to resilience (i.e. VoLL is not 0). The SAM microgrid potential for PV and BESS microgrids is substantially larger when the model incorporates a financial value of resilience. The estimated capacity of fuel cells is slightly larger with a financial value for resilience than without.

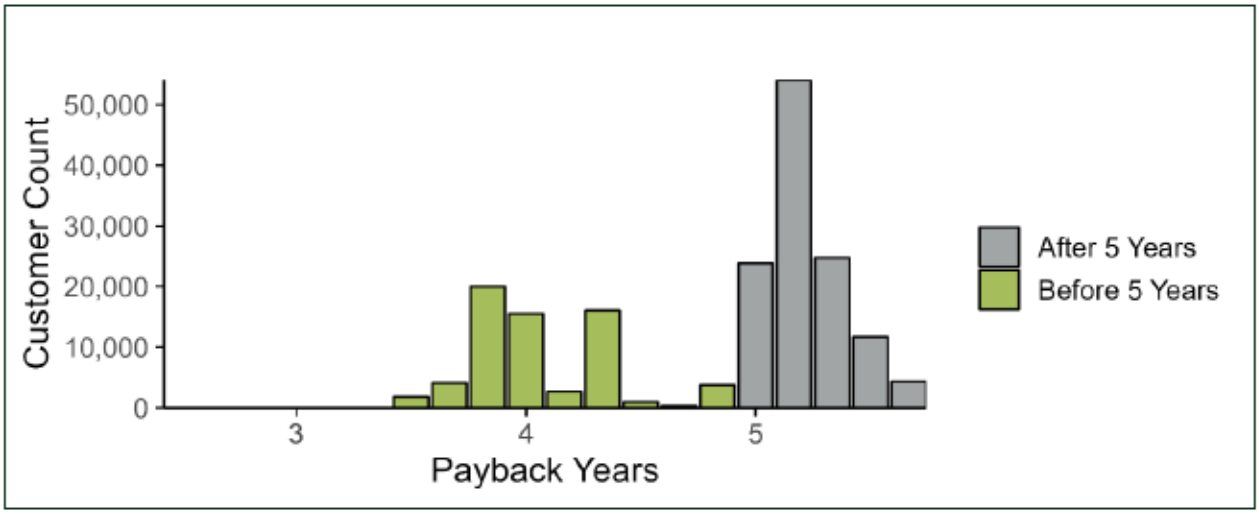
TABLE 1-4: SERVICABLE ADDRESSABLE MARKET ESTIMATES WHEN FINANCIAL VALUE IS ASCRIBED TO RESILIENCE

Customer Segment	Total PV* (MW)	Fuel Cell (MW)	Potential Number of Microgrids
Accommodation and Food Services	1,867	161	17,154
Admin. & Support & Waste Mgmt. & Remediation Services	19	111	200
Agriculture, Forestry, Fishing and Hunting	942	370	1,851
Arts, Entertainment, and Recreation	1,120	-	5,057
Construction	12	-	468
Data Center	2	1	4
Educational Services	2,025	-	9,156
EV Chargers	612	240	1,713
Finance and Insurance	107	885	718
Health Care and Social Assistance	935	527	3,959
Information	75	272	699
Management of Companies and Enterprises	11	41	152
Manufacturing	1,017	-	4,059
Mining, Quarrying, and Oil and Gas Extraction	630	328	167
Other Services (except Public Administration)	530	2,909	3,740
Professional, Scientific, and Technical Services	20	89	235
Public Administration	211	796	1,858
Real Estate and Rental and Leasing	3,819	19,558	16,241
Retail Trade	765	-	6,243
Transportation and Warehousing	196	-	1,664
Utilities	93	37	260
Wholesale Trade	61	-	516
Total	15,067	26,323	76,114

* This reflects the total PV size. Every PV system is accompanied by a BESS, although the size of the BESS is not quantified here.

While the results presented above assume businesses will only find microgrids with a payback under five years viable, new or existing financial mechanisms may encourage companies to invest in microgrids with longer paybacks. Figure 2 presents the REopt estimated payback periods for microgrid installation across all customers in the TAM. This figure highlights two key points: first, a significant number of customers meet the five-year payback requirement for microgrid adoption (as also seen in Table 1-4); and second, there is considerable potential for additional microgrids to be installed if this payback requirement were relaxed, potentially with the support of utility programs, funding, or other financial mechanisms (potentially including power purchase agreements).

FIGURE 2: TAM CUSTOMER MICROGRID PAYBACK YEARS



It is important to recall that REopt is producing optimized estimates of the microgrid market from an economic point of view. For many of these sites, however, there may be other financial concerns, a lack of knowledge and willingness, and other constraints that may limit the microgrid potential beyond the optimized, economically feasible potential estimated within REopt. In addition, the REopt microgrid potential market was developed with an expansive definition of a microgrid, including microgrids that could include only PV and BESS or only fuel cells. Conditional on this definition of a microgrid, the number of sites with economic potential supports the conclusion that the microgrid market within SoCalGas's territory is an underserved market within select customer segment types. Tapping into this market, however, may require extensive marketing and education programs, incentives, and or favorable rates to encourage customers to participate in the market.