Company: San Diego Gas & Electric Company (U 902 M)
Proceeding: 2024 General Rate Case
Application: A.22-05-015/-016 (cons.)
Exhibit: SDG&E-14-E

PREPARED DIRECT TESTIMONY OF

DANIEL S. BAERMAN

(ELECTRIC GENERATION)

ERRATA

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

May 2023

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<u>**SUMMARY**</u>

ELECTRIC GENERATION (In 2021 $)			
	2021 Adjusted-Recorded (000s)	TY2024 Estimated (000s)	Change (000s)
Total Non-Shared Services	36,576	40,809	4,233
Total O&M	**36,576**	**40,809**	**4,233**

ELECTRIC GENERATION (In 2021 $)				
	2021 Adjusted-Recorded (000s)	Estimated 2022 (000s)	Estimated 2023 (000s)	Estimated 2024 (000s)
Total CAPITAL	**43,625**	**37,375**	**45,406**	**43,854**

Summary of Requests

- SDG&E's Electric Generation fleet consists of the Palomar Energy Center (PEC), Desert Star Energy Center (DSEC), Miramar Energy Facility (MEF), and Cuyamaca Peak Energy Plant (CPEP). I describe each of these plants and their forecasted costs in greater detail in my testimony.
- SDG&E's current Electric Generation Distributed Energy Facilities (DEF) fleet consists of the Escondido Battery Energy Storage System (Escondido BESS), El Cajon Battery Energy Storage System (El Cajon BESS), the Ramona Solar Energy Project (RSEP), Miguel Vanadium Redox Flow (VRF) BESS, and the Top Gun BESS. I describe each of these DEF and their forecasted costs in greater detail in my testimony.
- New Distributed Energy Facilities (DEF) will be added to the Electric Generation fleet in 2022 and 2023. Additional employees are included in the forecast for 2022 to support the expansion of the SDG&E fleet. I describe each of these DEF and their forecasted costs in greater detail in my testimony. These facilities are:
    - Scheduled for 2022 and 2023
        - Borrego Springs Microgrid
        - Butterfield Ranch Microgrid
        - Cameron Corners Microgrid

- Fallbrook BESS
- Kearny BESS
- Melrose BESS
- Pala-Gomez Creek BESS
- Ramona Microgrid
- Ramona Solar
- Shelter Valley Microgrid
- Westside Canal BESS

PREPARED DIRECT TESTIMONY OF DANIEL S. BAERMAN (ELECTRIC GENERATION)

I. INTRODUCTION

A. Summary of Electric Generation Costs and Activities

My testimony supports the Test Year 2024 forecasts for operations and maintenance (O&M) costs for non-shared services, and capital costs for the forecast years 2022, 2023, and 2024, associated with the electric Generation area for SDG&E. This testimony covers Generation Plant, Distributed Energy Facilities and Administration. Table DSB-1 below summarizes my sponsored costs. San Onofre Nuclear Generating Station (SONGS) costs that were previously requested in SDG&E's Electric Generation Chapter in the TY 2019 General Rate Case (GRC) are now being requested in the Environmental Services and SONGS Chapter because the SONGS and Environmental Services departments are in the same organizational division whereas in the prior GRC, they were organized in separate divisions; additionally, since SONGS is in decommissioning, it should no longer be placed in this Electric Generation Chapter.

TABLE DSB-1
Test Year 2024 Summary of Total Costs

ELECTRIC GENERATION (In 2021 $)			
	2021 Adjusted-Recorded (000s)	TY2024 Estimated (000s)	Change (000s)
Total Non-Shared Services	36,576	40,787	4,211
Total O&M	**36,576**	**40,787**	**4,211**

ELECTRIC GENERATION (In 2021 $)				
	2021 Adjusted-Recorded (000s)	Estimated 2022 (000s)	Estimated 2023 (000s)	Estimated 2024 (000s)
Total CAPITAL	**43,625**	**37,375**	**45,406**	**43,854**

Electric Generation is responsible for the safe and reliable operation and maintenance of the Generation Plant and Distributed Energy Facilities. Costs are included for new distributed energy facilities including additional employees to support these assets. Also, costs are included for cybersecurity and atypical and special power plant projects.

B. Support To and From Other Witnesses

My testimony also references the testimony and workpapers of several other witnesses, either in support of their testimony or as referential support for mine. Those witnesses are the following:

- Fernando Valero's Clean Energy Innovations testimony (Exhibit (Ex.) SDG&E-15). See references to Palomar Hydrogen Systems and Hybrid at Miramar Energy Facility.
- Jonathan Woldemariam's Wildfire Mitigation and Vegetation Management testimony (Ex. SDG&E-13). See references to the Wildfire Mitigation Plan.
- Arthur Alvarez's Fleet Services testimony (Ex. SDG&E-22).

C. Organization of Testimony

My testimony is organized as follows:

- Introduction
- Sustainability and Safety Culture
- Non-Shared Costs
- Capital
- Conclusion
- Witness Qualifications.

D. Description of Electric Generation Facilities

1. Generation Plants

a. Generation Plant Palomar

The Palomar Energy Center (PEC) is a 588 megawatt gas-fired combined-cycle plant with 2 GE 7FA model combustion turbines and a GE steam turbine. The plant is equipped with inlet-air chillers and a thermal energy storage tank that allows the plant to produce energy at its capacity during the summer months. Recycled water is used for cooling plant equipment.

b. Generation Plant Desert Star

The Desert Star Energy Center[1] (DSEC), located in Boulder City, NV, is a 480 megawatt gas-fired combined-cycle plant with 2 Siemens 501-FC model combustion turbines and a Westinghouse steam turbine. This plant was acquired by SDG&E in October 2011 pursuant to D.07-11-046. This Decision permitted SDG&E to exercise an option to purchase the facility from El Dorado Energy, LLC, a subsidiary of Sempra Energy.

c. Generation Plant Miramar

The Miramar Energy Facility (MEF) is a peaking plant with two GE LM6000 model turbines that together produce 92 megawatts (MEF-1 and MEF-2). This site also provides black start services used for restoration of the electric grid. Operations and maintenance personnel based out of the Palomar Energy Center provide all plant services to this facility.

d. Generation Plant Cuyamaca

The Cuyamaca Peak Energy Plant (CPEP) is a peaking plant with a Pratt & Whitney FT8 model turbine generator set that produces 45 megawatts. This site also provides black start services used for restoration of the electric grid. Operations and maintenance personnel based out of the Palomar Energy Center provide all plant services to this facility.

2. Distributed Energy Facilities - Current

a. Escondido Battery Energy Storage System

The Escondido Battery Energy Storage System (BESS) is a 120 megawatt-hour energy storage system with a maximum output of 30 megawatts for up to 4 hours. The energy storage system uses lithium-ion batteries. The project construction began Q4/2016 and began to operate commercially Q1/2017. Pursuant to California Public Utilities Commission (CPUC or Commission) Resolution E-4791 on May 26, 2016,[2] SDG&E developed expedited energy storage projects to alleviate reliability issues associated with Aliso Canyon. CPUC approval was requested via Tier 3 Advice Letter 2924-E. The Advice Letter was approved in its entirety in

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[1] The current lease agreement expires in 2027, but SDG&E is exploring a potential lease extension, along with alternatives to convert the plant to a clean dispatchable resource. If these initiatives move forward, additional filings would be made in the future to seek applicable regulatory approvals.

[2] Resolution Authorizing Expedited Procurement of Storage Resources to Ensure Electric Reliability in the Los Angeles Basin due to Limited Operations of the Aliso Canyon Storage Facility), issued May 31, 2016. Available at: https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M162/K850/162850315.PDF.

CPUC Resolution E-4798 on August 24, 2016, and effective on August 18, 2016. Operations and maintenance personnel based out of the Palomar Energy Center provide all plant services to this facility.

b. El Cajon Battery Energy Storage System

The El Cajon BESS was developed and constructed under the same authorization as the Escondido battery project and uses lithium-ion technology for the energy storage system. This energy storage system is rated at 30 megawatt-hours with a maximum output of 7.5 megawatts for up to 4 hours. Operations and maintenance personnel based out of the Palomar Energy Center provide all plant services to this facility.

c. Kearny BESS

The Kearny BESS was developed and constructed as part of SDG&E's Integrated Resource Plan. This energy storage system uses two lithium-ion battery systems each rated at 40 megawatt-hours with a maximum output of 10 megawatts for up to 4 hours. The combination provides a total of 80 megawatt-hours with a maximum output of 20 megawatts for up to 4 hours. Operations and maintenance personnel based out of the Palomar Energy Center provide all plant services to this facility.

d. Miguel Vanadium Redox Flow BESS

The Miguel Vanadium Redox Flow (VRF) BESS was constructed as a demonstration project in partnership with Sumitomo, Japan's New Energy and Industrial Technology Development Organization (NEDO) and GO-Biz and uses flow technology. This energy storage system is rated at 8 megawatt-hours with a maximum output of 2 megawatts for up to 4 hours. Operations and maintenance personnel based out of the Palomar Energy Center provide all plant services to this facility.

e. Ramona Solar Energy Project (RSEP)

The Ramona Solar Energy Project was developed and constructed pursuant to D.10-09-016 and SDG&E's Advice Letter 2374-E-A, approved August 23, 2012 and effective August 5, 2012. The project is built with fixed photovoltaic panels and can produce up to 4.32 megawatts. Operations and maintenance personnel based out of the Palomar Energy Center provide all plant services to this facility.

f. **Top Gun BESS**

The Top Gun BESS was constructed pursuant to Assembly Bill (AB) 2514 and uses lithium-ion battery technology energy storage.[3] This energy storage system is rated at 120 megawatt-hours with a maximum output of 30 megawatts for up to 4 hours. Operations and maintenance personnel based out of the Palomar Energy Center provide all plant services to this facility.

3. Distributed Energy Facilities – Scheduled for 2022 and 2023

a. Borrego Springs Microgrid

The Borrego Microgrid was constructed by the SDG&E Advanced Clean Technology department. It uses a combination of technologies to support the microgrid: a lithium-ion BESS rated at 13.6 megawatt-hours with a maximum output of 6.7 megawatts for 2 hours and a 1 megawatt hydrogen electrolyzer to produce fuel for over 8 hours of output via a 250 kilowatt fuel cell to supply a local 12 kilovolt distribution circuit serving the desert community of Borrego Springs. Operations and maintenance personnel based out of the Palomar Energy Center provide all plant services to this facility.

b. Butterfield Ranch Microgrid

The Butterfield Ranch Microgrid will be constructed to support the Wildfire Mitigation Program. The site combines a lithium-ion BESS rated at 2.5 megawatt-hours with a maximum output of 600 kilowatts and a 650 kilowatts (alternating current) solar power plant. Operations and maintenance personnel based out of the Palomar Energy Center will provide all plant services to this facility.

c. Cameron Corners Microgrid

The Cameron Corners Microgrid was constructed to support the Wildfire Mitigation Program. The site combines an Iron Flow BESS rated at 2.4 MWh with a maximum output of 540 kilowatts and an 875 kilowatts (alternating current) solar power plant. Operations and

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[3] AB 2514 (Skinner, Chapter 469, Statutes of 2010), amended by Assembly Bill 2227 (Bradford, Chapter 606, Statutes of 2012), was designed to encourage California to incorporate energy storage into the electricity grid, as codified at Public Utilities Code § 2835-2839 and § 9506. Energy storage can provide a multitude of benefits to California, including supporting the integration of greater amounts of renewable energy into the electric grid, deferring the need for new fossil-fueled power plants and transmission and distribution infrastructure, and reducing dependence on fossil fuel generation to meet peak loads.

maintenance personnel based out of the Palomar Energy Center provide all plant services to this facility.

d. Fallbrook BESS

The Fallbrook BESS will be constructed pursuant to AB 2514 and uses lithium-ion technology.[4] This energy storage system is rated at 160 megawatt-hours with a maximum output of 40 megawatts for up to 4 hours. Operations and maintenance personnel based out of the Palomar Energy Center will provide all plant services to this facility.

e. Melrose BESS

The Melrose BESS will be constructed to support the Emergency Reliability Order Instituting Rulemaking (OIR) R.20-11-003. The energy storage system uses two lithium-ion batteries each rated at 40 megawatt-hours with a maximum output of 10 megawatts. The combination provides a total of 80 megawatt-hours with a maximum output of 20 megawatts. Operations and maintenance personnel based out of the Palomar Energy Center will provide all plant services to this facility.

f. Pala-Gomez Creek BESS

The Pala-Gomez Creek BESS will be constructed to support the Emergency Reliability OIR R.20-11-003. The energy storage system uses lithium-ion technology and is rated at 60 megawatt-hours with a maximum output of 10 megawatts for up to 6 hours. Operations and maintenance personnel based out of the Palomar Energy Center will provide all plant services to this facility.

g. Ramona Microgrid

The Ramona Microgrid was constructed to support the Wildfire Mitigation Program. The site uses lithium-ion technology rated at 2 megawatt-hours with a maximum output of 500 kilowatts. Operations and maintenance personnel based out of the Palomar Energy Center provide all plant services to this facility.

h. Shelter Valley Microgrid

The Shelter Valley Microgrid will be constructed to support the Wildfire Mitigation Program. The site combines a lithium-ion battery rated at 3.25 megawatt-hours with a maximum output of 700 kilowatts and an 800 kilowatt (alternating current) solar power plant. Operations

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4 *Id.*

and maintenance personnel based out of the Palomar Energy Center will provide all plant services to this facility.

i. Westside Canal

The Westside Canal BESS will be constructed to support the Emergency Reliability OIR R.20-11-003. This energy storage system uses lithium-ion technology and is rated at 528 megawatt-hours with a maximum output of 132 megawatts for up to four hours. Operations and maintenance personnel based out of the Palomar Energy Center will provide all plant services to this facility.

4. Administration

Generation Plant Administration provides managerial oversight and analytical support for the generating fleet.

II. SUSTAINABILITY AND SAFETY CULTURE

Sustainability, safety, and reliability are the cornerstones of SDG&E's core business operations and are central to SDG&E's GRC presentation. SDG&E is committed to not only deliver clean, safe, and reliable electric and natural gas service, but to do so in a manner that supports California's climate policy, adaptation, and mitigation efforts. In support of the legal and regulatory framework set by the state, SDG&E has set a goal to reach Net Zero greenhouse gas (GHG) emissions by 2045, adopted a Sustainability Strategy to facilitate the integration of GHG emission reduction strategies into SDG&E's day-to-day operations and long-term planning, and published an economy-wide GHG Study that recommends a diverse approach for California leveraging clean electricity, clean fuels, and carbon removal to achieve the 2045 goals through the lens of reliability, affordability, and equity. The Sustainability Strategy serves as SDG&E's guide to enable a more just and equitable energy future in SDG&E's service territory and beyond. As a "living" strategy, SDG&E will continue to update the goals and objectives as technologies, policies, and stakeholder preferences change. See the Sustainability Policy testimony of Estela de Llanos (Ex. SDG&E-02).

In this GRC, SDG&E focuses on three major categories that underpin the Sustainability Strategy: mitigating climate change, adapting to climate change, and transforming the grid to be the reliable and resilient catalyst for clean energy. SDG&E's goal is to contribute to the decarbonization of the economy by way of diversifying energy resources, collaborating with regional partners, and providing customer choice that enables an affordable, flexible, and resilient grid.

Many of the activities described in further detail in this testimony advance the state's climate goals and align with SDG&E's Sustainability Strategy. Specifically, the proposed DEF projects will drive progress in the areas of Climate Adaptation, Climate Mitigation and/or Grid Transformation.

Safety is a core value and SDG&E is committed to providing safe and reliable service to all its stakeholders. This safety-first culture is embedded in every aspect of the Company's work. A safety culture includes the integration of an effective risk management process and approach. SDG&E has in place, a well-structured and documented approach to risk management. Risks related to Electric Generation are generally related to safety, system reliability, physical site and cybersecurity, natural disaster, and recovery from grid outages. System reliability risks may include unexpected damage to major generating equipment that could adversely affect the plant rating or ability to produce power. Physical security risks, such as vandalism, theft, sabotage, and terrorism, may affect employee safety and plant reliability and could result in down time and costly repairs. Wildfires and earthquakes are types of risks from natural disasters.

As SDG&E's generation business has become more complex, the safety and security risks associated with operating the systems have also grown. These dynamics require an evolution in the Company's approach to managing risks. The integration of risks and their mitigation activities in an ever-changing environment is a way in which Electric Generation builds and maintains SDG&E's safety culture for both its employees, customers, and the communities in which SDG&E serves.

Voluntary Protection Program - Star (VPP)

Electric Generation's Voluntary Protection Program - Star (VPP) recognizes outstanding safety and health practices. Currently, DSEC maintains Nevada VPP status (since 2009) and the California plants maintain VPP status as follows: PEC since 2018, MEF since 2021 and CPEP since 2021. Successful completion of the certification and periodic recertification process indicates that the employer and employees work together to elevate the safety and health practices beyond the standard requirements. The costs include engineered improvements, additional safety equipment, and additional employee and management time in developing new practices and maintaining the elevated requirements and documentation.

III. NON-SHARED COSTS

"Non-Shared Services" are activities that are performed by a utility solely for its own benefit. Corporate Center provides certain services to the utilities and to other subsidiaries. For purposes of this general rate case, SDG&E treats costs for services received from Corporate Center as Non-Shared Services costs, consistent with any other outside vendor costs incurred by the utility. Table DSB-2 summarizes the total non-shared O&M forecasts for the listed cost categories.

TABLE DSB-2
Non-Shared O&M Summary of Costs

ELECTRIC GENERATION (In 2021 $)			
Categories of Management	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
A. Generation Plant	36,308	40,506	4,198
B. Administration	268	303	35
Total Non-Shared Services	**36,576**	**40,809**	**4,233**

A. Generation Plant

TABLE DSB-3
Generation Plant O&M

ELECTRIC GENERATION (In 2021 $)			
A. Generation Plant	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. Generation Plant Palomar	19,016	20,745	1,729
2. Generation Plant Desert Star	13,769	15,112	1,343
3. Generation Plant Miramar	1,980	1,964	-16
4. Generation Plant Cuyamaca	1,114	906	-208
5. Distributed Energy Facilities	429	1,779	1,350
Total	**36,308**	**40,506**	**4,198**
B. Administration	**2021 Adjusted-Recorded (000s)**	**TY2024 Estimated (000s)**	**Change (000s)**
1. Generation Plant Administration	268	303	35
Total	**268**	**303**	**35**

1. Generation Plant Palomar

a. Description of costs and Underlying Activities

The O&M request for Palomar as shown in Table DSB-3 includes labor and non-labor costs. The labor component includes salaries for supervision, support staff and maintenance and operations personnel. The non-labor component includes, but is not limited to, industrial gases, chemicals, water, outside services, spare parts, miscellaneous consumables, and maintenance activities. Maintenance activities are performed while the plant is operating and during planned maintenance outages.

The O&M request for Palomar includes supporting a hydrogen fueling pump for hydrogen powered vehicles to provide for additional transportation needs for the DEFs. The request for those vehicles is included in the Fleet Services testimony of Arthur Alvarez (Ex. SDG&E-22).

b. Forecast Method

Forecasting for labor and non-labor is based on a five-year average. This method was selected because it allows for inclusion of a variety of planned (e.g., scheduled maintenance outages and repairs) and unplanned but typical (e.g., steam valve damage, combustion turbine component failures, auxiliary equipment failures) maintenance events and provides a more representative history of recorded spending.

c. Cost Drivers

Maintenance outages are a major portion of the O&M request for the Generation Plant. These outages are scheduled at least annually, with the extent of the maintenance dependent on the accumulated service hours on the equipment and the number of start-cycles the equipment experiences. Generally, more starts and more service hours result in more required maintenance. Much of the required maintenance is performed during planned outages. Planned outages are scheduled through the California Independent System Operator (CAISO).

2. Generation Plant Desert Star

a. Description of Costs and Underlying Activities

The O&M request for Desert Star as shown in Table DSB-3 includes labor and non-labor costs. The labor component includes salaries for supervision, support staff and maintenance and operations personnel. The non-labor component includes, but is not limited to, industrial gases, chemicals, water, outside services, spare parts, miscellaneous consumables, and maintenance activities. Maintenance activities are performed while the plant is operating, and during planned maintenance outages. The non-labor component also includes the payments for the Desert Star Long-Term Service Agreement (LTSA) purchased through Siemens. Costs related to the LTSA with Siemens for the major plant equipment are dependent on the amount of run time for the plant. LTSA costs are generally based on a dollar-per-operating-hour basis so more run time equates to higher LTSA costs. Costs for the lease payments to Boulder City on behalf of SDG&E's Desert Star Energy Center are included in Dale Tattersall's Real Estate, Land Services & Facility Operations testimony (Ex. SDG&E-23).

b. Forecast Method

Forecasting for labor and non-labor is based on a five-year average for O&M expenses including the LTSA. This method was selected because it allows for inclusion of a variety of planned (e.g., scheduled maintenance outages and repairs) and unplanned but typical (e.g., steam valve damage, combustion turbine component failures, auxiliary equipment failures) maintenance events and provides a more representative history of recorded spending.

c. Cost Drivers

Again, maintenance outages are a major portion of the O&M request for the Generation Plant. These outages are scheduled at least annually, with the extent of the maintenance dependent on the accumulated service hours on the equipment and the number of start-cycles the equipment experiences. Generally, more starts and more service hours result in more required maintenance. Much of the required maintenance is performed during planned outages. Planned outages are scheduled through the CAISO.

3. Generation Plant Miramar

The O&M request for Miramar as shown in Table DSB-3 includes labor and non-labor costs. The labor component includes salaries for supervision, support staff and maintenance and operations personnel. The non-labor component includes, but is not limited to, industrial gases, chemicals, water, outside services, spare parts, miscellaneous consumables, and maintenance activities. Maintenance activities are performed while the plant is operating and during planned maintenance outages.

a. Forecast Method

Forecasting for labor and non-labor is based on a five-year average. This method was selected because it allows for inclusion of a variety of planned (e.g., scheduled maintenance outages and repairs) and unplanned but typical (e.g., combustion turbine component failures, auxiliary equipment failures) maintenance events and provides a more representative history of recorded spending.

b. Cost Drivers

Once again, maintenance outages are a major portion of the O&M request for the Generation Plant. These outages are scheduled at least annually, with the extent of the maintenance dependent on the accumulated service hours on the equipment and the number of start-cycles the equipment experiences. Generally, more starts and more service hours result in more required maintenance. Much of the required maintenance is performed during planned outages. Planned outages are scheduled through the CAISO.

4. Generation Plant Cuyamaca

a. Description of Costs and Underlying Activities

The O&M request for Cuyamaca as shown in Table DSB-3, consists of labor and non-labor costs. The labor component includes salaries for supervision, support staff and maintenance and operations personnel. The non-labor component includes, but is not limited to, industrial gases, chemicals, water, outside services, spare parts, miscellaneous consumables and maintenance activities. Maintenance activities are performed while the plant is operating and during planned maintenance outages.

b. Forecast Method

Forecasting for labor and non-labor is based on a five-year average. This method was selected because it allows for inclusion of a variety of planned (e.g., scheduled maintenance outages and repairs) and unplanned but typical (e.g., combustion turbine component failures, auxiliary equipment failures) maintenance events and provides a more representative history of recorded spending.

c. Cost Drivers

Maintenance outages, as with other facilities, are a major portion of the O&M request for the Generation Plant. These outages are scheduled at least annually, with the extent of the maintenance dependent on the accumulated service hours on the equipment and the number of start-cycles the equipment experiences. Generally, more starts and more service hours result in more required maintenance. Much of the required maintenance is performed during planned outages. Planned outages are scheduled through the CAISO.

5. Distributed Energy Facilities current and scheduled

Distributed Energy Facilities, located throughout San Diego County, are the following:

- Borrego Springs Microgrid
- Butterfield Ranch Microgrid
- Cameron Corners Microgrid
- El Cajon BESS
- Escondido BESS
- Fallbrook BESS
- Kearny BESS
- Melrose BESS
- Miguel VRF BESS
- Pala / Gomez Creek BESS
- Ramona Microgrid
- Ramona Solar
- Shelter Valley Microgrid
- Top Gun BESS
- Westside Canal BESS

a. Description of costs and Underlying Activities

The O&M request for Distributed Energy Facilities as shown in Table DSB-3 consists of labor and non-labor costs. The labor component includes salaries for supervision, support staff and maintenance and operations personnel. The non-labor component includes, but is not limited to, outside services, spare parts, miscellaneous consumables and maintenance activities. Maintenance activities are performed while the plant is operating and during planned maintenance outages.

b. Forecast Method

Forecasting for labor and non-labor is done using a base year method because the limited available historical costs are not representative of current and future costs. This method was selected because it allows for inclusion of a variety of planned (e.g., scheduled maintenance outages and repairs) and unplanned but typical maintenance events that are expected to occur at these facilities.

c. Cost Drivers

Maintenance outages are a significant portion of the O&M request for the distributed Energy Facilities. These outages are scheduled at least annually, with the extent of the maintenance dependent on prescribed maintenance periods and occasional unplanned outages. Much of the required maintenance is performed during planned outages. Planned outages are scheduled through the CAISO.

B. Administration

1. Description of Costs

The O&M request for Administration includes labor and non-labor costs. The labor component includes administrative salaries. The non-labor component includes, but is not limited to, travel, supplies, consulting, and other miscellaneous administrative activities.

2. Forecast Method

Forecasting for labor and non-labor is based on a 5-year average.

3. Cost Drivers

There is no significant change to the forecast over the 5-year average.

IV. CAPITAL

Table DSB-4 summarizes the total capital forecasts for 2022, 2023, and 2024.

TABLE DSB-4
Capital Expenditures Summary of Costs

ELECTRIC GENERATION (In 2021 $)				
Categories of Management	**2021 Adjusted-Recorded**	**Estimated 2022 (000s)**	**Estimated 2023 (000s)**	**Estimated 2024 (000s)**
A. Generation Capital	43,625	37,375	45,406	43,854
Total	**43,625**	**37,375**	**45,406**	**43,854**

A. Introduction

All capital projects being considered improve the overall safety, reliability and operability of the plants. Table DSB-4 summarizes the total capital forecasts for 2022, 2023, and 2024.

In addition to this testimony, please also refer to my capital workpapers, Ex. SDG&E-14-CWP, for additional information on the activities described herein.

B. Capital Projects

TABLE DSB-5

Capital Expenditures Summary of Costs

ELECTRIC GENERATION (In 2021 $)				
A. Generation Capital	**2021 Adjusted-Recorded**	**Estimated 2022(000s)**	**Estimated 2023(000s)**	**Estimated 2024(000s)**
1. Capital Tools & Test Equipment	50	86	86	86
2. Palomar Energy Center	8,862	19,251	18,751	8,501
3. Desert Star Energy Center	9,879	6,864	6,864	6,864
4. Miramar Energy Facility	1,008	2,201	11,300	27,853
5. Cuyamaca Peak Energy Plant	281	495	495	495
6. Ramona Solar Plant	0	55	55	55
7. Palomar Hydrogen Systems[5]	1,224	8,423	7,855	0
Total	**21,304**	**37,375**	**45,406**	**43,854**

1. Description

The forecasts for 2022, 2023, and 2024 are shown in Table DSB-5 above. SDG&E does not propose a specific list of capital projects, but instead will plan, schedule, and perform capital projects, as appropriate, to best support the safe and reliable operation for Generation plants. To effectively meet this goal, SDG&E will use a general capital project budget, rather than proposing specific projects. The general capital budget allows flexibility and adaptability in capital projects to meet the current and future plant needs.

Projecting capital projects years in advance is difficult for a variety of reasons, such as changes in costs and technology from the time of planning to the time of implementation. Most importantly, power plant needs may change, resulting in different or unexpected priorities. Resources are then reallocated to accommodate the new priorities.

For example, various unplanned turbine repairs have been required in the past due to wear and tear or greater than expected start cycles. For example:

- In the 2021 PEC outage, a gas turbine annual inspection indicated that the stage 17 compressor nozzles need to be replaced to safely restart the turbine. A new set of nozzles was purchased and installed.

[5] See Fernando Valero's Clean Energy Innovation testimony for more information on Palomar Hydrogen Systems (Ex. SDG&E-15).

- In 2020, during a periodic borescope inspection at MEF, it was determined that stage 2 high pressure turbine nozzles required replacement to continue operation. A nozzle set was purchased and installed to allow continued turbine operation.

2. Forecast Method

The five-year average is used to forecast capital expenditures. The average has been adjusted by removing some large, one-time, capital projects from the history. This method is appropriate because it reflects the operational needs of the assets, through the averaging period.

3. Cost Drivers

The underlying cost drivers for these capital projects relate to maintaining the clean, safe, and reliable operation of the Generation assets. Capital improvements provide for equipment upgrades to keep up with current technologies for meeting the Company goals for safety and reliability.

V. CONCLUSION

This testimony describes the activities of SDG&E's Electric Generation and presents the forecast for both existing and reasonably anticipated new expenses for the GRC test year 2024. This testimony and my workpapers demonstrate the justification for the requested funding so that SDG&E can continue to meet its obligations to comply with applicable regulations and provide safe and reliable service. I request the Commission to approve funding for the expenses and projects presented here.

This concludes my prepared direct testimony.

VI. WITNESS QUALIFICATIONS

My name is Daniel S. Baerman. My business address is 2300 Harveson Place, Escondido, CA 92029. I am employed by SDG&E as Director – Electric Generation. I joined SDG&E in 2005 and have been working in the power generation/utility industry for more than 30 years in positions of increasing responsibility. I have experience with operations and maintenance, construction management, commissioning, mobilization and plant outfitting both in the United States and abroad. I have managed 7 power plants and commissioned 13 plants of varying technologies. I am familiar with several technologies including coal-fired boilers, internal combustion reciprocating engines, aero derivative gas turbines and heavy industrial gas turbines in peaking and combined-cycle configurations.

I have also held the position of Director – Origination & Portfolio Design. My responsibilities included procurement of generation and other long-term supply side resources such as storage and demand response. I hold a Bachelor of Science degree in Marine Engineering from the United States Merchant Marine Academy at Kings Point, New York.

I have previously testified before the Commission.

APPENDIX A – Glossary of Terms

BESS	Battery Energy Storage System
CAISO	California Independent System Operator
CPUC	California Public Utility Commission
CPEP	Cuyamaca Peak Energy Plant
DSEC	Desert Star Energy Center
GHG	Green House Gas
GRC	General Rate Case
LTSA	Long Term Service Agreement
MEF	Miramar Energy Facility
O&M	Operations and Maintenance
OIR	Order Instituting Rulemaking
PEC	Palomar Energy Center
RSEP	Ramona Solar Energy Project
SDG&E	San Diego Gas & Electric Company
VPP	Voluntary Protection Program
VRF	Vanadium Redox Flow