Application: A.18-02-

Exhibit SDGE-

Witness: Steven Prsha

****PUBLIC VERSION****

DIRECT TESTIMONY OF

STEVEN PRSHA

ON BEHALF OF SAN DIEGO GAS & ELECTRIC COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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DIRECT TESTIMONY OF STEVEN PRSHA

I. PURPOSE AND OVERVIEW

My direct testimony describes the seven utility-owned energy storage investments proposed by San Diego Gas & Electric Company ("SDG&E") to accelerate the widespread deployment of distributed energy storage systems based on the goals and priorities directed by California Assembly Bill ("AB") 2868.[1] My testimony[2] describes the specific project sites, how these investments align with the AB 2868 statutory criteria, the estimated project costs, and proposed cost cap for each project.

In total, SDG&E requests Commission approval for 100 megawatts ("MW") in circuit-level energy storage investments, and an associated cost cap for each project based on estimated project costs. Seven projects are proposed, three of which have been identified as optimal sites to be deployed during the 2019 timeframe. All seven investments will focus on providing backup power capabilities by using microgrid design and technology to support public sector customers, such as municipal critical facilities or public-sector agencies in accordance with the framework described in Stephen T Johnston's testimony. Additionally, these investments will be located on SDG&E-owned land adjacent to substations. Energy storage deployed through these investments will maximize ratepayer benefits by providing multiple services, as encouraged by the Commission's multiple-use application policies.[3]

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[1] Stats. 2016, ch.681, *codified at* Cal. Pub. Util. Code ("P.U. Code") §§ 2838.2 and 2838.3. All statutory citations herein to "sections" are to the P.U. Code unless otherwise indicated.

[2] References to "testimony" herein are to the prepared direct testimony served in support of this application.

[3] As most recently reflected in Decision ("D.") 18-01-003.

SDG&E investments align with AB 2868 and meet California's greenhouse gas ("GHG") goals, by deploying energy storage to provide resiliency service to critical public-sector infrastructure and prioritizing low-income areas. In these ways, SDG&E will maximize ratepayer benefits, prioritize public sector and low-income customers, and accelerate the deployment of distributed energy storage systems.

II. PROPOSED UTILITY-OWNED ENERGY STORAGE PROJECTS

A. Overview

The proposed energy storage investments are circuit-level microgrid projects selected using the evaluation process described in Stephen T Johnston's testimony, which incorporate the AB 2868 statutory criteria. In accordance with the Commission's recent Decision on Multiple-Use Application Issues,[4] these projects are designed to provide "multiple benefits and services to the electricity system."[5] The primary use case for these projects is to provide backup power and enhance circuit resiliency[6] to critical public-sector facilities and to prioritized locations in low-income communities.

The circuit-level microgrid projects will be located on existing SDG&E substation property and connected to the grid. However, during a substation outage or for other distribution operation needs, these energy storage assets will be able to disconnect from the larger grid and island a predetermined load. The energy storage resource will continue to power critical public

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[4] D.18-01-003.

[5] *Id.* at 2.

[6] The National Renewable Energy Laboratory ("NREL") states: "For a power system to be resilient, it must be capable of islanding and operating independently from the grid during times of outages." *See* NREL, *Valuing the Resilience Provided by Solar and Battery Energy Storage Systems* (January 2018) at 1. Available at: https://www.nrel.gov/docs/fy18osti/70679.pdf

See also D.16-12-036 at 78, Ordering Paragraph 2.

facilities and coincidental load located on the microgrid. An overview of the seven circuit-level proposed energy storage projects is provided below in Table SP-1, including the name, location, capacity, expected commercial on-line date, term and multiple customer sites served by each project.

Table SP – 1
Utility-Owned Energy Storage Projects

Project Name	Location	Capacity	Expected COD	Customer Sites	Low-Income[7]	DAC[8]
Kearny	Kearny Mesa San Diego, CA	30 MW / 40 MWh	12/31/2019	City of San Diego Metropolitan Operations Center, Polinsky Children's Center, CA State Police and Border Division HQ, County Office of Emergency Services, San Diego County Sheriff's Department Headquarters	No	Yes
Melrose	Vista, CA	20 MW / 20 MWh	12/31/2019	Vista Library Cool Zone, Civic Center, Fire Station 6, Vista Courthouse, Vista Detention Facility, San Diego County Sheriff's Department Vista Patrol Station	Yes	No
Boulevard	Boulevard, CA	10 MW / 10 MWh	12/31/2019	County Sheriff Dept., San Diego County Fire Station 47, Boulevard Border Patrol Station, Campo Reservation Fire Station, CAL Fire White Star	Yes	Yes

[7] *See* testimony of Stephen T Johnston for a description of the low-income designation

[8] For the purposes of this testimony, DACs are defined as sites in the top quartile of census tracts defined through the most updated version of California Environmental Protection Agency's CalEnviroScreen, either on a state-wide or utility territory basis, whichever is broader. DACs must also meet the spirit of the definition, as described in D.16-12-065. Available at: https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30

Clairemont	Clairemont Mesa San Diego, CA	10 MW / 10 MWh	12/31/2020	Balboa Branch Library (Cool Zone), Fire Station 36	No	No
Paradise	Skyline San Diego, CA	10 MW / 10 MWh	12/31/2020	Fire Station 51, South East Division Police department, Fire Station 32	Yes	Yes
Elliot	Tierrasanta, San Diego, CA	10 MW / 10 MWh	12/31/2020	Fire Station 39, Tierrasanta Public Library (Cool Zone)	No	No
Santee	Santee, CA	10 MW / 10 MWh	12/31/2020	Fire Station 4, Padre Dam Northcote Pump Station	No	No

B. 2019 Projects

This section describes each of the circuit-level projects that are proposed in the 2019 timeframe, estimated project costs, and proposed cost cap. The following three circuit-level microgrid energy storage projects located at SDG&E's Kearny, Melrose and Boulevard substations have been identified as optimal sites to be deployed in the 2019 timeframe due to the multiple benefits offered by each project as well as the ability to construct the projects in the expedited timeframe. This target can change based on the Commission approval date of the SDG&E AB 2868 program and other possible factors. By using utility-owned land and existing infrastructure, these sites were selected to maximize benefits and minimize costs. These circuit-level projects also serve multiple critical facilities. With the ability to construct them in an expedited timeframe, these projects will readily provide resiliency services to the community during emergencies and other unforseen outages. Accordingly, these projects merit an expedited online date of 2019.

1. Kearny

a. Project overview

The Kearny circuit-level energy storage project is a 30 MW, 40 MWh energy storage project located on SDG&E's Kearny Operations Center in San Diego, California. Kearny Mesa

is a community in the eastern part of San Diego, California. The site will be constructed after a Request for Proposal ("RFP") competitive solicitation process. The proposed on-line date is December 31, 2019. The Kearny energy storage project will be constructed on existing SDG&E land within the boundaries of an existing SDG&E Operations Center and adjacent to Kearny substation. The energy storage systems will interconnect to Kearny substation on three separate circuits, each of which serve the facilities/agencies noted in table SP-1 above. The project site provides an ideal location for leveraging existing interconnection capacity to repower the site with a modern grid-scale energy storage resource.

The Kearny facility will have the capability to island[9] multiple critical public-sector facilities including: the City of San Diego Metropolitan Operations Center, Polinsky Children's Center, The California State Police and Border Division headquarters, the County Office of Emergency Services, and San Diego County Sheriff's Department Headquarters during a system disturbance, providing back-up power resiliency.

The Polinsky Children's Center is a 24-hour facility for the temporary emergency shelter of children who must be separated from their families for their own safety, or when parents cannot provide care. Each month more than 300 children ages birth to 18 years old are admitted to the Polinsky Children's Center.[10] The California State Police and Border Division headquarters office is strategically located to provide the highest level of safety, service and security from the devoted members of the California Highway Patrol. The Office of Emergency Services (OES) coordinates the overall county response to disasters. The OES is responsible for

[9] "Island" refers to the ability to isolate a portion of the grid and to operate that portion independenty from the rest of the grid.

[10] *See* https://www.sandiegocounty.gov/hhsa/programs/cs/child_welfare_services/polinsky_childrens_center.html

alerting and notifying appropriate agencies when disaster strikes; coordinating all agencies that respond; ensuring resources are available and mobilized in times of disaster; developing plans and procedures for response to and recovery from disasters; and developing and providing preparedness materials for the public.[11] The Kearny circuit-level microgrids will allow the critical facilities described above to remain operational during power outages. This increased grid resilience benefits the community by ensuring the uninterrupted availability of essential services.

b. AB 2868 evaluation results

In addition to supporting multiple critical facilities outlined above, the Kearny site will provide 30 MW of energy storage to help integrate renewables and reduce GHG emissions. There are 1300 kW of renewables already installed on the distribution circuits feeding into the circuit-level microgrids with more proposed to be added in the future. The energy storage system will be able to absorb and store excess solar generation and provide that energy back on the grid when it is needed. The project will help reduce dependence on petroleum by limiting the need for back-up diesel generation at these critical facilities. Currently, at least four of the facilities have back-up generation (City of San Diego Metro Ops Center, County of Emergency Services, San Diego County Sheriff's Department Headquarters, and County Ops Center), the use of which would be offset by the integration of energy storage systems. This site prioritizes the public sector by providing resiliency to the multiple critical sites located on the distribution circuit. Lastly, this site will be able to participate in the California Independent System Operator

[11] *See* https://www.sandiegocounty.gov/oes/

("CAISO") market[12] used to provide local resource adequacy to the extent these resources qualify for resource adequacy.[13]

c. Project costs

Table SP-2 below provides details around the total direct and indirect costs outlined in the capital cost cap, as well as the anticipated operations and maintenance ("O&M") direct costs associated with the Kearny energy storage circuit-level microgrid project. All the values are shown on a nominal basis. Based on the estimated project costs, SDG&E requests Commission approval of approximately [redacted] for the Kearny project. This is a not-to-exceed cost cap. The regulatory accounting, revenue requirement and cost recovery of this AB 2868 investment are described in the testimony of Noma G. Jasso, Michael R. Woodruff/James G. Vanderhye Jr., and Kellen C. Gill, respectively.

Table SP – 2
Kearny Mesa Estimated Project Costs

Capital Cost	**Amount**	**Notes**
Total Direct Costs	[redacted]	Includes interconnection and CAISO network upgrade costs
Total Indirect Costs	[redacted]	
Contingency	[redacted]	
Total Project Costs	[redacted]	
Operations and Maintenance Costs	**Amount**	**Notes**

[12] *See* Evan M. Bierman's testimony.

[13] *See* Jennifer W. Summers's testimony.

O&M Fixed Maintenance[14]	[redacted]	5% of total direct project costs
O&M Variable Costs (per cycle)[15]	[redacted]	Variable costs for each MWh of discharged energy

2. Melrose

a. Project overview

The Melrose circuit-level energy storage project is a 20 MW, 20 MWh energy storage project located in Vista, California. Vista is a city in Southern California located in northwestern San Diego County and is a designated low-income community.[16] The proposed on-line date is December 31, 2019. The Melrose energy storage project will be constructed on existing SDG&E land, and will interconnect to Melrose substation. The Melrose facility will have the capability to island critical public-sector facilities including the Civic Center, Fire Station 6, Vista Courthouse, Vista Library Cool Zone, Vista Detention Facility and San Diego County Sheriff's Department Vista Patrol Station during a system disturbance, thus providing back-up power resiliency.

Fire Station 6 serves Otay Mesa and its surrounding areas. Vista Library Cool Zone is a designated, air-conditioned building that residents can go beat the heat in for free. The sites provide refreshing relief for older adults and others, especially for seniors and disabled persons with health problems that could be complicated by the effects of heat.[17] The Vista Detention Facility serves as the primary point of intake for arrestees in northern San Diego County. San

[14] O&M estimations are included in the cost cap but are subject to change. These estimations contain two categories: fixed and variable. The fixed O&M has been estimated at 5% of the total direct project costs. The variable O&M is estimated at [redacted] per MWh of discharge from the unit. The cycling is estimated at 365 deep cycles per year for 10 years.

[15] *See* fn. 14.

[16] *See* testimony of Stephen T Johnston for a description of the low-income designation.

[17] *See* http://www.ci.vista.ca.us/services/residential-services/cool-zones

Diego County Sheriff's Department Vista Patrol Station in the City of Vista ensures the safety and security of those living, working, and visiting the area and provide a full range of public safety services.

b. AB 2868 evaluation results

The Melrose site will provide 20 MW of energy storage on two separate circuits (10 MW each) to help integrate renewables and reduce GHG emissions. The circuit-level microgrids will support multiple critical facilities outlined above. There is 2250 kW of renewables already installed on the distribution circuits feeding into the circuit –level microgrids. The project will help reduce dependence on petroleum by offsetting backup diesel generation at these critical facilities. Currently, at least three of the facilities have back-up generation Civic Center, Fire Station 6, and Vista Detention Facility, the use of which would be reduced by the integration of energy storage. Lastly, this site will be able to participate in the CAISO market[18] used to provide local resource adequacy to the extent these resources qualify for resource adequacy.[19]

c. Project costs

The below table, Table SP-3 provides details around the total direct and indirect costs outlined in the capital cost cap, as well as the anticipated O&M direct costs associated with the Melrose energy storage circuit-level microgrid project. All the values are shown on a nominal basis. Based on the estimated project costs, SDG&E requests Commission approval of approximately [redacted] for the Melrose project. This is a not-to-exceed cost cap. The regulatory accounting, revenue requirement and cost recovery of this AB 2868 investment are described in

[18] *See* Evan M. Bierman's testimony.

[19] *See* Jennifer W. Summers's testimony.

the testimony of Noma G. Jasso, Michael R. Woodruff/James G. Vanderhye Jr., and Kellen C. Gill, respectively.

Table SP – 3
Melrose Estimated Project Costs

Capital Cost	Amount	Notes
Total Direct Costs	[redacted]	Includes interconnection and CAISO network upgrade costs
Total Indirect Costs	[redacted]	
Contingency	[redacted]	
Total Project Costs	[redacted]	
Operations and Maintenance Costs	**Amount**	**Notes**
O&M Fixed Maintenance	[redacted]	5% of total direct project costs
O&M Variable Costs (per cycle)	[redacted]	Variable costs for each MWh of discharged energy

3. Boulevard

a. Project overview

The Boulevard circuit-level energy storage project is a 10 MW, 10 MWh energy storage project located in Boulevard, California. The Boulevard area is rural desert along the Mexican border near the eastern extent of San Diego County and is a designated low-income community.[20] The site will be constructed after a RFP competitive solicitation process. The proposed on-line date is December 31, 2019. The Boulevard energy storage project will be constructed on existing SDG&E land, and will interconnect at the Boulevard substation. The

[20] *See* testimony of Stephen T Johnston for a description of the low-income designation.

Boulevard facility will have the capability to island critical preselected load including the County Sheriff Dept, San Diego County Fire Station 47, Boulevard Border Patrol Station, Campo Reservation Fire Station, and CAL Fire White Star during a system disturbance thus providing them back-up power resiliency.

The Boulevard County Sheriff office serves an area encompassing over 200 square miles which includes the communities of Boulevard and Jacumba. The Boulevard community is located in the rural high desert along the east San Diego/Mexico border. The community of Jacumba is located in the Jacumba Mountains along the U.S./Mexico border.[21] San Diego County's Fire Station 47 serves Pacific Highlands Ranch and its surrounding areas. The Boulevard Patrol Station is also responsible for two eastbound tactical checkpoints, which are an integral part of the San Diego Sector's defense.[22] The Campo Reservation Fire Station, located on Campo Kumeyaay Nation Indian Reservation, provides protection from fire and other emergencie to the surrounding communities. The CAL Fire White Star provides fire protection and stewardship of the local wildlands. In addition, the facility provides varied emergency services.

b. AB 2868 evaluation results

The Boulevard site will provide 10 MW of energy storage to help integrate renewables and reduce GHG emissions. The circuit-level microgrid will support multiple critical facilities outlined above. There is 600 kW of renewables already installed on the distribution circuit feeding into the circuit–level microgrid. The energy storage system will be able to absorb and store excess solar generation and provide that energy back on the grid when it is needed. The

[21] *See* https://www.sdsheriff.net/patrolstations/boulevard.html

[22] The Boulevard Patrol Station is also responsible for two eastbound tactical checkpoints, which are an integral part of the San Diego Sector's defense.

project will help reduce dependence on petroleum by limiting the need for back-up diesel generation at these critical facilities. Currently, one of the facilities (San Diego County Fire Station 47) has back-up generation, the use of which would be offset by the integration of an energy storage system. This site prioritizes the public sector by providing resiliency to the multiple critical sites located on the distribution circuit. This site will be able to participate in the CAISO market,[23] and will be used to provide local resource adequacy to the extent these resources qualify for resource adequacy.[24]

c. Project costs

The below table, Table SP-4 provides details around the total direct and indirect costs outlined in the capital cost cap, as well as the anticipated O&M direct costs associated with the Boulevard energy storage circuit-level microgrid project. All the values are shown on a nominal basis. Based on the estimated project costs, SDG&E requests Commission approval of approximately [redacted] for the Boulevard project. This is a not-to-exceed cost cap. The regulatory accounting, revenue requirement and cost recovery of this AB 2868 investment are described in the testimony of Noma G. Jasso, Michael R. Woodruff/James G. Vanderhye Jr., and Kellen C. Gill, respectively.

Table SP – 4
Boulevard Estimated Project Costs

Capital Cost	Amount	Notes
Total Direct Costs	[redacted]	Includes interconnection and CAISO network upgrade costs
Total Indirect Costs	[redacted]	

[23] *See* Evan M. Bierman's testimony.

[24] *See* Jennifer W. Summers' testimony.

Contingency	[redacted]	
Total Project Costs	[redacted]	
Operations and Maintenance Costs	**Amount**	**Notes**
O&M Fixed Maintenance	[redacted]	5% of total direct project costs
O&M Variable Costs (per cycle)	[redacted]	Variable costs for each MWh of discharged energy

C. 2020 projects

This section provides a description of each of the circuit-level projects that are proposed in the 2020 timeframe as well as approximate project costs (not to exceed our estimated cost cap). The following four circuit-level microgrid energy storage projects located at SDG&E's Paradise, Clairemont, Elliot, and Santee substations have been identified as optimal sites to be deployed by the end of 2020. This target can change based on the Commission approval date of the SDG&E AB 2868 program and other possible factors. These sites were ranked among the highest to maximize benefits and minimize costs in accordance with the AB 2868 evaluation matrix described in Stephen T Johnston's testimony.

1. Paradise

a. Project overview

The Paradise circuit-level energy storage project is a 10 MW, 10 MWh energy storage project located in Skyline San Diego, California. Skyline is a hilly neighborhood in Southeastern San Diego and is a designated low-income community.[25] The site will be constructed after a RFP competitive solicitation process. The proposed on-line date is December 31, 2020. The

[25] The testimony of Stephen T Johnston and Mayda Bandy describes the identification of low-income communities.

Paradise energy storage project will be constructed on existing SDG&E land, and will interconnect at the Paradise substation. The Paradise facility will have the capability to island critical pre-determined load Fire Station 51, South East Division Police department, and Fire Station 32 during a system disturbance thus providing back-up power resiliency.

Fire Station 51 and Fire Station 32 serves Skyline Hills and Paradise Hills and their surrounding areas respectively, be providing essential services such as fire, emergency medical and emergency management services. This includes 9-1-1 services, fire inspections, permits and community education. The South East Division Police department serves the the southeastern neighborhoods of San Diego.

b. AB 2868 evaluation results

The Paradise site will provide 10 MW of energy storage to help integrate renewables and reduce GHG emissions. The circuit-level microgrid will support several critical facilities outlined above. There is 1,500 kW of renewables already installed on the distribution circuit feeding into the circuit –level microgrid. The energy storage system will be able to absorb and store excess solar generation and provide that energy back on the grid when it is needed. The project will help reduce dependence on petroleum by limiting the need for back-up diesel generation at these critical facilities. Currently, two facilities (Fire Station 51 and Fire Station 32) have back-up generation, the use of which would be offset by the integration of energy storage systems. This site prioritizes the public sector by providing resiliency to the multiple critical sites located on the distribution circuit. This site will be able to participate in the CAISO

market,[26] and will be used to provide local resource adequacy to the extent these resources qualify for resource adequacy.[27]

c. Project costs

The below table, Table SP-5 provides details around the total direct and indirect costs outlined in the capital cost cap, as well as the anticipated O&M direct costs associated with the Paradise energy storage circuit-level microgrid project. All the values are shown on a nominal basis. Based on the estimated project costs, SDG&E requests Commission approval of approximately [redacted] for the Paradise project.

Table SP – 5
Paradise Estimated Project Costs

Capital Cost	**Amount**	**Notes**
Total Direct Costs	[redacted]	Includes interconnection and CAISO network upgrade costs
Total Indirect Costs	[redacted]	
Contingency	[redacted]	
Total Project Costs	[redacted]	
Operations and Maintenance Costs	**Amount**	**Notes**
O&M Fixed Maintenance	[redacted]	5% of total direct project costs
O&M Variable Costs (per cycle)	[redacted]	Variable costs for each MWh of discharged energy

[26] *See* Evan M. Bierman's testimony.

[27] *See* Jennifer W. Summers' testimony.

2. Clairemont

a. Project overview

The Clairemont circuit-level energy storage project is a 10 MW, 10 MWh energy storage project located in Clairemont, San Diego, California. Clairemont is a community within the City of San Diego. The site will be constructed after a RFP competitive solicitation process. The proposed on-line date is December 31, 2020. The Clairemont energy storage project will be constructed on existing SDG&E land adjacent to Clairemont substation, and will interconnect to one circuit at the Clairemont substation. The Clairemont facility will have the capability to island critical pre-determined load including Balboa Branch Library (Cool Zone) and Fire Station 36 during a system disturbance thus providing back-up power grid resiliency.

Fire Station 36 serves East Clairemont and its surrounding areas. Fire Station 36 is responsible for repairing and maintaining approximately 450 Self Contained Breathing Apparatus ("SCBA") and approximately 1,400 Air Cylinders used by City of San Diego and Poway firefighters. SCBA's are portable air units that supply breathable air to firefighters when entering oxygen-deprived environments where the air supply is contaminated by smoke, toxic gases or other hazardous materials.[28] The Balboa Branch Library is a designated cool zone.

b. AB 2868 evaluation results

The Clairemont site will provide 10 MW of energy storage to help integrate renewables and reduce GHG emissions. The circuit-level microgrid will support multiple critical facilities outlined above. There is 1,700 kW of renewables already installed on the distribution circuit feeding into the circuit–level microgrid. The energy storage system will absorb and store excess solar generation and provide that energy back on the grid when it is needed. The project will

[28] *See* https://www.sandiego.gov/fire/about/firestations/sta36

help reduce dependence on petroleum by offsetting the use of backup diesel generation at one of these critical facilities (Fire Station 36). This site prioritizes the public sector by providing resiliency to the multiple critical sites located on the distribution circuit. This site will be able to participate in the CAISO market, and will be used to provide local resource adequacy to the extent these resources qualify for resource adequacy.[29]

c. Project costs

Table SP-6 below provides details around the total direct and indirect costs outlined in the capital cost cap, as well as the anticipated O&M direct costs associated with the Clairemont energy storage circuit-level microgrid project. All the values are shown on a nominal basis. Based on the estimated project costs, SDG&E requests Commission approval of approximately [redacted] for the Clairemont project. This is a not-to-exceed cost cap. The regulatory accounting, revenue requirement and cost recovery of this AB 2868 investment is described in the testimony of Noma G. Jasso, Michael R. Woodruff/James G. Vanderhye Jr., and Kellen C. Gill, respectively.

Table SP – 6
Clairemont Estimated Project Costs

Capital Cost	Amount	Notes
Total Direct Costs	[redacted]	Includes interconnection and CAISO network upgrade costs
Total Indirect Costs	[redacted]	
Contingency	[redacted]	
Total Project Costs	[redacted]	

[29] *See* Jennifer W. Summers' testimony.

Operations and Maintenance Costs	Amount	Notes
O&M Fixed Maintenance	[redacted]	5% of total direct project costs
O&M Variable Costs (per cycle)	[redacted]	Variable costs for each MWh of discharged energy

3. Elliot

a. Project overview

The Elliot circuit-level energy storage project is a 10 MW, 10 MWh energy storage system located in Tierrasanta, San Diego, California. Tierrasanta is a community in the northeastern part of San Diego. The site will be constructed after a RFP competitive solicitation process. The proposed on-line date is December 31, 2020. The Elliot energy storage project will be constructed on existing SDG&E land and will interconnect to the Elliot substation. The Elliot facility will have the capability to island critical predetermined load including Fire Station 39 and Tierrasanta Public Library during a system disturbance. Fire Station 39 serves Tierrasanta and the surrounding areas. The Tierrasanta Public Library is a designated cool zone.

b. AB 2868 evaluation results

The Elliot site will provide 10 MW of energy storage to help integrate renewables and reduce GHG emissions. The circuit-level microgrid will support multiple critical facilities outlined above. There is 2650 kW of renewables already installed on the distribution circuit feeding into the circuit–level microgrid. The energy storage system will absorb and store excess solar generation and provide that energy back on the grid when it is needed. The project will help reduce dependence on petroleum, by offsetting the use of backup diesel generation at one of these critical facilities (Fire Station 39). This site prioritizes the public sector by providing

resiliency to the critical sites located on the distribution circuit. This site will be able to participate in the CAISO market,[30] and will be used to provide local resource adequacy to the extent these resources qualify for resource adequacy.[31]

c. Project costs

Table SP-7 below provides details around the total direct and indirect costs outlined in the capital cost cap, as well as the anticipated O&M direct costs associated with the Elliot energy storage circuit-level microgrid project. All the values are shown on a nominal basis. Based on the estimated project costs, SDG&E requests Commission approval of approximately [redacted] for the Elliot project. This is a not-to-exceed cost cap. The regulatory accounting, revenue requirement and cost recovery of this AB 2868 investment are described in the testimony of Noma G. Jasso, Michael R. Woodruff/James G. Vanderhye Jr., and Kellen C. Gill, respectively.

Table SP – 7
Elliot Estimated Project Costs

Capital Cost	**Amount**	**Notes**
Total Direct Costs	[redacted]	Includes interconnection and CAISO network upgrade costs
Total Indirect Costs	[redacted]	
Contingency	[redacted]	
Total Project Costs	[redacted]	
Operations and Maintenance Costs	**Amount**	**Notes**
O&M Fixed Maintenance	[redacted]	5% of total direct project costs

[30] *See* Evan M. Bierman's testimony.

[31] *See* Jennifer W. Summers' testimony.

O&M Variable Costs (per cycle)	[redacted]	Variable costs for each MWh of discharged energy

4. Santee

a. Project overview

The Santee circuit-level energy storage project is a 10 MW, 10 MWh energy storage project located in Santee, California. Santee is located in eastern San Diego County. The site will be constructed after a RFP competitive solicitation process. The proposed on-line date is December 31, 2020. The Santee energy storage project will be constructed on existing SDG&E land and will interconnect at the Santee substation. The Santee facility will have the capability to island critical predetermined load including City of Santee Fire Station 4 and Padre Dam Northcote pump station during a system disturbance thus providing back-up power resiliency. The City of Santee Fire Station works to protect life and property in the community through fire suppression, public education and emergency medical services.[32]

b. AB 2868 evaluation results

The Santee site will provide 10 MW of energy storage to help integrate renewables and reduce GHG emissions. The energy storage system will absorb and store excess solar generation and provide that energy back on the grid when it is needed. There is 1,250 kW of renewables already installed on the distribution circuit feeding into the circuit–level microgrid. The project will help reduce dependence on petroleum by offsetting the use of backup diesel generation at one of the critical facilities (City of Santee Fire Station 4). This site prioritizes the public sector by providing resiliency to the multiple critical sites located on the distribution circuit. This site

[32] *See* https://www.santeefiredepartment.org/

will be able to participate in the CAISO market,[33] and will be used to provide local resource adequacy to the extent these resources qualify for resource adequacy.[34]

c. Project costs

Table SP-8 below provides details around the total direct and indirect costs outlined in the capital cost cap, as well as the anticipated O&M direct costs associated with the Santee energy storage circuit-level microgrid project. All the values are shown on a nominal basis. Based on the estimated project costs, SDG&E requests Commission approval of approximately [redacted] for the Santee project. This is a not-to-exceed cost cap. The regulatory accounting, revenue requirement and cost recovery of this AB 2868 investment are described in the testimony of Noma G. Jasso, Michael R. Woodruff/James G. Vanderhye Jr., and Kellen C. Gill, respectively.

Table SP – 8
Santee Estimated Project Costs

Capital Cost	**Amount**	**Notes**
Total Direct Costs	[redacted]	Includes interconnection and CAISO network upgrade costs
Total Indirect Costs	[redacted]	
Contingency	[redacted]	
Total Project Costs	[redacted]	
Operations and Maintenance Costs	**Amount**	**Notes**
O&M Fixed Maintenance	[redacted]	5% of total direct project costs

[33] *See* Evan M. Bierman's testimony.

[34] *See* Jennifer W. Summers' testimony.

O&M Variable Costs (per cycle)	[redacted]	Variable costs for each MWh of discharged energy

III. THE PROPOSED PROJECTS ALIGN WITH AB 2868 STATUTORY FACTORS

A. Proposed Projects Align with AB 2868 Statutory Factors by Minimizing Costs and Maximizing Benefits

To minimize overall costs SDG&E will be using existing substation land for these projects and will be conducting a Request for Information ("RFI") and RFP through Supply Management to ensure a prudent and competitive solicitation process. This solicitation process is described in greater detail by Stephen T Johnston. The substation sites will be built and designed in such a way to allow expansion, accommodating longer duration energy storage systems in the future. After reviewing the bids of multiple vendors, SDG&E will select the most appropriate vendor for the energy storage resources at the specific circuit-level sites.

SDG&E will leverage its existing project management organization ("PMO") to manage the implementation phase of the energy storage microgrid projects. This will include both the administration of vendor contracts and construction oversight, as well as the performance of SDG&E's scope of work to integrate the energy storage systems into existing infrastructure, software and controls. Building on its previous experience with deployment of both large and small energy storage projects, SDG&E is well positioned to leverage its expertise and prior lessons learned to deploy the microgrid projects using a programmatic and cost-effective approach.

As part of the RFP evaluation, SDG&E will evaluate the long-term capability of energy storage vendors to provide operations and maintenance service for the energy systems. SDG&E plans to enter into service agreements with qualified vendors as a cost-effective means of managing the long-term operations and maintenance of the energy storage systems. In

SDG&E's experience, this model has worked well to minimize cost and maximize the operational performance of the energy storage resources.

Pursuant to D.18-01-003, energy storage will provide multiple services in the distribution domain. To increase the overall cost effectiveness of these projects for customers, SDG&E will deploy the circuit-level energy storage resources to participate in the CAISO market when the energy storage resources are not being used for grid resiliency purposes. The forecasted revenues generated by providing ancillary, energy and capacity services to the grid are described by the testimony of Evan M. Bierman. The energy resources will also be used to support local capacity, to the extent that these resources qualify for resource adequacy.

Under the Track 4 Decision, SDG&E was authorized to procure a total of 500-800 MW of capacity by the end of 2021 to meet this in-basin need.[35] The decision also required SDG&E to procure at least 25 MW of capacity from energy storage resources and, consistent with the Loading Order of the Energy Action Plan, to procure at least 175 MW of capacity from preferred resources or energy storage.[36] SDG&E currently has 56 MW remaining under its fulfillment obligation and intends to have the seven energy storage resources count towards its in-basin local capacity requirement, as described in Jennifer W. Summer's testimony.

B. Distributed Energy Storage Management System

SDG&E uses a Distributed Energy Resource Management System ("DERMS") to manage distributed energy resources under its operational control. DERMS can monitor and control various sized energy storage systems and has been deployed at our Borrego Springs Microgrid. DERMS creates user situational awareness by visualizing real-time battery points

[35] D.14-03-004 at 143, ordering paragraph 2.

[36] *See* Jennifer W. Summers' testimony.

such as state of charge and the current charge and discharge rates of the battery. It can also be used to manage future battery dispatch. This DERMS management capability includes the scheduling of energy storage devices to assist with daily or weekly activities such as peak shaving. The system can also accommodate data from external sources such as circuit loading, and substation loading to help support local distribution deficiencies. DERMS in conjunction with distribution operations assistance is capable of sectionalizing load to provide electricity to critical facilities as part of a pre-defined microgrid. Without DERMS control of these assets and overall management of the microgrid, these customers would be without power during certain outage conditions.

C. Environmental Benefits

Energy storage deployed on the circuit-level microgrid will be able to integrate renewables and provide environmental benefits in a number of ways. Firstly, energy storage paired on the distribution circuit will be able to assist in smoothing short-term variability caused by rapid fluctuations of intermittent wind and solar energy resources. This smoothing of short duration variability will support the grid as well as allow for a higher penetration of renewables on the distribution circuits. Energy storage can be used to address both short-duration and long-duration variability. This capability, paired with the proper inverter, can enable concurrent operations to take place, such as smoothing and market participation.

To address long-duration variability, energy storage will help integrate renewables during times when the sun is not shinning and when the wind is not blowing. The energy storage system will absorb and store excess solar generation during times when solar and wind production is high and provide that energy back on the grid when it is needed. Furthermore, when energy is at its greatest demand during the evening ramp, the energy storage resources will be used to help shave peak demand. The stored energy can also be discharged to dispel energy

sourced from less efficient natural gas peaker plants, which will help to decrease emissions of climate-changing greenhouse gases and other pollutants. In times during the day when renewables are most abundant and subsequent energy prices fall, and even sometimes go negative, the energy storage resources will be able to charge and harness renewable energy. Separately, by providing ancillary services, the energy storage resources will help foster a higher penetration of renewables by smoothing the intermittency of renewable resources on to the electric grid.

Properly designed and dispatched energy storage systems will help customers manage energy costs, help reduce overall system peak energy demand, improve public health, and assist in achieving greenhouse gas emission goals.[37] Many emergency service locations, such as those described in the project descriptions above, use petroleum-based generation as a backup. Energy storage providing microgrid resiliency for those emergency service locations will mitigate the need for onsite backup power and therefore help reduce the GHG and carbon footprint of those sites. Energy storage will also be able to utilize any connected and available renewables during times of islanding.

D. Prioritizes Public Sector and Low-Income Customers

In accordance with D.17-04-039, the circuit-level microgrid distributed energy systems achieve ratepayer benefits, maximize overall benefits and minimize overall costs. As detailed in the testimony of Stephen T Johnston, the selection process for the seven sites focus on providing maximum benefits to customers and the local communities served near the connected substations. Circuits that included public sector facilities such as fire stations, police stations, and cool zones were selected to keep people safe and provide a place to go when the lights go

[37] *See* AB 2868, P.U. Code §§ 2838.2(b).

out. Low-income areas were also prioritized to provide the neighboring community with access to localized backup power. Facilities and circuit loads with local distributed renewables were also prioritized during the evaluation process to better integrate renewables on the utility's side of the meter.

IV. DISTRIBUTION ENERGY STORAGE MICROGRID PROJECTS

As indicated previously, the proposed facilities are augmenting the existing 12kV electric distribution system, allowing critical customer load distribution circuits to be able to operate independently during outages, essentially creating self-contained electric distribution systems during outages. These distribution assets will be located at, and connected to, existing SDG&E electric distribution substations solely at 12kV electric distribution voltage. Due to their nature as critical load circuit support, the facilities will be controlled and operated as part of the electric distribution system, to provide distribution system resiliency as integral parts of the electric distribution substation and associated circuits. As with all of our electric distribution activities, SDG&E will be conferring with local agencies to ensure that these facilities are integrated into the existing utility properties to the greatest extent feasible, focusing on any outstanding land use matters if and as needed.

V. SAFETY AND ENVIRONMENTAL

SDG&E performs environmental review on all of its O&M and capital projects, employing a detailed set of criteria for determining whether a more robust environmental review is needed based on project location and scope relative to sensitive environmental resources. We do this independently of any specific permit oversight from the Commission or other state agencies. Our environmental review focuses on avoiding and minimizing any impacts to biological resources through review and compliance with our existing endangered species permits as well as cultural resource review, paleontological resources, water quality, air quality

and hazardous materials/substances reviews. This internal environmental review ensures compliance with existing laws, regulations and SDG&E standards and policies.

SDG&E will construct the energy storage sites in compliance with County, State and Federal guidelines. Proper environmental studies and necessary infrastructure and/or mitigations will be in place to prevent or contain spills and audible levels from encroaching into the surrounding environment. All the projects listed above will be constructed on previously disturbed sites that are owned by SDG&E.

SDG&E works to ensure its energy storage procurements yield energy storage systems that are designed, constructed and operated safely, regardless of use case or ownership structure. For utility-owned energy storage systems such as these, SDG&E undertakes a comprehensive evaluation of all components of each project, including assessment of the contractor's prior experience in safely constructing and operating energy storage systems, the technical merit of the proposed system, and the projects safety components. In accordance with best practices in safety, SDG&E has preliminarily evaluated sites based on the Commission's Safety and Enforcement Division's Safety Inspection Items for Energy Storage Checklist and other energy storage safety documentation in the industry.

VI. CONCLUSION

SDG&E's distributed energy resource projects described in my testimony will provide microgrid resiliency to critical public infrastructure by providing back-up power capability during outages. My testimony provides details surrounding the proposed capital cost cap of each circuit-level microgrid energy storage resource for which we are seeking approval, as well as the anticipated O&M direct costs associated with the energy storage circuit-level microgrid projects.

This concludes my prepared direct testimony.

VII. STATEMENT OF QUALIFICATIONS

My name is Steven Prsha and my business address is 8335 Century Park Ct., San Diego, California 92123. I currently work under the Growth and Technology Integration division as an engineer in the distributed energy resources group of SDG&E. I hold a Bachelor's of Science Degree in Electrical Engineering from San Diego State University. I have been employed by SDG&E since 2013. I am a licensed Professional Engineer in the State of California and have over three years of experience with integrating, installing and operating numerous utility scale multi-Megawatt energy storage systems of various technologies (flow, lead acid, Li-ion, etc.) in SDG&E's territory. Prior to working in the distributed energy resources division, I held positions in resource planning, generation and system protection.

I have not previously testified before the California Public Utilities Commission.

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

DECLARATION OF TED REGULY REGARDING CONFIDENTIALITY OF CERTAIN DATA/DOCUMENTS PURSUANT TO D.17-09-023

I, Ted Reguly, do declare as follows:

1. I am the Director of the Growth & Technology Integration Department for San Diego Gas & Electric Company ("SDG&E"). I have been delegated authority to sign this declaration by Caroline Winn, SDG&E's Chief Operating Officer. I have reviewed the confidential information included within the Direct Testimony of Stephen Prsha and the Direct Testimony of Michael R. Woodruff and James G. Vanderhye Jr., submitted concurrently herewith (the "Direct Testimony"). I am personally familiar with the facts in this Declaration and, if called upon to testify, I could and would testify to the following based upon my personal knowledge and/or information and belief.

2. I hereby provide this Declaration in accordance with Decision ("D.") 17-09-023 and General Order ("GO") 66-D to demonstrate that the confidential information ("Protected Information") provided in the Direct Testimony is within the scope of data protected as confidential under applicable law.

3. In accordance with the narrative justification described in Attachment A, the Protected Information should be protected from public disclosure.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct to the best of my knowledge. Executed this 28th day of February, 2018, at San Diego

Ted Reguly

ATTACHMENT A

SDG&E Request for Confidentiality on the following information in its Direct Testimony

Location of Protected Information	Legal Citations	Narrative Justification
Highlighted data within documents: Direct Testimony of Steven Prsha, SP-7 to SP-10, SP-12 to SP-13, SP-15, SP-17 to SP-19, SP-21. Direct Testimony of Michael R. Woodruff and James G. Vanderhye Jr., MW-1 to MW-2.	CPRA Exemption, Gov't Code § 6254.7(d) CPRA Exemption, Gov't Code § 6254(k) • Cal. Evid. Code § 1060 • Cal. Civil Code §§ 3426 *et seq.*	The Protected Information is entitled to confidential treatment under applicable law, including, but not limited to, the legal authority cited herein. The identified confidential information are project cost estimates which third-party vendors will bid upon based upon an RFI/RFP process. Public disclosure would pose potential negative impacts and/or competitive harm by setting a cost target for third parties. Cost estimates should not be made visible to the public, other vendors, contractors, or any others outside SDG&E, as public disclosure would impact competitive pricing, and the ability to secure optimal terms with third parties.