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Form 4: Demand Forecast Methods and Models

Presented below is a summary of the methodology underlying the long-term forecast of electric energy for the San Diego Gas & Electric Company ("SDG&E") service territory for the years 2025-2036[1].

SDG&E uses a combination of econometric and statistically adjusted end-use models ("SAE") to develop forecasts of electric customers, sales, system energy requirements and system peak demand. In general, the forecasting models integrate input assumptions regarding demographic and macroeconomic concepts, weather, energy prices, building and appliance standards and saturations, energy efficiency programs, building electrification, and other factors affecting electricity consumption, such as new or changing technologies. Additionally, adjustments are made for electric vehicles, climate impacts and behind the meter solar and battery storage.

Electricity consumption is modeled in the following sectors and categories: Residential, Small/Medium/Large Commercial combined, Agriculture and Water Pumping, and Street Lighting.

The residential class electric sales are modeled as the product of per-customer-usage and the number of customers. Usage per customer is modeled using the residential SAE model and incorporates equipment efficiency and saturation trends along with billing days, real electric prices, weather, seasonal and real personal income to forecast energy sales. Residential sales are adjusted to account for energy efficiency & standards impacts, building electrification, electric vehicle load, climate impacts, and self-served load (like solar and battery storage).

[1] SDG&E's 2025 and 2026 Forecast were submitted in CPUC's 2025 ERRA Forecast Application (approved & in Electric Rates) and CPUC's 2026 ERRA Forecast Application (currently pending). The same forecasts are being used for years 2025 & 2026 in this 2025 IEPR filing.

Combined Small/Medium/Large non-residential electric sales are modeled as the product of per-customer-usage and the number of customers. Usage per customer is modeled using the commercial SAE model and incorporates equipment efficiency and saturation trends along with billing days, real electric prices, weather, seasonal and economic employment conditions to forecast energy sales. Combined Small/Medium/Large commercial sales are adjusted to account for energy efficiency & standards impacts, electric vehicle load, climate impacts, and self-served load (from both solar and non-solar).

Agriculture class electric sales are forecasted as an individual sector based primarily on customer counts and recent energy usage trends. An econometric model was used to forecast the agriculture class on a usage per customer basis using an estimation period of 2017 through 2024. The model was fitted using monthly binary variables and historical rain data. Solar was included for the estimation of agriculture consumption and was later subtracted off forecast to determine reported sales.

Street lighting class electric sales are forecasted as an individual sector based primarily on customer counts and recent energy usage trends. A three-year average (2022-2024) usage per customer was applied to forecasted customers to come up with a lighting sales forecast.

The hourly forecast is based on individual forecasts by sector for all LSEs in SDG&E service territory and is calibrated to the resulting control totals from the sector sales forecasts. Hourly loads provide an 8760 (8784 leap year) shape to the forecast period and incorporates hourly PV generation, charging and discharging battery storage, and electric vehicle charging.

The energy forecast is disaggregated into bundled service, direct access service, and CCA service. The amount of direct access load in the forecast is limited to an authorized cap of 3,942

GWh, as per an April 2019 CPUC draft decision (R.19-03-009) in a rulemaking proceeding to implement California Senate Bill 237 (SB 237).

The economic assumptions are based on a blend of the latest available forecasts from Global Insight, Inc. (June 2024 Regional forecast for San Diego) and Moody's Economy.com (May 2024 Regional Forecast for San Diego). Numerical values for key assumptions are presented in IEPR Form 2.1.

Electric Vehicle Forecast:

SDG&E's light-duty EV adoption forecast utilizes DMV registration data to determine the current market share of electric vehicles compared to the total light-duty vehicle population. This percentage market share acts as the baseline for the forecast. The CEC 2024 CEDU LD forecast is leveraged to determine the expected growth rate of light-duty EV's across the state year over year. SDG&E assumes approximately 10% of the total light-duty vehicle population and EV population reside within the service territory. We then calculate the market share and percent of market share growth due to EV adoption each year throughout the forecast. This market share growth rate is applied for each year following the baseline year (and market share) to calculate the SDG&E light-duty EV adoption forecast.

SDG&E applied annual LDEV vehicle efficiency assumptions provided by the CEC during the development of the 2024 CEDU to its annual stock forecast to forecast annual LDEV charging load. SDG&E also developed assumptions for daily EV consumption, and charging sites (residential/public charging) to obtain a forecast for EV charging load. SDG&E used the CEC's 2023 CEDU hourly LDEV forecast for SDG&E, along with internal charging

assumptions, as a basis for the LDEV charging profile. The charging profile was applied to the LDEV charging load forecast to develop an hourly EV load forecast.

SDG&E's medium and heavy-duty EV adoption forecast utilizes several data sources to identify facilities with fleets domiciled within the SDG&E service territory. For each facility, the count of vehicles by vehicle class is identified. The rate of EV adoption is based upon California MDHD ZEV mandates which are applied to each fleet to maintain compliance. Heavy duty vehicles that are not expected to electrify but instead leverage Hydrogen to meet the CA MDHD ZEV mandates are excluded from the EV adoption forecast. The relevant CA ZEV mandates are applied to the MDHD vehicles present at each facility in order to calculate the number of MDHD EVs year over year.

Climate Data:

SDG&E uses various weather variables in the sales forecast development process, including heating-degree days, cooling-degree days and relative humidity. The three weather stations that represent the majority of load centers within SDG&E's service area are Lindbergh Field (KSAN), Marine Corps Air Station (KNKX), and El Cajon Gillespie Field (KSEE). While load-forecasting models traditionally rely on the relationship between historical weather and energy demand, incorporating climate projections allows utilities to anticipate shifts in consumption patterns more effectively. Climate data at the three weather station locations is used for the calculation.

The climate data used in this analysis comes from the Localized Constructed Analogs Version 2 (LOCA2), a high-resolution dataset tailored to California and aligned with the Coupled Model Intercomparison Project Phase 6 (CMIP6). The projections are based on the Shared

Socioeconomic Pathway 3–7.0 (SSP3-7.0), which was designated by the California Public Utilities Commission as the reference scenario for energy utility planning in the Climate Adaptation Vulnerability Assessment (CAVA). This dataset is consistent with those used in SDG&E's 2025 CAVA and California's upcoming Fifth Climate Change Assessment in 2026. To improve accuracy, the LOCA2-based climate projections at the three selected weather station locations are adjusted using the downscaling of the ERA5 reanalysis data, which blends model outputs with real-world weather observations. Daily values are then calculated using a 10-year averaging window, a standard approach in climate science to reduce short-term variability and highlight long-term trends. Heating and cooling degree days are computed at various temperature thresholds using the heat index, which more accurately reflects how people experience temperature by accounting for both heat and humidity. SDG&E is engaging with the Cal-Adapt Analytics Engine team —a group supported by the California Energy Commission and involved in the state's Fifth Climate Change Assessment—on collaboratively determining appropriate methods for applying climate data in this context.

PV Self-Served Load:

Over the past 10 years, SDG&E has experienced exponentially increasing solar installation, with year-over-year growth reaching as high as 50 percent. SDG&E believes the California Energy Commission (CEC) has accurately accounted for this trend in its PV forecast. SDG&E has adopted the CEC CEDU 2024 Planning Scenario for the 2025 IEPR annual growth rate of installed PV capacity forecast. SDG&E applied this growth rate to actual installed capacity in its service territory as of December 2024 to forecast installed capacity. SDG&E has a representative sample of solar generation meters which are used to derive hourly capacity factors. These

historical capacity factors were used to create an average shape and applied to the PV forecast of installed capacity to obtain estimates of PV generation.

Battery Storage:

Battery storage is still in its early stages of adoption in SDG&E service territory. Recent changes to the state's NEM landscape have furthered the relevance of paired solar and battery storage systems. SDG&E's forecast of annual installed capacity of battery storage is informed by the CEC's 2024 CEDU forecast annual growth rate of installed PV capacity. SDG&E has applied the annual growth rate to actual installed capacity of battery storage as of December 2024. SDG&E's forecast includes a charge/discharge profile that considers publicly available information, along with the charge/discharge profile from the CEC CEDU 2024 hourly forecast for SDG&E service territory. This profile was applied to the installed capacity forecast to obtain an hourly battery storage forecast.

Non-PV Self-Served Load:

SDG&E witnessed rapid growth in non-PV self-served load from the early 1980s through the mid-2000s. From 2007 to 2013, SDG&E saw relatively constant non-PV self-served load. A structural shift occurred in 2014, and there was a significant decrease in non-PV installed capacity within the SDG&E service territory, as well as a noticeable decrease in self-served load. The forecast anticipates that no major non-PV projects will be added to the system within the forecast period and has therefore determined that non-PV self-served load will see no growth over the next 10 years.

Demand-Side Methodology

Committed and uncommitted energy efficiencies and standards are incorporated into the inputs of the sector forecast models. Efficiencies and standards are reflected in model parameters such as residential unit-energy-consumption (UEC) and commercial energy-use-intensities (EUI). Efficiencies and standards included in the models for years subsequent to 2024 were developed by analyzing the Energy Efficiency Potential and Goals Study 2023 and Beyond as prepared for the CPUC and by incorporating efficiencies from standards, behavioral programs, equipment, and end-of-use decay for measures.

Building Electrification

SDG&E has reviewed and included policies that align with CARB's 2022 State Strategy for the State Implementation Plan. Beginning in 2030, the concept for zero-emission standards for these appliances would mean that a person or business purchases a new space or water heater (whether for new construction or to replace in existing buildings), they would only be able to purchase electric units. This potential regulation would not limit use or repair of existing fossil gas space or water heaters and therefore gas appliances could remain in operation after 2030.

Departing Load Assumptions

SDG&E's retail sales forecast does not include any assumed departing load migration or load to previously unserved areas. SDG&E develops its year-ahead departed load forecast through the CPUC Resource Adequacy Meet and Confer process. Year-ahead migrating load forecasts are coordinated with the CCAs while the Direct Access load is forecast at the CPUC's DA cap.