

Application No: A.15-07-
Exhibit No.: _____
Witness: Jeff Huang

Application of Southern California Gas Company
(U 904 G) and San Diego Gas & Electric Company
(U 902 G) for Authority to Revise their Natural Gas
Rates Effective January 1, 2017 in this Triennial
Cost Allocation Proceeding Phase 2

A.15-07-_____
(Filed July 8, 2015)

PREPARED DIRECT TESTIMONY OF
JEFF HUANG
SAN DIEGO GAS & ELECTRIC COMPANY
AND
SOUTHERN CALIFORNIA GAS COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

July 8, 2015

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**PREPARED DIRECT TESTIMONY
OF JEFF HUANG**

I. INTRODUCTION

The purpose of my direct testimony on behalf of Southern California Gas Company (SoCalGas) and San Diego Gas & Electric Company (SDG&E) is to present a portion of the forecast of natural gas demand for electric generation (EG) customers for the Triennial Cost Allocation Proceeding (TCAP) period (2017-2019) for SoCalGas and SDG&E. My testimony covers the portion of the EG market comprised of: (1) utility electric generation (UEG) customers; Southern California Edison Company (SCE); SDG&E; the cities of Anaheim, Burbank, Colton, Corona, Glendale, Pasadena, Riverside, and Vernon; the Los Angeles Department of Water and Power (LADWP); and the Imperial Irrigation District (IID); (2) exempt wholesale generation (EWG) customers; and (3) SoCalGas large cogeneration customers with generating capacity greater than 20 megawatts (MW).¹

II. EG FORECAST METHODOLOGY

Due to the complex interaction of the electric supply and electric demand components, the EG natural gas demand forecast of the UEG, EWG, and SoCalGas large cogeneration customers is based on an analysis of the operation of power plants in the Western United States electric market using a production cost model. This method has been used in previous applications before the California Public Utilities Commission (Commission). This forecast uses the Zonal Market Analysis model (Model) developed by the software provider Ventyx.² The Model evaluates, in detail, the least-cost dispatch of the electricity supply to meet system

¹ The forecast of the natural gas demand for the remainder of the EG market (small EG customers) is covered in the direct testimony of Dr. Wetzel.

² Ventyx is now referred to publicly as the Enterprise Software product group within the ABB company.

1 demand on an hourly basis and provides results of generation unit output, including fuel burn.

2 The major inputs used in the Model are discussed below.

3 **A. Electricity Demand**

4 The demand forecast for California used in the Model is from the California Energy
5 Commission's (CEC's) California Energy Demand Updated Forecast, 2015 - 2025, dated
6 December 2014.³ This demand forecast was developed as part of the CEC's Integrated Energy
7 Policy Report process. The mid energy demand forecast with mid Additional Achievable Energy
8 Efficiency (AAEE) scenario was selected as the energy demand forecast. For the remainder of
9 the Western Electricity Coordinating Council (WECC), the demand forecast used the Ventyx
10 electric demand forecasts. Ventyx develops these forecasts by collecting data from various
11 sources including demand forecasts filed by utilities with the Federal Energy Regulatory
12 Commission (FERC).

13 **B. Availability of Hydroelectricity**

14 Limited multi-year water storage in California and the Pacific Northwest (PNW) makes
15 annual hydroelectric generation dependent on each year's snowpack run-off. In the last 20 years,
16 hydro has varied from 56% to 151% of normal. This can cause substantial swings in EG
17 volumes. Because the hydroelectric generation exhibits a year-to-year random variability, the
18 forecast assumes that the availability of hydroelectricity generation in California and the PNW
19 will be equal to the 15-year average, based on data from 1994-2008.

³ The CEC report can be found at <http://www.energy.ca.gov/2014publications/CEC-200-2014-009/CEC-200-2014-009-SD.pdf>

1 **C. Generation Capacity**

2 The generator operating characteristics used in the Model are based on values provided
3 by Ventyx. Ventyx develops these from regulatory proceedings and filings (*e.g.*, CEC’s
4 Electricity Report and FERC forms).

5 In addition to existing generation capacity, plants under construction were added to the
6 electricity supply mix. In Southern California, plants that were selected as part of recent Investor
7 Owned Utility (IOU) Requests for Offers (RFOs) were also added, even though they are
8 currently not under construction.

9 In the SoCalGas service area, the forecast assumes the repowering of LADWP’s
10 Scattergood Unit 3 (currently 450 MW) from an old steam plant into a 308 MW combined cycle
11 unit and two 100 MW simple cycle turbines will be completed prior to 2016.

12 In the SDG&E service area, the forecast includes the Pio Pico Energy Center peaking
13 plant (300 MW), with an expected summer 2017 in-service date. Its in-service date coincides
14 with the retirement of three older peaking plants: El Cajon (16 MW), Kearny (120 MW), and
15 Miramar (36 MW). The Carlsbad Energy Center peaking plant (500 MW) is also included in the
16 forecast, assuming its proposed 2018 in-service date, which coincides with the retirement of the
17 Encina Power Plant (964 MW) due to once-through cooling (OTC) regulations.

18 In this forecast, energy storage resources consistent with the Commission’s Storage
19 Decision (D.) 13-10-040 were added in the SDG&E and SCE service area. Installed storage
20 capacity data is based on the mid scenario from the Commission’s 2014 Long Term Procurement
21 Plan Standard Planning Assumptions. This forecast includes a statewide installed capacity of
22 190 MW by 2017 and is increased to 390 MW by 2019.

1 California has adopted an aggressive Renewables Portfolio Standard (RPS), requiring
2 IOUs, electric service providers, and community choice aggregators to increase procurement
3 from eligible renewable energy resources to 33% of total procurement by 2020. While the state
4 is on track to meet the standard, there are uncertainties as to how much renewable power will be
5 added specifically during the TCAP period. For this forecast, SoCalGas and SDG&E assume the
6 state of California as a whole will reach 24% RPS by 2015 and assume that RPS levels will
7 increase linearly until the state reaches the targeted 33% RPS by 2020.

8 **D. Electric Transmission**

9 The addition of large transmission projects, especially ones that interconnect Southern
10 California with other regions and states, can have an impact on UEG and EWG demand in the
11 service territories of both SoCalGas and SDG&E. There is no new major transmission line
12 added in this forecast as there are no known projects expected to come online during the TCAP
13 period.

14 **E. Greenhouse Gas (GHG) Cap-and-Trade Program Costs**

15 In response to Assembly Bill 32, the California Air Resources Board (ARB) implemented
16 a Cap-and-Trade program for GHG emissions beginning in 2013. The forecast of natural gas
17 demand for UEG and EWG customers assumes GHG compliance costs based on recent futures
18 market prices of \$13-15 per metric ton of carbon dioxide-equivalent (MTCO_{2e}).

19 **III. UEG, EWG, AND LARGE COGENERATION FORECAST**

20 The UEG, EWG, and SoCalGas large cogeneration forecast, based on the aforementioned
21 assumptions for the years 2017 through 2019, is shown in Table 1.
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Table 1
Annual EG and Large Cogeneration Forecast (MMDth)

<i>Year</i>	<i>SDG&E UEG/EWG</i>	<i>SoCalGas UEG/EWG</i>	<i>SoCalGas Large Cogen</i>	<i>Total</i>
2017	52	172	51	275
2018	47	171	51	269
2019	46	172	51	269
Average	48	172	51	271

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Dry-year hydro, which is defined as hydro conditions expected once every 10 years, is about 70% of normal and can cause an increase in EG demand of about 31 MMDth above demand during an average hydro year.

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IV. WINTER PEAK FORECAST

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For the purpose of establishing the marginal demand measures presented in the direct testimony of Dr. Wetzel, a winter peak day forecast was developed for UEG, EWG, and large cogeneration natural gas demand. For 2017–2019, the winter peak demand was the coincidental peak day of the combined SoCalGas and SDG&E system from the production cost model run for the month of December. The result is shown in Table 2.

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Table 2
Winter Coincidental Peak Day Demand (MDth/day)

<i>Year</i>	<i>SDG&E</i>	<i>SoCalGas</i>	<i>Total</i>
2017	172	803	975
2018	179	789	968
2019	172	827	999

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This concludes my prepared direct testimony.

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V. QUALIFICATIONS

My name is Jeff Huang. My business address is 555 West Fifth Street, Los Angeles, California, 90013. I am employed by SoCalGas as a Senior Resource Planner in the Quantitative Research Group. My responsibilities include the development of natural gas demand forecasts for EGs in the service areas of both SoCalGas and SDG&E and evaluating various EG related projects.

I have a Master of Science degree in Electrical Engineering from University of Southern California. I am a registered Professional Engineer in California. I have been employed by SoCalGas since 1999.