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:



**OFFICE OF RATEPAYER ADVOCATES
CALIFORNIA PUBLIC UTILITIES COMMISSION**

**Triennial Cost Allocation (TCAP)
Proceeding, Phase 2**

**Southern California Gas Company (U 9042G) and
San Diego Gas & Electric Company (U 902 G)**

ORA Testimony on Throughput

San Francisco, California
March 11, 2016

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1 **I. INTRODUCTION**

2 This exhibit presents the analyses and recommendations of the Office of
3 Ratepayer Advocates (ORA) regarding Phase 2 of SoCalGas/SDG&E’s (Sempra) 2016
4 Triennial Cost Allocation Proceeding (TCAP) Application regarding throughput.
5 SoCalGas/SDG&E forecast natural gas throughput to the residential, core commercial
6 and industrial classes of service as well as for the commercial and industrial non-core
7 classes of service. SoCalGas/SDG&E also forecast demand to the electric generation
8 (EG) and Enhanced Oil Recovery (EOR) classes of service. For the weather sensitive
9 sectors, primarily the core class of service SoCalGas/SDG&E forecast gas demand under
10 average and cold temperature conditions.

11 Section I of this testimony discusses SoCalGas/SDG&E’s recommended forecasts
12 for the core class of service.

13 In this proceeding SoCalGas and SDG&E rely upon end-use models to forecast
14 gas throughput to the various classes of service. As the name suggests, end-use models
15 derive demand from the stock of energy using appliances, commercial and industrial
16 equipment, space heating requirements, and a variety of other end-uses. The end-uses, in
17 turn, are influenced by other exogenous variables such as the vintages of the stock of
18 energy using equipment, prices of electricity and natural gas, employment growth, price
19 and output (employment) elasticities, saturation rates, and weather.¹

20 An alternative to end-use models involves constructing econometric models for
21 each class of service. Econometric models attempt to establish a statistical relationship
22 between historical natural gas demand to weather, economic and demographic variables
23 such as employment and personal income, and natural gas prices. Prior to 2008,
24 SoCalGas and SDG&E relied upon econometric models to forecast gas throughput. In
25 2009, SoCalGas and SDG&E began to rely upon end-use models. In 2009, Sempra

¹ Unlike the California Energy Commission (CEC), ORA does not maintain a generic electric and gas end use model. Furthermore, ORA does not have access to SoCalGas’ proprietary end-use model. In lieu of running the model itself, ORA requested SDG&E and SoCalGas to rerun its end-use models with updated price and employment elasticities.

1 explained that: “End-use models with an equipment choice module are a more effective
2 forecasting tool in today’s energy efficiency world. Also, we had been maintaining two
3 sets of models for forecasting purposes, econometric and end-use models. To save
4 resources, we decided to use end-use models exclusively to be more in line with CEC
5 [California Energy Commission] and the use of our end-use models in the CGR
6 [California Gas Report].”²

7 SoCalGas and SDG&E rely upon variations of their previously econometrically
8 estimated models to generate price and employment elasticities. The price and
9 employment elasticities are inputs into the end-use models. However, SoCalGas and
10 SDG&E have not recently updated the econometric models that generate their price and
11 employment elasticities. The price and employment elasticities were last updated in
12 2005. SoCalGas and SDG&E argue that altering the estimated price elasticities has a
13 negligible impact on the final throughput forecast. SoCalGas/SDG&E conclude that: “It
14 is our opinion that the resulting load is not overly sensitive to changes in the elasticity
15 values. For example, even [when] we double the price elasticity of demand (a 100%
16 increase in elasticity values) for the commercial and industrial market, the load reduction
17 is no more than 3%. Furthermore, in 2009, price elasticities were re-estimated for the
18 core commercial and industrial markets and compared to the 2005 elasticity results.
19 However, the results were not seemingly very different from a weighted average of the
20 2005 price elasticity estimates. Therefore, it does not appear that price elasticities have
21 changed in a meaningful way over time.”³

² SDG&E/SoCalGas, 2009 Biennial Cost Allocation Proceeding, (A.08-02-001), Response to DRA Data Request No. DRA-TMR1, Question 1.

³ SDG&E/SoCalGas Response to ORA Data Request ORA-TCAP2-SCG-03, Response to Question 1.

1 II. SUMMARY OF RECOMMENDATIONS

2 ORA utilized modified price and employment elasticities based on econometric
3 models estimated through the end of 2014. ORA does not oppose the SoCalGas/SDG&E
4 proposed throughput forecasts, based on the results of ORA's analysis and requested
5 sensitivity runs.

- 6 • For Test Year 2017 SoCalGas recommends residential throughput of 244,825
7 (Mdth). On a cold temperature basis SoCalGas forecasts residential demand of
8 269,689 (Mdth). ORA does not oppose these forecasts.
- 9 • For Test Year 2017 SDG&E recommends residential throughput of 31,912
10 (Mdth). On a cold year basis SDG&E forecasts residential throughput of 35,283
11 (Mdth).
- 12 • For the commercial and industrial core sector, SoCalGas forecasts Test Year
13 average temperature throughput of 103,342 (Mdth). Under cold year conditions
14 SoCalGas forecasts Test Year throughput of 108,366 (Mdth).
- 15 • SDG&E forecasts Test Year core commercial and industrial throughput of 18,468
16 (Mdth). Under cold year conditions SDG&E forecasts commercial and industrial
17 core throughput of 19,178 (Mdth).
- 18 • Under average and cold year temperatures SoCalGas forecasts Test Year gas air
19 conditioning (GAC) throughput of 77 (Mdth).
- 20 • Under average and cold year temperature conditions SoCalGas forecasts Test Year
21 gas engine throughput of 2,049 (Mdth).
- 22 • For the Natural Gas Vehicle (NGV) class of service SoCalGas forecasts Test Year
23 throughput of 14,831 (Mdth).
- 24 • Under average and cold year conditions SDG&E forecasts Test Year NGV
25 throughput of 1,747 (Mdth).
- 26 • For the noncore commercial and industrial class of service SoCalGas forecasts
27 Test Year throughput of 154,392 (Mdth). Since this load is not weather sensitive

1 the recommended forecast is identical under both average and cold year weather
2 assumptions.

- 3 • SDG&E forecasts Test Year noncore commercial and industrial throughput of
4 4,590 (Mdth).
- 5 • For the electric generation class of service, (EG), SoCalGas forecasts Test Year
6 throughput of 268,103 (Mdth). This class of service is also not weather sensitive.
7 Therefore, the recommended throughput forecast is identical under average and
8 cold year conditions.
- 9 • SDG&E forecasts Test Year throughput of 70,627 (Mdth) for the EG class of
10 service.
- 11 • For the Enhanced Oil Recovery (EOR) SoCalGas recommends a forecast of
12 23,157 (Mdth) for Test Year 2017.
- 13 • SoCalGas provide wholesale service to the City of Long Beach, SDG&E, the City
14 of Vernon, and the City of Mexicali. Under normal or average year weather
15 assumptions SoCalGas forecasts aggregate wholesale throughput of 160,777
16 (Mdth) for Test Year 2017. Under a cold year scenario SoCalGas forecasts
17 aggregate wholesale Test Year throughput of 165,590 (Mdth).

1 Table 2-1 reports SoCalGas' recommended throughput forecasts on an average
 2 temperature basis for Test Year 2017, 2018 and 2019.

3 **Table 2-1⁴**
 4 **SoCalGas Average Year Throughput Forecast**
 5 **(MdtH/Year)**
 6 **2017-2019**

Sector	2017	2018	2019
Core			
Residential	244,825	243,608	242,115
Core C&I	103,342	102,434	101,179
Gas AC	77	77	77
Gas Engine	2,049	2,070	2,091
NGV	14,831	15,639	16,599
Total Core	365,131	363,882	362,061
Noncore			
C&I	154,392	152,639	150,571
Electric Generation	268,103	267,235	268,000
EOR	23,157	23,157	23,157
Total Noncore	445,652	443,032	441,727
Wholesale			
Long Beach	7,309	7,389	7,358
SDG&E	128,524	124,059	122,885
SWG	6,481	6,537	6,592
Vernon	9,371	9,513	9,657
Mexicali	9,092	9,138	9,183
Total Wholesale	160,777	156,635	155,675
Total Throughput	971,560	963,549	959,463

⁴ Prepared Direct Testimony of Bruce M. Wetzel, Southern California Gas Company and San Diego Gas & Electric Company, July 8, 2015, p. 8.

1 Table 2-2 reports SoCalGas recommended throughput forecasts under cold
 2 temperature conditions for Test Year 2017, 2018 and 2019.

3 **Table 2-2⁵**
 4 **SoCalGas Cold-Year Throughput Forecast**
 5 **(MdtH/Year)**
 6 **2017-2019**

Sector	2017	2018	2019
Core			
Residential	269,689	268,736	267,515
Core C&I	108,366	107,423	106,120
Gas AC	77	77	77
Gas Engine	2,049	2,070	2,091
NGV	14,837	15,693	16,599
Total Core	395,018	393,999	375,803
Noncore			
C&I	154,824	153,072	151,004
Electric Generation	268,103	267,235	268,000
EOR	23,157	23,157	23,157
Total Noncore	446,085	443,465	442,160
Wholesale			
Long Beach	7,965	8,049	8,019
SDG&E	132,643	128,222	127,090
SWG	6,519	6,575	6,631
Vernon	9,371	9,513	9,657
Mexicali	9,092	9,138	9,183
Total Wholesale	165,590	161,497	160,579
Total Cold Year Throughput	1,006,694	998,960	995,141

⁵ Prepared Direct Testimony of Bruce M. Wetzel, Southern California Gas Company and San Diego Gas & Electric, July 8, 2015, p. 9.

1 Table 2-3 reports SDG&E's recommended throughput forecasts for Test Year
2 2017, 2018 and 2019 under average temperature conditions.

3 **Table 2-3⁶**
4 **SDG&E Average Year Throughput Forecast**
5 **2017 – 2019**
6 **(Mdt)**

Sector	2017	2018	2019
Core			
Residential	31,912	32,014	32,069
Core C&I	18,468	18,290	18,040
NGV	1,747	1,848	1,995
Total Core	52,127	52,152	52,063
Noncore			
Noncore C&I	4,590	4,608	4,618
Electric Generation	70,627	66,160	65,076
Total Noncore	75,217	70,768	69,694
Total Average Year Throughput	127,345	122,921	121,757

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⁶ Prepared Direct Testimony of Bruce Wetzel Southern California Gas Company and San Diego Gas & Electric Company, July 8, 2015, p. 13.

1 Table 2-4 reports SDG&E’s recommended throughput forecasts under cold
 2 temperature conditions for Test Year 2017, 2018, and 2019.

3 **Table 2-4⁷**
 4 **SDG&E Cold Year Throughput Forecast**
 5 **2017 – 2019**
 6 **(Mdth)**

Sector	2017	2018	2019
Core			
Residential	35,283	35,435	35,420
Core C&I	19,178	18,994	18,734
NGV	1,747	1,848	1,955
Total Core	56,208	56,277	56,231
Noncore			
Noncore C&I	4,590	4,608	4,618
Electric Generation	70,627	66,160	65,076
Total Noncore	75,217	70,768	69,694
Total Average Year Throughput	131,426	127,046	125,924

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 8 **III. Residential Gas Demand**

9 **A. Background**

10 For 2017, 2018 and 2019, SoCalGas forecasts average temperature year total
 11 residential throughput of 244,825 (Mdth), 243,608 (Mdth), and 242,115 (Mdth),
 12 respectively. On a cold temperature year basis, SoCalGas forecasts residential gas
 13 demand of 269,689 (Mdth) for 2017, 268,736 (Mdth) in 2018, and 267,515 (Mdth) in
 14 2019. On an average temperature basis SDG&E forecasts residential gas demand of
 15 31,912 (Mdth) in 2017, 32,014 (Mdth) in 2018, and 32,069 (Mdth) for 2019. On a cold

⁷ Prepared Direct Testimony of Bruce Wetzel Southern California Gas Company and San Diego Gas & Electric Company, July 8, 2015, p. 14.

1 year basis, SDG&E forecasts residential gas demand of 35,283 (Mdt) in 2017, 35,435
2 (Mdt) in 2018, and 35,542 (Mdt) in 2019.

3 **B. ORA Analysis**

4 SoCalGas' and SDG&E residential forecasts are consistent with the long-term
5 growth in residential gas demand. Over the historical period, 1990 through 2014,
6 residential gas demand for SoCalGas declined, on average, by approximately one per cent
7 per annum.⁸ Over the 2015 – 2019 forecast period SoCalGas forecasts a slight decline in
8 residential throughput. Over the 2017 – 2019 TCAP forecast period SoCalGas expects
9 residential throughput to decline, on average, by less than one percent per year.

10 The historical pattern of residential gas demand for SDG&E is similar to
11 SoCalGas' experience. Over the period 1990 through 2014, total residential gas demand
12 at SDG&E declined, on average, by one percent per year. Over the 2017 – 2019 TCAP
13 forecast period, SDG&E forecasts that residential gas demand will grow, on average, by
14 one-half percent per year.

15 In analyzing the reasonableness of SoCalGas' residential throughput forecast,
16 ORA requested SoCalGas to re-run its end-use model with a different set of residential
17 price elasticities. To arrive at a set of alternative residential price elasticities ORA
18 updated SoCalGas' residential econometric model with data through December 2014.⁹
19 Table 2-5 shows a comparison of SoCalGas' residential price elasticities with ORA's
20 updated price elasticities. On a weighted average basis SoCalGas' and ORA's updated
21 price elasticities are similar to ORA's results showing slightly less price responsiveness
22 than SoCalGas'.

⁸ ORA measured the compound growth rate as $(\text{Year } t / \text{Year } t-1)^{1/t}$. Where Year $t = 2014$ and Year $t-1 = 1990$.

⁹ ORA's model was estimated with monthly observations over the period January 1990 through December 2014. ORA's results also include a correction for first-order autocorrelation.

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**Table 2-5
Residential Price Elasticities**

Sector	SoCalGas¹⁰	ORA
	(1)	(2)
Single-family	-0.1053	-0.0794
Premise 2	-0.1171	-0.0832
Premise3	-0.0714	-0.0557
Master Meter	-0.0688	-0.0153
Sub-Meter	-0.1053	-0.0583
Weighted Average	-0.09838	-0.07153

3 The use of the price elasticities reported in column (2) of Table 2-5 have little
4 impact on SoCalGas' and SDG&E's residential throughput forecasts. For SoCalGas the
5 use of the residential price elasticities reported in column (2) of Table 2-5 resulted in total
6 residential average temperature throughput forecasts of 244,168 (Mdt) in 2017, 242,988
7 (Mdt) in 2018, and 242,652 (Mdt) in 2019. For these years, SoCalGas recommends
8 total residential throughput of 244,825 (Mdt), 243,608 (Mdt) and 242,115 (Mdt). For
9 each of these years this is a difference of less than one percent. For SDG&E the results
10 are similar. The alternative residential price elasticities produced average temperature
11 throughput forecasts of 31,815 (Mdt) in 2017, 31,908 (Mdt) in 2018, and 31,971
12 (Mdt) in 2019. For these years SDG&E recommends residential throughputs of 31,912
13 (Mdt), 32,014 (Mdt), and 32,069 (Mdt) respectively. ¹¹

14 ORA does not oppose SoCalGas' and SDG&E's residential gas demand forecasts.

¹⁰ The SoCalGas price elasticities were taken from the SoCalGas/SDG&E TCAP workpapers.

¹¹ SoCalGas/SDG&E response to ORA data request ORA-TCAP2-SCG-21, February 25, 2016.

1 **IV. Commercial and Industrial Core**

2 **A. Background**

3 For 2017 SoCalGas recommends average year commercial and industrial core
4 throughput of 103,342 (Mdt). For 2017 SoCalGas projects that commercial and
5 industrial core throughput will decline to 102,434 (Mdt) in 2018 with a further decline
6 to 101,179 (Mdt) in 2019. Under cold-temperature year conditions SoCalGas forecasts
7 declines in commercial and industrial throughput. In 2017 SoCalGas forecasts
8 commercial and industrial throughput of 108,366 (Mdt) with a decline to 107,423
9 (Mdt) in 2018 and 106,120 (Mdt) in 2019.

10 SDG&E forecasts a similar pattern for commercial and industrial throughput.
11 Under average year conditions SDG&E forecasts commercial and industrial throughput
12 of 18,468 (Mdt) in 2017. Commercial and industrial throughput is expected to decline to
13 18,290 (Mdt) in 2018 and 18,040 (Mdt) in 2019.

14 **B. ORA Analysis**

15 ORA analyzed SoCalGas' commercial and industrial core forecasts separately. In
16 both cases, ORA requested SoCalGas to re-run its end-use model with updated price and
17 employment elasticities.

18 SoCalGas' commercial core forecast is consistent with the long-term growth in
19 commercial core throughput. Over the historical period 1990 through 2014 commercial
20 core throughput grew, on average, by only 0.21 percent per year. SoCalGas forecasts an
21 increase in commercial core throughput to 82,223 (Mdt) in 2015 from 77,074 (Mdt) in
22 2014. After that, commercial core throughput is forecast to decline in each of the forecast
23 years. For example, over the forecast period 2015 – 2017 commercial core throughput is
24 expected to decline, on average, by 0.49 percent per year.

25 Over the 1998 – 2014 historical period, SDG&E's commercial core throughput
26 declined, on average, by approximately one percent per annum. SDG&E's commercial
27 core throughput forecast is generally consistent with this historical pattern. Over the 2017
28 – 2019 forecast period, SDG&E expects commercial core throughput to decline on
29 average by less than one percent per year.

1 As in the case of the residential sector, ORA re-estimated SoCalGas’ traditional
 2 econometric models with updated data through 2014.¹² Table 2-6 reports a comparison of
 3 SoCalGas’ commercial core price elasticities with ORA’s updated price elasticities.

4 **Table 2-6**
 5 **Commercial Core Price Elasticities**

Sector	SoCalGas¹³	ORA
	(1)	(2)
Office	-0.1353	-0.1350
Restaurant	-0.0191	-0.0325
Retail	-0.2650	-0.2650
Laundry	-0.1227	-0.0894
Warehouse	-0.04303	-0.1577
Schools	-0.0000	-0.0406
College	-0.0371	-0.0424
Health	-0.0968	-0.0970
Lodging	-0.1056	-0.0652
Miscellaneous	-0.0000	-0.0652
TCU	-0.1293	-0.6478
Construction	-0.1610	-0.1610
Agriculture	-0.3152	-0.2723
Weighted Average¹⁴	-0.0861	-0.1223

6
 7 On a weighted average basis, the elasticities reported in Table 2-6 are quite similar
 8 to ORA’s, showing slightly more price responsiveness than SoCalGas’.

¹² Specifically, ORA estimated its commercial core sector econometric models with monthly observations over the period from January 2001 through December 2014.

¹³ The SoCalGas price and employment elasticities were taken from the SoCalGas/SDG&E TCAP workpapers.

¹⁴ The weights are based on the percent of total commercial core usage in each sector.

1 SoCalGas' econometric models also yield employment elasticities. Table 2-7
 2 compares SoCalGas' employment elasticities with those derived from ORA's updated
 3 econometric models. The results in Table 2-7 show that on a weighted average basis
 4 ORA's updated employment elasticities are nearly identical to the employment
 5 elasticities used by SoCalGas.

6 **Table 2-7**
 7 **Commercial Core Employment Elasticities**

Sector	SoCalGas¹⁵	ORA
	(1)	(2)
Office	0.5050	0.5050
Restaurant	1.1390	0.8175
Retail	0.8700	1.4868
Laundry	0.4110	0.5288
Warehouse	0.5410	0.5410
Schools	0.0000	0.0000
College	0.7340	0.7340
Health	0.1340	1.1383
Lodging	0.4290	0.1808
Miscellaneous	0.0000	0.0000
Government	1.6920	0.0000
TCU	0.7240	0.7240
Construction	0.1060	0.1060
Agriculture	0.6690	0.9510
Weighted Average¹⁶	0.6767	0.6405

8 As in the case of the residential sector, reliance upon ORA's commercial core
 9 price and employment elasticities have a very small impact on the commercial core

¹⁵ The SoCalGas price and employment elasticities were taken from the SoCalGas/SDG&E TCAP workpapers.

¹⁶ The weights are based on the percent of total commercial core usage in each sector.

1 throughput forecast. For SoCalGas, reliance upon the alternative price and employment
2 elasticities reported in column (2) of Tables 2-6 and 2-7 resulted in commercial core
3 forecasts of 81,813 (Mdt) in 2017, 81,276 (Mdt) in 2018, and 80,548 (Mdt) in 2019.¹⁷
4 For these years SoCalGas recommends commercial throughput forecasts of, respectively,
5 81,407 (Mdt), 80,825 (Mdt), and 80,076 (Mdt). For each of the 2017 – 2019 forecast
6 years this is a difference of less than one percent. Turning to the results for SDG&E,
7 yields a similar conclusion. In 2017, 2018, and 2019, the alternative price and
8 employment elasticities yield forecasts, respectively, of 17,189 (Mdt), 17,048 (Mdt)
9 and 17,048¹⁸. These forecasts are less than one percent different from SDG&E’s
10 commercial core throughput recommendations.

11 SoCalGas’ industrial forecast is generally consistent with the historical pattern of
12 industrial core demand. Over the period 1990 through 2014, industrial throughput
13 actually declined, on average, by 2.28 percent per year. From its forecast level of 22,424
14 (Mdt) in Test Year 2017, SoCalGas expects further declines in industrial throughput in
15 2018 and 2019. Over the 2017 – 2019 forecast period industrial core throughput is
16 forecast to decline, on average, by 1.27 percent per year.

17 Over the 1998 – 2014 historical period, SDG&E’s industrial core throughput
18 declined, on average, by slightly more than one percent per year. For the 2017 – 2019
19 forecast period SDG&E expects this trend to continue. Over the 2017 – 2019 forecast
20 period SDG&E projects that industrial core throughput will decline, on average, by one
21 half a percent per year.

22 As in the case of the core commercial sector, ORA requested SoCalGas to re-run
23 its end-use models with updated price and employment elasticities. Table 2-8 reports a
24 comparison of ORA’s updated industrial core price elasticities to SoCalGas’ estimated

¹⁷ SoCalGas/SDG&E response to ORA data request ORA-TCAP2-SCG-21, February 25, 2016.

¹⁸ SoCalGas/SDG&E response to ORA data request ORA-TCAP2-SCG-21, February 25, 2016.

1 price elasticities.¹⁹ The results reported in Table 2-8 show that ORA’s and SoCalGas’
 2 estimated price elasticities are virtually identical.

3 **Table 2-8**
 4 **Industrial Core Price Elasticities**

Sector	SoCalGas²⁰	ORA
	(1)	(2)
Mining	0.0000	-0.0248
Food	-0.1910	-0.1397
Textile	0.0000	0.0000
Wood and Paper	0.0000	-0.2157
Chemical	-0.0810	-0.2050
Petroleum	-0.1810	-0.0577
Stone and Clay	0.0000	0.0000
Primary Metals	0.0000	-0.0565
Fabricated Metals	-0.1370	-0.0054
Transport	0.0000	-0.2194
Miscellaneous	-0.1080	-0.0370
Weighted Average²¹	-0.1073	-0.1036

5
 6 The econometric models used by ORA and SoCalGas are also capable of
 7 generating employment elasticities. Table 2-9 reports a comparison of the industrial core
 8 employment elasticities derived from SoCalGas’ and ORA’s econometric models.

¹⁹ ORA estimated its econometric model with monthly observations over the period January 2006 through December 2014.

²⁰ The SoCalGas price and employment elasticities were taken from the SoCalGas/SDG&E TCAP workpapers.

²¹ The weights are based on each sector’s percentage of 2014 total industrial core throughput.

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**Table 2-9
Industrial Core Employment Elasticities**

Sector	SoCalGas²²	ORA
Mining	0.3215	0.0000
Food	1.2425	1.2176
Textile	0.0333	1.3026
Wood and Paper	0.5083	0.1432
Chemical	0.6501	0.6401
Petroleum	0.0845	0.0000
Stone and Clay	0.4169	1.3070
Primary Metals	0.9567	0.8728
Fabricated Metals	1.0239	1.1927
Transport	0.4025	0.6862
Miscellaneous	0.8793	1.5664
Weighted Average	0.8422	1.0377

On a weighted average basis the results reported in Table 2-9 show that ORA’s estimated employment elasticities indicated that industrial core throughput is slightly more output elastic than suggested by SoCalGas’ results.

V. Core Gas Air Conditioning and Gas Engines

A. Background

For the TCAP forecast period SoCalGas’ gas air conditioning throughput will remained unchanged. For Test Year 2017 and the years 2018 and 2019 SoCalGas forecasts gas air conditioning throughput of 77 (Mdt). Gas engine use, on the other hand, is expected to increase only slightly over the forecast period. From its forecast level

²² The SoCalGas price and employment elasticities were taken from the SoCalGas/SDG&E TCAP workpapers.

1 of 2,049 (Mdth) in Test Year 2017, demand is expected to increase only slightly such that
2 by 2019 gas engine use will reach 2,091 (Mdth).

3 **B. ORA Analysis**

4 ORA does not oppose SoCalGas' forecasts of gas air conditioning and gas engine
5 throughput.

6 **VI. Core Natural Gas Vehicles**

7 **A. Background**

8 Over the 2017 – 2019 TCAP period SoCalGas is forecasting an increase in NGV
9 throughput. SoCalGas explains that: “NGV throughput is expected to increase from
10 125,389 Mdth in 2014 to 148,370 Mdth in 2016 and 165,986 Mdth by 2019. SoCalGas
11 remains optimistic about the NGV market, with growth expected in both private and
12 public sectors.”²³ SDG&E is also forecasting an increase in NGV throughput. From a
13 level of 1,747 (Mdth) in 2017, SDG&E expects NGV throughput to rise to 1,955 in 2019.

14 **B. ORA Analysis**

15 ORA does not oppose SoCalGas' forecasts of NGV throughput.

16 **VII. Non-Core Commercial and Industrial**

17 **A. Background**

18 Over the 2017 – 2019 forecast period SoCalGas is forecasting a decline in
19 throughput to the commercial and industrial non-core class. From a throughput level of
20 154,392 (Mdth) in Test Year 2017, SoCalGas expects commercial and industrial non-
21 core throughput to decline to 150,571 (Mdth) in 2019. This is an annual average decline
22 of 0.80 percent per year. SDG&E, on the other hand, is forecasting increasing
23 Commercial and industrial non-core throughput over the 2017-2019 forecast period from
24 4,590 (Mdth) in 2017 to 4,618 (Mdth) in 2019. This represents an annual average
25 increase of less than one percent per year.

²³ Prepared Direct Testimony of Rose-Marie Payan San Diego Gas & Electric Company and Southern California Gas Company, July 8, 2015, p. 4.

1 **B. ORA Analysis**

2 As in the case of the core sector, ORA analyzed SoCalGas’ commercial and
3 industrial non-core throughput separately. Specifically, ORA analyzed SoCalGas’
4 commercial non-core price and employment elasticities by attempting to update their
5 commercial non-core econometric models. ORA, however, was unable to produce
6 econometric models which yielded any plausible results.²⁴ As a result, ORA did not
7 request SoCalGas to rerun its end use model with alternative commercial non-core price
8 and employment elasticities.

9 Over the historical period 2005 – 2014, commercial non-core throughput declined,
10 on average, by almost 2 percent per year. SoCalGas expects this decline to continue but
11 at a lower rate. Over the 2017 – 2019 forecast period SoCalGas forecasts non-core
12 commercial throughput declines from 17,427 (Mdt) to 17,214 (Mdt) in 2019. This is a
13 decline of less than one percent per year.

14 Over the recent 2006-2014 period SDG&E experienced a sharp decline in
15 commercial and industrial non-core throughput. Over this period commercial and
16 industrial non-core throughput declined, on average, by 2.70 percent per year. Over the
17 2017 – 2019 period, SDG&E expects a reversal of this trend with commercial and
18 industrial non-core throughput to increase slightly.

19 Non-core industrial demand includes non-core industrial usage coupled with
20 refinery demand. SoCalGas expects both loads to decline over the 2017 – 2019 forecast
21 period. Non-core industrial demand is expected to decline, on average, by approximately
22 one percent per year while industrial refinery demand is expected to decline by somewhat
23 less than one percent per year. ORA does not oppose SoCalGas’ and SDG&E’s forecast
24 commercial and industrial demand forecasts.

²⁴ In many cases, ORA’s alternative econometric models produced results which were counter-intuitive with incorrect signs on coefficients on the price and employment variables.

1 **VIII. Electric Generation**

2 **A. Background**

3 For the electric generation (EG) class of service SoCalGas is forecasting EG
4 throughput demand to remain relatively constant over the 2017 – 2019 forecast period.
5 From a level of 268,103 (Mdth) in 2017 SoCalGas expects a minimal decline in EG
6 throughput to 268,000 (Mdth) in 2019. SDG&E, on the other hand, forecasts a greater
7 decline in EG throughput. From 70,627 (Mdth) in Test Year 2017, SDG&E is forecasting
8 that EG demand will decline to 65,076 in 2019. This is an annual average decline of 2.67
9 percent per year.

10 The EG forecasts for SoCalGas and SDG&E are a function of electricity demand,
11 hydro conditions, electric generation capacity, new electric transmission projects, as well
12 as renewable portfolio standards. To capture these diverse impacts on EG gas demand
13 SoCalGas and SDG&E rely upon a proprietary model. SoCalGas explains that “the Zonal
14 Market Analysis model...has been used in previous applications before the California
15 Public Utilities Commission (Commission).”²⁵

16 **B. ORA Analysis**

17 ORA does not oppose SoCalGas’ and SDG&E’s EG forecasts.

18 **IX. Enhanced Oil Recovery (EOR)**

19 **A. Background**

20 SoCalGas expects EOR throughput demand to remain constant at 23,157 (Mdth)
21 for the 2017 – 2019 forecast period. SoCalGas explains that: “The Enhanced Oil
22 Recovery (EOR) demand is prepared based on historical throughput, knowledge of
23 customer operations, and general market conditions.”²⁶

24 **B. ORA Analysis**

25 ORA does not oppose SoCalGas’ EOR forecast.

²⁵ Prepared Direct Testimony of Jeff Huang, San Diego Gas and Electric Company and Southern California Gas Company, July 8, 2015, p. 1.

²⁶ Prepared Testimony of Bruce M. Wetzel, Southern California Gas Company and San Diego Gas & Electric Company, July 8, 2015, p. 5.

1 **X. Wholesale and International**

2 **A. Background**

3 This class of service includes throughput to the City of Long Beach, SDG&E,
4 Southwest Gas, the City of Vernon, and the City of Mexicali. SoCalGas is forecasting
5 declines in throughput to the wholesale class of service. SoCalGas expects wholesale and
6 international throughput to decline from 160,777 (Mdt) in Test Year 2017 to 155,675
7 (Mdt) in 2019. This is an annual average decline of approximately one percent.

8 **B. ORA Analysis**

9 ORA does not oppose SoCalGas' wholesale and international throughput forecast.

10 **XI. Total Throughput Forecasts**

11 **A. Background**

12 Under average temperature conditions SoCalGas and SDG&E are forecasting a
13 decline in total throughput. SoCalGas, for example, estimates that total average year
14 throughput will decline from 971,560 (Mdt) in Test Year 2017 to 959,463 (Mdt) in
15 2019. For SoCalGas this is a decline of less than one percent per annum. SDG&E is
16 forecasting a slightly larger decline in throughput over the forecast period. SDG&E
17 expects total throughput to decline from 127,345 in Test Year 2017 to 121,757 (Mdt) in
18 2019. This is an annual decline of 1.47 per cent per year.

19 On a cold year basis the decline in forecast total throughputs for SoCalGas and
20 SDG&E are similar to the declines in total throughput under average year conditions.
21 SoCalGas forecasts that total cold year throughput will decline from 1,006,694 in Test
22 Year 2017 to 995,141, (Mdt) in 2019. For SDG&E, it is projected that total throughput
23 will decline from 131,426 (Mdt) in Test Year 2017 to 125,924 (Mdt) in 2019.

24 **B. ORA Analysis**

25 ORA does not oppose SoCalGas' and SDG&E's average year and cold
26 temperature forecasts.

WITNESS QUALIFICATIONS

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Q.1 Please state your name and address.
A.1 My name is Thomas M. Renaghan. My business address is 505 Van Ness Avenue, San Francisco, California, 94102.

Q.2 By whom are you employed and in what capacity?
A.2 I am employed by the California Public Utilities Commission as a Public Utilities Regulatory Analyst V in the Office of Ratepayer Advocates Energy Cost of Service and Natural Gas Branch.

Q.3 Briefly describe your educational background and work experience.
A.3 I have a Bachelor of Arts degree in Economics from California State University, East Bay (formerly California State University, Hayward) and a PhD in Economics from the University of California, Davis. I have been employed with the Commission since January 1984.

Q.4 What is your area of responsibility in this proceeding?
A.4 I am responsible for Exhibit ORA-2, ORA's throughput testimony.

Q.5 Does that complete your prepared testimony?
A.5 Yes, it does.