

Docket : A.10-12-005 / 006
Exhibit Number : DRA-3
Commissioner : Ferron
ALJ : Wong
Witness : Tom Renaghan



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

**Report on the Results of Operations
for
San Diego Gas & Electric Company
Southern California Gas Company
General Rate Case
Test Year 2012**

**SDG&E
Electric and Gas Customers**

San Francisco, California
September 1, 2011

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SDG&E ELECTRIC and GAS CUSTOMERS

1

I. INTRODUCTION

2

3 This exhibit presents the Division of Ratepayer Advocates (DRA) and San
4 Diego Gas & Electric's (SDG&E) forecasts of electric and gas customers for 2010,
5 2011, and Test Year (TY) 2012. DRA and SDG&E forecast customers in the
6 residential, commercial, and industrial classes of service. Econometric models are
7 used to establish a statistical relationship between historic customers and
8 economic/demographic conditions in SDG&E's service area. These models are then
9 used to project the level of electric and gas customers in 2010, 2011 and TY 2012.

10 Section II summarizes DRA's recommendations. Section III discusses the
11 specific econometric model results obtained by DRA and SDG&E. Section IV
12 discusses DRA's and SDG&E's recommended gas customers. Section V discusses
13 DRA's analysis of electric and gas sales. Section VI presents DRA's conclusion.

II. SUMMARY OF RECOMMENDATIONS

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15 The following summarizes DRA's recommendations:

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- 17 • For the residential class of service SDG&E recommends residential
18 electric customers of 1,227,609 in 2010, 1,234,330 in 2011 and 1,244,624
19 in TY 2012. DRA recommends residential electric customers of 1,227,781
20 in 2010, 1,235,107 in 2011 and 1,245,526 in TY 2012. These forecasts
differ by less than one percent.
- 21 • SDG&E forecasts small electric commercial customers of 121,464 in
22 2010, 122,916 in 2011, and 124,819 in TY 2012. DRA forecasts a similar
23 number of electric customers. DRA's forecasts of small electric customers
24 are virtually identical to SDG&E's. In 2010, 2011, and TY 2012, DRA
25 forecasts small commercial customers of 121,464, 122,988, and 124,015,
26 respectively.
- 27 • For the medium and large commercial/industrial class of service, SDG&E
28 forecasts electric customers of 23,922 in 2010, 24,572 in 2011 and 25,433
29 in 2012. For 2010, 2011, and TY 2012, DRA forecasts slightly lower
30 customers than does SDG&E. Specifically, for 2010, DRA forecasts
31 customers of 23,922, while for 2011 and 2012, DRA forecasts,
32 respectively, customers for this class of service of 23,390 and 22,895.

- 1 • SDG&E forecasts electric agricultural customers of 3,348 for 2010, 2011,
2 and TY 2012. DRA agrees with SDG&E's forecast of agricultural electric
3 customers.
- 4 • SDG&E forecasts electric lighting customers of 6,126 in 2010, 6,019 in
5 2011 and 5,920 in 2012. DRA forecasts slightly higher electric lighting
6 customers. In 2010, DRA forecasts electric lighting customers of 6,149 in
7 2010, 6,063 in 2011 and 6,045 in TY 2012.
- 8 • Little change is forecasted in the total number of electric customers over
9 the forecast period. In 2010, SDG&E forecasts total electric customers of
10 1,382,469. In 2011 and 2012, SDG&E forecasts total electric customers of
11 1,391,185 and 1,404,144, respectively. DRA's forecast for total electric
12 customers differs from SDG&E's forecast by less than one percent. In
13 2010 DRA forecasts total electric customers of 1,382,664, while for 2011,
14 and TY 2012, DRA forecasts, respectively, total electric customers of
15 1,390,894, and 1,401,829.
- 16 • DRA adopts SDG&E's electric sales forecast for 2010, 2011, and test year
17 2012.
- 18 • DRA adopts SDG&E's gas department sales forecast. The gas
19 department sales forecast is taken from the adopted sales forecast taken
20 from the Commission's most recent Biennial Cost Allocation (BCAP)
21 decision D.09-11-006.

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23 DRA's and SDG&E forecasts of electric customers for 2010, 2011 and TY
24 2012 are summarized in Table 03-1.

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Table 03-1
DRA and SDG&E Electric Customers
2010 – 2012

Year/Sector	2010	2011	2012
Residential			
SDG&E	1,227,609	1,234,330	1,244,624
DRA	1,227,781	1,235,107	1,245,526
Small Commercial			
SDG&E	121,464	122,916	124,819
DRA	121,464	122,986	124,015
Large Commercial/Industrial			
SDG&E	23,922	24,572	25,433
DRA	23,922	23,390	22,895
Agricultural			
SDG&E	3,348	3,348	3,348
DRA	3,348	3,348	3,348
Street Lighting			
SDG&E	6,126	6,019	5,920
DRA	6,149	6,063	6,045
Total Customers			
SDG&E	1,382,469	1,391,185	1,404,144
DRA	1,382,664	1,390,894	1,401,829

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- For SDG&E's gas department SDG&E is forecasting residential gas customers of 816,877 in 2010, 822,196 in 2011, and 829,373 in TY 2012. DRA forecasts residential gas customers of 817,007 in 2010, 822,297 in 2011, and 829,403 in TY 2012.
- For the commercial and industrial sector, SDG&E forecasts gas customers of 30,091 in 2010, 30,167 in 2011, and 30,231 in TY 2012. DRA's forecast

1 for commercial and industrial customers is virtually identical to SDG&E,
2 with DRA forecasting commercial and industrial customers in 2010 of
3 30,207 and 30,152 in 2011, and 30,214 in TY 2012.

- 4 • DRA and SDG&E are forecasting the same level of natural gas vehicle
5 customers for the 2010 – 2012 forecast period.
- 6 • SDG&E forecasts electric generation customers of 68, 72, and 74,
7 respectively, for 2010, 2011, and TY 2012. DRA agrees with SDG&E's
8 forecast of electric generation customers.
- 9 • DRA's and SDG&E's forecasts of total gas customers are virtually
10 identical. For 2010 SDG&E forecasts total gas customers of 847, 063
11 while DRA forecasts total gas customers of 847,309. In 2011 and TY
12 2012, SDG&E forecasts total gas customers of 852,465 and 859,709,
13 respectively. In these two years, DRA forecasts total gas customers of
14 852,551 and 859,721, respectively.

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16 DRA's and SDG&E's forecasts of gas customers for 2010, 2011, and TY
17 2012 are summarized in Table 03-2.

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Table 03-2
DRA and SDG&E Gas Customers Forecast
2010-2012

Year/Sector	2010	2011	2012
Residential			
SDG&E	816,877	822,196	829,373
DRA	817,007	822,297	829,403
Commercial/Industrial			
SDG&E	30,091	30,167	30,231
DRA	30,207	30,152	30,214
Natural Gas Vehicle			
SDG&E	27	30	31
DRA	27	30	31
Electric Generation			
SDG&E	68	72	74
DRA	68	72	74
Total Gas Customers			
SDG&E	847,063	852,465	859,709
DRA	847,309	852,551	859,721

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DRA's and SDG&E's electric sales forecasts are reported in Table 03-3.

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Table 03-3
DRA and SDG&E Electric Sales Forecast¹
2010 – 2012
(Gwh)

Year/Sector	2010	2011	2012
Residential			
DRA	7,707	7,773	7,839
SDG&E	7,707	7,773	7,839
Commercial			
DRA	8,843	8,944	9,103
SDG&E	8,843	8,944	9,103
Industrial			
DRA	1,499	1,540	1,605
SDG&E	1,499	1,540	1,605
Mining/TCU/Agriculture			
DRA	2,097	2,117	2,148
SDG&E	2,097	2,117	2,148
Lighting			
DRA	113	114	115
SDG&E	113	114	115
Total Sales			
DRA	20,258	20,488	20,809
SDG&E	20,258	20,488	20,809

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¹ California Energy Demand-Adopted Forecast, Publication Number: CEC-200-2009-012-CMF, December 2009 (SDG&E Form 1.1b Sales).

1 **III. DISCUSSION OF ELECTRIC AND GAS CUSTOMER MODELING**

2 SDG&E and DRA rely upon econometric models to forecast electric and gas
3 customers to the residential, commercial, and industrial classes of service. Historic
4 data on the number of customers and economic/demographic variables such as
5 housing starts and employment are used to establish a statistical relationship
6 between the number of customers and housing starts and employment. Forecasts of
7 housing starts and employment are then coupled with the model coefficients to
8 forecast customers to the various sectors.

9 Since the economic/demographic assumptions play an important role in the
10 final forecasts, it will be useful to first discuss SDG&E economic/demographic
11 forecast assumptions. This is the task of the next section.

12 **A. Economic/Demographic Assumptions**

13 For the residential sector electric and gas customers are a function of housing
14 starts and population. SDG&E notes that: “Economic and demographic data,
15 [housing starts, employment, and population], were based on February 2010
16 information released from IHS Global Insight’s Regional Economic Service.”²
17 Similarly, for SDG&E’s gas department, “New housing permit and employment
18 assumptions underlying the customer forecast came from IHS’ Global Insight’s
19 Winter 2009 Regional Forecast for San Diego County released in February 2009.”³

20 SDG&E’s forecasts of building permits and employment are generally
21 consistent with the most recent (June 2011) UCLA Anderson Forecast for the Nation
22 and California.⁴ UCLA notes that: “Since the beginning of the year California has
23 added 104,000 private payroll jobs and unemployment has fallen from 12.5% to
24 11.9%. To put this in perspective, were the entire year to look the same, about 40%
25 of the private sector payroll jobs lost in the recession would be recovered and the

² Exh. SDG&E-36, p. KES 2.

³ Exh. SDG&E-37, p. SRW-2.

⁴ DRA does not currently have access to the Global Insight Regional Economic Forecasting service. As a result, DRA compared SDG&E’s forecasts of employment and building permits to those available from UCLA.

1 unemployment rate would be poised to drop below double digits by the end of
2 December. So the progress thus far is heartening.”⁵ Over the 2011–2012 forecast
3 period SDG&E projects that total non-farm employment quarterly employment for the
4 electric sector will grow, on average, by 0.62% and for the gas sector by 0.46%.
5 UCLA projects a quarterly average growth rate of 0.60%.⁶

6 While the employment picture in California is improving, the housing industry
7 still appears to be characterized by slow growth. UCLA, for example, explains that:
8 “From the 2006 peak, building permits have declined steadily for both single and
9 multi-family dwellings until both were at about 20% of their previous peak. For
10 single-family structures the decline has continued. But for multi-family dwellings,
11 permits began to increase in the second quarter of 2010 and are now back to 40% of
12 the peak.”⁷ UCLA is projecting that total residential building permits will increase
13 from 44,700 in 2010 to 46,400 in 2011 with a further increase to 59,700 in 2012.⁸
14 SDG&E’s forecasts of building permits for its electric and gas customer models are
15 generally consistent with UCLA’s projections. Over the 2011–2012 forecast horizon
16 SDG&E forecasts that building permits in its electric service area will grow, on
17 average, by 8.84%. Over the same period, UCLA is projecting an average quarterly
18 growth rate of 7.92%.⁹

19 **B. Residential Electric Customers**

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21 Total residential customers include customers on rate schedules DR, DRLI,
22 DM, DS, DLI, DT, and DTLI. SDG& first forecasts incremental customers on

⁵ The UCLA Anderson Forecast For The Nation and California, June, 2011, p. 80.

⁶ DRA calculated the quarterly percent changes from the second quarter of 2011 through the fourth quarter of 2012 and averaged the results. The UCLA data on total non-farm employment was taken from The UCLA Anderson Forecast For The Nation and California, June, 2011, p. 106.

⁷ The UCLA Anderson Forecast For The Nation and California, June, 2011, p. 84.

⁸ The UCLA Anderson Forecast For The Nation and California, June, 2011, pp. 105-106.

⁹ DRA calculated the quarterly percent changes from the second quarter of 2011 through the fourth quarter of 2012 and averaged the result. The UCLA building permit data was taken from The UCLA Anderson Forecast For California and The Nation, June, 2011, p. 106.

1 combined schedules DR and DRLI as a function of housing starts in SDG&E's
2 service area. Incremental DR & DRLI customers are modeled as a four quarter
3 polynomial distributed lag on housing starts in SDG&E's service area, quarterly
4 seasonal dummies, and a dummy variable for the 2003 fire storm. ¹⁰ ¹¹ SDG&E's
5 model was estimated over the period from the fourth quarter of 1989 through the
6 fourth quarter of 2009. To arrive at forecasts of customers on schedules DR and
7 DRLI forecasted incremental DR & DRLI customers are then coupled with the
8 historic growth in customers on schedule DR & DRLI. SDG&E forecasts schedules
9 DM, DS, DT as a function of the logarithmic historical growth in customers on these
10 schedules. ¹² Combining the individual forecasts for DR & DRLI, DM, DMLI, DT and
11 DTLI results in the forecast of total residential customers.

12 DRA adopted a similar approach. DRA models incremental DR & DRLI
13 customers as a four quarter polynomial distributed lag on housing starts in SDG&E's
14 service area along with quarterly seasonal dummy variables and a dummy variable
15 capturing the 2003 fire storm. DRA's model is estimated over the period from the
16 first quarter of 1990 through the fourth quarter of 2010.¹³ In modeling customers on
17 schedules DM, DS, and DT, DRA followed an approach similar to SDG&E's. For
18 these schedules historic customers were modeled as a function of time. Specifically,
19 with monthly observations over the period January 2007 through December 2010,
20 DRA regressed the log of customers on schedules DM, DS, and DT on a time trend.
21 DRA's approach yields forecasts which were very similar to SDG&E's.

22 DRA's and SDG&E's residential customer forecasts are consistent with the
23 long-term trend in total residential customers. Over the period 1990 through 2009,
24 for example, total residential electric customers grew, on average, by 1.26% per

¹⁰ This technique forces the coefficients to lay along a polynomial of a pre-specified degree.

¹¹ A dummy variable is a variable which takes on the value one at a particular point in time and zero elsewhere.

¹² More formally, schedules DM, DS, and DT are modeled as $y = \text{constant} * e^{At}$. Where e is the exponential operator and t is the estimated growth rate.

¹³ DRA experimented with longer lags on the polynomial on housing starts and found that the lengthening the lag response made little difference to the model coefficients or the forecast.

1 year. Over the more recent, 2000 through 2009 period, residential electric customer
2 growth averaged 1.33% per year. Over the 2010–2012 forecast period SDG&E is
3 forecasting that residential customers will increase, on average, by 0.63% per year.
4 This is below the long-term trend growth in residential electric customers. DRA's
5 forecast is slightly higher than SDG&E's because DRA relied upon a slightly different
6 econometric model and estimated its model through 2010.

7 **C. Non-Residential Electric Customers**

8 Non-residential electric customers include combined commercial and
9 industrial customers on schedules A (Small Commercial), AD (General Service,
10 Demand Metered), ALTOUC (General Service-Time Metered Commercial), ALTOUI
11 (General Service, Time Metered, Industrial) and PAT1 (Experimental Power, Time of
12 Use, Agriculture). SDG&E first forecasts total non-residential electric customers as a
13 function of commercial and industrial employment in the SDG&E service area.
14 Forecasts to the individual commercial and industrial customers are then based on
15 the growth in the forecasted growth in the total non-residential customers coupled
16 with the historic growth in customers on schedules A, AD, ALTOUC, ALTOUI, and
17 PAT1.

18 **1. Total Non-Residential Customers**

19 SDG&E based its forecast of total non-residential customers on the rate of
20 growth of commercial and industrial employment. As SDG&E explains: "The
21 commercial/industrial forecast was developed using a statistical analysis based on
22 non-farm employment relative to the growth of commercial/industrial customers."¹⁴
23 In contrast to SDG&E's approach, DRA developed an econometric model to forecast
24 non-residential commercial and industrial customers. With quarterly observations
25 over the period from the second quarter through the fourth quarter of 2010, DRA
26 regressed the log of commercial and industrial customers on the log of non-farm
27 employment. DRA modeled total non-farm employment as a 6 quarter polynomial
28 distributed lag.

¹⁴ Exh. SDG&E-36, p. KES-2.

1 These forecast results are consistent with the recent trend growth in small electric
2 customers.

3 **3. Large Commercial and Industrial**

4 Medium commercial and industrial customers consist of customers on
5 schedules ALTOUC, ALTOUI, AD, and PAT1. SDG&E generally models these
6 customers as a function of the growth in total non-residential customers. In the case
7 of schedule AD, forecasted customers are simply equal to the prior months
8 customers times a constant.¹⁵ For the remaining customers in this class, the
9 forecast is based on the growth in total commercial and industrial customers less
10 customers on schedules A (Small Commercial) and AD.

11 DRA adopted SDG&E's methodology for forecasting medium large
12 commercial and industrial customers.¹⁶ DRA's forecasts to this class are slightly
13 lower than SDG&E's because DRA has a slightly lower total commercial and
14 industrial customer forecast.

15 DRA's and SDG&E's forecasts for this class of service are consistent with the
16 long-run growth in large commercial and industrial customers. Over the period 1990
17 through 2009 large commercial and industrial customer growth averaged 3.54% per
18 year. Over the most recent 1990-2009 the growth rate was similar averaging 3.83%
19 per year. In the 2010–2012 forecast period, SDG&E forecasts an average growth
20 rate of 3.25% per year while DRA's projected growth rate is 2.90% per year.

21 **4. Street Lighting**

22 Street lighting customers consist of customers on schedules LS1, LS2, LS3,
23 DWL, OL1R and OL1C. SDG&E forecasts street lighting customers on these
24 schedules based on the logarithmic monthly growth rate over the period January
25 2007 through December 2009. This is the same approach used to forecast
26 residential customers on schedules DM, DS and DT.

¹⁵ SDG&E uses the constant 0.99374 so the forecast is equal to AD (prior month) * 0.99374

¹⁶ DRA experimented with alternative methodologies such as regressing the individual schedules in this class on employment. The results, however, proved unreliable.

1 DRA used a similar approach. Specifically, DRA regressed the log of
2 customers on schedules LS1, LS2, LS3, DWL, OL1R and OL1C on time over the
3 period January 2007 through December 2010. DRA obtained results nearly identical
4 to SDG&E's findings.

5 **IV. DISCUSSION / ANALYSIS OF GAS CUSTOMERS**

6 SDG&E and DRA rely upon econometric models to forecast gas customers
7 to the residential, commercial, and industrial classes of service. Similar to the
8 electric department historic gas customers are modeled as a function of
9 economic/demographic conditions in SDG&E's service area.

10 **A. Residential Gas Customers**

11 SDG&E models historic residential households with gas service as a function
12 of building permits and quarterly seasonal dummy variables. SDG&E explains that:
13 "Residential customers are first forecasted in terms of gas-serviced residential
14 dwelling units as a function of lagged authorized housing permits. Some residential
15 gas meters have multiple residential units connected to them. To convert forecasted
16 gas-service residential units to residential customers (meters), that portion of
17 residential units is divided by 14, which is the average number of residential units
18 connected to each multi-unit gas meter."¹⁷ SDG&E regresses the first difference in
19 residential gas units on a three quarter polynomial distributed lag of building permits
20 along with quarterly dummy variables. SDG&E's model is estimated from the first
21 quarter of 1989 through the fourth quarter of 2008.

22 DRA's model is similar. DRA also regresses the first differences of residential
23 gas units on a three quarter polynomial distributed lag of building permits along with
24 quarterly seasonal dummy variables. DRA, however, regresses its model over the
25 period from the second quarter of 1990 through the fourth quarter of 2010. DRA's
26 use of 2010 data coupled with the use of a slightly different econometric model
27 explains the difference between the DRA and SDG&E residential customer forecast.

¹⁷ Exh. SDG&E-37, p. SRW-2.

1 Both models yield similar results. The DRA and SDG&E forecasted growth
2 rates for residential gas customers are slightly below the long-run growth in
3 residential gas customers. Over the period 1988 through 2009 residential gas
4 customers grew, on average, by 1.40% per year. Over the more recent 2000-2009
5 the historic growth rate was lower with residential customer growth averaging 1.28%
6 per year. Over the 2010-2012 forecast horizon DRA and SDG&E are projecting a
7 less than one percent growth in residential gas customers.

8 **B. Commercial and Industrial Customers**

9 SDG&E's commercial and industrial customer econometric model regresses
10 historic commercial and industrial customers as a function of quarterly seasonal
11 dummy variables and commercial and industrial employment lagged one quarter. A
12 log-log functional form is used with the model estimated from the first quarter of
13 1990 through the fourth quarter of 1998.

14 DRA also relied upon a log-log functional form with employment and quarterly
15 seasonal dummy variables. DRA, however, modeled the log of employment in
16 SDG&E's gas service area as a three quarter polynomial distributed lag. DRA
17 estimated its model over the period from the third quarter of 1991 through the fourth
18 quarter of 2010.

19 Over the period 1988 through 2009 commercial and industrial gas customers
20 grew, on average, by 0.53% per cent per year. Over the more recent 2000 – 2009
21 period commercial and industrial customers grew at the slightly higher rate of 0.78%
22 per year. Over the 2010–2012 forecast period SDG&E and DRA are forecasting
23 virtually no change in the number of commercial and industrial gas customers.

24 **V. DISCUSSION / ANALYSIS OF ELECTRIC AND GAS SALES**

25 SDG&E explains that the electric “sales forecast for the TY 2012 GRC was
26 obtained from the adopted California Energy Commission forecast.”¹⁸ While this

¹⁸ Exh. SDG&E-36, p. KES-2.

1 forecast was completed in 2009, currently there is no updated forecast available
2 from the California Energy Commission (CEC).

3 The gas sales forecast is taken directly from the most recent Commission
4 adopted BCAP forecast.

5 **VI. CONCLUSION**

6 DRA and SDG&E rely upon econometric models to forecast the number of
7 electric and gas residential, commercial, and industrial customers. These
8 econometric equations model customers as a function of economic activity in
9 SDG&E's service area. For the residential sector customers are modeled primarily
10 as a function of building permits while for the non-residential (commercial and
11 industrial) sector customers are modeled as a function of employment. DRA arrived
12 at forecasts which are very close to SDG&E. DRA concludes that SDG&E's
13 forecasts of electric and gas customers for TY 2012 are reasonable. DRA also
14 concludes that SDG&E's electric and gas department sales forecasts are
15 reasonable.