**APPLICATION OF SOUTHERN CALIFORNIA GAS COMPANY & SAN DIEGO GAS & ELECTRIC COMPANY FOR AUTHORITY TO REVISE THEIR NATURAL GAS RATES EFFECTIVE JANUARY 1, 2017 IN THIS TRIENNIAL COST ALLOCATION PROCEEDING PHASE 2**

**(A.15-07-014)**

**(1st Data Request from Office of Ratepayer Advocates)**

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**QUESTION 1:**

Please provide a copy of the residential econometric models and data used to generate the residential price elasticities referenced on page 117 of the Southern California Gas Company throughput workpapers.

**RESPONSE 1 (TEPLOW):**

The below response assumes that the question was meant to refer to Figure 6, page 79 of the Workpapers to the Prepared Direct Testimony of Gregory Teplow.

For a description of the model used to generate the residential elasticities, please see the attached Word document.

Residential Model Description.doc

Included below are the two primary data sets used to support the econometric estimation of the residential price elasticities. Also included is the SAS code that generated the SUR Estimation. The output results are summarized in the PDF file below.

Residential Model Data 1.xls

Residential Model Data 2.xls

Residential Model SAS Code.doc

Residential Model Elasticities.pdf

All of the elasticity output values were used except for the elasticity #5, the elasticity for the submeter market. The estimated price elasticity for the submeter market was -.34371. It was deemed inappropriate to use the value -.34371. Instead, in the end use model, we substituted the value -.105 for the submeter segment. The impact on the forecast was minimal (approximately a 1% difference in submeter load).

The SAS software was used to develop the price elasticities. A copy of the program is above.

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**QUESTION 2:**

Please provide a copy of the core commercial econometric models and data used to generate the price elasticities reported on page 133 of the Southern California Gas Company throughput workpapers.

**RESPONSE 2 (PAYAN):**

The documentation and description of the non-residential core industrial and core commercial models is fully contained in the attached PDF file. This document was prepared in 2003 for the (unfiled) 2005 BCAP.


pt5.pdf


pt4.pdf


pt3.pdf


pt2.pdf


20110413155827.pdf

The documentation and description of the core commercial model used to generate the price elasticities is contained in the attached PDF document below.

> For a description of the model used to generate core commercial price elasticities, please see the attached pdf document called *Data Request_Core Commercial Price Elasticity Data and Estimation Writeup*


Adobe Acrobat Document

I. Core Commercial SoCalGas and SDG&E

(A) For a description of the model used to generate core commercial price elasticities, please see the attached pdf document called *Data Request_Core Commercial Price Elasticity Data and Estimation Writeup*

Adobe Acrobat Document

(B) The data for the estimation of the price elasticity model are contained within the attached Zip folder called Commercial Core Price Elasticity Data Files.Zip.

Package

(C) The SAS software was utilized to develop the price elasticities. A copy of the program is contained in the above Data Zip folder.

II. Industrial Price Elasticities SoCalGas and SDG&E

(A) The industrial model that generated the industrial price elasticities is contained in the description of the attached PDF file.

Industrial Elasticities Modal.pdf

(B) The data used to generate the industrial price elasticities are contained in the attached file on pages 231 to 236. The core industrial econometric equation results are on page 224.

Industrial Elasticities Modal.pdf

C) The SAS software was utilized to develop the price elasticities

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**QUESTION 3:**

In developing its commercial core gas throughput forecast did SoCalGas rely upon econometrically estimated employment elasticities?

**RESPONSE 3 (PAYAN):**

Yes. The employment elasticities were developed from econometric studies done for the 2005 BCAP.

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**QUESTION 4:**

If the answer to question 3 is yes, please provide a copy of the econometric models and data used to generate the commercial core employment elasticities.

**RESPONSE 4 (PAYAN):**

I. Core Commercial- SoCalGas

For a description of the model used to generate core commercial employment elasticities, please see the attached pdf document called *Data Request_Core Comm Employment Elasticity Writeup.*

Adobe Acrobat Document

II. Core Commercial SDG&E

The SDG&E employment elasticities were derived from the SoCalGas model employment elasticity estimates described in detail within Response 4 Section I above. The attached Excel formatted file called contains the mathematical derivation of the SDG&E employment elasticities and a description of the adjustment factors utilized.

Microsoft Office Excel Worksheet

III. Core Industrial-SoCalGas and SDG&E

(A) The industrial model that generated the industrial employment elasticities is contained in the description of the attached PDF file.

Industrial Elasticities Modal.pdf

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**QUESTION 5:**

In developing its commercial non-core gas throughput forecast did SoCalGas rely upon econometrically estimated price elasticities?

**RESPONSE 5 (WETZEL):**

SoCalGas' Noncore commercial:

Yes, gas price elasticities used in the noncore commercial end-use models were calculated from consumption data for this market segment. Statistical regression methods (Ordinary Least Squares) were used to do the estimation. This analysis was conducted by relevant business types. These individual gas price elasticity estimates were then aggregated by calculating a consumption-weighted average value for noncore commercial. The resulting consumption-weighted value was used in the end-use model.

SDG&E's Noncore commercial:

Gas price elasticities were not calculated for SDG&E noncore commercial segment.

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**QUESTION 6:**

If the answer to question 5 is yes, please provide a copy of the econometric models and data used to generate the commercial non-core price elasticities.

**RESPONSE 6 (WETZEL):**

The noncore price elasticity estimates by building type were estimated using linear regression equations with data from January 2002 through December 2006 for premises (specific meters) that had gas service in December 2001 as well as December 2006. The building type of the premise in December 2006 was assigned the entire historic period regardless if the customer changed or not.

The price term (PTERM1) used in the analysis was the monthly weighted average price of gas (WACOG) for the Southern California Gas service territory. This price indicator was chosen since all customers pay for the cost of gas whether they are volumetric or just transportation customers. The WACOG was adjusted to account for changes in the gas producer price index. In order to interpret the price term regression coefficient as an elasticity value, the real WACOG was interacted with the ratio of the average building type usage to the average real WACOG.

The general form of the monthly regression model by building type is as follows:

Use = a + b * HDD + c * PTERM1 + d * summer + e * fall + f * spring + g * yr03 + h * yr04+ i * yr05 + j * yr06 + k * EMPLOY

Where:

| | |
|---|---|
| Use | monthly usage for a given building type |
| HDD | monthly heating degree days |
| PTERM1 | real monthly WACOG interacted by the ratio of average use to average price |
| Summer | indicator equal to one June-September, zero otherwise |
| Fall | indicator equal to one October-November, zero otherwise |
| Spring | indicator equal to one April-May, zero otherwise |
| Yr03 | indicator equal to one in 2003, zero otherwise |
| Yr04 | indicator equal to one in 2004, zero otherwise |
| Yr05 | indicator equal to one in 2005, zero otherwise |

| | |
|---|---|
| Yr06 | indicator equal to one in 2006, zero otherwise |
| EMPLOY | monthly employment for a given building type |

As the results show, the yearly indicator terms as well as the Employ variable were excluded from some of the building type models due to insignificant coefficient values or unexpected signs (e.g. a negative Employ coefficient value).

For the noncore commercial market segment the file attached below provides the statistical estimation results for each relevant noncore commercial business type:

SCG Noncore Commercial GasPriceE

Additionally, the EXCEL workbook file below provides the underlying data and worksheet tabs that can readily be used to calculate these estimation results.

ComNCore-GasPriceElasticity_Regression_I

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**QUESTION 7:**

In developing its non-core commercial gas throughput forecast did SoCalGas rely upon econometrically estimated employment elasticities?

**RESPONSE 7 (WETZEL):**

SoCalGas' Noncore commercial:

Yes, employment elasticities were used for noncore commercial in the end-use model.

SDG&E's Noncore commercial:

No, employment elasticities were not calculated and used for this market.

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**QUESTION 8:**

If the answer to question 7 is yes, please provide a copy of the econometric models and data used to generate the commercial non-core price elasticities.

**RESPONSE 8 (WETZEL):**

SoCalGas' Noncore commercial:

Employment elasticities were used for the noncore commercial in the end-use model. The value used was +0.474 and was calculated from the data analysis performed for a prior SoCalGas regulatory filing (the filing was for SoCalGas' 2005 BCAP which was initially filed, but then withdrawn).

SDG&E's Noncore commercial:

Employment elasticities were not calculated for this market. However, the econometric model does include an employment variable for each market segment. The estimation results are in Mr. Wetzel's work papers—see the material on pages p-127 through p-141 of the Work Papers, July 2015 at web-link:

http://www.socalgas.com/regulatory/A15-07-014.shtml

Estimation of the parameters in the noncore commercial equations was done using SAS software. Using the historical data, the noncore commercial employment elasticity is estimated to be 0.8945; the table below shows the calculation:

| |
|---|
| Calculation of employment elesticity: |
| Q: commercial mdth |
| E: commercial employment / 1000 |
| For commercial: dQ/dE=Regression Coefficient=0.1583 |
| 212.8 |
| 1,202.3 |
| Average Q = 212.8 |
| Average E = 1202.3 |
| |
| employment elesticity = (dQ/Q)/(dE/E) = (dQ/dE) (E/Q) = |
| **0.8945** |

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**QUESTION 9:**

Please provide a copy of the econometric models and data that were used to generate the price and employment elasticities reported on page 179 of the Southern California Gas Company throughput workpapers.

**RESPONSE 9 (PAYAN):**

Please refer to the response to question 2 and 4 above.

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**QUESTION 10:**

For the year 2014 please provide, on a quarterly basis, actual values for the following customer variables:

(a) ConnSF Connected Residential Single Family Meter Counts
(b) ConnMF Connected Residential Multi-Family Meter Counts
(c) ConnMM Connected Residential Master-Meter Counts
(d) ConnCom Connected Commercial Meter Counts
(e) ActInd Active Industrial Meter Counts
(f) HSSF Residential Single-Family Housing Starts
(g) HSMF Residential Multi-Family Housing Starts
(h) EMPCOM Commercial Employment in the SoCalGas Service Area
(i) EMPIND Industrial Employment in the SoCalGas Service Area

**RESPONSE 10 (PAYAN):**

Please refer to the attached file.


Payan_ORA-SCG-01 Question 10_A.xlsx


PAYAN_ORA_SCG-01 _Question 10 B.xlsx

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**QUESTION 11:**

Do the econometric and demographic forecast assumptions used in SoCalGas' TCAP customer forecast reflect the same economic and demographic forecast assumptions that were used in its most recent General Rate Case customer forecast?

**RESPONSE 11 (PAYAN):**

Yes. The assumptions and forecast are based on the 2014 Global Insights economic drivers for employment and housing start data. For SoCalGas, the forecasted years covering 2015 through 2020 are identical to the forecast for the General Rate Case covering the same time horizon. The forecast for 2014 was replaced with the actual historical data.

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**QUESTION 12:**

If the answer to question 11 is yes, please provide, on a quarterly basis, for the period from 2017 through 2019, updated forecasts of the following variables:

(a) HSSF Residential Single Family Housing Starts
(b) HSMF Residential Multi-Family Housing Starts
(c) EMPCOM Commercial Employment in the SoCal Gas Service Area
(d) EMPIND Industrial Employment in the SoCalGas Service Area

**RESPONSE 12 (PAYAN):**

N/A