

**SAN DIEGO GAS AND ELECTRIC COMPANY
SOUTHERN CALIFORNIA GAS COMPANY
2013 TRIENNIAL COST ALLOCATION PROCEEDING (A.11-11-002)
(DATA REQUEST DRA-MPS-2)**

QUESTION 1:

Please provide the following in excel format for SCG and SDG&E:

- a) Provide historical quarterly data for all variables for the customer/meter forecast model **(1988Q1 to 2011Q4)** workpapers page 5, Volume 3 of 4 for SDG&E.
- b) Provide historical quarterly data for all variables for the customer/meter forecast model **(1988Q1 to 2011Q4)** workpapers page 6, Volume 3 of 4 for SCG.

RESPONSE 1:

- a) For SDG&E historical quarterly data:



Q1a SDG&E
Customer Historical C

- b) For SoCalGas historical quarterly data:



Q1b SoCalGas
Customer Historical C

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QUESTION 2:

Please provide table in Ms. Rose-Marie Payan gas demand workpapers, Page 8 in excel format including 2011 recorded data.

RESPONSE 2:



Q2 SDGE Cutomer
Annual Meter Count:

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QUESTION 3:

Please provide table in Ms. Rose-Marie Payan gas demand workpapers, Page 20 in excel format from 2004 to 2016 including 2011 recorded data.

RESPONSE 3:



Q3 SoCalGas Annual
Meter Counts.xlsx

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QUESTION 4:

In prior BCAP proceedings SCG and SDG&E relied upon econometric models to forecast gas demand. Please explain why in this BCAP SCG and SDG&E are relying upon end-use models to forecast gas demand.

RESPONSE 4:

End use models with an equipment choice module are a more effective forecasting tool in today's energy efficiency-oriented world. Also, SoCalGas and SDG&E had been maintaining two sets of models for forecasting purposes: (1) econometric models and (2) end use models. To save resources, SoCalGas and SDG&E decided to use end use models exclusively, for regulatory proceedings like TCAPs. Additionally, end-use models are typically the basis for long term gas demand forecasting for our California Gas Reports and employed by the California Energy Commission (CEC) for its long-term energy demand forecasts.

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QUESTION 5:

Please explain how SCG and SDG&E benefit from the use of the end-use model forecast.

RESPONSE 5:

As discussed in Response 4, maintaining two detailed sets of modeling methodologies *and* their accompanying data bases was not feasible to support the gas demand forecasting requirements for the various gas regulatory proceedings of SoCalGas and SDG&E. To efficiently and effectively meet this need, an end-use model capability was obtained that had a sufficiently generic structure that could readily be applied to specific market segments of each Company so that we could separate the specific underlying data needs from a general methodology. The result being that we are able to maintain and support gas demand forecasting capability for both, SoCalGas and SDG&E.

In addition, the structure embedded in our end-use modeling framework has been readily adaptable to addressing questions related to the growing emphasis on: 1) incorporation of energy efficiency policy goals into our gas demand forecasts, and 2) regulation of emissions from burning fuels like natural gas.

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QUESTION 6:

Please explain how rate payers benefit from the end-use model forecast

RESPONSE 6:

Ratepayers benefit from the utilities' use of end use models to generate forecasts because the utilities do not have to maintain two sets of data. Also, as stated in Response 4, the end use models are a more effective forecasting tool in today's energy planning and regulatory environment with emphasis on: 1) energy efficiency goals and policies, and 2) air quality issues related to emissions from natural gas. The cost savings of maintaining only the end use models is passed on to ratepayers in the next General Rate Case (GRC) when a cost true-up is performed as part of the GRC process.

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QUESTION 7:

Please explain are the main differences between the end-use models compared to SCG and SDG&E econometric old model.

RESPONSE 7:

In general, econometric models produce forecasts that rely on historical data to fit an equation. The fitted equation is used to explain how changes in the independent variables drive changes in the dependent variable. Extrapolation of the fitted relationship (e.g., a line), going forward into the forecast horizon, is based on the assumption that no structural change in the fitted relationship occurs. Capturing energy efficiency in an econometric model has been done by including an efficiency index as an explanatory variable. The efficiency index is only a *proxy* used to account for the downward trend in gas use that occurs because of improvements in energy efficiency. In prior econometric work of SoCalGas, the proxy for energy efficiency (the *energy efficiency index*) was, in fact, derived from end-use model simulations. Often, with econometric work, diagnostic tests and corrective steps must be taken to ascertain that the estimation results yields the best linear unbiased estimators.

End use models, like EU Forecaster, track the consumption of energy usage (e.g., natural gas or electricity) by simulating customers' energy consumption into two key steps: 1) The model simulates the choices in the selection of end use equipment from two fuel types (gas or electric), and various efficiency levels of equipment that consume energy to satisfy customers' demand for gas from end-uses (e.g., space heating, water heating, clothes drying or cooking) and then 2) The model forecasts the energy usage derived from the customers' end-uses from the set of customers' equipment. The important model characteristic of the end use model is its vintaging capability. Vintaging refers to product turnover that is a function of the useful life of the equipment. As the simulation software iterates from one vintage year to the next, it distinguishes, in each year, between the load added due to new meters in addition to changes in the load due to existing customers replacing worn out equipment with newer, more energy efficient appliances or other equipment.

In the modeling process underlying the EU Forecaster tool, historical accounts are segmented into the total number of accounts in the base year and their distribution among the historical vintages. The model produces a forecast over the planning horizon by applying a forecast of equipment capital costs, energy consumption, and fuel price forecasts to the choice parameters. The usage calculation for each customer type is based on the optimization of the underlying customer choices.

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EU Forecaster's model structure is designed to keep track of the usage results for each market segment, each end use and for each vintage as the model steps through the entire forecast time horizon. In contrast, the previously-used econometric models step through the forecast time horizon by using the same structure for predicting energy consumption from the independent variables (e.g., energy prices, employment levels, meter counts), from one year to the next.

A final important distinction that is important for Company planning activities is that our end-use model framework and data structures allow us to readily address many questions about emissions (e.g., CO₂, NO_x) due to natural gas consumption by SoCalGas' and SDG&E's customers. Air quality regulatory agencies develop emission inventories based on the forecast detail. Our end-use modeling framework is readily designed to provide natural gas consumption forecasts for regulatory purposes. Our prior econometric framework and forecast data structures are not as well suited for these kinds of applications.

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QUESTION 8:

Does SCG and SDG&E still use the old econometric model?

RESPONSE 8:

SoCalGas and SDG&E do not use the old econometric models.

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QUESTION 9:

If the answer to question (MPS1-8) is yes please provide the following for SCG and SDG&E:

- a) Provide all variables and equations.
- b) The complete historical data set used to generate the estimates in excel format
- c) Statistical analysis.

RESPONSE 9:

N/A.

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QUESTION 10:

Please provide the following for SCG and SDG&E:

- a) Provide a copy of the EU Forecaster Software discussed in the workpapers.
- b) Provide an electronic copy of all the sources used.
- c) Provide historical data set including 2011 for all variables used.

RESPONSE 10:

SoCalGas and SDG&E will provide response via an external drive when provided by DRA. An external drive is necessary to accommodate the size of the files.

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QUESTION 11:

Please provide 2005 to 2011 recorded data for total therm sales for SCG/SDG&E in excel format.

RESPONSE 11:



Question 11 dra data request CORE.xls

**SOCALGAS CORE HISTORICAL RECORDED DATA WITH ACCOUNTING ADJUSTMENT
At Actual Weather (in Therms)**

	<u>Residential</u>	<u>Core Non Residential</u>	<u>NGV</u>
2005	2,475,488,400	1,035,204,240	75,014,800
2006	2,549,435,940	1,052,864,400	78,964,830
2007	2,531,371,725	1,087,022,925	86,510,475
2008	2,484,057,006	1,036,594,350	94,235,850
2009	2,418,521,025	1,008,654,505	97,490,770
2010	2,514,176,575	1,034,809,675	100,865,925
2011	2,593,494,360	1,035,907,230	104,335,980

**SDGE Recorded Historical Data
At Actual Weather (in Therms)**

	<u>Residential</u>	<u>Core Non Residential</u>	<u>NGV</u>
2005	317,540,948	168,825,974	9,078,242
2006	318,154,860	166,880,922	10,036,511
2007	332,436,955	171,679,873	9,892,976
2008	317,238,021	171,798,624	10,442,634
2009	305,861,601	167,415,768	10,614,907
2010	316,887,068	169,405,858	10,309,533
2011	326,309,790	174,532,847	11,008,392



sdge Question 11 dra data request COF

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Data for SoCalGas' Noncore:

	Scg Retail Noncore	Com	Ind (non-Ref)	Ind (Refinery)	EOR (Steaming)	Cogen (EOR)	Cogen (Refinery)	Cogen (c&i Small)	EWG/UEG, Cogen (Large)
Year	Thm	Thm	Thm	Thm	Thm	Thm	Thm	Thm	Thm
2005	4,121,822,453	211,321,820	629,442,855	644,705,856	130,908,100	157,533,100	191,361,524	177,339,506	1,979,209,692
2006	4,532,344,941	215,847,605	632,149,900	671,131,654	148,266,134	180,558,592	185,139,895	176,326,606	2,322,924,555
2007	4,831,135,681	206,004,851	600,820,775	702,296,761	149,432,743	242,401,916	186,094,498	186,081,453	2,558,002,684
2008	5,075,528,960	204,130,246	519,601,561	770,856,939	150,685,000	220,500,000	196,994,155	191,108,200	2,821,652,859
2009	4,559,961,370	178,279,768	445,172,499	761,879,734	135,804,800	78,574,500	195,143,275	205,719,870	2,559,386,924
2010	4,525,062,000	193,134,238	489,076,157	862,353,056	106,410,000	45,740,000	209,011,874	210,767,685	2,408,568,990
2011	4,361,289,127	180,853,400	514,672,342	862,786,950	103,840,000	41,780,000	217,560,727	213,611,904	2,226,183,804

	Scg Whsle&Intrn'l (Excl-SDG&E)	LB	SWG	Vernon	MEXI	SD
Year	Thm	Thm	Thm	Thm	Thm	Thm
2005	255,857,563	108,365,726	93,470,435	16,767,951	37,253,451	1,124,762,505
2006	334,443,423	108,994,957	106,081,478	66,453,825	52,913,163	1,016,925,385
2007	312,934,735	98,164,834	102,671,574	60,628,712	51,469,615	965,651,367
2008	329,050,439	86,446,266	94,472,584	91,554,075	56,577,514	1,125,031,055
2009	325,773,353	85,335,820	90,851,677	89,081,253	60,504,603	1,205,711,567
2010	327,858,673	89,825,245	88,930,795	84,411,947	64,690,686	1,198,775,393
2011	342,560,465	93,130,175	96,400,000	83,013,176	70,017,114	1,162,730,994

Data for SDG&E's Noncore:

	Scg Retail Noncore	Com	Ind	Cogen	Power Plants
Year	Thm	Thm	Thm	Thm	Thm
2005	#N/A	#N/A	#N/A	#N/A	#N/A
2006	682,476,155	37,565,965	13,736,740	163,001,344	468,172,106
2007	647,063,494	25,598,221	14,834,271	199,204,070	407,426,932
2008	624,352,470	25,456,185	18,863,954	189,290,468	390,741,863
2009	470,577,019	25,364,559	16,702,751	192,428,507	236,081,202
2010	695,704,646	25,594,192	19,120,932	174,795,352	476,194,170
2011	630,017,048	25,252,358	20,188,568	170,463,502	414,112,620

The attached EXCEL workbook file contains respective worksheet tabs for the above tables:



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QUESTION 12:

Please explain how SCG and SDG&E calculated price elasticity's by sector. Were these elasticity's based on econometrically estimated models?

RESPONSE 12:

Yes, the elasticities were estimated using econometric models as indicated in the following description of the analytical process. The documentation and description of the residential, core industrial and core commercial are fully contained in the attached PDF files. These documents were prepared in 2003 for the 2005 BCAP (A.03-09-008).



pt5.pdf



pt4.pdf



pt3.pdf



pt2.pdf



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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 entitled *Core Commercial Price Elasticity Data Description and Model Specification*.



Adobe Acrobat
Document

SoCalGas' Noncore C&I:

Gas price elasticities used in the noncore C&I end-use models were calculated from consumption data for these market segments. Statistical regression methods (Ordinary Least Squares) were used to do the estimation. For each of the commercial and industrial sector, analyses were conducted by each relevant business type; these individual gas price elasticity estimates were then aggregated by calculating a consumption-weighted average value for noncore commercial and noncore industrial sectors. The resulting consumption-weighted value was used in the respective end-use model.

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The attached EXCEL workbook file has separate worksheet tabs that provide the summaries of the estimated gas price elasticities and the respective consumption-weighted calculations.



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SDG&E's Noncore C&I:

Gas price elasticities were not calculated for these noncore C&I market segments.

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QUESTION 13:

If the answer to question (MPSI-12) is yes please provide the following for Residential, Core, G-10 and Non-Core for SCG/SDG&E.

- a) Provide a complete description of all the models used including all variable definitions and equations.
- b) The complete historical data set used to generate the estimates including 20 ll data in Excel format.
- c) A description of the software used in the estimation, i.e. SAS, EViews etc.

RESPONSE 13:

I. Residential _SoCalGas

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



Residential Model
SoCalGas and SDG.dc

- b) 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 attached Pdf file



Microsoft Office
Excel Worksheet



Microsoft Office
Excel Worksheet



Microsoft Word
Document



Adobe Acrobat
Document

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 $-.34371$. SoCalGas deemed it was 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).

- c) The SAS software was used to develop the price elasticities. A copy of the program is provided in response 13.I.b. above.

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II. 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 below.



Adobe Acrobat
Document

b) The data for the estimation of the price elasticity model are contained within the attached Zip folder in the following section.



Package

c) The SAS software was utilized to develop the price elasticities. A copy of the program is contained in the Zip folder provided in Response 13.II.b.

III. 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

IV. SoCalGas' Noncore C&I Markets:

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

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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:

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

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:



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Testimony\BMW\Data

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



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



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



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Please note that the EXCEL data analysis tool that is used in the REGRESSION tool available from the ANALYSIS TOOLPACK add-in library should be available with EXCEL 2003 software.

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QUESTION 14:

Please explain how SCG and SDG&E calculated employment elasticity's by sector. Were these elasticity's based on econometrically estimated models?

RESPONSE 14:

Yes, these elasticities were calculated with econometric models as indicated in the following description.

I. Core Commercial- SoCalGas

a) For a description of the model used to generate core commercial employment elasticities, please see the attached pdf document.



Adobe Acrobat
Document

I. Core Commercial SDG&E

The SDG&E employment elasticities were derived from the SoCalGas model employment elasticity estimates described in detail in Response 14 I.a. 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

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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

IV. SoCalGas' Noncore C&I:

An overall employment elasticity was used for the noncore C&I in each respective 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).

V. SDG&E's Noncore C&I:

Employment elasticities were not calculated for this market; however, the econometric model does include an employment variable for each of these market segments. The estimation results are in Mr. Wetzel's work papers—see the material on pp. Wetzel-134 through Wetzel-141 of the Updated Work Papers, June 1st, 2012 at web-link:

<http://www.socalgas.com/regulatory/A1111002.shtml>.

Estimation of the parameters in the noncore C&I equations was done using HIS Global Insight's AREMOS software. The AREMOS software provided estimates of the employment elasticities calculated from each equation's estimated parameters. The noncore commercial employment elasticity was 0.9456 while the noncore industrial employment elasticity was 1.051

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QUESTION 15:

If the answer to question (MPSI-14), is yes please provide the following for Residential, Core, G-10 and Non-Core for SCG/SDG&E.

- a) Provide a complete description of all the models used including all variable definitions and equations.
- b) The complete historical data set used to generate the estimates including 2011 data in Excel format.
- c) A description of the software used in the estimation, i.e. SAS, EViews etc.

RESPONSE 15:

I. Core Commercial- SoCalGas

- a) For a description of the model used to generate core commercial employment elasticities, please see the attached pdf document.



Adobe Acrobat
Document

- b) The data for the estimation of the core commercial employment elasticity model are contained within the attached Zip folder.



Package

- c) The SAS software was utilized to develop the core commercial employment elasticities. A copy of the program is contained in the Zip folder provided in Response 15.I.b above.

II. Core Commercial SDG&E

The SDG&E employment elasticities were derived from the SoCalGas model employment elasticity estimates described in detail within Response 15.I. above. The

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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

b) The data used to generate the industrial employment 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

The sectoral employment elasticities for SDG&E's industrial demand forecast use elasticities from SoCalGas' econometric model based on the information shown above.

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

IV. SoCalGas' Noncore C&I:

Below is a copy of the documentation provided as work papers for the intended witness for the noncore C&I markets in SoCalGas' 2005 BCAP. The employment elasticity value that was estimated is shown on page 20 of the attached file. It is the "Parameter Estimate" for the "Variable" named LEMP; the value calculated is shown there as "0.474177"



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Testimony\BMW\Data

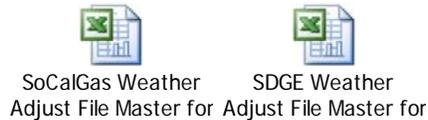
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SOUTHERN CALIFORNIA GAS COMPANY
2013 TRIENNIAL COST ALLOCATION PROCEEDING (A.11-11-002)
(DATA REQUEST DRA-MPS-2)**

QUESTION 16:

Please explain how SCG/SDG&E forecasted average year, cold-year, hot-year, and base year demand forecast.

RESPONSE 16:

The attached Excel workbook files support the weather adjusted calculations shown in the TCAP testimony.



I. SoCalGas Residential

Begin by taking the SoCalGas Residential forecast after accounting for energy efficiency and AMI. This forecast is found in column G in each of the tabs of the workbook titled “SoCalGas Weather Adjust File Master for TCAP.”

Average year monthly allocators are shown in the tab called “ResAverage Year SCG TCAP 2013” and can be found by looking at Row #3, columns “J” through “U”. These allocators are as follows:

January:	0.141429
February:	0.119577
March:	0.108935
April:	0.085196
May:	0.062033
June:	0.048619
July:	0.046106
August:	0.045971
September:	0.045312
October:	0.057545
November:	0.092147
<u>December:</u>	<u>0.147131</u>
Total	1.00000

The monthly allocators were derived from the following steps:

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- (1) For each individual month (January through December), the monthly average year load was calculated from the following equation:

$$\text{Load per meter per month} = 0.74 * (\text{days}) + 0.17 * (\text{Hdds})$$

Where days= the number of days in a calendar month and

Hdds= the number of hdd's in the calendar month based on an average year weather design.

- (2) An annual number was generated based on the summation of the load for the individual 12 months from step (1).
- (3) The individual monthly shares (allocators) were generated by taking the respective calculated monthly load per meter and dividing by the annual number from step (2), above.

$$\text{Allocator} = (\text{load per meter for individual month}) / (\sum \text{load per meter for all months})$$

The weather adjustment process for cold year, base year and hot year followed a standard process in which the average year monthly load values were scaled up or down based on a factor. As an example, consider the cold year conversion process:

- (1) For each individual month, the monthly cold year load per meter was calculated from the following equation

$$\text{Load per meter per month} = 0.74 * (\text{days}) + 0.17 * (\text{Hdds})$$

Where days= the number of days in a calendar month and

Hdds= the number of hdd's in the calendar month based on a COLD year weather design.

- (2) The individual factors were generated by taking the cold year monthly values and dividing by the average year monthly values as an estimate of how much larger the cold year load is expected to be relative to the average year load.
- (3) The resulting factors were then multiplied by the average year monthly number to generate the respective cold year monthly total.
- (4) As an example, the value of January's cold year factor is 1.138356. This was derived by taking the ratio of January's load per meter for a cold Hdd January to the load per meter for an average Hdd January [$1.138356 = (80.71)/(70.90)$]. Follow the calculation at cell#J42, of worksheet "Res Col" in the above EXCEL

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attachment file. Basically, this factor turns out to be the ratio of January's cold year therms per meter to January's average year therms per meter.

The details and formulas are shown in the EXCEL attachment file of the tab named "Res Col". The formatted results for the cold year forecast are in the tab called ResCol(TCAP SCG).

The residential base year and the residential hot year weather adjustments followed the same methodology as described above for the cold year. See the tabs called "Res Bas" and "Res Hot" in the attached EXCEL workbook file for the details. The formatted base and hot year forecasts are in the tabs called RES BAS(TCAP SCG) and RES HOT (TCAP SCG).

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II. SDGE Residential

Begin by taking the SDG&E Residential forecast after accounting for energy efficiency. This forecast is found in column G in each of the tabs of the workbook titled "SDGE Weather Adjust File Master for TCAP."

Average year monthly allocators are shown in the San Diego Residential file above within the tab called "Res Avg. Please focus on Row #3, columns "J" through "U". The allocators listed in the file are as follows:

January:	0.135751
February:	0.116619
March:	0.112292
April:	0.089552
May:	0.066356
June:	0.050159
July:	0.047338
August:	0.047100
September:	0.045989
October:	0.056525
November:	0.091111
<u>December:</u>	<u>0.141209</u>
Total	1.000000

The monthly allocators were derived from the following steps:

- (1) For each individual month (January through December), the monthly average year load was calculated from the following equation:

$$\text{Load per meter per month} = 0.627 * (\text{days}) + 0.14 * (\text{Hdds})$$

Where days= the number of days in a calendar month and

Hdds= the number of hdd's in the calendar month based on an average year weather design.

- (2) An annual number was generated based on the summation of the load for the individual 12 months from step (1).
- (3) The individual monthly shares were generated by taking the monthly estimate and dividing by the annual estimate.

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Allocator = (load per meter for individual month)/(\sum load per meter for all months)

The weather adjustment process for cold year, base year and hot year followed a standard process in which the average year monthly load values were scaled up or down based on an allocator. As an example, let's consider the cold year conversion process:

- (1) For each individual month, the monthly cold year load was calculated from the following equation

$$\text{Load per meter per month} = 0.627 * (\text{days}) + 0.14 * (\text{Hdds})$$

Where days= the number of days in a calendar month and
Hdds= the number of hdd's in the calendar month based on
a COLD year weather design.

- (2) The individual factors were generated by taking the cold year monthly values and dividing by the average year monthly values as an estimate of how much larger the cold year load is expected to be relative to the average year load.
- (3) The resulting factors were then multiplied by the average year monthly number to generate the respective cold year monthly total.
- (4) As an example, January's cold year allocator value is 1.168406. This was derived by taking (65.50)/(56.06). Basically, this value is the ratio of January's cold year therms per meter to January's average year therms per meter.

The details are shown in the EXCEL attachment file to this response at the tab called "Res Col".

The residential base year and the residential hot year weather adjustments followed the same methodology as described above for the cold year. The work is illustrated in the attached Excel workbook within the tabs called "Res Bas" and "Res Hot".

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III. SoCalGas Core Commercial



TCAP_ SOCal Math
for Core Commercial_



TCAP SOCAL COMM
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The following steps were taken to generate the average year, cold year, hot year and base year forecasts.

For average year weather adjustment, the first step is to insert the average year forecast after AMI and EE savings into row 11-17 of the Excel spreadsheet called "TCAP_ SOCAL Math for Core Commercial."

Columns "C" to "O" convert the annual load to monthly load based on the following monthly allocators:

January	.11204
February	.10368
March	.09119
April	.08004
May	.07619
June	.06952
July	.06272
August	.06125
September	.06597
October	.06751
November	.09528
December	.1146

For cold year weather adjustment, a monthly allocator is applied to the average year load for the corresponding month. For example, to derive the cold year load for January 2011, start with the average year forecast for January 2011 (or 9,079 mdth) and multiply by 1.09. This yields 9,921 Mdth, the cold year forecast for January 2011. The cold year forecasts are located in rows 39-58.

The allocators for cold year are:

January	1.09
February	1.08
March	1.07
April	1.05
May	1.04
June	1.02
July	1

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August	1
September	1.01
October	1.02
November	1.07
December	1.10

Similarly, the forecast for hot year and base year are generated by applying the respective hot year allocators and base year allocators to the respective average year forecast.

The hot year factors are found in row 61.
The hot year forecast is in row 66-85.

The base year factors are found in row 87.
The base year forecast is found in Rows 92-111.

After obtaining the average year, cold year, hot year and base year values, the remaining out of model adjustments are carried out in the respective tabs within the file called "TCAP SoCal Comm ScgCom10Tput".

IV. SDGE Core Commercial



TCAP Math SDGE
Core Commercial_JUL

The following steps were taken to generate the average year, cold year, hot year and base year forecasts.

For average year weather adjustment, the first step is to insert the average year forecast after AMI and EE savings into row 11-31 of the Excel spreadsheet called "TCAP Math SDGE Core Commercial".

Columns "C" to "O" convert the annual load forecast to a monthly load forecast based on the following monthly allocators:

January	.1368
February	.1184
March	.1126
April	.0876
May	.0656
June	.0498
July	.0472
August	0471

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September	.046
October	.0561
November	.09
December	.1429

For cold year weather adjustment, a monthly allocator is applied to the average year load for the corresponding month. For example, to derive the cold year load for January 2011, start with the average year forecast for January 2011 (or 2,388 mdth) and multiply by 1.18. This yields 2,819 Mdth, the cold year forecast for January 2011. The cold year forecasts are located in rows 41-60..

The allocators for cold year are:

January	1.18
February	1.17
March	1.16
April	1.13
May	1.08
June	1.02
July	1.01
August	0.98
September	1.0
October	1.05
November	1.13
December	1.18

Similarly, the forecast for hot year and base year are generated by applying the respective hot year allocators and base year allocators to the respective average year forecast.

The hot year factors are found in row 63.

The hot year forecast is in row 66-85.

The base year factors are found in row 87.

The base year forecast is found in Rows 90-109.

V. SoCalGas Core Industrial



Q16 SCG Demand
Forecast.xls

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Similarly, all the steps that were taken to generate the average year, cold year, hot year and base year forecasts for SoCalGas core industrial are the same as those in the above SoCalGas Core Commercial.

VI. SDGE Core Industrial



Q16 SDG&E
Demand Forecast.xls

Similarly, all the steps that were taken to generate the average year, cold year, hot year and base year forecasts for SDG&E core industrial are the same as those in the above SDG&E Core Commercial.

VII. SoCalGas' Noncore C&I:

Statistical analyses of the monthly gas consumption for SoCalGas' noncore C&I markets (referred to in this discussion and in the attached files as "g-30 com," g-30 rate commercial and "g-30 ind-nonref," g-30 industrial (non-refinery) gas load) was done to try to determine significant dependence of the monthly gas consumption on monthly heating degree-days (HDD). The results of the data analyses indicated that of the two noncore market segments, only the noncore commercial group showed a statistically significant relationship to monthly HDD. The noncore industrial (non-refinery) segment had a non-statistically-significant value for this HDD sensitivity.

The first page attached ".pdf" file shows the dependent variables along with the monthly HDD data and the annual and monthly indicator variables used to model the respective noncore C&I gas load. The estimated equation on page 2 shows the results used for the noncore industrial (non-refinery) segment and the results on page 4 show the results for the non core commercial segment.



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The EXCEL workbook file attached below has the data along with the statistical regression results from using the EXCEL data analysis tool available from the ANALYSIS TOOLPACK add-in library which should be available with EXCEL 2003 software.

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VIII. SDG&E's Noncore C&I:

The models used to forecast SDG&E's noncore C&I gas demand do not include a weather variable (e.g., Heating Degree Days).

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QUESTION 17:

For the commercial core, industrial core, and commercial and industrial non-core sectors please explain how SCG/SDG&E arrived at the sector employment forecast show in Ms. Rose- Marie Payan's gas demand workpapers. If these employment forecast were derived from econometric models please provide a detailed description of the models used along with the complete historic and forecast data used to generate the employment forecast.

RESPONSE 17:

SoCalGas and SDG&E did not derive the employment forecasts from econometric models. The employment forecasts are based on IHS Global Insight's March 2011 Regional forecast. For SDG&E the forecast is based on growth rates from Global Insight's employment forecast for San Diego County. For SoCalGas, its forecast is based on growth rates from Global Insight's employment forecast for California and for the aggregated six counties of Kern, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. (The historical data to which the forecasted growth rates are applied are derived from county-level monthly reported employment data from the California Employment Development Department: San Diego County for SDG&E, and for SoCalGas the aggregated 12 counties of Fresno, Kern, Kings, Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Luis Obispo, Santa Barbara, Tulare, and Ventura.)