A.15-07-014- SoCalGas and SDG&E
Triennial Cost Allocation Proceeding, Phase 2

Work Papers of Bruce M. Wetzel

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SoCalGas Consolidated Gas Demand

Marginal Demand Measures (MDM)

Marginal Demand Measures (MDMs) are used for rate design and cost allocation calculations. Figure 1, below, shows the relationships among the various MDMs that are provided in the accompanying tables.

Figure 1

LENART Diagram Depicting the Relationships

Among "Direct" and "Cumulative" MDMs

<table>
<tr><td rowspan="3">Direct Basis</td><td>D_T</td><td>T (Trans.)</td><td></td><td></td></tr>
<tr><td>D_H</td><td>H (High Press.)</td><td>H (High Press.)</td><td></td></tr>
<tr><td>D_M</td><td>M (Medium Press.)</td><td>M (Medium Press.)</td><td>M (Medium Press.)</td></tr>
<tr><td></td><td></td><td>$C_T = D_T + D_H + D_M$</td><td>$C_H = D_H + D_M$</td><td>$C_M = D_M$</td></tr>
<tr><td></td><td></td><td colspan="3">Cumulative Basis</td></tr>
</table>

For example, the MDM data in the tables below for Noncore C&I (G-30), Avearge Year throughput gas demand have *direct* values for various segments of pressure service:

D_T = 660,238 MTh, D_H = 571,574 MTh, and D_M = 293,527 MTh.

The corresponding *cumulative* totals are:

C_T = 1,525,339 MTh, C_H = 865,102 MTh, and C_M = 293,527 MTh,

using the formulas indicated in the Figure 1, above.

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.846%
MDM #Yrs Av (2- or 3-yr)
3

Btu Factor:	1.0300

	Co-Use-Fuel	UAF
	0.479%	0.835%
	0.485%	0.846%

Row	Forecast Summary	MDM	Residential	G-10	G-AC	G-GE	G-NGV	Total Core
9				Nonresidential Core				
10			Residential	G-10	G-AC	G-GE	G-NGV	Core
11	<< TCAP Period >> January 2017 - December 2019							
12	**DIRECT (%'s Load or Cust/Mtrs Sum to 100%)**							
13	Transmission	%-Load:	0.005%	0.72%	0.00%	4.11%	25.74%	
14		Average Year Throughput (MTh)	121	7,372	0	851	40,433	48,777
15		Cold Year Throughput (1-in-35) (MTh)	134	7,731	0	851	40,433	49,148
16		Cold Year Peak Month (December) (MTh)	20	854	0	59	3,341	4,274
17		Peak Day (see note a/ below) (MTh)	1	42	-	2	108	153
18		%-Cust/Mtrs:	0.0004%	0.0337%	0.00%	2.60%	4.12%	
19		Number of Customers	23	70	-	19	15	127
20	High Pressure	%-Load:	0.47%	5.94%	49.71%	16.41%	43.01%	
21		Average Year Throughput (MTh)	11,469	60,825	384	3,397	67,562	143,636
22		Cold Year Throughput (1-in-35) (MTh)	12,652	63,788	384	3,397	67,562	147,783
23		Cold Year Peak Month (December) (MTh)	1,896	7,047	19	236	5,583	14,780
24		Peak Day (see note a/ below) (MTh)	114	347	1	8	180	650
25		%-Cust/Mtrs:	0.1272%	1.2453%	33.33%	21.50%	16.48%	
26		Number of Customers	7,148	2,582	3	160	59	9,952
27	Medium Pressure	%-Load:	99.52%	93.33%	50.29%	79.48%	31.26%	
28		Average Year Throughput (MTh)	2,423,570	954,989	388	16,451	49,101	3,444,499
29		Cold Year Throughput (1-in-35) (MTh)	2,673,681	1,001,512	388	16,451	49,101	3,741,133
30		Cold Year Peak Month (December) (MTh)	400,588	110,646	19	1,142	4,058	516,452
31		Peak Day (see note a/ below) (MTh)	24,156	5,449	1	37	131	29,774
32		%-Cust/Mtrs:	99.8723%	98.7210%	66.67%	75.90%	79.40%	
33		Number of Customers	5,610,637	204,666	6	566	285	5,816,160

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.846%
MDM #Yrs Av (2- or 3-yr)
3

Btu Factor:	1.0300

	Co-Use-Fuel	UAF
	0.479%	0.835%
	0.485%	0.846%

Row	Forecast Summary	MDM	Residential	G-10 (Nonresidential Core)	G-AC (Nonresidential Core)	G-GE (Nonresidential Core)	G-NGV (Nonresidential Core)	Total Core
11	<< TCAP Period >> January 2017 - December 2019							
34	**CUMULATIVE (Calc'd from DIRECT %'s)**							
35	Transmission	%-Load:	100.00%	100.00%	100.00%	100.00%	100.00%	
36		Average Year Throughput (MTh)	2,435,160	1,023,186	772	20,699	157,095	**3,636,911**
37		Cold Year Throughput (1-in-35) (MTh)	2,686,467	1,073,031	772	20,699	157,095	**3,938,064**
38		Cold Year Peak Month (December) (MTh)	402,503	118,547	37	1,437	12,982	**535,507**
39		Peak Day (see note a/ below) (MTh)	24,272	5,839	1	46	419	**30,577**
40		%-Cust/Mtrs:	100.00%	100.00%	100.00%	100.00%	100.00%	
41		Number of Customers	5,617,809	207,317	9	745	359	**5,826,239**
42	High Pressure	%-Load:	100.00%	99.28%	100.00%	95.89%	74.26%	
43		Average Year Throughput (MTh)	2,435,038	1,015,814	772	19,848	116,663	**3,588,135**
44		Cold Year Throughput (1-in-35) (MTh)	2,686,333	1,065,299	772	19,848	116,663	**3,888,915**
45		Cold Year Peak Month (December) (MTh)	402,483	117,693	37	1,378	9,641	**531,232**
46		Peak Day (see note a/ below) (MTh)	24,271	5,797	1	44	311	**30,424**
47		%-Cust/Mtrs:	100.00%	1.28%	33.33%	24.10%	20.60%	
48		Number of Customers	5,617,785	207,248	9	726	344	**5,826,112**
49	Medium Pressure	%-Load:	0.00%	0.72%	0.00%	4.11%	25.74%	
50		Average Year Throughput (MTh)	2,423,570	954,989	388	16,451	49,101	**3,444,499**
51		Cold Year Throughput (1-in-35) (MTh)	2,673,681	1,001,512	388	16,451	49,101	**3,741,133**
52		Cold Year Peak Month (December) (MTh)	400,588	110,646	19	1,142	4,058	**516,452**
53		Peak Day (see note a/ below) (MTh)	24,156	5,449	1	37	131	**29,774**
54		%-Cust/Mtrs:	0.00%	0.03%	0.00%	2.60%	4.12%	
55		Number of Customers	5,610,637	204,666	6	566	285	**5,816,160**

Note: a/ **Core HDD-sensitive markets (Res & G10) at 1-in-35 exceedance peak-day design temp.; Noncore HDD-sensitive markets (G30-Com) at 1-in-10 exceedance design temp.; UEG/EWG & Large CoGen peak daily load in month of DECEMBER for BASE HYDRO water year; all other market segments at average daily load in DECEMBER month.**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.846%
MDM #Yrs Av (2- or 3-yr)
3

Row	Forecast Summary / MDM	N	O	P	Q	R	S	T	U	V	W
9	**Forecast Summary** **MDM**			Noncore - C&I	EG-Dist	EG-Trans	EG-Dist	EG-Trans	Noncore - Electric Generatiion		
10		G-30 Dist	G-30 Trans	G-30	EG (<3MMThms)	EG (<3MMThms)	EG (>=3MMThms)	EG (>=3MMThms)	EG (<3MMThms)	(>=3MMThms)	EG (Total)
11	<< TCAP Period >> January 2017 - December 2019										
12	**DIRECT (%'s Load or Cust/Mtrs Sum to 100%)**										
13	Transmission %-Load:										
14	Average Year Throughput (MTh)	0	660,238	660,238	0	20,005	0	2,372,694	20,005	2,372,694	2,392,699
15	Cold Year Throughput (1-in-35) (MTh)	0	660,388	660,388	0	20,005	0	2,372,694	20,005	2,372,694	2,392,699
16	Cold Year Peak Month (December) (MTh)	0	56,427	56,427	0	1,567	0	209,418	1,567	209,418	210,985
17	Peak Day (see note a/ below) (MTh)	0	1,826	1,826	0	81	0	8,381	81	8,381	8,462
18	%-Cust/Mtrs:										
19	Number of Customers	0	38	38	0	15	0	41	15	41	56
20	High Pressure %-Load:										
21	Average Year Throughput (MTh)	571,574	0	571,574	21,258	0	170,790	0	21,258	170,790	192,048
22	Cold Year Throughput (1-in-35) (MTh)	572,981	0	572,981	21,258	0	170,790	0	21,258	170,790	192,048
23	Cold Year Peak Month (December) (MTh)	44,354	0	44,354	1,661	0	13,909	0	1,661	13,909	15,570
24	Peak Day (see note a/ below) (MTh)	1,487	0	1,487	65	0	450	0	65	450	515
25	%-Cust/Mtrs:										
26	Number of Customers	225	0	225	37	0	22	0	37	22	59
27	Medium Pressure %-Load:										
28	Average Year Throughput (MTh)	293,527	0	293,527	55,949	0	37,099	0	55,949	37,099	93,048
29	Cold Year Throughput (1-in-35) (MTh)	296,299	0	296,299	55,949	0	37,099	0	55,949	37,099	93,048
30	Cold Year Peak Month (December) (MTh)	24,069	0	24,069	4,488	0	2,968	0	4,488	2,968	7,456
31	Peak Day (see note a/ below) (MTh)	888	0	888	145	0	96	0	145	96	241
32	%-Cust/Mtrs:										
33	Number of Customers	358	0	358	164	0	6	0	164	6	170

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

3	**Unaccounted**	
4	**Fcst (%*AYTP)**	
5	**0.846%**	
6	**MDM #Yrs Av (2- or 3-yr)**	
7	**3**	

Row	**Forecast Summary** / **MDM**			**Noncore - C&I**	**EG-Dist**	**EG-Trans**	**EG-Dist**	**EG-Trans**	**Noncore - Electric Generatiion**		
10		**G-30 Dist**	**G-30 Trans**	**G-30**	**EG (<3MMThms)**	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (>=3MMThms)**	**EG (<3MMThms)**	**(>=3MMThms)**	**EG (Total)**
11	<< TCAP Period >> January 2017 - December 2019										
34	**CUMULATIVE (Calc'd from DIRECT %'s)**										
35	Transmission %-Load:										
36	Average Year Throughput (MTh)	865,102	660,238	1,525,339	77,207	20,005	207,889	2,372,694	97,212	2,580,583	2,677,795
37	Cold Year Throughput (1-in-35) (MTh)	869,280	660,388	1,529,668	77,207	20,005	207,889	2,372,694	97,212	2,580,583	2,677,795
38	Cold Year Peak Month (December) (MTh)	68,423	56,427	124,850	6,149	1,567	16,877	209,418	7,715	226,295	234,011
39	Peak Day (see note a/ below) (MTh)	2,375	1,826	4,201	210	81	546	8,381	291	8,927	9,218
40	%-Cust/Mtrs:										
41	Number of Customers	584	38	622	201	15	28	41	216	68	285
42	High Pressure %-Load:										
43	Average Year Throughput (MTh)	865,102	0	865,102	77,207	0	207,889	0	77,207	207,889	285,096
44	Cold Year Throughput (1-in-35) (MTh)	869,280	0	869,280	77,207	0	207,889	0	77,207	207,889	285,096
45	Cold Year Peak Month (December) (MTh)	68,423	0	68,423	6,149	0	16,877	0	6,149	16,877	23,026
46	Peak Day (see note a/ below) (MTh)	2,375	0	2,375	210	0	546	0	210	546	756
47	%-Cust/Mtrs:										
48	Number of Customers	584	0	584	201	0	28	0	201	28	229
49	Medium Pressure %-Load:										
50	Average Year Throughput (MTh)	293,527	0	293,527	55,949	0	37,099	0	55,949	37,099	93,048
51	Cold Year Throughput (1-in-35) (MTh)	296,299	0	296,299	55,949	0	37,099	0	55,949	37,099	93,048
52	Cold Year Peak Month (December) (MTh)	24,069	0	24,069	4,488	0	2,968	0	4,488	2,968	7,456
53	Peak Day (see note a/ below) (MTh)	888	0	888	145	0	96	0	145	96	241
54	%-Cust/Mtrs:										
55	Number of Customers	358	0	358	164	0	6	0	164	6	170

Note: a/ **Core HDD-sensitive markets (Res & G10) at 1-in-35 exceedance peak-day design temp.; Noncore HDD-sensitive markets (G30-Com) at 1-in-10 exceedance design temp.; UEG/EWG & Large CoGen peak daily load in month of DECEMBER for BASE HYDRO water year; all other market segments at average daily load in DECEMBER month.**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.846%
MDM #Yrs Av (2- or 3-yr)
3

Forecast Summary	MDM	EOR Dist	EOR Trans	Noncore- EOR EOR	Total Retail Noncore
<< TCAP Period >> January 2017 - December 2019					
DIRECT (%'s Load or Cust/Mtrs Sum to 100%)					
Transmission	%-Load:				
Average Year Throughput (MTh)		0	93,950	93,950	**3,146,887**
Cold Year Throughput (1-in-35) (MTh)		0	93,950	93,950	**3,147,037**
Cold Year Peak Month (December) (MTh)		0	7,979	7,979	**275,391**
Peak Day (see note a/ below) (MTh)		0	257	257	**10,546**
	%-Cust/Mtrs:				
Number of Customers		0	12	12	**106**
High Pressure	%-Load:				
Average Year Throughput (MTh)		136,497	0	136,497	**900,119**
Cold Year Throughput (1-in-35) (MTh)		136,497	0	136,497	**901,525**
Cold Year Peak Month (December) (MTh)		11,593	0	11,593	**71,517**
Peak Day (see note a/ below) (MTh)		374	0	374	**2,377**
	%-Cust/Mtrs:				
Number of Customers		15	0	15	**299**
Medium Pressure	%-Load:				
Average Year Throughput (MTh)		1,124	0	1,124	**387,699**
Cold Year Throughput (1-in-35) (MTh)		1,124	0	1,124	**390,471**
Cold Year Peak Month (December) (MTh)		95	0	95	**31,620**
Peak Day (see note a/ below) (MTh)		3	0	3	**1,131**
	%-Cust/Mtrs:				
Number of Customers		2	0	2	**530**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

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MDM #Yrs Av (2- or 3-yr)
3

Row	Forecast Summary		MDM	EOR Dist	EOR Trans	Noncore- EOR EOR	Total Retail Noncore
11	<< TCAP Period >> January 2017 - December 2019						
34	**CUMULATIVE (Calc'd from DIRECT %'s)**						
35	Transmission	%-Load:					
36		Average Year Throughput (MTh)		137,620	93,950	231,570	**4,434,704**
37		Cold Year Throughput (1-in-35) (MTh)		137,620	93,950	231,570	**4,439,033**
38		Cold Year Peak Month (December) (MTh)		11,688	7,979	19,668	**378,528**
39		Peak Day (see note a/ below) (MTh)		377	257	634	**14,054**
40		%-Cust/Mtrs:					
41		Number of Customers		17	12	29	**935**
42	High Pressure	%-Load:					
43		Average Year Throughput (MTh)		137,620	0	137,620	**1,287,818**
44		Cold Year Throughput (1-in-35) (MTh)		137,620	0	137,620	**1,291,996**
45		Cold Year Peak Month (December) (MTh)		11,688	0	11,688	**103,137**
46		Peak Day (see note a/ below) (MTh)		377	0	377	**3,508**
47		%-Cust/Mtrs:					
48		Number of Customers		17	0	17	**830**
49	Medium Pressure	%-Load:					
50		Average Year Throughput (MTh)		1,124	0	1,124	**387,699**
51		Cold Year Throughput (1-in-35) (MTh)		1,124	0	1,124	**390,471**
52		Cold Year Peak Month (December) (MTh)		95	0	95	**31,620**
53		Peak Day (see note a/ below) (MTh)		3	0	3	**1,131**
54		%-Cust/Mtrs:					
55		Number of Customers		2	0	2	**530**

Note: a/ **Core HDD-sensitive markets (Res & G10) at 1-in-35 exceedance peak-day design temp.; Noncore HDD-sensitive markets (G30-Com) at 1-in-10 exceedance design temp.; UEG/EWG & Large CoGen peak daily load in month of DECEMBER for BASE HYDRO water year; all other market segments at average daily load in DECEMBER month.**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.846%
MDM #Yrs Av (2- or 3-yr)
3

Forecast Summary — MDM

<< TCAP Period >> January 2017 - December 2019		Wholesale Noncore: Long Beach	Wholesale Noncore: SDG&E	Wholesale Noncore: Southwest Gas	Wholesale Noncore: Vernon	**Total Wholesale**	International NC: Ecogas	**Total Noncore**	**Total System**
DIRECT (%'s Load or Cust/Mtrs Sum to 100%)									
Transmission	%-Load:	100.00%	100.00%	100.00%	100.00%		100.00%		
	Average Year Throughput (MTh)	73,520	1,251,556	65,367	95,137	**1,485,580**	91,378	**4,723,845**	**4,772,622**
	Cold Year Throughput (1-in-35) (MTh)	80,110	1,293,181	65,748	95,137	**1,534,176**	91,378	**4,772,591**	**4,821,740**
	Cold Year Peak Month (December) (MTh)	10,024	141,015	10,598	8,180	**169,818**	7,682	**452,891**	**457,165**
	Peak Day (see note a/ below) (MTh)	530	6,308	516	264	**7,618**	248	**18,412**	**18,565**
	%-Cust/Mtrs:	100.00%	100.00%	100.00%	100.00%		100.00%		
	Number of Customers	1	1	1	1	**4**	1	**111**	**238**
High Pressure	%-Load:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Average Year Throughput (MTh)	0	0	0	0	**0**	0	**900,119**	**1,043,755**
	Cold Year Throughput (1-in-35) (MTh)	0	0	0	0	**0**	0	**901,525**	**1,049,308**
	Cold Year Peak Month (December) (MTh)	0	0	0	0	**0**	0	**71,517**	**86,298**
	Peak Day (see note a/ below) (MTh)	-	-	-	-	**0**	-	**2,377**	**3,026**
	%-Cust/Mtrs:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Number of Customers	-	-	-	-	**0**	-	**299**	**10,251**
Medium Pressure	%-Load:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Average Year Throughput (MTh)	0	0	0	0	**0**	0	**387,699**	**3,832,198**
	Cold Year Throughput (1-in-35) (MTh)	0	0	0	0	**0**	0	**390,471**	**4,131,603**
	Cold Year Peak Month (December) (MTh)	0	0	0	0	**0**	0	**31,620**	**548,072**
	Peak Day (see note a/ below) (MTh)	-	-	-	-	**0**	-	**1,131**	**30,906**
	%-Cust/Mtrs:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Number of Customers	-	-	-	-	**0**	-	**530**	**5,816,690**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.846%
MDM #Yrs Av (2- or 3-yr)
3

Forecast Summary **MDM**

<< TCAP Period >> January 2017 - December 2019		Wholesale Noncore				Total Wholesale	International NC Ecogas	Total Noncore	Total System
		Long Beach	SDG&E	Southwest Gas	Vernon				
CUMULATIVE (Calc'd from DIRECT %'s)									
Transmission	%-Load:	100.00%	100.00%	100.00%	100.00%		100.00%		
	Average Year Throughput (MTh)	73,520	1,251,556	65,367	95,137	**1,485,580**	91,378	**6,011,663**	**9,648,574**
	Cold Year Throughput (1-in-35) (MTh)	80,110	1,293,181	65,748	95,137	**1,534,176**	91,378	**6,064,587**	**10,002,651**
	Cold Year Peak Month (December) (MTh)	10,024	141,015	10,598	8,180	**169,818**	7,682	**556,028**	**1,091,535**
	Peak Day (see note a/ below) (MTh)	530	6,308	516	264	**7,618**	248	**21,920**	**52,497**
	%-Cust/Mtrs:	100.00%	100.00%	100.00%	100.00%		100.00%		
	Number of Customers	1	1	1	1	**4**	1	**940**	**5,827,179**
High Pressure	%-Load:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Average Year Throughput (MTh)	0	0	0	0	**0**	0	**1,287,818**	**4,875,953**
	Cold Year Throughput (1-in-35) (MTh)	0	0	0	0	**0**	0	**1,291,996**	**5,180,911**
	Cold Year Peak Month (December) (MTh)	0	0	0	0	**0**	0	**103,137**	**634,370**
	Peak Day (see note a/ below) (MTh)	0	0	0	0	**0**	0	**3,508**	**33,932**
	%-Cust/Mtrs:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Number of Customers	0	0	0	0	**0**	0	**830**	**5,826,941**
Medium Pressure	%-Load:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Average Year Throughput (MTh)	0	0	0	0	**0**	0	**387,699**	**3,832,198**
	Cold Year Throughput (1-in-35) (MTh)	0	0	0	0	**0**	0	**390,471**	**4,131,603**
	Cold Year Peak Month (December) (MTh)	0	0	0	0	**0**	0	**31,620**	**548,072**
	Peak Day (see note a/ below) (MTh)	0	0	0	0	**0**	0	**1,131**	**30,906**
	%-Cust/Mtrs:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Number of Customers	0	0	0	0	**0**	0	**530**	**5,816,690**

Note: a/ **Core HDD-sensitive markets (Res & G10) at 1-in-35 exceedance peak-day design temp.; Noncore HDD-sensitive markets (G30-Com) at 1-in-10 exceedance design temp.; UEG/EWG & Large CoGen peak daily load in month of DECEMBER for BASE HYDRO water year; all other market segments at average daily load in DECEMBER month.**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

ANNUAL FORECAST DATA

				Nonresidential Core				Total
			Residential	G-10	G-AC	G-GE	G-NGV	Core
Average Year Throughput (Mth)								
2014	Jan		2,495,092	1,041,349	912	25,849	125,389	**3,688,589**
2015	Jan		2,479,706	1,046,462	772	20,089	132,624	**3,679,653**
2016	Jan		2,459,111	1,041,322	772	20,290	140,276	**3,661,772**
2017	Jan		2,448,253	1,033,422	772	20,493	148,370	**3,651,309**
2018	Jan		2,436,075	1,024,343	772	20,698	156,931	**3,638,819**
2019	Jan		2,421,151	1,011,792	772	20,905	165,986	**3,620,606**
2020	Jan		2,398,613	992,074	429	20,905	175,563	**3,587,583**

				Nonresidential Core				Total
			Residential	G-10	G-AC	G-GE	G-NGV	Core
Average Year Sales (Mth)								
2014	Jan	365	2,444,198	901,150	912	23,609	99,126	**3,468,995**
2015	Jan	365	2,429,126	905,575	772	18,349	104,846	**3,458,668**
2016	Jan	366	2,408,951	901,128	772	18,532	110,896	**3,440,279**
2017	Jan	365	2,398,314	894,291	772	18,718	117,294	**3,429,389**
2018	Jan	365	2,386,385	886,434	772	18,905	124,062	**3,416,558**
2019	Jan	365	2,371,766	875,573	772	19,094	131,221	**3,398,425**
2020	Jan	366	2,349,687	858,509	429	19,094	138,792	**3,366,511**

				Nonresidential Core				Total
			Residential	G-10	G-AC	G-GE	G-NGV	Core
Cold Year Throughput (Mth)								
2014	Jan		2,738,066	1,091,493	912	25,849	125,389	**3,981,707**
2015	Jan		2,723,830	1,097,187	772	20,089	132,624	**3,974,502**
2016	Jan		2,705,319	1,091,869	772	20,290	140,276	**3,958,526**
2017	Jan		2,696,894	1,083,662	772	20,493	148,370	**3,950,191**
2018	Jan		2,687,361	1,074,229	772	20,698	156,931	**3,939,991**
2019	Jan		2,675,146	1,061,201	772	20,905	165,986	**3,924,009**
2020	Jan		2,655,315	1,040,676	429	20,905	175,563	**3,892,888**

			Nonresidential Core				Total
Specified	**Peak Day Thrughput (Mth/Day)**	Residential	G-10	G-AC	G-GE	G-NGV	Core
2014		24,497	5,903	2	30	334	**30,766**
2015		24,414	5,953	1	45	354	**30,767**
2016		24,289	5,929	1	45	374	**30,639**
2017		24,300	5,889	1	46	396	**30,631**
2018		24,278	5,844	1	46	418	**30,588**
2019		24,238	5,783	1	47	442	**30,512**
2020		24,115	5,683	1	47	468	**30,313**

			Nonresidential Core				Total
		Residential	G-10	G-AC	G-GE	G-NGV	Core
Forecast Number of Customers							
2014	Jan	5,432,625	204,498	9	718	298	**5,638,148**
2015	Jan	5,457,810	206,092	9	723	310	**5,664,944**
2016	Jan	5,504,197	206,676	9	730	326	**5,711,938**
2017	Jan	5,558,410	207,146	9	738	351	**5,766,654**
2018	Jan	5,617,329	207,377	9	745	355	**5,825,815**
2019	Jan	5,677,687	207,429	9	753	370	**5,886,248**
2020	Jan	5,738,021	207,403	5	753	386	**5,946,567**

	A	B	C	D	E	N	O	P	Q	R	S	T
1	**2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**											
59	***ANNUAL FORECAST DATA***						Noncore - G-30					Noncore - Electric Gene
60						G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)
61	**Average Year Throughput (Mth)**											
62	2014	Jan				885,904	675,210	**1,561,114**	85,984	20,981	248,382	2,803,129
63	2015	Jan				887,704	681,092	**1,568,796**	85,078	36,767	218,360	2,711,313
64	2016	Jan				888,276	677,006	**1,565,281**	79,267	24,073	212,555	2,432,780
65	2017	Jan				876,485	667,431	**1,543,916**	77,682	21,009	208,757	2,373,587
66	2018	Jan				865,382	661,012	**1,526,395**	77,350	19,832	208,255	2,366,916
67	2019	Jan				853,437	652,270	**1,505,708**	76,588	19,174	206,655	2,377,579
68	2020	Jan				838,113	639,903	**1,478,016**	74,394	18,575	202,651	2,372,174
69												
70												
71							Noncore - G-30					Noncore - Electric Gene
72						G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)
73	**Average Year Sales (Mth)**											
74	2014	Jan	365			0	0	**0**	0	0	0	0
75	2015	Jan	365			0	0	**0**	0	0	0	0
76	2016	Jan	366			0	0	**0**	0	0	0	0
77	2017	Jan	365			0	0	**0**	0	0	0	0
78	2018	Jan	365			0	0	**0**	0	0	0	0
79	2019	Jan	365			0	0	**0**	0	0	0	0
80	2020	Jan	366			0	0	**0**	0	0	0	0
81												
82												
83							Noncore - G-30					Noncore - Electric Gene
84						G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)
85	**Cold Year Throughput (Mth)**											
86	2014	Jan				890,082	675,360	**1,565,442**	85,984	20,981	248,382	2,803,129
87	2015	Jan				891,882	681,242	**1,573,125**	85,078	36,767	218,360	2,711,313
88	2016	Jan				892,454	677,156	**1,569,610**	79,267	24,073	212,555	2,432,780
89	2017	Jan				880,663	667,581	**1,548,244**	77,682	21,009	208,757	2,373,587
90	2018	Jan				869,561	661,163	**1,530,723**	77,350	19,832	208,255	2,366,916
91	2019	Jan				857,616	652,421	**1,510,036**	76,588	19,174	206,655	2,377,579
92	2020	Jan				842,291	640,054	**1,482,344**	74,394	18,575	202,651	2,372,174
93												
94												
95							Noncore - G-30					Noncore - Electric Gene
96	**Specified**	**Peak Day Thrughput (Mth/Day)**				G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)
97	2014					2,481	2,014	**4,495**	204	39	566	8,214
98	2015					2,429	1,879	**4,308**	234	124	597	10,451
99	2016					2,428	1,866	**4,295**	203	72	572	8,247
100	2017					2,402	1,846	**4,249**	214	94	531	8,344
101	2018					2,377	1,830	**4,207**	214	78	547	8,209
102	2019					2,347	1,803	**4,149**	201	72	560	8,589
103	2020					2,309	1,768	**4,076**	190	112	470	8,610
104												
105												
106							Noncore - G-30					Noncore - Electric Gene
107						G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)
108	**Forecast Number of Customers**											
109	2014	Jan				569	37	**606**	199	15	27	41
110	2015	Jan				574	37	**611**	201	15	28	41
111	2016	Jan				578	38	**616**	202	15	28	41
112	2017	Jan				581	38	**619**	202	15	28	41
113	2018	Jan				584	38	**621**	201	15	28	41
114	2019	Jan				586	38	**624**	201	15	28	41
115	2020	Jan				589	38	**627**	200	15	27	41

Row	A	B	C	U	V	W	Y	Z	AA	AC
1	**2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**									
59	***ANNUAL FORECAST DATA***			ratiion				Noncore - EOR		**Total**
60				**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
61	**Average Year Throughput (Mth)**									
62	2014	Jan		**106,966**	**3,051,511**	**3,158,477**	137,620	93,950	**231,570**	**4,951,160**
63	2015	Jan		**121,846**	**2,929,674**	**3,051,519**	137,620	93,950	**231,570**	**4,851,885**
64	2016	Jan		**103,339**	**2,645,335**	**2,748,674**	137,620	93,950	**231,570**	**4,545,525**
65	2017	Jan		**98,691**	**2,582,344**	**2,681,035**	137,620	93,950	**231,570**	**4,456,521**
66	2018	Jan		**97,182**	**2,575,172**	**2,672,354**	137,620	93,950	**231,570**	**4,430,319**
67	2019	Jan		**95,762**	**2,584,234**	**2,679,996**	137,620	93,950	**231,570**	**4,417,274**
68	2020	Jan		**92,969**	**2,574,825**	**2,667,794**	137,620	93,950	**231,570**	**4,377,380**
69										
70										
71				ratiion				Noncore - EOR		**Total**
72				**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
73	**Average Year Sales (Mth)**									
74	2014	Jan	365	**0**	**0**	**0**	0	0	**0**	**0**
75	2015	Jan	365	**0**	**0**	**0**	0	0	**0**	**0**
76	2016	Jan	366	**0**	**0**	**0**	0	0	**0**	**0**
77	2017	Jan	365	**0**	**0**	**0**	0	0	**0**	**0**
78	2018	Jan	365	**0**	**0**	**0**	0	0	**0**	**0**
79	2019	Jan	365	**0**	**0**	**0**	0	0	**0**	**0**
80	2020	Jan	366	**0**	**0**	**0**	0	0	**0**	**0**
81										
82										
83				ratiion				Noncore - EOR		**Total**
84				**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
85	**Cold Year Throughput (Mth)**									
86	2014	Jan		**106,966**	**3,051,511**	**3,158,477**	98,956	67,554	**166,510**	**4,890,429**
87	2015	Jan		**121,846**	**2,929,674**	**3,051,519**	137,620	93,950	**231,570**	**4,856,214**
88	2016	Jan		**103,339**	**2,645,335**	**2,748,674**	137,620	93,950	**231,570**	**4,549,853**
89	2017	Jan		**98,691**	**2,582,344**	**2,681,035**	137,620	93,950	**231,570**	**4,460,849**
90	2018	Jan		**97,182**	**2,575,172**	**2,672,354**	137,620	93,950	**231,570**	**4,434,647**
91	2019	Jan		**95,762**	**2,584,234**	**2,679,996**	137,620	93,950	**231,570**	**4,421,602**
92	2020	Jan		**92,969**	**2,574,825**	**2,667,794**	137,620	93,950	**231,570**	**4,381,708**
93										
94										
95				ratiion				Noncore - EOR		**Total**
96	**Specified**	**Peak Day Thrughput (Mth/Day)**		**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
97	2014			**242**	**8,780**	**9,023**	377	257	**634**	**14,152**
98	2015			**358**	**11,048**	**11,406**	377	257	**634**	**16,349**
99	2016			**276**	**8,818**	**9,094**	377	257	**634**	**14,023**
100	2017			**308**	**8,875**	**9,183**	377	257	**634**	**14,067**
101	2018			**293**	**8,756**	**9,049**	377	257	**634**	**13,890**
102	2019			**273**	**9,149**	**9,422**	377	257	**634**	**14,205**
103	2020			**302**	**9,080**	**9,382**	377	257	**634**	**14,092**
104										
105										
106				ratiion				Noncore - EOR		**Total**
107				**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
108	**Forecast Number of Customers**									
109	2014	Jan		**214**	**68**	**282**	17	12	**29**	**917**
110	2015	Jan		**216**	**68**	**284**	17	12	**29**	**924**
111	2016	Jan		**217**	**69**	**285**	17	12	**29**	**930**
112	2017	Jan		**217**	**69**	**285**	17	12	**29**	**933**
113	2018	Jan		**216**	**68**	**285**	17	12	**29**	**935**
114	2019	Jan		**216**	**68**	**284**	17	12	**29**	**937**
115	2020	Jan		**215**	**68**	**283**	17	12	**29**	**939**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

ANNUAL FORECAST DATA

Average Year Throughput (Mth)		Wholesale Noncore Long Beach	SDG&E	Southwest Gas	Vernon	Total Wholesale	International NC Ecogas	Total Noncore
2014	Jan	73,569	**1,298,475**	56,019	100,712	**1,528,774**	79,395	**6,559,330**
2015	Jan	73,898	**1,305,108**	63,712	91,246	**1,533,965**	84,714	**6,470,564**
2016	Jan	72,852	**1,298,829**	64,370	92,443	**1,528,493**	90,471	**6,164,488**
2017	Jan	73,091	**1,285,237**	64,809	93,714	**1,516,850**	90,923	**6,064,294**
2018	Jan	73,890	**1,240,586**	65,367	95,133	**1,474,975**	91,378	**5,996,671**
2019	Jan	73,579	**1,228,845**	65,925	96,566	**1,464,915**	91,835	**5,974,023**
2020	Jan	74,157	**1,212,923**	66,598	98,175	**1,451,853**	92,294	**5,921,527**

Average Year Sales (Mth)			Wholesale Noncore Long Beach	SDG&E	Southwest Gas	Vernon	Total Wholesale	International NC Ecogas	Total Noncore
2014	Jan	365	0	**0**	0	0	**0**	0	**0**
2015	Jan	365	0	**0**	0	0	**0**	0	**0**
2016	Jan	366	0	**0**	0	0	**0**	0	**0**
2017	Jan	365	0	**0**	0	0	**0**	0	**0**
2018	Jan	365	0	**0**	0	0	**0**	0	**0**
2019	Jan	365	0	**0**	0	0	**0**	0	**0**
2020	Jan	366	0	**0**	0	0	**0**	0	**0**

Cold Year Throughput (Mth)		Wholesale Noncore Long Beach	SDG&E	Southwest Gas	Vernon	Total Wholesale	International NC Ecogas	Total Noncore
2014	Jan	73,569	**1,338,333**	56,019	100,712	**1,568,632**	79,395	**6,538,457**
2015	Jan	80,450	**1,345,356**	64,094	91,246	**1,581,146**	84,714	**6,522,074**
2016	Jan	79,392	**1,339,577**	64,751	92,443	**1,576,163**	90,471	**6,216,487**
2017	Jan	79,653	**1,326,423**	65,190	93,714	**1,564,980**	90,923	**6,116,753**
2018	Jan	80,490	**1,282,217**	65,748	95,133	**1,523,588**	91,378	**6,049,613**
2019	Jan	80,187	**1,270,902**	66,306	96,566	**1,513,960**	91,835	**6,027,397**
2020	Jan	80,796	**1,255,357**	66,979	98,175	**1,501,307**	92,294	**5,975,309**

Specified	Peak Day Thrughput (Mth/Day)	Wholesale Noncore Long Beach	SDG&E	Southwest Gas	Vernon	Total Wholesale	International NC Ecogas	Total Noncore
2014		271	**6,166**	263	324	**7,023**	216	**21,391**
2015		530	**6,090**	503	418	**7,541**	244	**24,133**
2016		523	**5,914**	507	257	**7,201**	245	**21,469**
2017		529	**6,273**	512	260	**7,574**	247	**21,887**
2018		531	**6,354**	516	263	**7,664**	248	**21,802**
2019		531	**6,295**	521	269	**7,616**	249	**22,070**
2020		534	**6,067**	525	274	**7,400**	250	**21,742**

Forecast Number of Customers		Wholesale Noncore Long Beach	SDG&E	Southwest Gas	Vernon	Total Wholesale	International NC Ecogas	Total Noncore
2014	Jan	1	**1**	1	1	**4**	1	**922**
2015	Jan	1	**1**	1	1	**4**	1	**929**
2016	Jan	1	**1**	1	1	**4**	1	**935**
2017	Jan	1	**1**	1	1	**4**	1	**938**
2018	Jan	1	**1**	1	1	**4**	1	**940**
2019	Jan	1	**1**	1	1	**4**	1	**942**
2020	Jan	1	**1**	1	1	**4**	1	**944**

	A	B	C	D	E	AO	AP	AQ	AR	AS	AT	AU
1	**2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**											
59	***ANNUAL FORECAST DATA***					**Total**		**System Total**				**Total**
60						**System End-Use Dmd**		**(Mdth/d)**		**Co-Use-Fuel**	**"Un-Acnt'd-For" (UAF)**	**System Throughput**
61	**Average Year Throughput (Mth)**											
62	2014	Jan				**10,247,919**		**2,808**		**49,706**	**86,719**	**10,384,345**
63	2015	Jan				**10,150,217**		**2,781**		**49,232**	**85,893**	**10,285,342**
64	2016	Jan				**9,826,260**		**2,685**		**47,661**	**83,151**	**9,957,072**
65	2017	Jan				**9,715,603**		**2,662**		**47,124**	**82,215**	**9,844,943**
66	2018	Jan				**9,635,491**		**2,640**		**46,736**	**81,537**	**9,763,763**
67	2019	Jan				**9,594,629**		**2,629**		**46,538**	**81,191**	**9,722,358**
68	2020	Jan				**9,509,110**		**2,598**		**46,123**	**80,467**	**9,635,701**
69												
70								**Check of**				
71						**Total**		**System Total**				
72						**System End-Use Dmd**		**(Mdth/d)**				
73	**Average Year Sales (Mth)**											
74	2014	Jan	365			**3,468,995**		**950**				
75	2015	Jan	365			**3,458,668**		**948**				
76	2016	Jan	366			**3,440,279**		**940**				
77	2017	Jan	365			**3,429,389**		**940**				
78	2018	Jan	365			**3,416,558**		**936**				
79	2019	Jan	365			**3,398,425**		**931**				
80	2020	Jan	366			**3,366,511**		**920**				
81												
82								**Check of**				
83						**Total**		**System Total**				
84						**System End-Use Dmd**		**(Mdth/d)**		**Co-Use-Fuel**	**"Un-Acnt'd-For" (UAF)**	**System Throughput**
85	**Cold Year Throughput (Mth)**											
86	2014	Jan				**10,520,164**		**2,882**		**51,027**	**89,023**	**10,660,214**
87	2015	Jan				**10,496,576**		**2,876**		**50,912**	**88,824**	**10,636,312**
88	2016	Jan				**10,175,013**		**2,780**		**49,353**	**86,102**	**10,310,469**
89	2017	Jan				**10,066,944**		**2,758**		**48,829**	**85,188**	**10,200,960**
90	2018	Jan				**9,989,603**		**2,737**		**48,453**	**84,533**	**10,122,590**
91	2019	Jan				**9,951,406**		**2,726**		**48,268**	**84,210**	**10,083,885**
92	2020	Jan				**9,868,197**		**2,696**		**47,865**	**83,506**	**9,999,568**
93												
94												
95						**Total**						
96	**Specified**	**Peak Day Thrughput (Mth/Day)**				**System End-Use Dmd**						
97	2014					**52,157**						
98	2015					**54,900**						
99	2016					**52,108**						
100	2017					**52,518**						
101	2018					**52,390**						
102	2019					**52,582**						
103	2020					**52,055**						
104												
105												
106						**Total**						
107						**System**						
108	**Forecast Number of Customers**											
109	2014	Jan				**5,639,070**						
110	2015	Jan				**5,665,873**						
111	2016	Jan				**5,712,873**						
112	2017	Jan				**5,767,592**						
113	2018	Jan				**5,826,755**						
114	2019	Jan				**5,887,190**						
115	2020	Jan				**5,947,511**						

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

			Residential	G-10	G-AC	G-GE	G-NGV	Total Core	G-30 (Dist.)	G-30 (Trans.)	G-30 (Total)	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)
59	***MONTHLY FORECAST DATA***			Nonresidential Core				Total	Noncore - G-30			Noncore - Electric Gene			
61	**Average Year Throughput (Mth)**														
62	2014	Jan	342,753	113,121	33	1,185	9,880	**466,972**	80,283	62,613	**142,896**	6,654	1,400	17,563	192,159
63		Feb	300,769	105,436	43	1,725	9,271	**417,244**	68,937	47,705	**116,642**	6,289	3,466	15,901	208,728
64		Mar	266,415	94,717	38	1,465	10,497	**373,131**	74,883	52,067	**126,950**	6,626	1,723	17,300	180,229
65		Apr	219,648	84,637	57	1,188	10,444	**315,973**	74,628	58,968	**133,596**	6,822	1,178	18,378	205,316
66		May	155,701	80,785	59	2,707	10,859	**250,111**	74,823	60,412	**135,235**	6,915	1,309	19,041	208,674
67		Jun	123,821	74,860	91	3,408	10,389	**212,569**	70,042	56,397	**126,439**	6,958	1,444	22,752	188,876
68		Jul	118,506	68,752	94	3,404	10,604	**201,360**	73,799	55,165	**128,963**	8,030	2,374	26,742	289,355
69		Aug	118,299	67,607	114	3,217	10,694	**199,931**	78,811	54,153	**132,964**	8,395	2,293	29,362	287,682
70		Sep	116,523	71,755	117	2,710	11,101	**202,206**	78,055	56,365	**134,420**	7,755	2,181	24,642	313,940
71		Oct	147,450	72,724	121	2,239	11,202	**233,736**	73,720	56,090	**129,810**	7,423	1,516	21,305	325,680
72		Nov	227,278	96,097	93	1,672	10,085	**335,225**	67,135	53,047	**120,182**	7,484	1,190	17,652	199,391
73		Dec	357,929	110,857	54	928	10,362	**480,130**	70,789	62,228	**133,017**	6,634	907	17,745	203,100
74															
75	2015	Jan	340,639	113,753	32	1,285	10,450	**466,159**	78,094	57,041	**135,135**	7,080	2,947	18,281	223,035
76		Feb	298,914	106,009	32	1,468	9,806	**416,230**	70,876	52,667	**123,543**	6,155	1,958	15,903	165,652
77		Mar	264,772	95,194	38	1,299	11,103	**372,406**	77,473	58,759	**136,232**	6,455	2,277	17,627	163,920
78		Apr	218,294	85,034	49	987	11,047	**315,411**	73,500	56,218	**129,718**	6,540	1,591	17,189	156,716
79		May	154,741	81,158	63	1,786	11,485	**249,234**	74,094	58,730	**132,824**	6,657	2,041	17,685	185,392
80		Jun	123,057	75,184	77	2,186	10,989	**211,494**	69,479	55,149	**124,628**	6,978	2,107	17,920	206,583
81		Jul	117,776	69,026	89	2,202	11,216	**200,309**	74,305	56,697	**131,002**	8,081	4,615	19,813	308,214
82		Aug	117,570	67,868	106	2,319	11,311	**199,173**	79,761	56,865	**136,626**	8,321	5,067	20,452	314,623
83		Sep	115,804	72,047	106	1,921	11,741	**201,620**	77,874	56,066	**133,940**	7,757	4,023	19,349	274,929
84		Oct	146,540	73,031	83	1,972	11,848	**233,475**	74,562	58,368	**132,930**	7,332	4,534	19,005	251,521
85		Nov	225,876	96,617	59	1,270	10,667	**334,489**	68,492	56,517	**125,009**	6,854	2,768	17,434	212,366
86		Dec	355,722	111,540	37	1,395	10,960	**479,654**	69,195	58,014	**127,209**	6,868	2,840	17,702	248,363
87															
88	2016	Jan	337,301	113,219	32	1,298	11,053	**462,902**	78,165	56,773	**134,938**	6,439	2,604	17,847	205,197
89		Feb	299,691	105,506	32	1,483	10,372	**417,084**	71,525	53,907	**125,432**	5,689	1,317	15,790	175,661
90		Mar	262,177	94,733	38	1,312	11,744	**370,003**	77,420	58,143	**135,563**	6,218	1,263	17,115	146,189
91		Apr	216,154	84,613	49	996	11,684	**313,497**	73,441	55,601	**129,042**	6,347	1,259	16,773	140,438
92		May	153,225	80,753	63	1,804	12,148	**247,992**	74,075	58,194	**132,269**	6,422	1,400	17,342	160,276
93		Jun	121,851	74,802	77	2,208	11,623	**210,562**	69,461	54,639	**124,100**	6,552	1,439	17,462	182,445
94		Jul	116,622	68,668	89	2,224	11,863	**199,466**	74,296	56,152	**130,449**	7,392	3,031	19,223	274,383
95		Aug	116,417	67,515	106	2,342	11,964	**198,344**	79,777	56,319	**136,096**	7,661	3,118	19,800	289,659
96		Sep	114,669	71,677	106	1,940	12,419	**200,811**	77,895	55,605	**133,500**	7,166	2,768	18,765	251,903
97		Oct	145,104	72,658	83	1,992	12,532	**232,370**	74,578	57,936	**132,514**	6,732	2,437	18,302	213,966
98		Nov	223,663	96,154	59	1,282	11,283	**332,441**	68,476	56,098	**124,574**	6,338	1,667	16,958	189,599
99		Dec	352,236	111,025	37	1,409	11,592	**476,299**	69,167	57,637	**126,804**	6,311	1,770	17,176	203,063
100															
101	2017	Jan	336,319	112,385	32	1,311	11,691	**461,737**	77,238	56,197	**133,435**	6,268	1,633	17,465	190,812
102		Feb	295,122	104,722	32	1,498	10,971	**412,345**	69,896	51,374	**121,270**	5,589	1,334	15,338	149,136
103		Mar	261,413	94,018	38	1,325	12,421	**369,215**	76,360	57,240	**133,600**	6,102	1,268	16,816	150,394
104		Apr	215,525	83,965	49	1,006	12,358	**312,904**	72,516	54,947	**127,463**	6,184	1,263	16,596	145,383
105		May	152,778	80,132	63	1,822	12,849	**247,644**	73,175	57,623	**130,798**	6,249	1,403	16,945	159,256
106		Jun	121,496	74,221	77	2,230	12,293	**210,318**	68,601	54,062	**122,663**	6,438	1,367	17,373	183,918
107		Jul	116,282	68,127	89	2,247	12,547	**199,292**	73,350	55,517	**128,867**	7,357	2,812	18,876	268,601
108		Aug	116,078	66,981	106	2,365	12,654	**198,184**	78,760	55,694	**134,454**	7,478	2,722	19,468	282,450
109		Sep	114,335	71,116	106	1,959	13,135	**200,652**	76,916	54,966	**131,882**	7,070	2,068	18,332	242,462
110		Oct	144,682	72,092	83	2,012	13,255	**232,124**	73,641	57,271	**130,912**	6,582	1,831	17,945	201,711
111		Nov	223,011	95,440	59	1,295	11,934	**331,739**	67,665	55,523	**123,188**	6,193	1,698	16,664	192,234
112		Dec	351,210	110,222	37	1,423	12,261	**475,154**	68,367	57,017	**125,384**	6,172	1,609	16,938	207,230

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2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Row	A	B	F	G	I	J	K	L	N	O	P	Q	R	S	T
59	***MONTHLY FORECAST DATA***			Nonresidential Core				**Total**	Noncore - G-30			Noncore - Electric Gene			
60			Residential	G-10	G-AC	G-GE	G-NGV	**Core**	G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)
61	**Average Year Throughput (Mth)**														
113															
114	2018	Jan	334,646	111,425	32	1,324	12,365	**459,792**	76,233	55,545	**131,777**	6,317	1,779	17,446	194,655
115		Feb	293,654	103,823	32	1,513	11,604	**410,626**	69,006	50,836	**119,842**	5,543	1,307	15,247	154,937
116		Mar	260,113	93,198	38	1,338	13,138	**367,825**	75,377	56,655	**132,033**	6,065	1,261	16,855	148,338
117		Apr	214,453	83,222	49	1,016	13,071	**311,812**	71,590	54,403	**125,993**	6,177	1,215	16,548	139,315
118		May	152,018	79,420	63	1,840	13,591	**246,931**	72,245	57,092	**129,337**	6,239	1,303	16,924	156,786
119		Jun	120,892	73,553	77	2,252	13,003	**209,777**	67,727	53,557	**121,284**	6,393	1,248	17,246	179,960
120		Jul	115,703	67,505	89	2,269	13,271	**198,838**	72,403	55,003	**127,406**	7,101	2,435	18,808	269,264
121		Aug	115,501	66,367	106	2,389	13,384	**197,747**	77,733	55,177	**132,909**	7,516	2,233	19,398	277,674
122		Sep	113,767	70,470	106	1,979	13,893	**200,216**	75,940	54,462	**130,403**	7,101	2,233	18,320	246,049
123		Oct	143,962	71,441	83	2,032	14,020	**231,539**	72,714	56,751	**129,466**	6,545	1,627	17,888	200,212
124		Nov	221,902	94,619	59	1,308	12,622	**330,510**	66,844	55,023	**121,868**	6,186	1,634	16,654	190,401
125		Dec	349,463	109,300	37	1,437	12,968	**473,206**	67,570	56,507	**124,077**	6,167	1,558	16,919	209,324
126															
127	2019	Jan	332,596	110,108	32	1,337	13,079	**457,151**	75,270	55,000	**130,270**	6,228	1,707	17,269	201,768
128		Feb	291,855	102,585	32	1,528	12,273	**408,274**	68,115	50,288	**118,403**	5,480	1,262	15,263	153,852
129		Mar	258,520	92,064	38	1,351	13,896	**365,869**	74,376	56,011	**130,386**	5,997	1,264	16,641	147,884
130		Apr	213,139	82,191	49	1,027	13,826	**310,231**	70,623	53,740	**124,362**	6,104	1,220	16,419	138,667
131		May	151,087	78,431	63	1,858	14,375	**245,814**	71,243	56,355	**127,597**	6,168	1,333	16,800	154,042
132		Jun	120,152	72,624	77	2,275	13,753	**208,881**	66,768	52,812	**119,580**	6,320	1,211	17,140	176,504
133		Jul	114,995	66,638	89	2,292	14,037	**198,051**	71,368	54,232	**125,600**	7,142	2,110	18,583	259,321
134		Aug	114,793	65,510	106	2,413	14,156	**196,978**	76,619	54,402	**131,021**	7,420	2,017	19,195	276,687
135		Sep	113,070	69,570	106	1,999	14,695	**199,440**	74,863	53,680	**128,543**	7,016	2,095	18,237	242,780
136		Oct	143,080	70,535	83	2,052	14,829	**230,580**	71,672	55,919	**127,590**	6,493	1,754	17,779	210,446
137		Nov	220,543	93,490	59	1,321	13,351	**328,763**	65,887	54,173	**120,060**	6,112	1,669	16,554	203,930
138		Dec	347,322	108,045	37	1,452	13,716	**470,573**	66,634	55,660	**122,294**	6,107	1,532	16,774	211,700
139															
140	2020	Jan	329,003	108,018	18	1,337	13,833	**452,209**	73,943	53,976	**127,920**	6,003	1,519	16,924	195,725
141		Feb	292,318	100,626	18	1,528	12,981	**407,472**	67,451	50,724	**118,174**	5,318	1,258	15,132	153,109
142		Mar	255,727	90,279	21	1,351	14,698	**362,077**	72,944	54,712	**127,656**	5,814	1,187	16,354	147,306
143		Apr	210,837	80,575	27	1,027	14,623	**307,089**	69,276	52,521	**121,798**	5,923	1,212	16,027	139,277
144		May	149,455	76,885	35	1,858	15,204	**243,437**	69,867	55,076	**124,943**	6,007	1,316	16,529	154,671
145		Jun	118,854	71,176	43	2,275	14,547	**206,894**	65,475	51,600	**117,075**	6,134	1,197	16,759	177,693
146		Jul	113,752	65,292	50	2,292	14,847	**196,233**	70,007	53,045	**123,052**	6,868	2,048	18,272	261,533
147		Aug	113,553	64,181	59	2,413	14,973	**195,179**	75,185	53,268	**128,453**	7,164	2,067	18,724	275,068
148		Sep	111,848	68,170	59	1,999	15,543	**197,619**	73,484	52,575	**126,059**	6,988	1,879	17,916	244,020
149		Oct	141,534	69,124	46	2,052	15,685	**228,442**	70,346	54,780	**125,126**	6,282	1,643	17,423	215,394
150		Nov	218,160	91,704	33	1,321	14,121	**325,339**	64,678	53,053	**117,730**	5,949	1,467	16,179	195,952
151		Dec	343,571	106,041	21	1,452	14,508	**465,592**	65,457	54,573	**120,030**	5,943	1,781	16,413	212,427

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

	A	B	U	V	W	Y	Z	AA	AC	AE	AF	AG	AH	AI
59	***MONTHLY FORECAST DATA***		ratiion				Noncore - EOR		**Total**		Wholesale Noncore			**Total**
60			**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**	Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**
61	**Average Year Throughput (Mth)**													
62	2014	Jan	**8,053**	**209,722**	**217,775**	11,688	7,979	**19,668**	**380,339**	11,054	**133,651**	10,508	7,386	**162,599**
63		Feb	**9,755**	**224,629**	**234,383**	10,557	7,207	**17,764**	**368,790**	8,529	**105,287**	8,249	9,164	**131,230**
64		Mar	**8,350**	**197,529**	**205,879**	11,688	7,979	**19,668**	**352,497**	7,077	**99,086**	6,223	8,234	**120,620**
65		Apr	**8,000**	**223,694**	**231,693**	11,311	7,722	**19,033**	**384,323**	6,926	**103,466**	5,413	8,974	**124,779**
66		May	**8,224**	**227,715**	**235,939**	11,688	7,979	**19,668**	**390,841**	5,907	**92,975**	4,135	8,182	**111,199**
67		Jun	**8,402**	**211,628**	**220,030**	11,311	7,722	**19,033**	**365,502**	4,975	**85,827**	3,190	7,963	**101,955**
68		Jul	**10,403**	**316,097**	**326,500**	11,688	7,979	**19,668**	**475,131**	5,165	**104,905**	2,462	8,693	**121,224**
69		Aug	**10,688**	**317,044**	**327,732**	11,688	7,979	**19,668**	**480,363**	4,542	**104,240**	2,500	8,849	**120,130**
70		Sep	**9,936**	**338,582**	**348,518**	11,311	7,722	**19,033**	**501,971**	4,689	**110,176**	2,464	8,578	**125,907**
71		Oct	**8,940**	**346,985**	**355,925**	11,688	7,979	**19,668**	**505,403**	4,747	**109,650**	2,492	8,606	**125,495**
72		Nov	**8,673**	**217,043**	**225,716**	11,311	7,722	**19,033**	**364,932**	4,805	**111,323**	2,990	9,022	**128,139**
73		Dec	**7,541**	**220,844**	**228,386**	11,688	7,979	**19,668**	**381,070**	5,153	**137,890**	5,393	7,060	**155,496**
74														
75	2015	Jan	**10,027**	**241,315**	**251,342**	11,688	7,979	**19,668**	**406,145**	7,962	**123,661**	**10,342**	7,790	**149,755**
76		Feb	**8,113**	**181,555**	**189,668**	10,557	7,207	**17,764**	**330,975**	7,826	**104,788**	**8,745**	7,059	**128,418**
77		Mar	**8,732**	**181,546**	**190,278**	11,688	7,979	**19,668**	**346,177**	7,883	**106,130**	**6,914**	7,532	**128,459**
78		Apr	**8,131**	**173,906**	**182,037**	11,311	7,722	**19,033**	**330,788**	6,652	**96,211**	**5,202**	7,586	**115,651**
79		May	**8,698**	**203,077**	**211,775**	11,688	7,979	**19,668**	**364,266**	5,344	**89,071**	**3,118**	7,752	**105,284**
80		Jun	**9,085**	**224,503**	**233,587**	11,311	7,722	**19,033**	**377,248**	4,485	**82,438**	**2,555**	7,483	**96,960**
81		Jul	**12,696**	**328,028**	**340,724**	11,688	7,979	**19,668**	**491,394**	4,451	**120,439**	**2,376**	8,103	**135,369**
82		Aug	**13,388**	**335,075**	**348,463**	11,688	7,979	**19,668**	**504,756**	4,437	**119,694**	**2,376**	8,081	**134,587**
83		Sep	**11,780**	**294,278**	**306,058**	11,311	7,722	**19,033**	**459,031**	4,549	**116,208**	**2,296**	7,747	**130,800**
84		Oct	**11,866**	**270,526**	**282,392**	11,688	7,979	**19,668**	**434,990**	4,728	**102,533**	**3,202**	8,235	**118,697**
85		Nov	**9,622**	**229,800**	**239,422**	11,311	7,722	**19,033**	**383,464**	6,713	**108,791**	**6,306**	6,039	**127,848**
86		Dec	**9,708**	**266,065**	**275,773**	11,688	7,979	**19,668**	**422,650**	8,869	**135,146**	**10,281**	7,840	**162,137**
87														
88	2016	Jan	**9,043**	**223,045**	**232,088**	11,688	7,979	**19,668**	**386,694**	7,994	**125,361**	**10,434**	7,918	**151,708**
89		Feb	**7,006**	**191,452**	**198,458**	10,557	7,207	**17,764**	**341,654**	7,895	**118,634**	**8,933**	7,322	**142,784**
90		Mar	**7,481**	**163,304**	**170,786**	11,688	7,979	**19,668**	**326,017**	7,827	**103,380**	**6,974**	7,695	**125,876**
91		Apr	**7,606**	**157,212**	**164,818**	11,311	7,722	**19,033**	**312,893**	6,587	**94,034**	**5,246**	7,694	**113,561**
92		May	**7,821**	**177,617**	**185,438**	11,688	7,979	**19,668**	**337,375**	5,350	**84,937**	**3,143**	7,842	**101,272**
93		Jun	**7,992**	**199,907**	**207,899**	11,311	7,722	**19,033**	**351,032**	4,484	**78,693**	**2,575**	7,625	**93,376**
94		Jul	**10,422**	**293,607**	**304,029**	11,688	7,979	**19,668**	**454,145**	4,290	**118,764**	**2,395**	8,084	**133,533**
95		Aug	**10,779**	**309,459**	**320,238**	11,688	7,979	**19,668**	**476,002**	4,247	**120,193**	**2,394**	8,043	**134,877**
96		Sep	**9,934**	**270,668**	**280,602**	11,311	7,722	**19,033**	**433,135**	4,402	**115,312**	**2,315**	7,756	**129,785**
97		Oct	**9,168**	**232,268**	**241,437**	11,688	7,979	**19,668**	**393,618**	4,623	**97,623**	**3,228**	8,381	**113,855**
98		Nov	**8,005**	**206,557**	**214,561**	11,311	7,722	**19,033**	**358,168**	6,522	**110,293**	**6,360**	6,121	**129,297**
99		Dec	**8,081**	**220,239**	**228,320**	11,688	7,979	**19,668**	**374,791**	8,631	**131,606**	**10,372**	7,961	**158,569**
100														
101	2017	Jan	**7,901**	**208,277**	**216,179**	11,688	7,979	**19,668**	**369,281**	7,885	**117,724**	**10,527**	8,061	**144,198**
102		Feb	**6,923**	**164,474**	**171,397**	10,557	7,207	**17,764**	**310,431**	7,767	**107,936**	**8,900**	7,295	**131,898**
103		Mar	**7,370**	**167,211**	**174,581**	11,688	7,979	**19,668**	**327,849**	7,793	**104,109**	**7,035**	7,758	**126,695**
104		Apr	**7,447**	**161,979**	**169,426**	11,311	7,722	**19,033**	**315,922**	6,599	**95,062**	**5,291**	7,809	**114,761**
105		May	**7,652**	**176,201**	**183,853**	11,688	7,979	**19,668**	**334,319**	5,331	**85,390**	**3,168**	8,012	**101,902**
106		Jun	**7,805**	**201,290**	**209,095**	11,311	7,722	**19,033**	**350,792**	4,468	**78,987**	**2,595**	7,751	**93,801**
107		Jul	**10,169**	**287,478**	**297,647**	11,688	7,979	**19,668**	**446,181**	4,383	**118,137**	**2,414**	8,186	**133,120**
108		Aug	**10,200**	**301,918**	**312,118**	11,688	7,979	**19,668**	**466,239**	4,330	**118,490**	**2,413**	8,133	**133,366**
109		Sep	**9,138**	**260,794**	**269,931**	11,311	7,722	**19,033**	**420,847**	4,458	**116,899**	**2,333**	7,941	**131,631**
110		Oct	**8,414**	**219,656**	**228,070**	11,688	7,979	**19,668**	**378,649**	4,674	**96,110**	**3,254**	8,427	**112,465**
111		Nov	**7,891**	**208,898**	**216,788**	11,311	7,722	**19,033**	**359,010**	6,623	**112,674**	**6,415**	6,287	**131,999**
112		Dec	**7,781**	**224,168**	**231,949**	11,688	7,979	**19,668**	**377,000**	8,779	**133,718**	**10,464**	8,052	**161,014**

	A	B	U	V	W	Y	Z	AA	AC	AE	AF	AG	AH	AI
1	**2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**													
59	***MONTHLY FORECAST DATA***		ratiion				Noncore - EOR		**Total**		Wholesale Noncore			**Total**
60			**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**	Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**
61	**Average Year Throughput (Mth)**													
113														
114	2018	Jan	**8,095**	**212,101**	**220,197**	11,688	7,979	**19,668**	**371,642**	7,972	**127,402**	**10,622**	8,135	**154,130**
115		Feb	**6,850**	**170,184**	**177,034**	10,557	7,207	**17,764**	**314,640**	7,913	**105,564**	**8,979**	7,408	**129,864**
116		Mar	**7,326**	**165,193**	**172,519**	11,688	7,979	**19,668**	**324,219**	7,916	**97,748**	**7,097**	7,920	**120,681**
117		Apr	**7,392**	**155,864**	**163,256**	11,311	7,722	**19,033**	**308,282**	6,670	**87,641**	**5,337**	7,947	**107,594**
118		May	**7,542**	**173,710**	**181,252**	11,688	7,979	**19,668**	**330,256**	5,399	**80,999**	**3,194**	8,069	**97,660**
119		Jun	**7,641**	**197,206**	**204,847**	11,311	7,722	**19,033**	**345,164**	4,517	**81,177**	**2,615**	7,869	**96,177**
120		Jul	**9,536**	**288,073**	**297,608**	11,688	7,979	**19,668**	**444,682**	4,404	**104,480**	**2,433**	8,335	**119,652**
121		Aug	**9,749**	**297,072**	**306,822**	11,688	7,979	**19,668**	**459,399**	4,386	**108,182**	**2,432**	8,260	**123,259**
122		Sep	**9,334**	**264,369**	**273,703**	11,311	7,722	**19,033**	**423,138**	4,524	**103,079**	**2,351**	8,036	**117,990**
123		Oct	**8,172**	**218,100**	**226,272**	11,688	7,979	**19,668**	**375,406**	4,698	**99,585**	**3,280**	8,583	**116,145**
124		Nov	**7,820**	**207,056**	**214,876**	11,311	7,722	**19,033**	**355,777**	6,692	**111,955**	**6,471**	6,409	**131,527**
125		Dec	**7,726**	**226,243**	**233,969**	11,688	7,979	**19,668**	**377,713**	8,800	**132,775**	**10,557**	8,164	**160,295**
126														
127	2019	Jan	**7,935**	**219,037**	**226,972**	11,688	7,979	**19,668**	**376,910**	8,001	**126,970**	**10,716**	8,275	**153,962**
128		Feb	**6,742**	**169,114**	**175,856**	10,557	7,207	**17,764**	**312,023**	7,897	**105,219**	**9,058**	7,518	**129,692**
129		Mar	**7,261**	**164,524**	**171,786**	11,688	7,979	**19,668**	**321,839**	7,888	**98,490**	**7,158**	8,034	**121,569**
130		Apr	**7,324**	**155,086**	**162,410**	11,311	7,722	**19,033**	**305,806**	6,639	**86,561**	**5,382**	8,032	**106,614**
131		May	**7,501**	**170,842**	**178,343**	11,688	7,979	**19,668**	**325,608**	5,358	**79,742**	**3,220**	8,267	**96,587**
132		Jun	**7,531**	**193,644**	**201,176**	11,311	7,722	**19,033**	**339,789**	4,509	**78,454**	**2,636**	7,952	**93,551**
133		Jul	**9,252**	**277,904**	**287,156**	11,688	7,979	**19,668**	**432,423**	4,375	**102,265**	**2,451**	8,404	**117,495**
134		Aug	**9,437**	**295,881**	**305,318**	11,688	7,979	**19,668**	**456,007**	4,329	**105,069**	**2,451**	8,382	**120,230**
135		Sep	**9,111**	**261,017**	**270,128**	11,311	7,722	**19,033**	**417,704**	4,464	**100,896**	**2,369**	8,188	**115,917**
136		Oct	**8,248**	**228,225**	**236,473**	11,688	7,979	**19,668**	**383,731**	4,679	**104,710**	**3,307**	8,665	**121,361**
137		Nov	**7,781**	**220,484**	**228,265**	11,311	7,722	**19,033**	**367,358**	6,647	**109,404**	**6,527**	6,524	**129,102**
138		Dec	**7,639**	**228,475**	**236,114**	11,688	7,979	**19,668**	**378,076**	8,794	**131,065**	**10,649**	8,325	**158,834**
139														
140	2020	Jan	**7,522**	**212,649**	**220,171**	11,688	7,979	**19,668**	**367,758**	8,005	**124,034**	**10,810**	8,362	**151,212**
141		Feb	**6,576**	**168,241**	**174,817**	10,557	7,207	**17,764**	**310,756**	8,053	**104,528**	**9,251**	7,806	**129,638**
142		Mar	**7,002**	**163,660**	**170,661**	11,688	7,979	**19,668**	**317,985**	7,924	**97,750**	**7,220**	8,200	**121,094**
143		Apr	**7,135**	**155,303**	**162,439**	11,311	7,722	**19,033**	**303,269**	6,690	**85,697**	**5,428**	8,072	**105,887**
144		May	**7,323**	**171,200**	**178,523**	11,688	7,979	**19,668**	**323,134**	5,392	**78,072**	**3,245**	8,416	**95,126**
145		Jun	**7,331**	**194,453**	**201,784**	11,311	7,722	**19,033**	**337,892**	4,519	**77,284**	**2,656**	8,093	**92,552**
146		Jul	**8,916**	**279,804**	**288,721**	11,688	7,979	**19,668**	**431,441**	4,422	**100,872**	**2,471**	8,554	**116,318**
147		Aug	**9,230**	**293,792**	**303,023**	11,688	7,979	**19,668**	**451,143**	4,376	**103,653**	**2,470**	8,469	**118,968**
148		Sep	**8,867**	**261,936**	**270,802**	11,311	7,722	**19,033**	**415,894**	4,514	**99,332**	**2,388**	8,313	**114,547**
149		Oct	**7,925**	**232,818**	**240,742**	11,688	7,979	**19,668**	**385,536**	4,713	**101,459**	**3,334**	8,841	**118,347**
150		Nov	**7,416**	**212,131**	**219,547**	11,311	7,722	**19,033**	**356,311**	6,704	**109,022**	**6,583**	6,565	**128,874**
151		Dec	**7,725**	**228,839**	**236,564**	11,688	7,979	**19,668**	**376,261**	8,844	**131,221**	**10,742**	8,483	**159,290**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

MONTHLY FORECAST DATA

Row	Year	Month	International NC Ecogas	Total Noncore	Total System End-Use Dmd	System Total (Mdth/d)	Co-Use-Fuel	"Un-Acnt'd-For" (UAF)	Total System Throughput
61	**Average Year Throughput (Mth)**								
62	2014	Jan	6,610	**549,547**	**1,016,520**	**3,279**	**4,931**	**8,602**	**1,030,052**
63		Feb	6,251	**506,270**	**923,514**	**3,298**	**4,479**	**7,815**	**935,808**
64		Mar	6,794	**479,912**	**853,043**	**2,752**	**4,138**	**7,219**	**864,399**
65		Apr	6,467	**515,569**	**831,543**	**2,772**	**4,033**	**7,037**	**842,612**
66		May	6,322	**508,362**	**758,473**	**2,447**	**3,679**	**6,418**	**768,571**
67		Jun	6,155	**473,612**	**686,181**	**2,287**	**3,328**	**5,807**	**695,316**
68		Jul	6,477	**602,832**	**804,192**	**2,594**	**3,901**	**6,805**	**814,898**
69		Aug	6,761	**607,254**	**807,185**	**2,604**	**3,915**	**6,831**	**817,931**
70		Sep	6,554	**634,432**	**836,638**	**2,789**	**4,058**	**7,080**	**847,776**
71		Oct	7,270	**638,168**	**871,904**	**2,813**	**4,229**	**7,378**	**883,511**
72		Nov	7,044	**500,115**	**835,340**	**2,784**	**4,052**	**7,069**	**846,461**
73		Dec	6,690	**543,256**	**1,023,386**	**3,301**	**4,964**	**8,660**	**1,037,010**
74									
75	2015	Jan	7,043	**562,943**	**1,029,102**	**3,320**	**4,992**	**8,708**	**1,042,802**
76		Feb	6,296	**465,689**	**881,919**	**3,150**	**4,278**	**7,463**	**893,659**
77		Mar	7,206	**481,842**	**854,248**	**2,756**	**4,143**	**7,229**	**865,620**
78		Apr	6,873	**453,312**	**768,723**	**2,562**	**3,729**	**6,505**	**778,956**
79		May	6,713	**476,264**	**725,497**	**2,340**	**3,519**	**6,139**	**735,156**
80		Jun	6,550	**480,759**	**692,253**	**2,308**	**3,358**	**5,858**	**701,468**
81		Jul	7,257	**634,019**	**834,328**	**2,691**	**4,047**	**7,060**	**845,435**
82		Aug	7,171	**646,515**	**845,688**	**2,728**	**4,102**	**7,156**	**856,946**
83		Sep	7,208	**597,040**	**798,659**	**2,662**	**3,874**	**6,758**	**809,291**
84		Oct	7,344	**561,031**	**794,506**	**2,563**	**3,854**	**6,723**	**805,083**
85		Nov	7,484	**518,796**	**853,285**	**2,844**	**4,139**	**7,221**	**864,644**
86		Dec	7,568	**592,355**	**1,072,009**	**3,458**	**5,200**	**9,071**	**1,086,280**
87									
88	2016	Jan	7,875	**546,277**	**1,009,179**	**3,255**	**4,895**	**8,540**	**1,022,614**
89		Feb	7,124	**491,562**	**908,646**	**3,245**	**4,407**	**7,689**	**920,742**
90		Mar	8,039	**459,932**	**829,934**	**2,677**	**4,026**	**7,023**	**840,983**
91		Apr	7,705	**434,159**	**747,656**	**2,492**	**3,626**	**6,327**	**757,609**
92		May	7,544	**446,191**	**694,184**	**2,239**	**3,367**	**5,874**	**703,425**
93		Jun	7,380	**451,788**	**662,350**	**2,208**	**3,213**	**5,605**	**671,168**
94		Jul	7,431	**595,109**	**794,576**	**2,563**	**3,854**	**6,724**	**805,154**
95		Aug	7,345	**618,224**	**816,568**	**2,634**	**3,961**	**6,910**	**827,438**
96		Sep	7,382	**570,302**	**771,114**	**2,570**	**3,740**	**6,525**	**781,379**
97		Oct	7,519	**514,992**	**747,362**	**2,411**	**3,625**	**6,324**	**757,311**
98		Nov	7,521	**494,986**	**827,427**	**2,758**	**4,013**	**7,002**	**838,442**
99		Dec	7,606	**540,966**	**1,017,265**	**3,282**	**4,934**	**8,608**	**1,030,808**
100									
101	2017	Jan	7,915	**521,394**	**983,131**	**3,171**	**4,769**	**8,319**	**996,219**
102		Feb	7,160	**449,489**	**861,834**	**3,078**	**4,180**	**7,293**	**873,307**
103		Mar	8,079	**462,623**	**831,838**	**2,683**	**4,035**	**7,039**	**842,912**
104		Apr	7,743	**438,427**	**751,330**	**2,504**	**3,644**	**6,358**	**761,332**
105		May	7,581	**443,802**	**691,446**	**2,230**	**3,354**	**5,851**	**700,651**
106		Jun	7,417	**452,010**	**662,327**	**2,208**	**3,213**	**5,605**	**671,145**
107		Jul	7,468	**586,769**	**786,061**	**2,536**	**3,813**	**6,652**	**796,526**
108		Aug	7,381	**606,986**	**805,171**	**2,597**	**3,905**	**6,813**	**815,890**
109		Sep	7,419	**559,897**	**760,549**	**2,535**	**3,689**	**6,436**	**770,674**
110		Oct	7,557	**498,671**	**730,795**	**2,357**	**3,545**	**6,184**	**740,524**
111		Nov	7,559	**498,568**	**830,307**	**2,768**	**4,027**	**7,026**	**841,361**
112		Dec	7,644	**545,658**	**1,020,812**	**3,293**	**4,951**	**8,638**	**1,034,401**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

MONTHLY FORECAST DATA

Row	Year	Month	International NC Ecogas	Total Noncore	Total System End-Use Dmd	System Total (Mdth/d)	Co-Use-Fuel	"Un-Acnt'd-For" (UAF)	Total System Throughput
61	**Average Year Throughput (Mth)**								
113									
114	2018	Jan	7,954	**533,726**	**993,518**	**3,205**	**4,819**	**8,407**	**1,006,744**
115		Feb	7,195	**451,699**	**862,325**	**3,080**	**4,183**	**7,297**	**873,805**
116		Mar	8,119	**453,020**	**820,845**	**2,648**	**3,981**	**6,946**	**831,773**
117		Apr	7,782	**423,659**	**735,470**	**2,452**	**3,567**	**6,224**	**745,261**
118		May	7,619	**435,535**	**682,467**	**2,202**	**3,310**	**5,775**	**691,552**
119		Jun	7,454	**448,796**	**658,573**	**2,195**	**3,194**	**5,573**	**667,340**
120		Jul	7,505	**571,840**	**770,678**	**2,486**	**3,738**	**6,522**	**780,938**
121		Aug	7,418	**590,076**	**787,823**	**2,541**	**3,821**	**6,667**	**798,311**
122		Sep	7,456	**548,584**	**748,800**	**2,496**	**3,632**	**6,336**	**758,768**
123		Oct	7,595	**499,146**	**730,684**	**2,357**	**3,544**	**6,183**	**740,411**
124		Nov	7,597	**494,900**	**825,410**	**2,751**	**4,004**	**6,985**	**836,399**
125		Dec	7,682	**545,690**	**1,018,896**	**3,287**	**4,942**	**8,622**	**1,032,461**
126									
127	2019	Jan	7,994	**538,866**	**996,017**	**3,213**	**4,831**	**8,428**	**1,009,277**
128		Feb	7,231	**448,946**	**857,220**	**3,062**	**4,158**	**7,254**	**868,632**
129		Mar	8,160	**451,569**	**817,438**	**2,637**	**3,965**	**6,917**	**828,320**
130		Apr	7,821	**420,240**	**730,471**	**2,435**	**3,543**	**6,181**	**740,196**
131		May	7,657	**429,853**	**675,668**	**2,180**	**3,277**	**5,718**	**684,662**
132		Jun	7,491	**440,831**	**649,712**	**2,166**	**3,151**	**5,498**	**658,361**
133		Jul	7,543	**557,461**	**755,512**	**2,437**	**3,665**	**6,393**	**765,570**
134		Aug	7,455	**583,692**	**780,671**	**2,518**	**3,787**	**6,606**	**791,064**
135		Sep	7,494	**541,115**	**740,555**	**2,469**	**3,592**	**6,267**	**750,413**
136		Oct	7,633	**512,724**	**743,304**	**2,398**	**3,605**	**6,290**	**753,199**
137		Nov	7,635	**504,095**	**832,858**	**2,776**	**4,040**	**7,048**	**843,945**
138		Dec	7,721	**544,630**	**1,015,203**	**3,275**	**4,924**	**8,591**	**1,028,718**
139									
140	2020	Jan	8,034	**527,004**	**979,214**	**3,159**	**4,750**	**8,286**	**992,249**
141		Feb	7,268	**447,661**	**855,133**	**3,054**	**4,148**	**7,236**	**866,517**
142		Mar	8,201	**447,281**	**809,357**	**2,611**	**3,926**	**6,849**	**820,132**
143		Apr	7,860	**417,016**	**724,105**	**2,414**	**3,512**	**6,127**	**733,745**
144		May	7,696	**425,955**	**669,392**	**2,159**	**3,247**	**5,664**	**678,304**
145		Jun	7,529	**437,972**	**644,866**	**2,150**	**3,128**	**5,457**	**653,451**
146		Jul	7,581	**555,340**	**751,573**	**2,424**	**3,645**	**6,360**	**761,578**
147		Aug	7,493	**577,604**	**772,783**	**2,493**	**3,748**	**6,539**	**783,071**
148		Sep	7,531	**537,972**	**735,591**	**2,452**	**3,568**	**6,225**	**745,384**
149		Oct	7,671	**511,554**	**739,996**	**2,387**	**3,589**	**6,262**	**749,847**
150		Nov	7,673	**492,858**	**818,197**	**2,727**	**3,969**	**6,924**	**829,090**
151		Dec	7,759	**543,311**	**1,008,903**	**3,255**	**4,894**	**8,537**	**1,022,334**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

	A	B	C	F	G	I	J	K	L	N	O	P
154					Nonresidential Core				**Total**	Noncore - G-30		
155				Residential	G-10	G-AC	G-GE	G-NGV	**Core**	G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**
156	**Average Year Sales (Mth)**											
157	2014	Jan	31	335,762	97,892	33	1,083	7,926	**442,695**	0	0	**0**
158		Feb	28	294,634	91,241	43	1,576	7,323	**394,816**	0	0	**0**
159		Mar	31	260,980	81,965	38	1,338	8,268	**352,589**	0	0	**0**
160		Apr	30	215,168	73,242	57	1,085	8,278	**297,829**	0	0	**0**
161		May	31	152,525	69,909	59	2,472	8,643	**233,609**	0	0	**0**
162		Jun	30	121,295	64,782	91	3,113	8,307	**197,587**	0	0	**0**
163		Jul	31	116,089	59,495	94	3,109	8,586	**187,374**	0	0	**0**
164		Aug	31	115,886	58,505	114	2,938	8,588	**186,031**	0	0	**0**
165		Sep	30	114,146	62,095	117	2,475	8,868	**187,701**	0	0	**0**
166		Oct	31	144,442	62,933	121	2,045	8,646	**218,187**	0	0	**0**
167		Nov	30	222,642	83,159	93	1,527	7,746	**315,167**	0	0	**0**
168		Dec	31	350,628	95,932	54	848	7,947	**455,410**	0	0	**0**
169												
170	2015	Jan	31	333,691	98,438	32	1,174	8,384	**441,719**	0	0	**0**
171		Feb	28	292,817	91,737	32	1,341	7,746	**393,673**	0	0	**0**
172		Mar	31	259,371	82,378	38	1,186	8,745	**351,718**	0	0	**0**
173		Apr	30	213,841	73,586	49	901	8,756	**297,133**	0	0	**0**
174		May	31	151,585	70,232	63	1,631	9,142	**232,653**	0	0	**0**
175		Jun	30	120,547	65,062	77	1,997	8,786	**196,469**	0	0	**0**
176		Jul	31	115,373	59,733	89	2,012	9,082	**186,288**	0	0	**0**
177		Aug	31	115,172	58,731	106	2,118	9,083	**185,209**	0	0	**0**
178		Sep	30	113,442	62,347	106	1,754	9,380	**187,030**	0	0	**0**
179		Oct	31	143,551	63,199	83	1,801	9,145	**217,779**	0	0	**0**
180		Nov	30	221,269	83,609	59	1,160	8,193	**314,289**	0	0	**0**
181		Dec	31	348,466	96,523	37	1,274	8,406	**454,707**	0	0	**0**
182												
183	2016	Jan	31	330,421	97,976	32	1,185	8,868	**438,481**	0	0	**0**
184		Feb	29	293,578	91,301	32	1,355	8,192	**394,459**	0	0	**0**
185		Mar	31	256,829	81,979	38	1,198	9,250	**349,293**	0	0	**0**
186		Apr	30	211,745	73,221	49	910	9,261	**295,187**	0	0	**0**
187		May	31	150,099	69,881	63	1,647	9,670	**231,360**	0	0	**0**
188		Jun	30	119,366	64,732	77	2,017	9,293	**195,484**	0	0	**0**
189		Jul	31	114,243	59,424	89	2,032	9,606	**185,393**	0	0	**0**
190		Aug	31	114,043	58,425	106	2,139	9,607	**184,320**	0	0	**0**
191		Sep	30	112,331	62,027	106	1,772	9,921	**186,157**	0	0	**0**
192		Oct	31	142,144	62,876	83	1,819	9,672	**216,595**	0	0	**0**
193		Nov	30	219,100	83,209	59	1,171	8,665	**312,205**	0	0	**0**
194		Dec	31	345,051	96,077	37	1,287	8,891	**451,344**	0	0	**0**
195												
196	2017	Jan	31	329,459	97,254	32	1,197	9,379	**437,321**	0	0	**0**
197		Feb	28	289,103	90,624	32	1,368	8,665	**389,792**	0	0	**0**
198		Mar	31	256,081	81,360	38	1,210	9,783	**348,473**	0	0	**0**
199		Apr	30	211,129	72,660	49	919	9,795	**294,553**	0	0	**0**
200		May	31	149,662	69,344	63	1,664	10,228	**230,960**	0	0	**0**
201		Jun	30	119,018	64,228	77	2,037	9,829	**195,189**	0	0	**0**
202		Jul	31	113,910	58,955	89	2,052	10,160	**185,166**	0	0	**0**
203		Aug	31	113,711	57,963	106	2,160	10,162	**184,102**	0	0	**0**
204		Sep	30	112,003	61,541	106	1,790	10,493	**185,934**	0	0	**0**
205		Oct	31	141,730	62,387	83	1,838	10,230	**216,268**	0	0	**0**
206		Nov	30	218,462	82,591	59	1,183	9,165	**311,460**	0	0	**0**
207		Dec	31	344,046	95,383	37	1,300	9,404	**450,170**	0	0	**0**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

	A	B	C	F	G	I	J	K	L	N	O	P
154					Nonresidential Core				**Total**	Noncore - G-30		
155				Residential	G-10	G-AC	G-GE	G-NGV	**Core**	G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**
156	**Average Year Sales (Mth)**											
208												
209	2018	Jan	31	327,820	96,424	32	1,209	9,920	**435,405**	0	0	**0**
210		Feb	28	287,665	89,845	32	1,382	9,165	**388,089**	0	0	**0**
211		Mar	31	254,807	80,651	38	1,222	10,348	**347,066**	0	0	**0**
212		Apr	30	210,078	72,017	49	928	10,360	**293,434**	0	0	**0**
213		May	31	148,918	68,727	63	1,681	10,818	**230,206**	0	0	**0**
214		Jun	30	118,426	63,650	77	2,057	10,396	**194,607**	0	0	**0**
215		Jul	31	113,343	58,417	89	2,073	10,746	**184,668**	0	0	**0**
216		Aug	31	113,145	57,432	106	2,182	10,748	**183,613**	0	0	**0**
217		Sep	30	111,446	60,983	106	1,808	11,099	**185,442**	0	0	**0**
218		Oct	31	141,025	61,823	83	1,856	10,821	**215,608**	0	0	**0**
219		Nov	30	217,376	81,880	59	1,195	9,694	**310,204**	0	0	**0**
220		Dec	31	342,335	94,585	37	1,313	9,947	**448,216**	0	0	**0**
221												
222	2019	Jan	31	325,812	95,284	32	1,221	10,493	**432,841**	0	0	**0**
223		Feb	28	285,902	88,774	32	1,396	9,694	**385,798**	0	0	**0**
224		Mar	31	253,246	79,669	38	1,234	10,945	**345,133**	0	0	**0**
225		Apr	30	208,791	71,125	49	938	10,958	**291,862**	0	0	**0**
226		May	31	148,005	67,872	63	1,697	11,442	**229,080**	0	0	**0**
227		Jun	30	117,701	62,846	77	2,078	10,996	**193,698**	0	0	**0**
228		Jul	31	112,649	57,667	89	2,093	11,366	**183,864**	0	0	**0**
229		Aug	31	112,452	56,690	106	2,204	11,368	**182,820**	0	0	**0**
230		Sep	30	110,763	60,204	106	1,826	11,739	**184,638**	0	0	**0**
231		Oct	31	140,161	61,039	83	1,874	11,445	**214,603**	0	0	**0**
232		Nov	30	216,044	80,903	59	1,207	10,254	**308,466**	0	0	**0**
233		Dec	31	340,238	93,499	37	1,326	10,520	**445,621**	0	0	**0**
234												
235	2020	Jan	31	322,292	93,476	18	1,221	11,098	**428,105**	0	0	**0**
236		Feb	29	286,356	87,079	18	1,396	10,253	**385,101**	0	0	**0**
237		Mar	31	250,511	78,125	21	1,234	11,577	**341,467**	0	0	**0**
238		Apr	30	206,536	69,727	27	938	11,591	**288,819**	0	0	**0**
239		May	31	146,407	66,534	35	1,697	12,102	**226,775**	0	0	**0**
240		Jun	30	116,429	61,593	43	2,078	11,630	**191,774**	0	0	**0**
241		Jul	31	111,432	56,502	50	2,093	12,022	**182,099**	0	0	**0**
242		Aug	31	111,237	55,540	59	2,204	12,024	**181,064**	0	0	**0**
243		Sep	30	109,567	58,993	59	1,826	12,417	**182,861**	0	0	**0**
244		Oct	31	138,647	59,818	46	1,874	12,105	**212,491**	0	0	**0**
245		Nov	30	213,710	79,358	33	1,207	10,845	**305,153**	0	0	**0**
246		Dec	31	336,563	91,765	21	1,326	11,127	**440,802**	0	0	**0**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Row	A	B	C	Q	R	S	T	U	V	W
154				Noncore - Electric Generatiion						
155				EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**
156	**Average Year Sales (Mth)**									
157	2014	Jan	31	0	0	0	0	**0**	**0**	**0**
158		Feb	28	0	0	0	0	**0**	**0**	**0**
159		Mar	31	0	0	0	0	**0**	**0**	**0**
160		Apr	30	0	0	0	0	**0**	**0**	**0**
161		May	31	0	0	0	0	**0**	**0**	**0**
162		Jun	30	0	0	0	0	**0**	**0**	**0**
163		Jul	31	0	0	0	0	**0**	**0**	**0**
164		Aug	31	0	0	0	0	**0**	**0**	**0**
165		Sep	30	0	0	0	0	**0**	**0**	**0**
166		Oct	31	0	0	0	0	**0**	**0**	**0**
167		Nov	30	0	0	0	0	**0**	**0**	**0**
168		Dec	31	0	0	0	0	**0**	**0**	**0**
169										
170	2015	Jan	31	0	0	0	0	**0**	**0**	**0**
171		Feb	28	0	0	0	0	**0**	**0**	**0**
172		Mar	31	0	0	0	0	**0**	**0**	**0**
173		Apr	30	0	0	0	0	**0**	**0**	**0**
174		May	31	0	0	0	0	**0**	**0**	**0**
175		Jun	30	0	0	0	0	**0**	**0**	**0**
176		Jul	31	0	0	0	0	**0**	**0**	**0**
177		Aug	31	0	0	0	0	**0**	**0**	**0**
178		Sep	30	0	0	0	0	**0**	**0**	**0**
179		Oct	31	0	0	0	0	**0**	**0**	**0**
180		Nov	30	0	0	0	0	**0**	**0**	**0**
181		Dec	31	0	0	0	0	**0**	**0**	**0**
182										
183	2016	Jan	31	0	0	0	0	**0**	**0**	**0**
184		Feb	29	0	0	0	0	**0**	**0**	**0**
185		Mar	31	0	0	0	0	**0**	**0**	**0**
186		Apr	30	0	0	0	0	**0**	**0**	**0**
187		May	31	0	0	0	0	**0**	**0**	**0**
188		Jun	30	0	0	0	0	**0**	**0**	**0**
189		Jul	31	0	0	0	0	**0**	**0**	**0**
190		Aug	31	0	0	0	0	**0**	**0**	**0**
191		Sep	30	0	0	0	0	**0**	**0**	**0**
192		Oct	31	0	0	0	0	**0**	**0**	**0**
193		Nov	30	0	0	0	0	**0**	**0**	**0**
194		Dec	31	0	0	0	0	**0**	**0**	**0**
195										
196	2017	Jan	31	0	0	0	0	**0**	**0**	**0**
197		Feb	28	0	0	0	0	**0**	**0**	**0**
198		Mar	31	0	0	0	0	**0**	**0**	**0**
199		Apr	30	0	0	0	0	**0**	**0**	**0**
200		May	31	0	0	0	0	**0**	**0**	**0**
201		Jun	30	0	0	0	0	**0**	**0**	**0**
202		Jul	31	0	0	0	0	**0**	**0**	**0**
203		Aug	31	0	0	0	0	**0**	**0**	**0**
204		Sep	30	0	0	0	0	**0**	**0**	**0**
205		Oct	31	0	0	0	0	**0**	**0**	**0**
206		Nov	30	0	0	0	0	**0**	**0**	**0**
207		Dec	31	0	0	0	0	**0**	**0**	**0**

	A	B	C	D	E	Q	R	S	T	U	V	W	X
1	**2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**												
154						Noncore - Electric Generatiion							
155						EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	
156	**Average Year Sales (Mth)**												
208													
209	2018	Jan	31			0	0	0	0	**0**	**0**	**0**	
210		Feb	28			0	0	0	0	**0**	**0**	**0**	
211		Mar	31			0	0	0	0	**0**	**0**	**0**	
212		Apr	30			0	0	0	0	**0**	**0**	**0**	
213		May	31			0	0	0	0	**0**	**0**	**0**	
214		Jun	30			0	0	0	0	**0**	**0**	**0**	
215		Jul	31			0	0	0	0	**0**	**0**	**0**	
216		Aug	31			0	0	0	0	**0**	**0**	**0**	
217		Sep	30			0	0	0	0	**0**	**0**	**0**	
218		Oct	31			0	0	0	0	**0**	**0**	**0**	
219		Nov	30			0	0	0	0	**0**	**0**	**0**	
220		Dec	31			0	0	0	0	**0**	**0**	**0**	
221													
222	2019	Jan	31			0	0	0	0	**0**	**0**	**0**	
223		Feb	28			0	0	0	0	**0**	**0**	**0**	
224		Mar	31			0	0	0	0	**0**	**0**	**0**	
225		Apr	30			0	0	0	0	**0**	**0**	**0**	
226		May	31			0	0	0	0	**0**	**0**	**0**	
227		Jun	30			0	0	0	0	**0**	**0**	**0**	
228		Jul	31			0	0	0	0	**0**	**0**	**0**	
229		Aug	31			0	0	0	0	**0**	**0**	**0**	
230		Sep	30			0	0	0	0	**0**	**0**	**0**	
231		Oct	31			0	0	0	0	**0**	**0**	**0**	
232		Nov	30			0	0	0	0	**0**	**0**	**0**	
233		Dec	31			0	0	0	0	**0**	**0**	**0**	
234													
235	2020	Jan	31			0	0	0	0	**0**	**0**	**0**	
236		Feb	29			0	0	0	0	**0**	**0**	**0**	
237		Mar	31			0	0	0	0	**0**	**0**	**0**	
238		Apr	30			0	0	0	0	**0**	**0**	**0**	
239		May	31			0	0	0	0	**0**	**0**	**0**	
240		Jun	30			0	0	0	0	**0**	**0**	**0**	
241		Jul	31			0	0	0	0	**0**	**0**	**0**	
242		Aug	31			0	0	0	0	**0**	**0**	**0**	
243		Sep	30			0	0	0	0	**0**	**0**	**0**	
244		Oct	31			0	0	0	0	**0**	**0**	**0**	
245		Nov	30			0	0	0	0	**0**	**0**	**0**	
246		Dec	31			0	0	0	0	**0**	**0**	**0**	

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Row	A	B	C	Noncore - EOR: EOR (Dist.)	Noncore - EOR: EOR (Trans.)	Noncore - EOR: **EOR (Total)**	**Total Retail Noncore**	Wholesale Noncore: Long Beach	Wholesale Noncore: SDG&E	Wholesale Noncore: Southwest Gas	Wholesale Noncore: Vernon	**Total Wholesale**
156	**Average Year Sales (Mth)**											
157	2014	Jan	31	0	0	**0**	**0**	0	**0**	0	0	**0**
158		Feb	28	0	0	**0**	**0**	0	**0**	0	0	**0**
159		Mar	31	0	0	**0**	**0**	0	**0**	0	0	**0**
160		Apr	30	0	0	**0**	**0**	0	**0**	0	0	**0**
161		May	31	0	0	**0**	**0**	0	**0**	0	0	**0**
162		Jun	30	0	0	**0**	**0**	0	**0**	0	0	**0**
163		Jul	31	0	0	**0**	**0**	0	**0**	0	0	**0**
164		Aug	31	0	0	**0**	**0**	0	**0**	0	0	**0**
165		Sep	30	0	0	**0**	**0**	0	**0**	0	0	**0**
166		Oct	31	0	0	**0**	**0**	0	**0**	0	0	**0**
167		Nov	30	0	0	**0**	**0**	0	**0**	0	0	**0**
168		Dec	31	0	0	**0**	**0**	0	**0**	0	0	**0**
169												
170	2015	Jan	31	0	0	**0**	**0**	0	**0**	0	0	**0**
171		Feb	28	0	0	**0**	**0**	0	**0**	0	0	**0**
172		Mar	31	0	0	**0**	**0**	0	**0**	0	0	**0**
173		Apr	30	0	0	**0**	**0**	0	**0**	0	0	**0**
174		May	31	0	0	**0**	**0**	0	**0**	0	0	**0**
175		Jun	30	0	0	**0**	**0**	0	**0**	0	0	**0**
176		Jul	31	0	0	**0**	**0**	0	**0**	0	0	**0**
177		Aug	31	0	0	**0**	**0**	0	**0**	0	0	**0**
178		Sep	30	0	0	**0**	**0**	0	**0**	0	0	**0**
179		Oct	31	0	0	**0**	**0**	0	**0**	0	0	**0**
180		Nov	30	0	0	**0**	**0**	0	**0**	0	0	**0**
181		Dec	31	0	0	**0**	**0**	0	**0**	0	0	**0**
182												
183	2016	Jan	31	0	0	**0**	**0**	0	**0**	0	0	**0**
184		Feb	29	0	0	**0**	**0**	0	**0**	0	0	**0**
185		Mar	31	0	0	**0**	**0**	0	**0**	0	0	**0**
186		Apr	30	0	0	**0**	**0**	0	**0**	0	0	**0**
187		May	31	0	0	**0**	**0**	0	**0**	0	0	**0**
188		Jun	30	0	0	**0**	**0**	0	**0**	0	0	**0**
189		Jul	31	0	0	**0**	**0**	0	**0**	0	0	**0**
190		Aug	31	0	0	**0**	**0**	0	**0**	0	0	**0**
191		Sep	30	0	0	**0**	**0**	0	**0**	0	0	**0**
192		Oct	31	0	0	**0**	**0**	0	**0**	0	0	**0**
193		Nov	30	0	0	**0**	**0**	0	**0**	0	0	**0**
194		Dec	31	0	0	**0**	**0**	0	**0**	0	0	**0**
195												
196	2017	Jan	31	0	0	**0**	**0**	0	**0**	0	0	**0**
197		Feb	28	0	0	**0**	**0**	0	**0**	0	0	**0**
198		Mar	31	0	0	**0**	**0**	0	**0**	0	0	**0**
199		Apr	30	0	0	**0**	**0**	0	**0**	0	0	**0**
200		May	31	0	0	**0**	**0**	0	**0**	0	0	**0**
201		Jun	30	0	0	**0**	**0**	0	**0**	0	0	**0**
202		Jul	31	0	0	**0**	**0**	0	**0**	0	0	**0**
203		Aug	31	0	0	**0**	**0**	0	**0**	0	0	**0**
204		Sep	30	0	0	**0**	**0**	0	**0**	0	0	**0**
205		Oct	31	0	0	**0**	**0**	0	**0**	0	0	**0**
206		Nov	30	0	0	**0**	**0**	0	**0**	0	0	**0**
207		Dec	31	0	0	**0**	**0**	0	**0**	0	0	**0**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

	A	B	C	Y	Z	AA	AC	AE	AF	AG	AH	AI
154				Noncore - EOR			**Total**	Wholesale Noncore				**Total**
155				EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**	Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**
156	**Average Year Sales (Mth)**											
208												
209	2018	Jan	31	0	0	**0**	**0**	0	**0**	0	0	**0**
210		Feb	28	0	0	**0**	**0**	0	**0**	0	0	**0**
211		Mar	31	0	0	**0**	**0**	0	**0**	0	0	**0**
212		Apr	30	0	0	**0**	**0**	0	**0**	0	0	**0**
213		May	31	0	0	**0**	**0**	0	**0**	0	0	**0**
214		Jun	30	0	0	**0**	**0**	0	**0**	0	0	**0**
215		Jul	31	0	0	**0**	**0**	0	**0**	0	0	**0**
216		Aug	31	0	0	**0**	**0**	0	**0**	0	0	**0**
217		Sep	30	0	0	**0**	**0**	0	**0**	0	0	**0**
218		Oct	31	0	0	**0**	**0**	0	**0**	0	0	**0**
219		Nov	30	0	0	**0**	**0**	0	**0**	0	0	**0**
220		Dec	31	0	0	**0**	**0**	0	**0**	0	0	**0**
221												
222	2019	Jan	31	0	0	**0**	**0**	0	**0**	0	0	**0**
223		Feb	28	0	0	**0**	**0**	0	**0**	0	0	**0**
224		Mar	31	0	0	**0**	**0**	0	**0**	0	0	**0**
225		Apr	30	0	0	**0**	**0**	0	**0**	0	0	**0**
226		May	31	0	0	**0**	**0**	0	**0**	0	0	**0**
227		Jun	30	0	0	**0**	**0**	0	**0**	0	0	**0**
228		Jul	31	0	0	**0**	**0**	0	**0**	0	0	**0**
229		Aug	31	0	0	**0**	**0**	0	**0**	0	0	**0**
230		Sep	30	0	0	**0**	**0**	0	**0**	0	0	**0**
231		Oct	31	0	0	**0**	**0**	0	**0**	0	0	**0**
232		Nov	30	0	0	**0**	**0**	0	**0**	0	0	**0**
233		Dec	31	0	0	**0**	**0**	0	**0**	0	0	**0**
234												
235	2020	Jan	31	0	0	**0**	**0**	0	**0**	0	0	**0**
236		Feb	29	0	0	**0**	**0**	0	**0**	0	0	**0**
237		Mar	31	0	0	**0**	**0**	0	**0**	0	0	**0**
238		Apr	30	0	0	**0**	**0**	0	**0**	0	0	**0**
239		May	31	0	0	**0**	**0**	0	**0**	0	0	**0**
240		Jun	30	0	0	**0**	**0**	0	**0**	0	0	**0**
241		Jul	31	0	0	**0**	**0**	0	**0**	0	0	**0**
242		Aug	31	0	0	**0**	**0**	0	**0**	0	0	**0**
243		Sep	30	0	0	**0**	**0**	0	**0**	0	0	**0**
244		Oct	31	0	0	**0**	**0**	0	**0**	0	0	**0**
245		Nov	30	0	0	**0**	**0**	0	**0**	0	0	**0**
246		Dec	31	0	0	**0**	**0**	0	**0**	0	0	**0**

	A	B	C	D	E	AK	AL	AM	AN	AO	AP	AQ
1	**2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**											
154						International NC		**Total**		**Total**		**System Total**
155						Ecogas		**Noncore**		**System End-Use Dmd**		**(Mdth/d)**
156	**Average Year Sales (Mth)**											
157	2014	Jan	31			0		**0**		**442,695**		**1,428**
158		Feb	28			0		**0**		**394,816**		**1,410**
159		Mar	31			0		**0**		**352,589**		**1,137**
160		Apr	30			0		**0**		**297,829**		**993**
161		May	31			0		**0**		**233,609**		**754**
162		Jun	30			0		**0**		**197,587**		**659**
163		Jul	31			0		**0**		**187,374**		**604**
164		Aug	31			0		**0**		**186,031**		**600**
165		Sep	30			0		**0**		**187,701**		**626**
166		Oct	31			0		**0**		**218,187**		**704**
167		Nov	30			0		**0**		**315,167**		**1,051**
168		Dec	31			0		**0**		**455,410**		**1,469**
169												
170	2015	Jan	31			0		**0**		**441,719**		**1,425**
171		Feb	28			0		**0**		**393,673**		**1,406**
172		Mar	31			0		**0**		**351,718**		**1,135**
173		Apr	30			0		**0**		**297,133**		**990**
174		May	31			0		**0**		**232,653**		**750**
175		Jun	30			0		**0**		**196,469**		**655**
176		Jul	31			0		**0**		**186,288**		**601**
177		Aug	31			0		**0**		**185,209**		**597**
178		Sep	30			0		**0**		**187,030**		**623**
179		Oct	31			0		**0**		**217,779**		**703**
180		Nov	30			0		**0**		**314,289**		**1,048**
181		Dec	31			0		**0**		**454,707**		**1,467**
182												
183	2016	Jan	31			0		**0**		**438,481**		**1,414**
184		Feb	29			0		**0**		**394,459**		**1,360**
185		Mar	31			0		**0**		**349,293**		**1,127**
186		Apr	30			0		**0**		**295,187**		**984**
187		May	31			0		**0**		**231,360**		**746**
188		Jun	30			0		**0**		**195,484**		**652**
189		Jul	31			0		**0**		**185,393**		**598**
190		Aug	31			0		**0**		**184,320**		**595**
191		Sep	30			0		**0**		**186,157**		**621**
192		Oct	31			0		**0**		**216,595**		**699**
193		Nov	30			0		**0**		**312,205**		**1,041**
194		Dec	31			0		**0**		**451,344**		**1,456**
195												
196	2017	Jan	31			0		**0**		**437,321**		**1,411**
197		Feb	28			0		**0**		**389,792**		**1,392**
198		Mar	31			0		**0**		**348,473**		**1,124**
199		Apr	30			0		**0**		**294,553**		**982**
200		May	31			0		**0**		**230,960**		**745**
201		Jun	30			0		**0**		**195,189**		**651**
202		Jul	31			0		**0**		**185,166**		**597**
203		Aug	31			0		**0**		**184,102**		**594**
204		Sep	30			0		**0**		**185,934**		**620**
205		Oct	31			0		**0**		**216,268**		**698**
206		Nov	30			0		**0**		**311,460**		**1,038**
207		Dec	31			0		**0**		**450,170**		**1,452**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Row	A	B	C	AK	AM	AO	AQ
154				International NC	**Total**	**Total**	**System Total**
155				Ecogas	**Noncore**	**System End-Use Dmd**	**(Mdth/d)**
156	**Average Year Sales (Mth)**						
208							
209	2018	Jan	31	0	**0**	**435,405**	**1,405**
210		Feb	28	0	**0**	**388,089**	**1,386**
211		Mar	31	0	**0**	**347,066**	**1,120**
212		Apr	30	0	**0**	**293,434**	**978**
213		May	31	0	**0**	**230,206**	**743**
214		Jun	30	0	**0**	**194,607**	**649**
215		Jul	31	0	**0**	**184,668**	**596**
216		Aug	31	0	**0**	**183,613**	**592**
217		Sep	30	0	**0**	**185,442**	**618**
218		Oct	31	0	**0**	**215,608**	**696**
219		Nov	30	0	**0**	**310,204**	**1,034**
220		Dec	31	0	**0**	**448,216**	**1,446**
221							
222	2019	Jan	31	0	**0**	**432,841**	**1,396**
223		Feb	28	0	**0**	**385,798**	**1,378**
224		Mar	31	0	**0**	**345,133**	**1,113**
225		Apr	30	0	**0**	**291,862**	**973**
226		May	31	0	**0**	**229,080**	**739**
227		Jun	30	0	**0**	**193,698**	**646**
228		Jul	31	0	**0**	**183,864**	**593**
229		Aug	31	0	**0**	**182,820**	**590**
230		Sep	30	0	**0**	**184,638**	**615**
231		Oct	31	0	**0**	**214,603**	**692**
232		Nov	30	0	**0**	**308,466**	**1,028**
233		Dec	31	0	**0**	**445,621**	**1,437**
234							
235	2020	Jan	31	0	**0**	**428,105**	**1,381**
236		Feb	29	0	**0**	**385,101**	**1,328**
237		Mar	31	0	**0**	**341,467**	**1,102**
238		Apr	30	0	**0**	**288,819**	**963**
239		May	31	0	**0**	**226,775**	**732**
240		Jun	30	0	**0**	**191,774**	**639**
241		Jul	31	0	**0**	**182,099**	**587**
242		Aug	31	0	**0**	**181,064**	**584**
243		Sep	30	0	**0**	**182,861**	**610**
244		Oct	31	0	**0**	**212,491**	**685**
245		Nov	30	0	**0**	**305,153**	**1,017**
246		Dec	31	0	**0**	**440,802**	**1,422**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Row			Residential	G-10	G-AC	G-GE	G-NGV	Total Core	G-30 (Dist.)	G-30 (Trans.)	G-30 (Total)	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)
249				Nonresidential Core				Total	Noncore - G-30				
250			Residential	G-10	G-AC	G-GE	G-NGV	Core	G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)
251	**Cold Year Throughput (Mth)**												
252	2014	Jan	391,766	123,008	33	1,185	9,880	**525,872**	81,126	62,643	**143,769**	6,654	1,400
253		Feb	343,127	113,659	43	1,725	9,271	**467,825**	69,665	47,731	**117,396**	6,289	3,466
254		Mar	298,871	100,614	38	1,465	10,497	**411,485**	75,441	52,087	**127,528**	6,626	1,723
255		Apr	242,779	88,347	57	1,188	10,444	**342,814**	75,026	58,982	**134,009**	6,822	1,178
256		May	164,146	83,650	59	2,707	10,859	**261,421**	74,968	60,417	**135,385**	6,915	1,309
257		Jun	126,169	76,459	91	3,408	10,389	**216,516**	70,082	56,398	**126,480**	6,958	1,444
258		Jul	118,885	69,041	94	3,404	10,604	**202,028**	73,805	55,165	**128,970**	8,030	2,374
259		Aug	118,632	67,623	114	3,217	10,694	**200,280**	78,817	54,153	**132,970**	8,395	2,293
260		Sep	117,288	72,695	117	2,710	11,101	**203,910**	78,068	56,366	**134,433**	7,755	2,181
261		Oct	154,105	73,846	121	2,239	11,202	**241,513**	73,834	56,094	**129,929**	7,423	1,516
262		Nov	252,063	102,294	93	1,672	10,085	**366,208**	67,561	53,062	**120,624**	7,484	1,190
263		Dec	410,234	120,257	54	928	10,362	**541,835**	71,689	62,260	**133,949**	6,634	907
264													
265	2015	Jan	389,729	123,752	32	1,285	10,450	**525,248**	78,937	57,071	**136,008**	7,080	2,947
266		Feb	341,343	114,326	32	1,468	9,806	**466,976**	71,605	52,693	**124,297**	6,155	1,958
267		Mar	297,318	101,158	38	1,299	11,103	**410,915**	78,031	58,779	**136,810**	6,455	2,277
268		Apr	241,517	88,786	49	987	11,047	**342,385**	73,898	56,233	**130,131**	6,540	1,591
269		May	163,293	84,056	63	1,786	11,485	**260,683**	74,239	58,735	**132,975**	6,657	2,041
270		Jun	125,513	76,801	77	2,186	10,989	**215,566**	69,520	55,150	**124,670**	6,978	2,107
271		Jul	118,267	69,319	89	2,202	11,216	**201,093**	74,311	56,698	**131,009**	8,081	4,615
272		Aug	118,016	67,884	106	2,319	11,311	**199,635**	79,767	56,865	**136,632**	8,321	5,067
273		Sep	116,678	72,997	106	1,921	11,741	**203,443**	77,887	56,067	**133,953**	7,757	4,023
274		Oct	153,304	74,166	83	1,972	11,848	**241,374**	74,676	58,373	**133,049**	7,332	4,534
275		Nov	250,753	102,887	59	1,270	10,667	**365,636**	68,918	56,533	**125,451**	6,854	2,768
276		Dec	408,101	121,055	37	1,395	10,960	**541,548**	70,094	58,047	**128,141**	6,868	2,840
277													
278	2016	Jan	386,549	123,182	32	1,298	11,053	**522,113**	79,008	56,804	**135,812**	6,439	2,604
279		Feb	342,274	113,793	32	1,483	10,372	**467,954**	72,253	53,933	**126,186**	5,689	1,317
280		Mar	294,891	100,674	38	1,312	11,744	**408,659**	77,978	58,163	**136,141**	6,218	1,263
281		Apr	239,546	88,351	49	996	11,684	**340,627**	73,839	55,616	**129,454**	6,347	1,259
282		May	161,960	83,641	63	1,804	12,148	**259,616**	74,220	58,200	**132,420**	6,422	1,400
283		Jun	124,488	76,414	77	2,208	11,623	**214,810**	69,502	54,641	**124,142**	6,552	1,439
284		Jul	117,302	68,960	89	2,224	11,863	**200,438**	74,303	56,153	**130,455**	7,392	3,031
285		Aug	117,053	67,530	106	2,342	11,964	**198,994**	79,783	56,319	**136,102**	7,661	3,118
286		Sep	115,726	72,623	106	1,940	12,419	**202,814**	77,908	55,605	**133,513**	7,166	2,768
287		Oct	152,053	73,789	83	1,992	12,532	**240,449**	74,692	57,940	**132,632**	6,732	2,437
288		Nov	248,707	102,403	59	1,282	11,283	**363,734**	68,902	56,114	**125,015**	6,338	1,667
289		Dec	404,771	120,508	37	1,409	11,592	**538,317**	70,066	57,669	**127,736**	6,311	1,770
290													
291	2017	Jan	385,875	122,287	32	1,311	11,691	**521,195**	78,081	56,227	**134,308**	6,268	1,633
292		Feb	337,967	112,959	32	1,498	10,971	**463,427**	70,624	51,400	**122,024**	5,589	1,334
293		Mar	294,377	99,923	38	1,325	12,421	**408,085**	76,918	57,260	**134,178**	6,102	1,268
294		Apr	239,128	87,680	49	1,006	12,358	**340,222**	72,914	54,961	**127,875**	6,184	1,263
295		May	161,678	83,002	63	1,822	12,849	**259,414**	73,320	57,628	**130,949**	6,249	1,403
296		Jun	124,271	75,822	77	2,230	12,293	**214,694**	68,642	54,063	**122,705**	6,438	1,367
297		Jul	117,097	68,417	89	2,247	12,547	**200,398**	73,356	55,518	**128,874**	7,357	2,812
298		Aug	116,849	66,996	106	2,365	12,654	**198,970**	78,765	55,694	**134,460**	7,478	2,722
299		Sep	115,524	72,056	106	1,959	13,135	**202,781**	76,929	54,967	**131,896**	7,070	2,068
300		Oct	151,788	73,217	83	2,012	13,255	**240,355**	73,755	57,275	**131,030**	6,582	1,831
301		Nov	248,273	101,652	59	1,295	11,934	**363,213**	68,092	55,538	**123,630**	6,193	1,698
302		Dec	404,065	119,650	37	1,423	12,261	**537,437**	69,266	57,049	**126,315**	6,172	1,609

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Row				Nonresidential Core				Total	Noncore - G-30				
250			Residential	G-10	G-AC	G-GE	G-NGV	**Core**	G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)
251	**Cold Year Throughput (Mth)**												
304	2018	Jan	384,511	121,256	32	1,324	12,365	**519,488**	77,075	55,575	**132,651**	6,317	1,779
305		Feb	336,773	112,001	32	1,513	11,604	**461,922**	69,735	50,862	**120,596**	5,543	1,307
306		Mar	293,337	99,060	38	1,338	13,138	**406,911**	75,935	56,676	**132,611**	6,065	1,261
307		Apr	238,283	86,910	49	1,016	13,071	**339,330**	71,988	54,417	**126,405**	6,177	1,215
308		May	161,107	82,269	63	1,840	13,591	**258,869**	72,390	57,097	**129,487**	6,239	1,303
309		Jun	123,832	75,143	77	2,252	13,003	**214,308**	67,768	53,559	**121,326**	6,393	1,248
310		Jul	116,683	67,794	89	2,269	13,271	**200,106**	72,410	55,003	**127,413**	7,101	2,435
311		Aug	116,436	66,382	106	2,389	13,384	**198,697**	77,738	55,177	**132,915**	7,516	2,233
312		Sep	115,116	71,404	106	1,979	13,893	**202,498**	75,953	54,463	**130,416**	7,101	2,233
313		Oct	151,251	72,558	83	2,032	14,020	**239,944**	72,829	56,756	**129,584**	6,545	1,627
314		Nov	247,396	100,788	59	1,308	12,622	**362,173**	67,271	55,039	**122,309**	6,186	1,634
315		Dec	402,637	118,664	37	1,437	12,968	**535,744**	68,469	56,540	**125,009**	6,167	1,558
316													
317	2019	Jan	382,764	119,842	32	1,337	13,079	**517,053**	76,113	55,030	**131,143**	6,228	1,707
318		Feb	335,242	110,683	32	1,528	12,273	**459,758**	68,843	50,314	**119,157**	5,480	1,262
319		Mar	292,003	97,868	38	1,351	13,896	**405,157**	74,934	56,031	**130,965**	5,997	1,264
320		Apr	237,200	85,842	49	1,027	13,826	**337,944**	71,021	53,754	**124,775**	6,104	1,220
321		May	160,374	81,253	63	1,858	14,375	**257,924**	71,388	56,360	**127,748**	6,168	1,333
322		Jun	123,269	74,199	77	2,275	13,753	**213,573**	66,808	52,814	**119,622**	6,320	1,211
323		Jul	116,153	66,924	89	2,292	14,037	**199,495**	71,375	54,232	**125,607**	7,142	2,110
324		Aug	115,906	65,525	106	2,413	14,156	**198,106**	76,625	54,403	**131,027**	7,420	2,017
325		Sep	114,593	70,494	106	1,999	14,695	**201,886**	74,876	53,681	**128,557**	7,016	2,095
326		Oct	150,564	71,641	83	2,052	14,829	**239,169**	71,786	55,923	**127,709**	6,493	1,754
327		Nov	246,271	99,602	59	1,321	13,351	**360,604**	66,313	54,188	**120,501**	6,112	1,669
328		Dec	400,807	117,327	37	1,452	13,716	**533,340**	67,534	55,692	**123,226**	6,107	1,532
329													
330	2020	Jan	379,404	117,591	18	1,337	13,833	**512,183**	74,786	54,006	**128,793**	6,003	1,519
331		Feb	335,947	108,590	18	1,528	12,981	**459,065**	68,179	50,750	**118,929**	5,318	1,258
332		Mar	289,441	95,986	21	1,351	14,698	**401,497**	73,503	54,732	**128,235**	5,814	1,187
333		Apr	235,118	84,165	27	1,027	14,623	**334,961**	69,674	52,535	**122,210**	5,923	1,212
334		May	158,967	79,660	35	1,858	15,204	**255,725**	70,012	55,081	**125,093**	6,007	1,316
335		Jun	122,187	72,725	43	2,275	14,547	**211,777**	65,515	51,601	**117,117**	6,134	1,197
336		Jul	115,133	65,574	50	2,292	14,847	**197,895**	70,014	53,046	**123,059**	6,868	2,048
337		Aug	114,889	64,195	59	2,413	14,973	**196,529**	75,191	53,268	**128,459**	7,164	2,067
338		Sep	113,587	69,078	59	1,999	15,543	**200,266**	73,497	52,575	**126,072**	6,988	1,879
339		Oct	149,242	70,212	46	2,052	15,685	**237,238**	70,460	54,785	**125,245**	6,282	1,643
340		Nov	244,110	97,719	33	1,321	14,121	**357,304**	65,104	53,068	**118,172**	5,949	1,467
341		Dec	397,289	115,180	21	1,452	14,508	**528,450**	66,356	54,606	**120,962**	5,943	1,781
342													
343													
344				Nonresidential Core				Total	Noncore - G-30				
345	**Peak Day Throughput (Mth/Day)**		Residential	G-10	G-AC	G-GE	G-NGV	**Core**	G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)
346	2014		24,497	5,903	2	30	334	**30,766**	2,481	2,014	**4,495**	204	39
347	2015		24,414	5,953	1	45	354	**30,767**	2,429	1,879	**4,308**	**234**	**124**
348	2016		24,289	5,929	1	45	374	**30,639**	2,428	1,866	**4,295**	**203**	**72**
349	2017		24,300	5,889	1	46	396	**30,631**	2,402	1,846	**4,249**	**214**	**94**
350	2018		24,278	5,844	1	46	418	**30,588**	2,377	1,830	**4,207**	**214**	**78**
351	2019		24,238	5,783	1	47	442	**30,512**	2,347	1,803	**4,149**	**201**	**72**
352	2020		24,115	5,683	1	47	468	**30,313**	2,309	1,768	**4,076**	**190**	**112**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Row			Noncore - Electric Generatiion					Noncore - EOR			Total
250			EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
251	**Cold Year Throughput (Mth)**										
252	2014	Jan	17,563	192,159	**8,053**	**209,722**	**217,775**	8,154	5,566	**13,720**	**375,264**
253		Feb	15,901	208,728	**9,755**	**224,629**	**234,383**	7,363	5,027	**12,390**	**364,170**
254		Mar	17,300	180,229	**8,350**	**197,529**	**205,879**	8,154	5,566	**13,720**	**347,127**
255		Apr	18,378	205,316	**8,000**	**223,694**	**231,693**	7,886	5,384	**13,270**	**378,972**
256		May	19,041	208,674	**8,224**	**227,715**	**235,939**	8,154	5,566	**13,720**	**385,044**
257		Jun	22,752	188,876	**8,402**	**211,628**	**220,030**	7,886	5,384	**13,270**	**359,781**
258		Jul	26,742	289,355	**10,403**	**316,097**	**326,500**	8,653	5,907	**14,560**	**470,030**
259		Aug	29,362	287,682	**10,688**	**317,044**	**327,732**	8,653	5,907	**14,560**	**475,262**
260		Sep	24,642	313,940	**9,936**	**338,582**	**348,518**	8,374	5,716	**14,090**	**497,042**
261		Oct	21,305	325,680	**8,940**	**346,985**	**355,925**	8,653	5,907	**14,560**	**500,414**
262		Nov	17,652	199,391	**8,673**	**217,043**	**225,716**	8,374	5,716	**14,090**	**360,430**
263		Dec	17,745	203,100	**7,541**	**220,844**	**228,386**	8,653	5,907	**14,560**	**376,894**
264											
265	2015	Jan	18,281	223,035	**10,027**	**241,315**	**251,342**	11,688	7,979	**19,668**	**407,018**
266		Feb	15,903	165,652	**8,113**	**181,555**	**189,668**	10,557	7,207	**17,764**	**331,730**
267		Mar	17,627	163,920	**8,732**	**181,546**	**190,278**	11,688	7,979	**19,668**	**346,756**
268		Apr	17,189	156,716	**8,131**	**173,906**	**182,037**	11,311	7,722	**19,033**	**331,200**
269		May	17,685	185,392	**8,698**	**203,077**	**211,775**	11,688	7,979	**19,668**	**364,417**
270		Jun	17,920	206,583	**9,085**	**224,503**	**233,587**	11,311	7,722	**19,033**	**377,290**
271		Jul	19,813	308,214	**12,696**	**328,028**	**340,724**	11,688	7,979	**19,668**	**491,401**
272		Aug	20,452	314,623	**13,388**	**335,075**	**348,463**	11,688	7,979	**19,668**	**504,762**
273		Sep	19,349	274,929	**11,780**	**294,278**	**306,058**	11,311	7,722	**19,033**	**459,045**
274		Oct	19,005	251,521	**11,866**	**270,526**	**282,392**	11,688	7,979	**19,668**	**435,108**
275		Nov	17,434	212,366	**9,622**	**229,800**	**239,422**	11,311	7,722	**19,033**	**383,906**
276		Dec	17,702	248,363	**9,708**	**266,065**	**275,773**	11,688	7,979	**19,668**	**423,581**
277											
278	2016	Jan	17,847	205,197	**9,043**	**223,045**	**232,088**	11,688	7,979	**19,668**	**387,567**
279		Feb	15,790	175,661	**7,006**	**191,452**	**198,458**	10,557	7,207	**17,764**	**342,409**
280		Mar	17,115	146,189	**7,481**	**163,304**	**170,786**	11,688	7,979	**19,668**	**326,595**
281		Apr	16,773	140,438	**7,606**	**157,212**	**164,818**	11,311	7,722	**19,033**	**313,305**
282		May	17,342	160,276	**7,821**	**177,617**	**185,438**	11,688	7,979	**19,668**	**337,526**
283		Jun	17,462	182,445	**7,992**	**199,907**	**207,899**	11,311	7,722	**19,033**	**351,074**
284		Jul	19,223	274,383	**10,422**	**293,607**	**304,029**	11,688	7,979	**19,668**	**454,152**
285		Aug	19,800	289,659	**10,779**	**309,459**	**320,238**	11,688	7,979	**19,668**	**476,008**
286		Sep	18,765	251,903	**9,934**	**270,668**	**280,602**	11,311	7,722	**19,033**	**433,149**
287		Oct	18,302	213,966	**9,168**	**232,268**	**241,437**	11,688	7,979	**19,668**	**393,737**
288		Nov	16,958	189,599	**8,005**	**206,557**	**214,561**	11,311	7,722	**19,033**	**358,610**
289		Dec	17,176	203,063	**8,081**	**220,239**	**228,320**	11,688	7,979	**19,668**	**375,723**
290											
291	2017	Jan	17,465	190,812	**7,901**	**208,277**	**216,179**	11,688	7,979	**19,668**	**370,154**
292		Feb	15,338	149,136	**6,923**	**164,474**	**171,397**	10,557	7,207	**17,764**	**311,185**
293		Mar	16,816	150,394	**7,370**	**167,211**	**174,581**	11,688	7,979	**19,668**	**328,427**
294		Apr	16,596	145,383	**7,447**	**161,979**	**169,426**	11,311	7,722	**19,033**	**316,334**
295		May	16,945	159,256	**7,652**	**176,201**	**183,853**	11,688	7,979	**19,668**	**334,470**
296		Jun	17,373	183,918	**7,805**	**201,290**	**209,095**	11,311	7,722	**19,033**	**350,834**
297		Jul	18,876	268,601	**10,169**	**287,478**	**297,647**	11,688	7,979	**19,668**	**446,188**
298		Aug	19,468	282,450	**10,200**	**301,918**	**312,118**	11,688	7,979	**19,668**	**466,245**
299		Sep	18,332	242,462	**9,138**	**260,794**	**269,931**	11,311	7,722	**19,033**	**420,860**
300		Oct	17,945	201,711	**8,414**	**219,656**	**228,070**	11,688	7,979	**19,668**	**378,768**
301		Nov	16,664	192,234	**7,891**	**208,898**	**216,788**	11,311	7,722	**19,033**	**359,452**
302		Dec	16,938	207,230	**7,781**	**224,168**	**231,949**	11,688	7,979	**19,668**	**377,932**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

	A	B	S	T	U	V	W	Y	Z	AA	AC
249			Noncore - Electric Generatiion					Noncore - EOR			Total
250			EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
251	**Cold Year Throughput (Mth)**										
303											
304	2018	Jan	17,446	194,655	**8,095**	**212,101**	**220,197**	11,688	7,979	**19,668**	**372,515**
305		Feb	15,247	154,937	**6,850**	**170,184**	**177,034**	10,557	7,207	**17,764**	**315,394**
306		Mar	16,855	148,338	**7,326**	**165,193**	**172,519**	11,688	7,979	**19,668**	**324,798**
307		Apr	16,548	139,315	**7,392**	**155,864**	**163,256**	11,311	7,722	**19,033**	**308,694**
308		May	16,924	156,786	**7,542**	**173,710**	**181,252**	11,688	7,979	**19,668**	**330,406**
309		Jun	17,246	179,960	**7,641**	**197,206**	**204,847**	11,311	7,722	**19,033**	**345,206**
310		Jul	18,808	269,264	**9,536**	**288,073**	**297,608**	11,688	7,979	**19,668**	**444,689**
311		Aug	19,398	277,674	**9,749**	**297,072**	**306,822**	11,688	7,979	**19,668**	**459,405**
312		Sep	18,320	246,049	**9,334**	**264,369**	**273,703**	11,311	7,722	**19,033**	**423,152**
313		Oct	17,888	200,212	**8,172**	**218,100**	**226,272**	11,688	7,979	**19,668**	**375,524**
314		Nov	16,654	190,401	**7,820**	**207,056**	**214,876**	11,311	7,722	**19,033**	**356,218**
315		Dec	16,919	209,324	**7,726**	**226,243**	**233,969**	11,688	7,979	**19,668**	**378,645**
316											
317	2019	Jan	17,269	201,768	**7,935**	**219,037**	**226,972**	11,688	7,979	**19,668**	**377,783**
318		Feb	15,263	153,852	**6,742**	**169,114**	**175,856**	10,557	7,207	**17,764**	**312,778**
319		Mar	16,641	147,884	**7,261**	**164,524**	**171,786**	11,688	7,979	**19,668**	**322,418**
320		Apr	16,419	138,667	**7,324**	**155,086**	**162,410**	11,311	7,722	**19,033**	**306,218**
321		May	16,800	154,042	**7,501**	**170,842**	**178,343**	11,688	7,979	**19,668**	**325,759**
322		Jun	17,140	176,504	**7,531**	**193,644**	**201,176**	11,311	7,722	**19,033**	**339,831**
323		Jul	18,583	259,321	**9,252**	**277,904**	**287,156**	11,688	7,979	**19,668**	**432,430**
324		Aug	19,195	276,687	**9,437**	**295,881**	**305,318**	11,688	7,979	**19,668**	**456,013**
325		Sep	18,237	242,780	**9,111**	**261,017**	**270,128**	11,311	7,722	**19,033**	**417,718**
326		Oct	17,779	210,446	**8,248**	**228,225**	**236,473**	11,688	7,979	**19,668**	**383,849**
327		Nov	16,554	203,930	**7,781**	**220,484**	**228,265**	11,311	7,722	**19,033**	**367,799**
328		Dec	16,774	211,700	**7,639**	**228,475**	**236,114**	11,688	7,979	**19,668**	**379,007**
329											
330	2020	Jan	16,924	195,725	**7,522**	**212,649**	**220,171**	11,688	7,979	**19,668**	**368,631**
331		Feb	15,132	153,109	**6,576**	**168,241**	**174,817**	10,557	7,207	**17,764**	**311,510**
332		Mar	16,354	147,306	**7,002**	**163,660**	**170,661**	11,688	7,979	**19,668**	**318,564**
333		Apr	16,027	139,277	**7,135**	**155,303**	**162,439**	11,311	7,722	**19,033**	**303,681**
334		May	16,529	154,671	**7,323**	**171,200**	**178,523**	11,688	7,979	**19,668**	**323,284**
335		Jun	16,759	177,693	**7,331**	**194,453**	**201,784**	11,311	7,722	**19,033**	**337,934**
336		Jul	18,272	261,533	**8,916**	**279,804**	**288,721**	11,688	7,979	**19,668**	**431,447**
337		Aug	18,724	275,068	**9,230**	**293,792**	**303,023**	11,688	7,979	**19,668**	**451,149**
338		Sep	17,916	244,020	**8,867**	**261,936**	**270,802**	11,311	7,722	**19,033**	**415,908**
339		Oct	17,423	215,394	**7,925**	**232,818**	**240,742**	11,688	7,979	**19,668**	**385,655**
340		Nov	16,179	195,952	**7,416**	**212,131**	**219,547**	11,311	7,722	**19,033**	**356,752**
341		Dec	16,413	212,427	**7,725**	**228,839**	**236,564**	11,688	7,979	**19,668**	**377,193**
342											
343											
344			Noncore - Electric Generatiion					Noncore - EOR			Total
345	**Peak Day Throughput (Mth/Day)**		EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
346	2014		566	8,214	242	8,780	9,023	377	257	634	14,152
347	2015		**597**	**10,451**	**358**	**11,048**	**11,406**	377	257	**634**	**16,349**
348	2016		**572**	**8,247**	**276**	**8,818**	**9,094**	377	257	**634**	**14,023**
349	2017		**531**	**8,344**	**308**	**8,875**	**9,183**	377	257	**634**	**14,067**
350	2018		**547**	**8,209**	**293**	**8,756**	**9,049**	377	257	**634**	**13,890**
351	2019		**560**	**8,589**	**273**	**9,149**	**9,422**	377	257	**634**	**14,205**
352	2020		**470**	**8,610**	**302**	**9,080**	**9,382**	377	257	**634**	**14,092**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

	A	B	AE	AF	AG	AH	AI	AK	AM
249			Wholesale Noncore				Total	International NC	Total
250			Long Beach	SDG&E	Southwest Gas	Vernon	Wholesale	Ecogas	Noncore
251	Cold Year Throughput (Mth)								
252	2014	Jan	11,054	141,596	10,508	7,386	170,544	6,610	552,418
253		Feb	8,529	112,416	8,249	9,164	138,358	6,251	508,779
254		Mar	7,077	104,611	6,223	8,234	126,146	6,794	480,067
255		Apr	6,926	107,411	5,413	8,974	128,724	6,467	514,163
256		May	5,907	94,514	4,135	8,182	112,739	6,322	504,105
257		Jun	4,975	86,009	3,190	7,963	102,137	6,155	468,072
258		Jul	5,165	104,624	2,462	8,693	120,943	6,477	597,450
259		Aug	4,542	105,780	2,500	8,849	121,671	6,761	603,693
260		Sep	4,689	109,922	2,464	8,578	125,654	6,554	629,249
261		Oct	4,747	110,207	2,492	8,606	126,052	7,270	633,736
262		Nov	4,805	115,122	2,990	9,022	131,939	7,044	499,413
263		Dec	5,153	146,122	5,393	7,060	163,728	6,690	547,312
264									
265	2015	Jan	9,040	131,635	10,397	7,790	158,862	7,043	572,923
266		Feb	8,859	111,942	8,784	7,059	136,644	6,296	474,669
267		Mar	8,787	111,687	6,985	7,532	134,991	7,206	488,953
268		Apr	7,262	100,188	5,255	7,586	120,291	6,873	458,365
269		May	5,629	90,645	3,136	7,752	107,161	6,713	478,291
270		Jun	4,642	82,654	2,564	7,483	97,344	6,550	481,184
271		Jul	4,587	120,194	2,376	8,103	135,260	7,257	633,917
272		Aug	4,572	121,267	2,376	8,081	136,296	7,171	648,229
273		Sep	4,689	115,990	2,307	7,747	130,734	7,208	596,987
274		Oct	4,936	103,125	3,225	8,235	119,522	7,344	561,975
275		Nov	7,353	112,622	6,366	6,039	132,379	7,484	523,769
276		Dec	10,094	143,407	10,322	7,840	171,664	7,568	602,813
277									
278	2016	Jan	9,076	133,428	10,489	7,918	160,911	7,875	556,354
279		Feb	8,932	125,870	8,972	7,322	151,096	7,124	500,629
280		Mar	8,732	109,005	7,046	7,695	132,477	8,039	467,111
281		Apr	7,197	98,061	5,299	7,694	118,251	7,705	439,261
282		May	5,635	86,535	3,161	7,842	103,173	7,544	448,242
283		Jun	4,641	78,919	2,584	7,625	93,769	7,380	452,223
284		Jul	4,422	118,524	2,395	8,084	133,425	7,431	595,008
285		Aug	4,378	121,774	2,394	8,043	136,590	7,345	619,942
286		Sep	4,538	115,099	2,326	7,756	129,719	7,382	570,250
287		Oct	4,829	98,229	3,251	8,381	114,691	7,519	515,947
288		Nov	7,159	114,171	6,420	6,121	133,871	7,521	500,003
289		Dec	9,853	139,963	10,413	7,961	168,189	7,606	551,518
290									
291	2017	Jan	8,967	125,860	10,582	8,061	153,471	7,915	531,540
292		Feb	8,804	115,233	8,939	7,295	140,271	7,160	458,616
293		Mar	8,699	109,791	7,106	7,758	133,355	8,079	469,861
294		Apr	7,211	99,132	5,344	7,809	119,496	7,743	443,574
295		May	5,616	87,014	3,186	8,012	103,828	7,581	445,879
296		Jun	4,626	79,231	2,604	7,751	94,211	7,417	452,462
297		Jul	4,517	117,913	2,414	8,186	133,031	7,468	586,687
298		Aug	4,463	120,070	2,413	8,133	135,078	7,381	608,704
299		Sep	4,596	116,701	2,344	7,941	131,583	7,419	559,862
300		Oct	4,882	96,739	3,277	8,427	113,325	7,557	499,650
301		Nov	7,264	116,591	6,475	6,287	136,618	7,559	503,628
302		Dec	10,008	142,148	10,506	8,052	170,714	7,644	556,290

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Row			Wholesale Noncore				Total	International NC	Total
250			Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**	Ecogas	**Noncore**
251	**Cold Year Throughput (Mth)**								
303									
304	2018	Jan	9,059	**135,603**	**10,677**	8,135	**163,474**	7,954	**543,943**
305		Feb	8,957	**112,918**	**9,018**	7,408	**138,301**	7,195	**460,891**
306		Mar	8,828	**103,485**	**7,168**	7,920	**127,402**	8,119	**460,319**
307		Apr	7,285	**91,755**	**5,390**	7,947	**112,376**	7,782	**428,852**
308		May	5,686	**82,650**	**3,211**	8,069	**99,617**	7,619	**437,643**
309		Jun	4,676	**81,442**	**2,624**	7,869	**96,610**	7,454	**449,270**
310		Jul	4,538	**104,277**	**2,433**	8,335	**119,583**	7,505	**571,778**
311		Aug	4,521	**109,763**	**2,432**	8,260	**124,975**	7,418	**591,798**
312		Sep	4,664	**102,901**	**2,362**	8,036	**117,962**	7,456	**548,571**
313		Oct	4,906	**100,239**	**3,304**	8,583	**117,032**	7,595	**500,151**
314		Nov	7,337	**115,912**	**6,531**	6,409	**136,188**	7,597	**500,004**
315		Dec	10,033	**141,273**	**10,598**	8,164	**170,068**	7,682	**556,395**
316									
317	2019	Jan	9,092	**135,230**	**10,771**	8,275	**163,368**	7,994	**549,145**
318		Feb	8,943	**112,624**	**9,096**	7,518	**138,181**	7,231	**458,191**
319		Mar	8,801	**104,277**	**7,230**	8,034	**128,342**	8,160	**458,920**
320		Apr	7,255	**90,715**	**5,435**	8,032	**111,437**	7,821	**425,476**
321		May	5,645	**81,423**	**3,238**	8,267	**98,573**	7,657	**431,989**
322		Jun	4,668	**78,744**	**2,645**	7,952	**94,008**	7,491	**441,330**
323		Jul	4,509	**102,085**	**2,451**	8,404	**117,449**	7,543	**557,422**
324		Aug	4,461	**106,648**	**2,451**	8,382	**121,943**	7,455	**585,411**
325		Sep	4,602	**100,740**	**2,380**	8,188	**115,911**	7,494	**541,123**
326		Oct	4,887	**105,393**	**3,331**	8,665	**122,275**	7,633	**513,757**
327		Nov	7,292	**113,399**	**6,587**	6,524	**133,802**	7,635	**509,236**
328		Dec	10,031	**139,624**	**10,691**	8,325	**168,671**	7,721	**555,399**
329									
330	2020	Jan	9,100	**132,333**	**10,865**	8,362	**160,660**	8,034	**537,326**
331		Feb	9,106	**111,969**	**9,290**	7,806	**138,171**	7,268	**456,948**
332		Mar	8,842	**103,579**	**7,291**	8,200	**127,912**	8,201	**454,676**
333		Apr	7,308	**89,887**	**5,481**	8,072	**110,749**	7,860	**422,290**
334		May	5,680	**79,784**	**3,263**	8,416	**97,143**	7,696	**428,123**
335		Jun	4,678	**77,603**	**2,665**	8,093	**93,039**	7,529	**438,501**
336		Jul	4,558	**100,723**	**2,471**	8,554	**116,305**	7,581	**555,333**
337		Aug	4,510	**105,227**	**2,470**	8,469	**120,676**	7,493	**579,318**
338		Sep	4,653	**99,207**	**2,399**	8,313	**114,572**	7,531	**538,011**
339		Oct	4,922	**102,175**	**3,358**	8,841	**119,296**	7,671	**512,621**
340		Nov	7,353	**113,048**	**6,643**	6,565	**133,609**	7,673	**498,034**
341		Dec	10,085	**139,822**	**10,783**	8,483	**169,174**	7,759	**554,126**
342									
343									
344			Wholesale Noncore				**Total**	International NC	**Total**
345	**Peak Day Throughput (Mth/Day)**		Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**	Ecogas	**Noncore**
346	2014		271	**6,166**	263	324	**7,023**	216	**21,391**
347	2015		**530**	**6,090**	**503**	**418**	**7,541**	244	**24,133**
348	2016		**523**	**5,914**	**507**	**257**	**7,201**	245	**21,469**
349	2017		**529**	**6,273**	**512**	**260**	**7,574**	247	**21,887**
350	2018		**531**	**6,354**	**516**	**263**	**7,664**	248	**21,802**
351	2019		**531**	**6,295**	**521**	**269**	**7,616**	249	**22,070**
352	2020		**534**	**6,067**	**525**	**274**	**7,400**	250	**21,742**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Row	A	B	Total System End-Use Dmd	System Total (Mdth/d)	Co-Use-Fuel	"Un-Acnt'd-For" (UAF)	Total System Throughput
251	**Cold Year Throughput (Mth)**						
252	2014	Jan	**1,078,290**	**3,478**	**5,230**	**9,125**	**1,092,645**
253		Feb	**976,604**	**3,488**	**4,737**	**8,264**	**989,605**
254		Mar	**891,552**	**2,876**	**4,324**	**7,544**	**903,421**
255		Apr	**856,978**	**2,857**	**4,157**	**7,252**	**868,386**
256		May	**765,526**	**2,469**	**3,713**	**6,478**	**775,717**
257		Jun	**684,588**	**2,282**	**3,321**	**5,793**	**693,701**
258		Jul	**799,477**	**2,579**	**3,878**	**6,765**	**810,121**
259		Aug	**803,973**	**2,593**	**3,900**	**6,803**	**814,676**
260		Sep	**833,159**	**2,777**	**4,041**	**7,050**	**844,251**
261		Oct	**875,249**	**2,823**	**4,245**	**7,406**	**886,901**
262		Nov	**865,621**	**2,885**	**4,199**	**7,325**	**877,144**
263		Dec	**1,089,147**	**3,513**	**5,283**	**9,217**	**1,103,646**
264							
265	2015	Jan	**1,098,172**	**3,542**	**5,327**	**9,293**	**1,112,791**
266		Feb	**941,645**	**3,363**	**4,567**	**7,968**	**954,181**
267		Mar	**899,868**	**2,903**	**4,365**	**7,615**	**911,847**
268		Apr	**800,750**	**2,669**	**3,884**	**6,776**	**811,410**
269		May	**738,974**	**2,384**	**3,584**	**6,253**	**748,812**
270		Jun	**696,750**	**2,323**	**3,380**	**5,896**	**706,026**
271		Jul	**835,010**	**2,694**	**4,050**	**7,066**	**846,126**
272		Aug	**847,864**	**2,735**	**4,112**	**7,175**	**859,151**
273		Sep	**800,430**	**2,668**	**3,882**	**6,773**	**811,086**
274		Oct	**803,348**	**2,591**	**3,897**	**6,798**	**814,043**
275		Nov	**889,404**	**2,965**	**4,314**	**7,526**	**901,245**
276		Dec	**1,144,361**	**3,691**	**5,551**	**9,684**	**1,159,596**
277							
278	2016	Jan	**1,078,467**	**3,479**	**5,231**	**9,126**	**1,092,824**
279		Feb	**968,583**	**3,340**	**4,698**	**8,196**	**981,478**
280		Mar	**875,770**	**2,825**	**4,248**	**7,411**	**887,429**
281		Apr	**779,887**	**2,600**	**3,783**	**6,600**	**790,270**
282		May	**707,858**	**2,283**	**3,433**	**5,990**	**717,281**
283		Jun	**667,033**	**2,223**	**3,235**	**5,645**	**675,913**
284		Jul	**795,446**	**2,566**	**3,858**	**6,731**	**806,036**
285		Aug	**818,936**	**2,642**	**3,972**	**6,930**	**829,838**
286		Sep	**773,064**	**2,577**	**3,750**	**6,542**	**783,356**
287		Oct	**756,397**	**2,440**	**3,669**	**6,401**	**766,466**
288		Nov	**863,736**	**2,879**	**4,189**	**7,309**	**875,235**
289		Dec	**1,089,835**	**3,516**	**5,286**	**9,222**	**1,104,344**
290							
291	2017	Jan	**1,052,735**	**3,396**	**5,106**	**8,908**	**1,066,750**
292		Feb	**922,043**	**3,293**	**4,472**	**7,802**	**934,318**
293		Mar	**877,945**	**2,832**	**4,258**	**7,429**	**889,633**
294		Apr	**783,796**	**2,613**	**3,802**	**6,633**	**794,230**
295		May	**705,293**	**2,275**	**3,421**	**5,968**	**714,682**
296		Jun	**667,156**	**2,224**	**3,236**	**5,646**	**676,037**
297		Jul	**787,084**	**2,539**	**3,818**	**6,660**	**797,562**
298		Aug	**807,674**	**2,605**	**3,918**	**6,835**	**818,427**
299		Sep	**762,644**	**2,542**	**3,699**	**6,454**	**772,796**
300		Oct	**740,005**	**2,387**	**3,589**	**6,262**	**749,856**
301		Nov	**866,841**	**2,889**	**4,205**	**7,335**	**878,381**
302		Dec	**1,093,727**	**3,528**	**5,305**	**9,255**	**1,108,288**

	A	B	C	D	E	AO	AP	AQ	AR	AS	AT	AU
1	**2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**											
249						**Total**		**System Total**				**Total**
250						**System End-Use Dmd**		**(Mdth/d)**		**Co-Use-Fuel**	**"Un-Acnt'd-For" (UAF)**	**System Throughput**
251	**Cold Year Throughput (Mth)**											
303												
304	2018	Jan				**1,063,431**		**3,430**		**5,158**	**8,999**	**1,077,588**
305		Feb				**922,813**		**3,296**		**4,476**	**7,809**	**935,097**
306		Mar				**867,230**		**2,798**		**4,206**	**7,339**	**878,775**
307		Apr				**768,182**		**2,561**		**3,726**	**6,500**	**778,409**
308		May				**696,512**		**2,247**		**3,378**	**5,894**	**705,784**
309		Jun				**663,578**		**2,212**		**3,219**	**5,615**	**672,412**
310		Jul				**771,884**		**2,490**		**3,744**	**6,532**	**782,160**
311		Aug				**790,495**		**2,550**		**3,834**	**6,689**	**801,018**
312		Sep				**751,069**		**2,504**		**3,643**	**6,356**	**761,067**
313		Oct				**740,095**		**2,387**		**3,590**	**6,263**	**749,948**
314		Nov				**862,176**		**2,874**		**4,182**	**7,296**	**873,654**
315		Dec				**1,092,139**		**3,523**		**5,297**	**9,242**	**1,106,679**
316												
317	2019	Jan				**1,066,198**		**3,439**		**5,171**	**9,022**	**1,080,392**
318		Feb				**917,949**		**3,278**		**4,452**	**7,768**	**930,169**
319		Mar				**864,077**		**2,787**		**4,191**	**7,312**	**875,580**
320		Apr				**763,419**		**2,545**		**3,703**	**6,460**	**773,582**
321		May				**689,912**		**2,226**		**3,346**	**5,838**	**699,097**
322		Jun				**654,903**		**2,183**		**3,177**	**5,542**	**663,622**
323		Jul				**756,917**		**2,442**		**3,671**	**6,405**	**766,993**
324		Aug				**783,517**		**2,527**		**3,800**	**6,630**	**793,947**
325		Sep				**743,009**		**2,477**		**3,604**	**6,287**	**752,900**
326		Oct				**752,926**		**2,429**		**3,652**	**6,371**	**762,950**
327		Nov				**869,840**		**2,899**		**4,219**	**7,361**	**881,419**
328		Dec				**1,088,739**		**3,512**		**5,281**	**9,213**	**1,103,233**
329												
330	2020	Jan				**1,049,509**		**3,386**		**5,091**	**8,881**	**1,063,480**
331		Feb				**916,013**		**3,159**		**4,443**	**7,751**	**928,207**
332		Mar				**856,174**		**2,762**		**4,153**	**7,245**	**867,571**
333		Apr				**757,251**		**2,524**		**3,673**	**6,408**	**767,332**
334		May				**683,848**		**2,206**		**3,317**	**5,787**	**692,951**
335		Jun				**650,278**		**2,168**		**3,154**	**5,503**	**658,935**
336		Jul				**753,229**		**2,430**		**3,653**	**6,374**	**763,256**
337		Aug				**775,847**		**2,503**		**3,763**	**6,565**	**786,176**
338		Sep				**738,277**		**2,461**		**3,581**	**6,247**	**748,105**
339		Oct				**749,859**		**2,419**		**3,637**	**6,345**	**759,842**
340		Nov				**855,338**		**2,851**		**4,149**	**7,238**	**866,725**
341		Dec				**1,082,576**		**3,492**		**5,251**	**9,161**	**1,096,988**
342												
343												
344						**Total**						
345	**Peak Day Throughput (Mth/Day)**					**System End-Use Dmd**						
346	2014					**52,157**						
347	2015					**54,900**						
348	2016					**52,108**						
349	2017					**52,518**						
350	2018					**52,390**						
351	2019					**52,582**						
352	2020					**52,055**						

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

			Nonresidential Core				Total	Noncore - G-30		
		Residential	G-10	G-AC	G-GE	G-NGV	Core	G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**
Forecast Number of Customers										
2014	Jan	5,426,305	206,224	9	719	298	**5,633,555**	569	37	**606**
	Feb	5,426,305	205,994	9	716	298	**5,633,322**	569	37	**606**
	Mar	5,430,720	205,688	9	719	298	**5,637,434**	569	37	**606**
	Apr	5,432,449	205,303	9	710	298	**5,638,769**	569	37	**606**
	May	5,440,235	205,023	9	718	298	**5,646,283**	569	37	**606**
	Jun	5,433,982	204,307	9	725	298	**5,639,321**	569	37	**606**
	Jul	5,428,870	203,927	9	722	298	**5,633,826**	569	37	**606**
	Aug	5,428,863	203,633	9	721	298	**5,633,524**	569	37	**606**
	Sep	5,430,516	203,401	9	718	298	**5,634,942**	569	37	**606**
	Oct	5,433,681	203,203	9	721	298	**5,637,912**	569	37	**606**
	Nov	5,438,978	203,374	9	712	298	**5,643,371**	569	37	**606**
	Dec	5,440,595	203,899	9	712	298	**5,645,513**	569	37	**606**
2015	Jan	5,451,443	207,831	9	718	310	**5,660,312**	574	37	**611**
	Feb	5,451,443	207,600	9	719	310	**5,660,081**	574	37	**611**
	Mar	5,455,887	207,291	9	716	310	**5,664,213**	574	37	**611**
	Apr	5,457,630	206,903	9	715	310	**5,665,567**	574	37	**611**
	May	5,465,455	206,621	9	722	310	**5,673,117**	574	37	**611**
	Jun	5,459,175	205,899	9	725	310	**5,666,118**	574	37	**611**
	Jul	5,454,037	205,516	9	727	310	**5,660,599**	574	37	**611**
	Aug	5,454,033	205,220	9	728	310	**5,660,300**	574	37	**611**
	Sep	5,455,698	204,986	9	730	310	**5,661,733**	574	37	**611**
	Oct	5,458,881	204,787	9	728	310	**5,664,714**	574	37	**611**
	Nov	5,464,206	204,959	9	726	310	**5,670,210**	574	37	**611**
	Dec	5,465,834	205,488	9	724	310	**5,672,365**	574	37	**611**
2016	Jan	5,497,764	208,420	9	725	326	**5,707,244**	578	38	**616**
	Feb	5,497,764	208,188	9	726	326	**5,707,013**	578	38	**616**
	Mar	5,502,257	207,878	9	723	326	**5,711,193**	578	38	**616**
	Apr	5,504,022	207,489	9	722	326	**5,712,568**	578	38	**616**
	May	5,511,917	207,206	9	729	326	**5,720,188**	578	38	**616**
	Jun	5,505,579	206,483	9	732	326	**5,713,129**	578	38	**616**
	Jul	5,500,384	206,099	9	735	326	**5,707,553**	578	38	**616**
	Aug	5,500,382	205,802	9	736	326	**5,707,254**	578	38	**616**
	Sep	5,502,066	205,567	9	737	326	**5,708,705**	578	38	**616**
	Oct	5,505,279	205,367	9	735	326	**5,711,716**	578	38	**616**
	Nov	5,510,652	205,540	9	734	326	**5,717,261**	578	38	**616**
	Dec	5,512,294	206,070	9	731	326	**5,719,430**	578	38	**616**
2017	Jan	5,551,898	208,895	9	733	351	**5,761,885**	581	38	**619**
	Feb	5,551,898	208,662	9	734	351	**5,761,653**	581	38	**619**
	Mar	5,556,452	208,352	9	730	351	**5,765,893**	581	38	**619**
	Apr	5,558,244	207,962	9	729	351	**5,767,295**	581	38	**619**
	May	5,566,222	207,678	9	736	351	**5,774,997**	581	38	**619**
	Jun	5,559,815	206,953	9	739	351	**5,767,867**	581	38	**619**
	Jul	5,554,551	206,568	9	742	351	**5,762,221**	581	38	**619**
	Aug	5,554,550	206,270	9	743	351	**5,761,923**	581	38	**619**
	Sep	5,556,256	206,035	9	745	351	**5,763,396**	581	38	**619**
	Oct	5,559,506	205,835	9	743	351	**5,766,444**	581	38	**619**
	Nov	5,564,936	206,008	9	741	351	**5,772,045**	581	38	**619**
	Dec	5,566,593	206,540	9	738	351	**5,774,231**	581	38	**619**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**															
355							Nonresidential Core					**Total**		Noncore - G-30		
356						Residential	G-10		G-AC	G-GE	G-NGV	**Core**		G-30 (Dist.)	G-30 (Trans.)	**G-30 (Total)**
357	**Forecast Number of Customers**															
409																
410	2018	Jan				5,610,729	209,128		9	740	355	**5,820,961**		584	38	**621**
411		Feb				5,610,729	208,894		9	741	355	**5,820,728**		584	38	**621**
412		Mar				5,615,350	208,584		9	737	355	**5,825,035**		584	38	**621**
413		Apr				5,617,172	208,194		9	736	355	**5,826,466**		584	38	**621**
414		May				5,625,241	207,910		9	744	355	**5,834,259**		584	38	**621**
415		Jun				5,618,759	207,184		9	747	355	**5,827,053**		584	38	**621**
416		Jul				5,613,417	206,798		9	749	355	**5,821,329**		584	38	**621**
417		Aug				5,613,418	206,500		9	750	355	**5,821,033**		584	38	**621**
418		Sep				5,615,149	206,265		9	752	355	**5,822,530**		584	38	**621**
419		Oct				5,618,440	206,064		9	750	355	**5,825,619**		584	38	**621**
420		Nov				5,623,932	206,238		9	748	355	**5,831,282**		584	38	**621**
421		Dec				5,625,605	206,770		9	746	355	**5,833,485**		584	38	**621**
422																
423	2019	Jan				5,670,999	209,179		9	747	370	**5,881,305**		586	38	**624**
424		Feb				5,670,999	208,946		9	748	370	**5,881,072**		586	38	**624**
425		Mar				5,675,688	208,636		9	745	370	**5,885,448**		586	38	**624**
426		Apr				5,677,541	208,245		9	744	370	**5,886,910**		586	38	**624**
427		May				5,685,703	207,961		9	751	370	**5,894,795**		586	38	**624**
428		Jun				5,679,143	207,235		9	754	370	**5,887,512**		586	38	**624**
429		Jul				5,673,723	206,849		9	757	370	**5,881,709**		586	38	**624**
430		Aug				5,673,726	206,551		9	758	370	**5,881,414**		586	38	**624**
431		Sep				5,675,482	206,316		9	760	370	**5,882,937**		586	38	**624**
432		Oct				5,678,815	206,115		9	758	370	**5,886,067**		586	38	**624**
433		Nov				5,684,370	206,289		9	756	370	**5,891,793**		586	38	**624**
434		Dec				5,686,060	206,821		9	753	370	**5,894,013**		586	38	**624**
435																
436	2020	Jan				5,731,243	209,154		5	747	386	**5,941,534**		589	38	**627**
437		Feb				5,731,243	208,920		5	748	386	**5,941,302**		589	38	**627**
438		Mar				5,736,000	208,610		5	745	386	**5,945,746**		589	38	**627**
439		Apr				5,737,884	208,219		5	744	386	**5,947,238**		589	38	**627**
440		May				5,746,139	207,936		5	751	386	**5,955,217**		589	38	**627**
441		Jun				5,739,502	207,209		5	754	386	**5,947,856**		589	38	**627**
442		Jul				5,734,003	206,824		5	757	386	**5,941,975**		589	38	**627**
443		Aug				5,734,008	206,526		5	758	386	**5,941,682**		589	38	**627**
444		Sep				5,735,789	206,290		5	760	386	**5,943,230**		589	38	**627**
445		Oct				5,739,164	206,090		5	758	386	**5,946,402**		589	38	**627**
446		Nov				5,744,781	206,263		5	756	386	**5,952,191**		589	38	**627**
447		Dec				5,746,489	206,796		5	753	386	**5,954,429**		589	38	**627**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

		Noncore - Electric Generatiion							Noncore - EOR			Total
		EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
Forecast Number of Customers												
2014	Jan	199	15	27	41	**214**	**68**	**282**	17	12	**29**	**917**
	Feb	199	15	27	41	**214**	**68**	**282**	17	12	**29**	**917**
	Mar	199	15	27	41	**214**	**68**	**282**	17	12	**29**	**917**
	Apr	199	15	27	41	**214**	**68**	**282**	17	12	**29**	**917**
	May	199	15	27	41	**214**	**68**	**282**	17	12	**29**	**917**
	Jun	199	15	27	41	**214**	**68**	**282**	17	12	**29**	**917**
	Jul	199	15	27	41	**214**	**68**	**282**	17	12	**29**	**917**
	Aug	199	15	27	41	**214**	**68**	**282**	17	12	**29**	**917**
	Sep	199	15	27	41	**214**	**68**	**282**	17	12	**29**	**917**
	Oct	199	15	27	41	**214**	**68**	**282**	17	12	**29**	**917**
	Nov	199	15	27	41	**214**	**68**	**282**	17	12	**29**	**917**
	Dec	199	15	27	41	**214**	**68**	**282**	17	12	**29**	**917**
2015	Jan	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**924**
	Feb	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**924**
	Mar	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**924**
	Apr	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**924**
	May	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**924**
	Jun	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**924**
	Jul	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**924**
	Aug	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**924**
	Sep	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**924**
	Oct	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**924**
	Nov	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**924**
	Dec	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**924**
2016	Jan	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**930**
	Feb	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**930**
	Mar	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**930**
	Apr	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**930**
	May	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**930**
	Jun	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**930**
	Jul	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**930**
	Aug	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**930**
	Sep	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**930**
	Oct	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**930**
	Nov	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**930**
	Dec	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**930**
2017	Jan	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**933**
	Feb	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**933**
	Mar	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**933**
	Apr	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**933**
	May	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**933**
	Jun	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**933**
	Jul	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**933**
	Aug	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**933**
	Sep	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**933**
	Oct	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**933**
	Nov	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**933**
	Dec	202	15	28	41	**217**	**69**	**285**	17	12	**29**	**933**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

	A	B	Q	R	S	T	U	V	W	Y	Z	AA	AC
355			Noncore - Electric Generatiion							Noncore - EOR			**Total**
356			EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
357	**Forecast Number of Customers**												
409													
410	2018	Jan	201	15	28	41	**216**	**68**	**285**	17	12	**29**	**935**
411		Feb	201	15	28	41	**216**	**68**	**285**	17	12	**29**	**935**
412		Mar	201	15	28	41	**216**	**68**	**285**	17	12	**29**	**935**
413		Apr	201	15	28	41	**216**	**68**	**285**	17	12	**29**	**935**
414		May	201	15	28	41	**216**	**68**	**285**	17	12	**29**	**935**
415		Jun	201	15	28	41	**216**	**68**	**285**	17	12	**29**	**935**
416		Jul	201	15	28	41	**216**	**68**	**285**	17	12	**29**	**935**
417		Aug	201	15	28	41	**216**	**68**	**285**	17	12	**29**	**935**
418		Sep	201	15	28	41	**216**	**68**	**285**	17	12	**29**	**935**
419		Oct	201	15	28	41	**216**	**68**	**285**	17	12	**29**	**935**
420		Nov	201	15	28	41	**216**	**68**	**285**	17	12	**29**	**935**
421		Dec	201	15	28	41	**216**	**68**	**285**	17	12	**29**	**935**
422													
423	2019	Jan	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**937**
424		Feb	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**937**
425		Mar	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**937**
426		Apr	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**937**
427		May	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**937**
428		Jun	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**937**
429		Jul	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**937**
430		Aug	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**937**
431		Sep	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**937**
432		Oct	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**937**
433		Nov	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**937**
434		Dec	201	15	28	41	**216**	**68**	**284**	17	12	**29**	**937**
435													
436	2020	Jan	200	15	27	41	**215**	**68**	**283**	17	12	**29**	**939**
437		Feb	200	15	27	41	**215**	**68**	**283**	17	12	**29**	**939**
438		Mar	200	15	27	41	**215**	**68**	**283**	17	12	**29**	**939**
439		Apr	200	15	27	41	**215**	**68**	**283**	17	12	**29**	**939**
440		May	200	15	27	41	**215**	**68**	**283**	17	12	**29**	**939**
441		Jun	200	15	27	41	**215**	**68**	**283**	17	12	**29**	**939**
442		Jul	200	15	27	41	**215**	**68**	**283**	17	12	**29**	**939**
443		Aug	200	15	27	41	**215**	**68**	**283**	17	12	**29**	**939**
444		Sep	200	15	27	41	**215**	**68**	**283**	17	12	**29**	**939**
445		Oct	200	15	27	41	**215**	**68**	**283**	17	12	**29**	**939**
446		Nov	200	15	27	41	**215**	**68**	**283**	17	12	**29**	**939**
447		Dec	200	15	27	41	**215**	**68**	**283**	17	12	**29**	**939**

A B C D E AD AE AF AG AH AI AJ AK AL AM AN AO

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Row			Wholesale Noncore				Total	International NC	Total	Total
			Long Beach	SDG&E	Southwest Gas	Vernon	Wholesale	Ecogas	Noncore	System
357	**Forecast Number of Customers**									
358	2014	Jan	1	1	1	1	**4**	1	**922**	**5,634,477**
359		Feb	1	1	1	1	**4**	1	**922**	**5,634,244**
360		Mar	1	1	1	1	**4**	1	**922**	**5,638,356**
361		Apr	1	1	1	1	**4**	1	**922**	**5,639,691**
362		May	1	1	1	1	**4**	1	**922**	**5,647,205**
363		Jun	1	1	1	1	**4**	1	**922**	**5,640,243**
364		Jul	1	1	1	1	**4**	1	**922**	**5,634,748**
365		Aug	1	1	1	1	**4**	1	**922**	**5,634,446**
366		Sep	1	1	1	1	**4**	1	**922**	**5,635,864**
367		Oct	1	1	1	1	**4**	1	**922**	**5,638,834**
368		Nov	1	1	1	1	**4**	1	**922**	**5,644,293**
369		Dec	1	1	1	1	**4**	1	**922**	**5,646,435**
370										
371	2015	Jan	1	1	1	1	**4**	1	**929**	**5,661,241**
372		Feb	1	1	1	1	**4**	1	**929**	**5,661,010**
373		Mar	1	1	1	1	**4**	1	**929**	**5,665,142**
374		Apr	1	1	1	1	**4**	1	**929**	**5,666,496**
375		May	1	1	1	1	**4**	1	**929**	**5,674,046**
376		Jun	1	1	1	1	**4**	1	**929**	**5,667,047**
377		Jul	1	1	1	1	**4**	1	**929**	**5,661,529**
378		Aug	1	1	1	1	**4**	1	**929**	**5,661,230**
379		Sep	1	1	1	1	**4**	1	**929**	**5,662,663**
380		Oct	1	1	1	1	**4**	1	**929**	**5,665,644**
381		Nov	1	1	1	1	**4**	1	**929**	**5,671,140**
382		Dec	1	1	1	1	**4**	1	**929**	**5,673,294**
383										
384	2016	Jan	1	1	1	1	**4**	1	**935**	**5,708,179**
385		Feb	1	1	1	1	**4**	1	**935**	**5,707,948**
386		Mar	1	1	1	1	**4**	1	**935**	**5,712,128**
387		Apr	1	1	1	1	**4**	1	**935**	**5,713,503**
388		May	1	1	1	1	**4**	1	**935**	**5,721,122**
389		Jun	1	1	1	1	**4**	1	**935**	**5,714,064**
390		Jul	1	1	1	1	**4**	1	**935**	**5,708,487**
391		Aug	1	1	1	1	**4**	1	**935**	**5,708,189**
392		Sep	1	1	1	1	**4**	1	**935**	**5,709,640**
393		Oct	1	1	1	1	**4**	1	**935**	**5,712,651**
394		Nov	1	1	1	1	**4**	1	**935**	**5,718,195**
395		Dec	1	1	1	1	**4**	1	**935**	**5,720,365**
396										
397	2017	Jan	1	1	1	1	**4**	1	**938**	**5,762,824**
398		Feb	1	1	1	1	**4**	1	**938**	**5,762,592**
399		Mar	1	1	1	1	**4**	1	**938**	**5,766,832**
400		Apr	1	1	1	1	**4**	1	**938**	**5,768,233**
401		May	1	1	1	1	**4**	1	**938**	**5,775,935**
402		Jun	1	1	1	1	**4**	1	**938**	**5,768,805**
403		Jul	1	1	1	1	**4**	1	**938**	**5,763,159**
404		Aug	1	1	1	1	**4**	1	**938**	**5,762,861**
405		Sep	1	1	1	1	**4**	1	**938**	**5,764,334**
406		Oct	1	1	1	1	**4**	1	**938**	**5,767,382**
407		Nov	1	1	1	1	**4**	1	**938**	**5,772,983**
408		Dec	1	1	1	1	**4**	1	**938**	**5,775,169**

2016 TCAP-Phase II: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

Row			Wholesale Noncore				Total	International NC	Total	Total
356			Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**	Ecogas	**Noncore**	**System**
357	**Forecast Number of Customers**									
409										
410	2018	Jan	1	1	1	1	**4**	1	**940**	**5,821,901**
411		Feb	1	1	1	1	**4**	1	**940**	**5,821,669**
412		Mar	1	1	1	1	**4**	1	**940**	**5,825,976**
413		Apr	1	1	1	1	**4**	1	**940**	**5,827,407**
414		May	1	1	1	1	**4**	1	**940**	**5,835,199**
415		Jun	1	1	1	1	**4**	1	**940**	**5,827,993**
416		Jul	1	1	1	1	**4**	1	**940**	**5,822,269**
417		Aug	1	1	1	1	**4**	1	**940**	**5,821,973**
418		Sep	1	1	1	1	**4**	1	**940**	**5,823,470**
419		Oct	1	1	1	1	**4**	1	**940**	**5,826,559**
420		Nov	1	1	1	1	**4**	1	**940**	**5,832,222**
421		Dec	1	1	1	1	**4**	1	**940**	**5,834,425**
422										
423	2019	Jan	1	1	1	1	**4**	1	**942**	**5,882,247**
424		Feb	1	1	1	1	**4**	1	**942**	**5,882,015**
425		Mar	1	1	1	1	**4**	1	**942**	**5,886,390**
426		Apr	1	1	1	1	**4**	1	**942**	**5,887,852**
427		May	1	1	1	1	**4**	1	**942**	**5,895,737**
428		Jun	1	1	1	1	**4**	1	**942**	**5,888,454**
429		Jul	1	1	1	1	**4**	1	**942**	**5,882,651**
430		Aug	1	1	1	1	**4**	1	**942**	**5,882,356**
431		Sep	1	1	1	1	**4**	1	**942**	**5,883,879**
432		Oct	1	1	1	1	**4**	1	**942**	**5,887,009**
433		Nov	1	1	1	1	**4**	1	**942**	**5,892,735**
434		Dec	1	1	1	1	**4**	1	**942**	**5,894,956**
435										
436	2020	Jan	1	1	1	1	**4**	1	**944**	**5,942,479**
437		Feb	1	1	1	1	**4**	1	**944**	**5,942,247**
438		Mar	1	1	1	1	**4**	1	**944**	**5,946,690**
439		Apr	1	1	1	1	**4**	1	**944**	**5,948,183**
440		May	1	1	1	1	**4**	1	**944**	**5,956,161**
441		Jun	1	1	1	1	**4**	1	**944**	**5,948,800**
442		Jul	1	1	1	1	**4**	1	**944**	**5,942,919**
443		Aug	1	1	1	1	**4**	1	**944**	**5,942,627**
444		Sep	1	1	1	1	**4**	1	**944**	**5,944,175**
445		Oct	1	1	1	1	**4**	1	**944**	**5,947,347**
446		Nov	1	1	1	1	**4**	1	**944**	**5,953,135**
447		Dec	1	1	1	1	**4**	1	**944**	**5,955,373**

SDG&E Consolidated Gas Demand

Marginal Demand Measures (MDM)

Marginal Demand Measures (MDMs) are used for rate design and cost allocation calculations. Figure 1, below, shows the relationships among the various MDMs that are provided in the accompanying tables.

<u>Figure 1</u>

LENART Diagram Depicting the Relationships

Among “Direct” and “Cumulative” MDMs

Direct Basis	**D_T**	**T (Trans.)**		
	D_H	**H (High Press.)**	**H (High Press.)**	
	D_M	**M (Medium Press.)**	**M (Medium Press.)**	**M (Medium Press.)**
		$C_T = D_T + D_H + D_M$	**$C_H = D_H + D_M$**	**$C_M = D_M$**
		Cumulative Basis		

For example, the MDM data in the tables below for Noncore C&I, Avearge Year throughput gas demand have *direct* values for various segments of pressure service:

D_T = 17,168 MTh, D_H = 7,630 MTh, and D_M = 20,177 MTh.

The corresponding *cumulative* totals are:

C_T = 44,975 MTh, C_H = 27,807 MTh, and C_M = 20,177 MTh,

using the formulas indicated in the Figure 1, above.

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.537%
MDM #Yrs Av (2- or 3-yr)
3

Btu Factor:	1.0351

	Co-Use-Fuel	UAF
	0.385%	0.532%
	0.389%	0.537%

Forecast Summary — MDM

Row		Residential	GN-3	G-NGV	Total Core	C&I (Dist.)	C&I (Trans.)	Noncore - C&I C&I
			Nonresidential Core					
11	<< TCAP Period >> January 2017 - December 2019							
12	**DIRECT (%'s Load or Cust/Mtrs Sum to 100%)**							
13	Transmission %-Load:	0.00%	0.00%	0.00%				
14	Average Year Throughput (MTh)	0	0	0	0	0	17,168	17,168
15	Cold Year Throughput (1-in-35) (MTh)	0	0	0	0	0	17,168	17,168
16	Cold Year Peak Month (December) (MTh)	0	0	0	0	0	1,516	1,516
17	Peak Day (see note a/ below) (MTh)	-	-	-	0	0	49	49
18	%-Cust/Mtrs:	0.0000%	0.0000%	0.0000%				
19	Number of Customers	-	-	-	0	0	10	10
20	High Pressure %-Load:	0.03%	1.88%	61.29%				
21	Average Year Throughput (MTh)	93	3,429	11,340	14,862	7,630	0	7,630
22	Cold Year Throughput (1-in-35) (MTh)	102	3,561	11,340	15,003	7,630	0	7,630
23	Cold Year Peak Month (December) (MTh)	15	383	984	1,382	674	0	674
24	Peak Day (see note a/ below) (MTh)	1	17	32	49	22	0	22
25	%-Cust/Mtrs:	0.0001%	0.0182%	21.8750%				
26	Number of Customers	1	6	8	15	9	0	9
27	Medium Pressure %-Load:	99.97%	98.12%	38.71%				
28	Average Year Throughput (MTh)	319,890	179,231	7,162	506,282	20,177	0	20,177
29	Cold Year Throughput (1-in-35) (MTh)	354,096	186,126	7,162	547,383	20,177	0	20,177
30	Cold Year Peak Month (December) (MTh)	51,518	19,998	622	72,138	1,781	0	1,781
31	Peak Day (see note a/ below) (MTh)	2,911	879	20	3,810	57	0	57
32	%-Cust/Mtrs:	99.9999%	99.9818%	78.1250%				
33	Number of Customers	884,623	30,259	30	914,912	33	0	33
34	**CUMULATIVE (Calc'd from DIRECT %'s)**							
35	Transmission %-Load:	100.0000%	100.0000%	100.0000%				
36	Average Year Throughput (MTh)	319,982	182,660	18,501	521,144	27,807	17,168	44,975
37	Cold Year Throughput (1-in-35) (MTh)	354,198	189,687	18,501	562,386	27,807	17,168	44,975
38	Cold Year Peak Month (December) (MTh)	51,533	20,381	1,606	73,520	2,455	1,516	3,970
39	Peak Day (see note a/ below) (MTh)	2,912	896	52	3,859	79	49	128
40	%-Cust/Mtrs:	100.0000%	100.0000%	100.0000%				
41	Number of Customers	884,624	30,265	38	914,927	42	10	52
42	High Pressure %-Load:	0.0289%	1.8775%	61.2914%				
43	Average Year Throughput (MTh)	319,982	182,660	18,501	521,144	27,807	0	27,807
44	Cold Year Throughput (1-in-35) (MTh)	354,198	189,687	18,501	562,386	27,807	0	27,807
45	Cold Year Peak Month (December) (MTh)	51,533	20,381	1,606	73,520	2,455	0	2,455
46	Peak Day (see note a/ below) (MTh)	2,912	896	52	3,859	79	0	79
47	%-Cust/Mtrs:	0.0001%	0.0182%	21.8750%				
48	Number of Customers	884,624	30,265	38	914,927	42	0	42
49	Medium Pressure %-Load:	99.9711%	98.1225%	38.7086%				
50	Average Year Throughput (MTh)	319,890	179,231	7,162	506,282	20,177	0	20,177
51	Cold Year Throughput (1-in-35) (MTh)	354,096	186,126	7,162	547,383	20,177	0	20,177
52	Cold Year Peak Month (December) (MTh)	51,518	19,998	622	72,138	1,781	0	1,781
53	Peak Day (see note a/ below) (MTh)	2,911	879	20	3,810	57	0	57
54	%-Cust/Mtrs:	99.9999%	99.9818%	78.1250%				
55	Number of Customers	884,623	30,259	30	914,912	33	0	33

Note: a/ **Core HDD-sensitive markets (Res & GN3) at 1-in-35 exceedance peak-day design temp.; Power-Plant facilities' peak daily load in month of DECEMBER for BASE HYDRO water year; all other market segments at average daily load in DECEMBER month.**

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.537%
MDM #Yrs Av (2- or 3-yr)
3

Row	A–D	O	P	Q	R	S	T	U	V	W
9	**Forecast Summary** **MDM**					**Noncore - Electric Generatiion**			Noncore	System-Wide
10		EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	**Total**	**Total**
11	<< TCAP Period >> January 2017 - December 2019									
12	**DIRECT (%'s Load or Cust/Mtrs Sum to 100%)**									
13	Transmission %-Load:									
14	Average Year Throughput (MTh)	0	2,071	0	572,004	2,071	572,004	574,075	**591,243**	**591,243**
15	Cold Year Throughput (1-in-35) (MTh)	0	2,071	0	572,004	2,071	572,004	574,075	**591,243**	**591,243**
16	Cold Year Peak Month (December) (MTh)	0	166	0	53,795	166	53,795	53,961	**55,477**	**55,477**
17	Peak Day (see note a/ below) (MTh)	0	19	0	1,968	19	1,968	1,987	**2,036**	**2,036**
18	%-Cust/Mtrs:									
19	Number of Customers	0	5	0	13	5	13	18	**27**	**27**
20	High Pressure %-Load:									
21	Average Year Throughput (MTh)	4,914	0	68,276	0	4,914	68,276	73,190	**80,820**	**95,681**
22	Cold Year Throughput (1-in-35) (MTh)	4,914	0	68,276	0	4,914	68,276	73,190	**80,820**	**95,823**
23	Cold Year Peak Month (December) (MTh)	388	0	5,744	0	388	5,744	6,133	**6,806**	**8,188**
24	Peak Day (see note a/ below) (MTh)	22	0	185	0	22	185	207	**229**	**278**
25	%-Cust/Mtrs:									
26	Number of Customers	6	0	5	0	6	5	11	**20**	**35**
27	Medium Pressure %-Load:									
28	Average Year Throughput (MTh)	14,297	0	8,320	0	14,297	8,320	22,617	**42,794**	**549,076**
29	Cold Year Throughput (1-in-35) (MTh)	14,297	0	8,320	0	14,297	8,320	22,617	**42,794**	**590,177**
30	Cold Year Peak Month (December) (MTh)	1,203	0	700	0	1,203	700	1,903	**3,684**	**75,822**
31	Peak Day (see note a/ below) (MTh)	39	0	23	0	39	23	61	**119**	**3,928**
32	%-Cust/Mtrs:									
33	Number of Customers	40	0	2	0	40	2	42	**75**	**914,987**
34	**CUMULATIVE (Calc'd from DIRECT %'s)**									
35	Transmission %-Load:									
36	Average Year Throughput (MTh)	19,210	2,071	76,596	572,004	21,281	648,600	669,882	**714,857**	**1,236,000**
37	Cold Year Throughput (1-in-35) (MTh)	19,210	2,071	76,596	572,004	21,281	648,600	669,882	**714,857**	**1,277,243**
38	Cold Year Peak Month (December) (MTh)	1,591	166	6,444	53,795	1,757	60,239	61,997	**65,967**	**139,487**
39	Peak Day (see note a/ below) (MTh)	61	19	208	1,968	79	2,176	2,255	**2,383**	**6,242**
40	%-Cust/Mtrs:									
41	Number of Customers	46	5	7	13	51	20	71	**123**	**915,050**
42	High Pressure %-Load:									
43	Average Year Throughput (MTh)	19,210	0	76,596	0	19,210	76,596	95,807	**123,614**	**644,757**
44	Cold Year Throughput (1-in-35) (MTh)	19,210	0	76,596	0	19,210	76,596	95,807	**123,614**	**686,000**
45	Cold Year Peak Month (December) (MTh)	1,591	0	6,444	0	1,591	6,444	8,036	**10,490**	**84,010**
46	Peak Day (see note a/ below) (MTh)	61	0	208	0	61	208	268	**348**	**4,207**
47	%-Cust/Mtrs:									
48	Number of Customers	46	0	7	0	46	7	53	**95**	**915,022**
49	Medium Pressure %-Load:									
50	Average Year Throughput (MTh)	14,297	0	8,320	0	14,297	8,320	22,617	**42,794**	**549,076**
51	Cold Year Throughput (1-in-35) (MTh)	14,297	0	8,320	0	14,297	8,320	22,617	**42,794**	**590,177**
52	Cold Year Peak Month (December) (MTh)	1,203	0	700	0	1,203	700	1,903	**3,684**	**75,822**
53	Peak Day (see note a/ below) (MTh)	39	0	23	0	39	23	61	**119**	**3,928**
54	%-Cust/Mtrs:									
55	Number of Customers	40	0	2	0	40	2	42	**75**	**914,987**

Note: a/ **Core HDD-sensitive markets (Res & GN3) at 1-in-35 exceedance peak-day design temp.; Power-Plant facilities' peak daily load in month of DECEMBER for BASE HYDRO water year; all other market segments at average daily load in DECEMBER month.**

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

ANNUAL FORECAST DATA

				Nonresidential Core		Total	Noncore - C&I			Noncore - Electric Generatiion				
			Residential	GN-3	G-NGV	Core	C&I (Dist.)	C&I (Trans.)	C&I (Total)	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	EG (<3MMThms)
Average Year Throughput (Mth)														
2014	Jan		317,969	186,143	14,767	**518,880**	25,879	14,123	**40,002**	23,653	9,679	70,714	623,636	**33,331**
2015	Jan		313,872	185,894	15,619	**515,385**	26,942	16,634	**43,576**	23,399	8,517	75,477	626,781	**31,917**
2016	Jan		317,768	186,449	16,520	**520,738**	28,100	17,349	**45,448**	20,627	3,878	76,746	619,477	**24,505**
2017	Jan		319,124	184,677	17,474	**521,275**	28,379	17,521	**45,901**	19,911	2,594	77,566	606,202	**22,504**
2018	Jan		320,135	182,905	18,482	**521,522**	28,491	17,590	**46,081**	19,387	2,004	77,916	562,295	**21,391**
2019	Jan		320,688	180,398	19,548	**520,634**	28,550	17,627	**46,177**	19,176	1,616	77,959	552,011	**20,792**
2020	Jan		320,260	176,683	20,676	**517,619**	28,626	17,674	**46,300**	18,964	1,434	77,863	539,617	**20,398**

				Nonresidential Core		Total	Noncore - C&I			Noncore - Electric Generatiion				
			Residential	GN-3	G-NGV	Core	C&I (Dist.)	C&I (Trans.)	C&I (Total)	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	EG (<3MMThms)
Average Year Sales (Mth)														
2014	Jan	365	315,223	150,004	5,377	**470,603**	0	0	**0**	0	0	0	0	**0**
2015	Jan	365	311,160	149,803	5,687	**466,651**	0	0	**0**	0	0	0	0	**0**
2016	Jan	366	315,024	150,250	6,015	**471,289**	0	0	**0**	0	0	0	0	**0**
2017	Jan	365	316,367	148,822	6,362	**471,552**	0	0	**0**	0	0	0	0	**0**
2018	Jan	365	317,370	147,394	6,729	**471,493**	0	0	**0**	0	0	0	0	**0**
2019	Jan	365	317,918	145,374	7,118	**470,410**	0	0	**0**	0	0	0	0	**0**
2020	Jan	366	317,494	142,380	7,528	**467,402**	0	0	**0**	0	0	0	0	**0**

				Nonresidential Core		Total	Noncore - C&I			Noncore - Electric Generatiion				
			Residential	GN-3	G-NGV	Core	C&I (Dist.)	C&I (Trans.)	C&I (Total)	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	EG (<3MMThms)
Cold Year Throughput (Mth)														
2014	Jan		350,295	193,310	14,767	**558,372**	25,879	14,123	**40,002**	23,653	9,679	70,714	623,636	**33,331**
2015	Jan		346,595	193,049	15,619	**555,264**	26,942	16,634	**43,576**	23,399	8,517	75,477	626,781	**31,917**
2016	Jan		350,969	193,624	16,520	**561,113**	28,100	17,349	**45,448**	20,627	3,878	76,746	619,477	**24,505**
2017	Jan		352,827	191,783	17,474	**562,083**	28,379	17,521	**45,901**	19,911	2,594	77,566	606,202	**22,504**
2018	Jan		354,348	189,941	18,482	**562,771**	28,491	17,590	**46,081**	19,387	2,004	77,916	562,295	**21,391**
2019	Jan		355,419	187,338	19,548	**562,305**	28,550	17,627	**46,177**	19,176	1,616	77,959	552,011	**20,792**
2020	Jan		355,509	183,479	20,676	**559,663**	28,626	17,674	**46,300**	18,964	1,434	77,863	539,617	**20,398**

				Nonresidential Core		Total	Noncore - C&I			Noncore - Electric Generatiion				
Specified	**Peak Day Thrughput (Mth/Day)**		Residential	GN-3	G-NGV	Core	C&I (Dist.)	C&I (Trans.)	C&I (Total)	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	EG (<3MMThms)
2014			2,857	913	41.3	**3,811**	60	37	**97**	67	8	202	1,923	**76**
2015			2,838	911	43.7	**3,793**	78	48	**127**	66	35	205	1,808	**101**
2016			2,871	914	46.3	**3,832**	79	49	**128**	62	22	208	1,607	**84**
2017			2,895	905	48.9	**3,849**	80	49	**129**	62	14	210	1,952	**76**
2018			2,913	897	51.7	**3,861**	80	49	**130**	62	22	211	2,010	**84**
2019			2,928	884	54.7	**3,867**	80	50	**130**	59	21	210	1,951	**80**
2020			2,933	866	57.9	**3,857**	80	50	**130**	56	8	210	1,750	**65**

				Nonresidential Core		Total	Noncore - C&I			Noncore - Electric Generatiion				
			Residential	GN-3	G-NGV	Core	C&I (Dist.)	C&I (Trans.)	C&I (Total)	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	EG (<3MMThms)
Forecast Number of Customers														
2014	Jan		835,745	30,012	33	**865,790**	44	8	**52**	47	9	7	12	**56**
2015	Jan		846,046	29,995	34	**876,074**	42	10	**52**	47	8	7	12	**55**
2016	Jan		858,365	30,048	35	**888,448**	42	10	**52**	47	8	7	12	**55**
2017	Jan		871,364	30,150	37	**901,551**	42	10	**52**	47	7	7	12	**53**
2018	Jan		884,559	30,263	38	**914,860**	42	10	**52**	46	4	7	13	**50**
2019	Jan		897,948	30,382	40	**928,370**	42	10	**52**	46	4	7	13	**50**
2020	Jan		911,312	30,510	41	**941,863**	42	10	**52**	46	4	7	13	**50**

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

ANNUAL FORECAST DATA

Row	A	B	T	U	V	W	Y	AA	AB	AC	AD	AE
59					Noncore	System-Wide	System Total			Total	Check Sum of Month	
60			EG (>=3MMThms)	EG (Total)	Total	Total End-Use Dmd	(Mdth/d)	Co-Use-Fuel	"Un-Acnt'd-For" (UAF)	System Throughput	CoUseFue	UAF
61	Average Year Throughput (Mth)											
62	2014	Jan	694,350	727,681	767,683	1,286,563	352	5,001	6,910	1,298,475	5,001	6,910
63	2015	Jan	702,259	734,175	777,751	1,293,136	354	5,026	6,946	1,305,108	5,026	6,946
64	2016	Jan	696,222	720,728	766,176	1,286,914	352	5,002	6,912	1,298,829	5,002	6,912
65	2017	Jan	683,768	706,272	752,173	1,273,447	349	4,950	6,840	1,285,237	4,950	6,840
66	2018	Jan	640,212	661,603	707,684	1,229,205	337	4,778	6,602	1,240,586	4,778	6,602
67	2019	Jan	629,970	650,761	696,938	1,217,573	334	4,733	6,540	1,228,845	4,733	6,540
68	2020	Jan	617,480	637,878	684,178	1,201,797	328	4,671	6,455	1,212,923	4,671	6,455

Row	A	B	C	T	U	V	W	Y
70								Check of
71						Noncore	System-Wide	System Total
72				EG (>=3MMThms)	EG (Total)	Total	Total End-Use Dmd	(Mdth/d)
73	Average Year Sales (Mth)							
74	2014	Jan	365	0	0	0	470,603	129
75	2015	Jan	365	0	0	0	466,651	128
76	2016	Jan	366	0	0	0	471,289	129
77	2017	Jan	365	0	0	0	471,552	129
78	2018	Jan	365	0	0	0	471,493	129
79	2019	Jan	365	0	0	0	470,410	129
80	2020	Jan	366	0	0	0	467,402	128

Row	A	B	T	U	V	W	Y	AA	AB	AC	AD	AE
82							Check of					
83					Noncore	System-Wide	System Total				Check Sum of Month	
84			EG (>=3MMThms)	EG (Total)	Total	Total End-Use Dmd	(Mdth/d)	Co-Use-Fuel	"Un-Acnt'd-For" (UAF)	System Throughput	CoUseFue	UAF
85	Cold Year Throughput (Mth)											
86	2014	Jan	694,350	727,681	767,683	1,326,056	363	5,154	7,123	1,338,333	5,154	7,123
87	2015	Jan	702,259	734,175	777,751	1,333,015	365	5,181	7,160	1,345,356	5,181	7,160
88	2016	Jan	696,222	720,728	766,176	1,327,289	363	5,159	7,129	1,339,577	5,159	7,129
89	2017	Jan	683,768	706,272	752,173	1,314,256	360	5,109	7,059	1,326,423	5,109	7,059
90	2018	Jan	640,212	661,603	707,684	1,270,455	348	4,938	6,824	1,282,217	4,938	6,824
91	2019	Jan	629,970	650,761	696,938	1,259,243	345	4,895	6,764	1,270,902	4,895	6,764
92	2020	Jan	617,480	637,878	684,178	1,243,841	340	4,835	6,681	1,255,357	4,835	6,681

Row	A	B	T	U	V	W
95					Noncore	System-Wide
96	Specified	Peak Day Thrughput (Mth/Day)	EG (>=3MMThms)	EG (Total)	Total	Total End-Use Dmd
97	2014		2,125	2,201	2,298	6,109
98	2015		2,014	2,114	2,241	6,034
99	2016		1,816	1,900	2,028	5,860
100	2017		2,162	2,238	2,367	6,216
101	2018		2,221	2,305	2,435	6,296
102	2019		2,161	2,241	2,371	6,237
103	2020		1,960	2,024	2,154	6,011

Row	A	B	T	U	V	W
106					Noncore	System-Wide
107			EG (>=3MMThms)	EG (Total)	Total	Total
108	Forecast Number of Customers					
109	2014	Jan	19	75	127	865,917
110	2015	Jan	19	74	126	876,200
111	2016	Jan	19	74	126	888,574
112	2017	Jan	19	73	125	901,676
113	2018	Jan	20	70	122	914,982
114	2019	Jan	20	70	122	928,492
115	2020	Jan	20	70	122	941,985

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Row			Nonresidential Core		Total	Noncore - C&I			Noncore - Electric Gene			
59	***MONTHLY FORECAST DATA***											
60		Residential	GN-3	G-NGV	**Core**	C&I (Dist.)	C&I (Trans.)	**C&I (Total)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)
62	2014 Jan	42,906	19,465	1,127	**63,498**	2,457	1,341	**3,797**	1,732	199	6,340	56,859
63	Feb	38,225	19,228	1,142	**58,596**	2,174	1,187	**3,361**	1,892	869	5,365	34,239
64	Mar	35,376	16,853	1,108	**53,336**	2,320	1,266	**3,587**	1,668	1,046	5,200	33,339
65	Apr	29,015	16,080	1,180	**46,275**	2,337	1,276	**3,613**	1,563	820	5,404	44,841
66	May	20,946	14,542	1,209	**36,697**	2,134	1,165	**3,299**	2,211	1,584	6,353	41,979
67	Jun	16,103	13,200	1,220	**30,523**	2,002	1,093	**3,095**	2,147	545	6,286	42,443
68	Jul	15,205	12,694	1,213	**29,111**	2,142	1,169	**3,310**	2,287	978	6,596	61,660
69	Aug	15,129	12,122	1,283	**28,534**	1,923	1,049	**2,972**	1,851	506	6,346	63,073
70	Sep	14,756	12,837	1,297	**28,891**	1,932	1,055	**2,987**	2,224	1,263	6,220	67,580
71	Oct	18,175	13,199	1,326	**32,700**	2,462	1,344	**3,805**	1,906	992	5,006	64,235
72	Nov	27,954	16,519	1,379	**45,853**	2,050	1,119	**3,169**	2,231	619	5,256	53,174
73	Dec	44,179	19,404	1,282	**64,864**	1,945	1,062	**3,007**	1,941	257	6,343	60,214
74												
75	2015 Jan	42,353	19,437	1,192	**62,982**	2,107	1,301	**3,408**	1,970	724	6,238	47,206
76	Feb	37,733	19,201	1,208	**58,142**	2,189	1,351	**3,540**	1,667	321	6,273	33,885
77	Mar	34,920	16,830	1,171	**52,922**	2,224	1,373	**3,597**	1,757	423	6,291	40,166
78	Apr	28,641	16,058	1,248	**45,947**	2,230	1,377	**3,607**	1,579	222	6,249	37,724
79	May	20,676	14,522	1,279	**36,477**	2,224	1,373	**3,597**	1,787	433	6,261	39,698
80	Jun	15,896	13,183	1,291	**30,370**	2,228	1,376	**3,604**	1,717	374	6,279	39,338
81	Jul	15,009	12,679	1,283	**28,970**	2,230	1,377	**3,606**	2,134	955	6,310	77,358
82	Aug	14,934	12,108	1,357	**28,398**	2,236	1,380	**3,616**	2,261	1,150	6,278	76,892
83	Sep	14,566	12,821	1,372	**28,759**	2,243	1,385	**3,629**	2,194	1,055	6,317	73,189
84	Oct	17,941	13,182	1,403	**32,526**	2,272	1,403	**3,675**	2,445	1,411	6,313	55,222
85	Nov	27,594	16,497	1,459	**45,550**	2,333	1,441	**3,774**	1,959	787	6,304	49,420
86	Dec	43,610	19,376	1,356	**64,342**	2,426	1,498	**3,924**	1,930	664	6,365	56,682
87												
88	2016 Jan	42,813	19,493	1,261	**63,568**	2,376	1,467	**3,843**	1,958	655	6,315	47,873
89	Feb	38,630	19,257	1,278	**59,164**	2,383	1,471	**3,854**	1,546	106	6,362	46,513
90	Mar	35,299	16,880	1,239	**53,419**	2,368	1,462	**3,830**	1,496	35	6,389	37,263
91	Apr	28,952	16,106	1,320	**46,378**	2,341	1,445	**3,786**	1,501	43	6,354	35,111
92	May	20,901	14,565	1,353	**36,819**	2,311	1,427	**3,738**	1,555	102	6,370	35,575
93	Jun	16,069	13,223	1,365	**30,657**	2,300	1,420	**3,720**	1,558	119	6,393	35,523
94	Jul	15,172	12,717	1,357	**29,246**	2,292	1,415	**3,707**	1,856	547	6,441	75,877
95	Aug	15,096	12,145	1,435	**28,676**	2,289	1,413	**3,703**	1,978	616	6,400	77,716
96	Sep	14,724	12,860	1,451	**29,036**	2,291	1,414	**3,705**	1,968	611	6,433	72,502
97	Oct	18,136	13,222	1,484	**32,842**	2,315	1,429	**3,745**	1,858	495	6,421	51,367
98	Nov	27,894	16,546	1,543	**45,983**	2,372	1,464	**3,836**	1,656	267	6,406	51,133
99	Dec	44,083	19,434	1,434	**64,951**	2,462	1,520	**3,981**	1,698	282	6,462	53,024
100												
101	2017 Jan	43,062	19,307	1,334	**63,703**	2,408	1,487	**3,895**	1,618	193	6,399	40,837
102	Feb	38,364	19,073	1,352	**58,789**	2,413	1,490	**3,903**	1,584	120	6,445	36,106
103	Mar	35,504	16,720	1,310	**53,535**	2,397	1,480	**3,876**	1,514	27	6,470	37,731
104	Apr	29,120	15,953	1,396	**46,469**	2,368	1,462	**3,830**	1,519	45	6,436	35,891
105	May	21,022	14,427	1,431	**36,879**	2,337	1,443	**3,780**	1,559	75	6,448	35,866
106	Jun	16,162	13,098	1,444	**30,704**	2,324	1,435	**3,759**	1,556	82	6,466	35,694
107	Jul	15,260	12,597	1,435	**29,292**	2,315	1,429	**3,743**	1,866	466	6,509	75,178
108	Aug	15,184	12,031	1,518	**28,732**	2,310	1,426	**3,736**	1,959	595	6,463	75,917
109	Sep	14,810	12,738	1,535	**29,083**	2,310	1,426	**3,736**	1,750	357	6,492	74,409
110	Oct	18,241	13,097	1,569	**32,907**	2,333	1,440	**3,774**	1,683	217	6,476	50,171
111	Nov	28,056	16,388	1,632	**46,077**	2,388	1,475	**3,863**	1,680	235	6,455	53,330
112	Dec	44,339	19,248	1,517	**65,104**	2,477	1,529	**4,006**	1,622	182	6,506	55,071

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MONTHLY FORECAST DATA

Row	Year	Month	Residential	Nonresidential Core GN-3	Nonresidential Core G-NGV	Total Core	Noncore - C&I C&I (Dist.)	Noncore - C&I C&I (Trans.)	Noncore - C&I **C&I (Total)**	Noncore - Electric Gene EG-Dist. (<3MMThms)	Noncore - Electric Gene EG-Trans. (<3MMThms)	Noncore - Electric Gene EG-Dist. (>=3MMThms)	Noncore - Electric Gene EG-Trans. (>=3MMThms)
113													
114	2018	Jan	43,198	19,121	1,411	**63,730**	2,420	1,494	**3,914**	1,649	280	6,432	50,228
115		Feb	38,486	18,889	1,430	**58,805**	2,424	1,497	**3,921**	1,581	110	6,476	33,703
116		Mar	35,617	16,559	1,386	**53,562**	2,407	1,486	**3,894**	1,523	34	6,499	31,339
117		Apr	29,212	15,800	1,477	**46,489**	2,377	1,468	**3,844**	1,508	13	6,460	28,524
118		May	21,088	14,288	1,514	**36,890**	2,346	1,448	**3,794**	1,532	32	6,473	31,535
119		Jun	16,213	12,972	1,527	**30,713**	2,333	1,440	**3,774**	1,526	34	6,492	37,893
120		Jul	15,308	12,477	1,518	**29,303**	2,323	1,434	**3,757**	1,730	344	6,535	61,852
121		Aug	15,232	11,916	1,605	**28,753**	2,319	1,432	**3,750**	1,764	357	6,491	66,075
122		Sep	14,857	12,616	1,624	**29,097**	2,318	1,431	**3,749**	1,765	369	6,521	60,631
123		Oct	18,299	12,971	1,660	**32,930**	2,342	1,446	**3,788**	1,601	133	6,512	53,707
124		Nov	28,145	16,231	1,726	**46,102**	2,397	1,480	**3,877**	1,591	123	6,488	52,747
125		Dec	44,480	19,063	1,604	**65,147**	2,485	1,534	**4,019**	1,615	177	6,537	54,062
126													
127	2019	Jan	43,273	18,859	1,492	**63,624**	2,428	1,499	**3,927**	1,625	209	6,465	49,956
128		Feb	38,552	18,630	1,512	**58,695**	2,432	1,501	**3,933**	1,555	63	6,504	33,504
129		Mar	35,678	16,332	1,466	**53,477**	2,415	1,491	**3,905**	1,531	29	6,522	32,122
130		Apr	29,263	15,583	1,562	**46,408**	2,383	1,472	**3,855**	1,515	15	6,477	27,496
131		May	21,125	14,092	1,601	**36,818**	2,352	1,452	**3,804**	1,535	59	6,484	30,311
132		Jun	16,241	12,795	1,616	**30,652**	2,338	1,444	**3,782**	1,502	0	6,498	35,301
133		Jul	15,335	12,306	1,606	**29,246**	2,327	1,437	**3,763**	1,661	220	6,533	59,903
134		Aug	15,258	11,753	1,698	**28,709**	2,322	1,434	**3,756**	1,688	241	6,485	63,227
135		Sep	14,882	12,444	1,717	**29,043**	2,321	1,433	**3,754**	1,723	314	6,511	58,624
136		Oct	18,330	12,794	1,756	**32,880**	2,344	1,447	**3,791**	1,627	165	6,492	58,795
137		Nov	28,194	16,009	1,826	**46,028**	2,400	1,482	**3,881**	1,624	162	6,469	50,236
138		Dec	44,557	18,802	1,697	**65,055**	2,488	1,536	**4,024**	1,589	140	6,520	52,535
139													
140	2020	Jan	43,149	18,470	1,578	**63,197**	2,430	1,500	**3,930**	1,582	159	6,447	47,581
141		Feb	38,932	18,246	1,599	**58,778**	2,435	1,503	**3,938**	1,553	66	6,488	32,746
142		Mar	35,576	15,996	1,551	**53,123**	2,420	1,494	**3,913**	1,515	19	6,508	31,775
143		Apr	29,179	15,262	1,652	**46,093**	2,392	1,477	**3,869**	1,505	10	6,466	26,968
144		May	21,064	13,802	1,693	**36,559**	2,360	1,457	**3,817**	1,533	58	6,475	28,913
145		Jun	16,195	12,531	1,709	**30,435**	2,347	1,449	**3,795**	1,498	0	6,491	34,356
146		Jul	15,291	12,053	1,698	**29,042**	2,335	1,442	**3,777**	1,631	220	6,530	58,747
147		Aug	15,215	11,511	1,796	**28,521**	2,330	1,438	**3,768**	1,693	294	6,482	61,944
148		Sep	14,840	12,188	1,816	**28,844**	2,328	1,438	**3,766**	1,665	219	6,508	57,419
149		Oct	18,278	12,530	1,857	**32,665**	2,351	1,451	**3,802**	1,598	138	6,488	55,837
150		Nov	28,113	15,679	1,931	**45,723**	2,406	1,485	**3,891**	1,580	80	6,466	50,282
151		Dec	44,429	18,414	1,795	**64,638**	2,493	1,539	**4,033**	1,611	171	6,515	53,049

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Row	A	B	S	T	U	V	W	Y	AA	AB	AC
59	***MONTHLY FORECAST DATA***		ratiion			Noncore	System-Wide	**System Total**			**Total**
60			**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	**Total**	**Total End-Use Dmd**	**(Mdth/d)**	**Co-Use-Fuel**	**"Un-Acnt'd-For" (UAF)**	**System Throughput**
62	2014	Jan	1,931	63,199	65,130	68,927	132,425	427	515	711	133,651
63		Feb	2,761	39,603	42,365	45,725	104,322	373	406	560	105,287
64		Mar	2,714	38,539	41,254	44,840	98,177	317	382	527	99,086
65		Apr	2,383	50,246	52,628	56,241	102,516	342	398	551	103,466
66		May	3,794	48,332	52,126	55,425	92,122	297	358	495	92,975
67		Jun	2,693	48,729	51,422	54,516	85,040	283	331	457	85,827
68		Jul	3,265	68,256	71,521	74,831	103,943	335	404	558	104,905
69		Aug	2,358	69,420	71,778	74,750	103,283	333	401	555	104,240
70		Sep	3,487	73,800	77,287	80,274	109,165	364	424	586	110,176
71		Oct	2,898	69,240	72,138	75,944	108,644	350	422	584	109,650
72		Nov	2,850	58,430	61,279	64,449	110,302	368	429	592	111,323
73		Dec	2,197	66,557	68,754	71,761	136,625	441	531	734	137,890
74											
75	2015	Jan	2,693	53,444	56,137	59,545	122,527	395	476	658	123,661
76		Feb	1,988	40,158	42,145	45,685	103,827	371	404	558	104,788
77		Mar	2,181	46,457	48,638	52,235	105,156	339	409	565	106,130
78		Apr	1,801	43,973	45,774	49,381	95,329	318	371	512	96,211
79		May	2,220	45,959	48,179	51,777	88,253	285	343	474	89,071
80		Jun	2,091	45,617	47,708	51,312	81,681	272	317	439	82,438
81		Jul	3,089	83,668	86,758	90,364	119,334	385	464	641	120,439
82		Aug	3,411	83,170	86,581	90,197	118,596	383	461	637	119,694
83		Sep	3,249	79,505	82,754	86,383	115,142	384	448	618	116,208
84		Oct	3,855	61,536	65,391	69,066	101,592	328	395	546	102,533
85		Nov	2,745	55,724	58,469	62,243	107,793	359	419	579	108,791
86		Dec	2,594	63,047	65,641	69,565	133,907	432	520	719	135,146
87											
88	2016	Jan	2,612	54,188	56,801	60,644	124,211	401	483	667	125,361
89		Feb	1,653	52,874	54,527	58,381	117,546	405	457	631	118,634
90		Mar	1,530	43,652	45,183	49,013	102,432	330	398	550	103,380
91		Apr	1,543	41,464	43,007	46,793	93,171	311	362	500	94,034
92		May	1,656	41,945	43,601	47,339	84,158	271	327	452	84,937
93		Jun	1,678	41,916	43,594	47,314	77,971	260	303	419	78,693
94		Jul	2,404	82,318	84,721	88,429	117,674	380	457	632	118,764
95		Aug	2,595	84,117	86,711	90,414	119,090	384	463	640	120,193
96		Sep	2,579	78,935	81,513	85,218	114,254	381	444	614	115,312
97		Oct	2,353	57,788	60,141	63,885	96,727	312	376	520	97,623
98		Nov	1,923	57,539	59,462	63,298	109,281	364	425	587	110,293
99		Dec	1,980	59,486	61,466	65,448	130,398	421	507	700	131,606
100											
101	2017	Jan	1,811	47,236	49,047	52,942	116,644	376	453	627	117,724
102		Feb	1,704	42,551	44,254	48,157	106,946	382	416	574	107,936
103		Mar	1,541	44,202	45,743	49,619	103,154	333	401	554	104,109
104		Apr	1,564	42,327	43,891	47,721	94,190	314	366	506	95,062
105		May	1,633	42,314	43,948	47,728	84,607	273	329	454	85,390
106		Jun	1,639	42,161	43,800	47,559	78,262	261	304	420	78,987
107		Jul	2,332	81,686	84,018	87,761	117,053	378	455	629	118,137
108		Aug	2,554	82,381	84,935	88,671	117,403	379	456	631	118,490
109		Sep	2,107	80,901	83,007	86,743	115,826	386	450	622	116,899
110		Oct	1,900	56,647	58,548	62,321	95,228	307	370	511	96,110
111		Nov	1,915	59,785	61,700	65,563	111,640	372	434	600	112,674
112		Dec	1,804	61,578	63,382	67,387	132,492	427	515	712	133,718

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

Row	A	B	S	T	U	V	W	Y	AA	AB	AC
59	***MONTHLY FORECAST DATA***		ratiion			Noncore	System-Wide	System Total			Total
60			EG (<3MMThms)	EG (>=3MMThms)	EG (Total)	Total	Total End-Use Dmd	(Mdth/d)	Co-Use-Fuel	"Un-Acnt'd-For" (UAF)	System Throughput
113											
114	2018	Jan	1,929	56,660	58,589	62,503	126,233	407	491	678	127,402
115		Feb	1,691	40,179	41,870	45,791	104,596	374	407	562	105,564
116		Mar	1,558	37,838	39,396	43,289	96,852	312	376	520	97,748
117		Apr	1,521	34,983	36,504	40,349	86,838	289	338	466	87,641
118		May	1,564	38,007	39,571	43,366	80,256	259	312	431	80,999
119		Jun	1,560	44,386	45,945	49,719	80,432	268	313	432	81,177
120		Jul	2,074	68,387	70,462	74,219	103,522	334	402	556	104,480
121		Aug	2,120	72,566	74,686	78,437	107,190	346	417	576	108,182
122		Sep	2,135	67,152	69,287	73,037	102,133	340	397	549	103,079
123		Oct	1,734	60,219	61,953	65,741	98,671	318	384	530	99,585
124		Nov	1,714	59,235	60,949	64,825	110,928	370	431	596	111,955
125		Dec	1,792	60,599	62,391	66,409	131,557	424	511	707	132,775
126											
127	2019	Jan	1,834	56,421	58,254	62,181	125,805	406	489	676	126,970
128		Feb	1,618	40,007	41,626	45,559	104,254	372	405	560	105,219
129		Mar	1,560	38,644	40,204	44,109	97,586	315	379	524	98,490
130		Apr	1,531	33,973	35,504	39,359	85,767	286	333	461	86,561
131		May	1,594	36,795	38,389	42,193	79,011	255	307	424	79,742
132		Jun	1,502	41,799	43,301	47,083	77,735	259	302	418	78,454
133		Jul	1,881	66,436	68,317	72,080	101,327	327	394	544	102,265
134		Aug	1,928	69,712	71,640	75,396	104,105	336	405	559	105,069
135		Sep	2,037	65,135	67,172	70,927	99,970	333	389	537	100,896
136		Oct	1,792	65,287	67,078	70,870	103,750	335	403	557	104,710
137		Nov	1,786	56,706	58,492	62,373	108,401	361	421	582	109,404
138		Dec	1,729	59,055	60,784	64,807	129,863	419	505	698	131,065
139											
140	2020	Jan	1,741	54,027	55,769	59,699	122,896	396	478	660	124,034
141		Feb	1,619	39,234	40,853	44,791	103,570	357	403	556	104,528
142		Mar	1,533	38,283	39,817	43,730	96,853	312	376	520	97,750
143		Apr	1,516	33,433	34,949	38,818	84,911	283	330	456	85,697
144		May	1,591	35,388	36,979	40,796	77,356	250	301	415	78,072
145		Jun	1,498	40,847	42,344	46,140	76,575	255	298	411	77,284
146		Jul	1,851	65,277	67,128	70,905	99,946	322	388	537	100,872
147		Aug	1,987	68,426	70,412	74,181	102,702	331	399	552	103,653
148		Sep	1,884	63,927	65,811	69,577	98,421	328	383	529	99,332
149		Oct	1,736	62,325	64,061	67,863	100,528	324	391	540	101,459
150		Nov	1,660	56,748	58,408	62,299	108,022	360	420	580	109,022
151		Dec	1,783	59,564	61,347	65,380	130,018	419	505	698	131,221

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

Row	A	B	C	F	G	I	J	L	M	N
154	***MONTHLY FORECAST DATA***				Nonresidential Core		**Total**		Noncore - C&I	
155				Residential	GN-3	G-NGV	**Core**	C&I (Dist.)	C&I (Trans.)	**C&I (Total)**
156	**Average Year Sales (Mth)**									
157	2014	Jan	31	42,535	15,686	415	**58,637**	0	0	**0**
158		Feb	28	37,895	15,495	421	**53,811**	0	0	**0**
159		Mar	31	35,070	13,581	434	**49,085**	0	0	**0**
160		Apr	30	28,764	12,958	432	**42,155**	0	0	**0**
161		May	31	20,765	11,719	460	**32,943**	0	0	**0**
162		Jun	30	15,964	10,637	457	**27,059**	0	0	**0**
163		Jul	31	15,073	10,229	432	**25,735**	0	0	**0**
164		Aug	31	14,998	9,769	450	**25,217**	0	0	**0**
165		Sep	30	14,629	10,345	465	**25,439**	0	0	**0**
166		Oct	31	18,018	10,637	464	**29,119**	0	0	**0**
167		Nov	30	27,713	13,312	488	**41,513**	0	0	**0**
168		Dec	31	43,797	15,637	458	**59,892**	0	0	**0**
169										
170	2015	Jan	31	41,987	15,663	439	**58,090**	0	0	**0**
171		Feb	28	37,407	15,473	445	**53,325**	0	0	**0**
172		Mar	31	34,618	13,563	459	**48,640**	0	0	**0**
173		Apr	30	28,394	12,941	457	**41,792**	0	0	**0**
174		May	31	20,497	11,703	486	**32,686**	0	0	**0**
175		Jun	30	15,759	10,624	484	**26,866**	0	0	**0**
176		Jul	31	14,879	10,217	457	**25,553**	0	0	**0**
177		Aug	31	14,805	9,757	476	**25,038**	0	0	**0**
178		Sep	30	14,440	10,332	492	**25,264**	0	0	**0**
179		Oct	31	17,786	10,623	491	**28,900**	0	0	**0**
180		Nov	30	27,356	13,294	516	**41,166**	0	0	**0**
181		Dec	31	43,233	15,615	484	**59,332**	0	0	**0**
182										
183	2016	Jan	31	42,443	15,709	465	**58,617**	0	0	**0**
184		Feb	29	38,296	15,518	470	**54,284**	0	0	**0**
185		Mar	31	34,994	13,603	485	**49,083**	0	0	**0**
186		Apr	30	28,702	12,979	484	**42,165**	0	0	**0**
187		May	31	20,720	11,737	515	**32,972**	0	0	**0**
188		Jun	30	15,930	10,656	512	**27,097**	0	0	**0**
189		Jul	31	15,041	10,248	483	**25,772**	0	0	**0**
190		Aug	31	14,966	9,787	503	**25,256**	0	0	**0**
191		Sep	30	14,597	10,363	520	**25,481**	0	0	**0**
192		Oct	31	17,979	10,655	519	**29,153**	0	0	**0**
193		Nov	30	27,653	13,334	546	**41,533**	0	0	**0**
194		Dec	31	43,703	15,661	512	**59,875**	0	0	**0**
195										
196	2017	Jan	31	42,690	15,559	492	**58,740**	0	0	**0**
197		Feb	28	38,033	15,370	498	**53,900**	0	0	**0**
198		Mar	31	35,198	13,474	513	**49,185**	0	0	**0**
199		Apr	30	28,869	12,856	512	**42,236**	0	0	**0**
200		May	31	20,840	11,626	544	**33,010**	0	0	**0**
201		Jun	30	16,022	10,555	541	**27,118**	0	0	**0**
202		Jul	31	15,128	10,151	511	**25,790**	0	0	**0**
203		Aug	31	15,053	9,695	532	**25,280**	0	0	**0**
204		Sep	30	14,682	10,265	550	**25,498**	0	0	**0**
205		Oct	31	18,083	10,554	549	**29,187**	0	0	**0**
206		Nov	30	27,814	13,207	578	**41,598**	0	0	**0**
207		Dec	31	43,956	15,511	542	**60,009**	0	0	**0**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

Row				Residential	Nonresidential Core GN-3	Nonresidential Core G-NGV	Total Core	Noncore - C&I C&I (Dist.)	Noncore - C&I C&I (Trans.)	Noncore - C&I **C&I (Total)**
154	***MONTHLY FORECAST DATA***									
156	**Average Year Sales (Mth)**									
208										
209	2018	Jan	31	42,825	15,409	520	**58,754**	0	0	**0**
210		Feb	28	38,153	15,222	526	**53,902**	0	0	**0**
211		Mar	31	35,309	13,344	543	**49,197**	0	0	**0**
212		Apr	30	28,960	12,732	541	**42,233**	0	0	**0**
213		May	31	20,906	11,514	576	**32,996**	0	0	**0**
214		Jun	30	16,073	10,454	572	**27,099**	0	0	**0**
215		Jul	31	15,176	10,054	541	**25,771**	0	0	**0**
216		Aug	31	15,100	9,602	563	**25,266**	0	0	**0**
217		Sep	30	14,728	10,167	582	**25,478**	0	0	**0**
218		Oct	31	18,141	10,453	581	**29,175**	0	0	**0**
219		Nov	30	27,902	13,080	611	**41,593**	0	0	**0**
220		Dec	31	44,096	15,362	573	**60,031**	0	0	**0**
221										
222	2019	Jan	31	42,899	15,197	550	**58,646**	0	0	**0**
223		Feb	28	38,219	15,013	557	**53,789**	0	0	**0**
224		Mar	31	35,370	13,161	574	**49,106**	0	0	**0**
225		Apr	30	29,010	12,558	572	**42,140**	0	0	**0**
226		May	31	20,942	11,356	609	**32,907**	0	0	**0**
227		Jun	30	16,101	10,311	605	**27,017**	0	0	**0**
228		Jul	31	15,202	9,917	572	**25,691**	0	0	**0**
229		Aug	31	15,127	9,471	596	**25,193**	0	0	**0**
230		Sep	30	14,754	10,028	616	**25,398**	0	0	**0**
231		Oct	31	18,172	10,310	614	**29,096**	0	0	**0**
232		Nov	30	27,950	12,901	646	**41,497**	0	0	**0**
233		Dec	31	44,172	15,151	606	**59,929**	0	0	**0**
234										
235	2020	Jan	31	42,776	14,884	582	**58,242**	0	0	**0**
236		Feb	29	38,596	14,704	589	**53,889**	0	0	**0**
237		Mar	31	35,269	12,890	607	**48,767**	0	0	**0**
238		Apr	30	28,927	12,299	605	**41,831**	0	0	**0**
239		May	31	20,882	11,122	644	**32,649**	0	0	**0**
240		Jun	30	16,055	10,099	640	**26,794**	0	0	**0**
241		Jul	31	15,159	9,713	605	**25,476**	0	0	**0**
242		Aug	31	15,083	9,276	630	**24,989**	0	0	**0**
243		Sep	30	14,712	9,821	651	**25,184**	0	0	**0**
244		Oct	31	18,120	10,098	650	**28,868**	0	0	**0**
245		Nov	30	27,870	12,635	684	**41,188**	0	0	**0**
246		Dec	31	44,045	14,839	641	**59,525**	0	0	**0**

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

A	B	C	O	P	Q	R	S	T	U	V	W	Y
MONTHLY FORECAST DATA			Noncore - Electric Generatiion							Noncore	System-Wide	**System Total**
			EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	**Total**	**Total End-Use Dmd**	**(Mdth/d)**
Average Year Sales (Mth)												
2014	Jan	31	0	0	0	0	**0**	**0**	**0**	**0**	**58,637**	**189**
	Feb	28	0	0	0	0	**0**	**0**	**0**	**0**	**53,811**	**192**
	Mar	31	0	0	0	0	**0**	**0**	**0**	**0**	**49,085**	**158**
	Apr	30	0	0	0	0	**0**	**0**	**0**	**0**	**42,155**	**141**
	May	31	0	0	0	0	**0**	**0**	**0**	**0**	**32,943**	**106**
	Jun	30	0	0	0	0	**0**	**0**	**0**	**0**	**27,059**	**90**
	Jul	31	0	0	0	0	**0**	**0**	**0**	**0**	**25,735**	**83**
	Aug	31	0	0	0	0	**0**	**0**	**0**	**0**	**25,217**	**81**
	Sep	30	0	0	0	0	**0**	**0**	**0**	**0**	**25,439**	**85**
	Oct	31	0	0	0	0	**0**	**0**	**0**	**0**	**29,119**	**94**
	Nov	30	0	0	0	0	**0**	**0**	**0**	**0**	**41,513**	**138**
	Dec	31	0	0	0	0	**0**	**0**	**0**	**0**	**59,892**	**193**
2015	Jan	31	0	0	0	0	**0**	**0**	**0**	**0**	**58,090**	**187**
	Feb	28	0	0	0	0	**0**	**0**	**0**	**0**	**53,325**	**190**
	Mar	31	0	0	0	0	**0**	**0**	**0**	**0**	**48,640**	**157**
	Apr	30	0	0	0	0	**0**	**0**	**0**	**0**	**41,792**	**139**
	May	31	0	0	0	0	**0**	**0**	**0**	**0**	**32,686**	**105**
	Jun	30	0	0	0	0	**0**	**0**	**0**	**0**	**26,866**	**90**
	Jul	31	0	0	0	0	**0**	**0**	**0**	**0**	**25,553**	**82**
	Aug	31	0	0	0	0	**0**	**0**	**0**	**0**	**25,038**	**81**
	Sep	30	0	0	0	0	**0**	**0**	**0**	**0**	**25,264**	**84**
	Oct	31	0	0	0	0	**0**	**0**	**0**	**0**	**28,900**	**93**
	Nov	30	0	0	0	0	**0**	**0**	**0**	**0**	**41,166**	**137**
	Dec	31	0	0	0	0	**0**	**0**	**0**	**0**	**59,332**	**191**
2016	Jan	31	0	0	0	0	**0**	**0**	**0**	**0**	**58,617**	**189**
	Feb	29	0	0	0	0	**0**	**0**	**0**	**0**	**54,284**	**187**
	Mar	31	0	0	0	0	**0**	**0**	**0**	**0**	**49,083**	**158**
	Apr	30	0	0	0	0	**0**	**0**	**0**	**0**	**42,165**	**141**
	May	31	0	0	0	0	**0**	**0**	**0**	**0**	**32,972**	**106**
	Jun	30	0	0	0	0	**0**	**0**	**0**	**0**	**27,097**	**90**
	Jul	31	0	0	0	0	**0**	**0**	**0**	**0**	**25,772**	**83**
	Aug	31	0	0	0	0	**0**	**0**	**0**	**0**	**25,256**	**81**
	Sep	30	0	0	0	0	**0**	**0**	**0**	**0**	**25,481**	**85**
	Oct	31	0	0	0	0	**0**	**0**	**0**	**0**	**29,153**	**94**
	Nov	30	0	0	0	0	**0**	**0**	**0**	**0**	**41,533**	**138**
	Dec	31	0	0	0	0	**0**	**0**	**0**	**0**	**59,875**	**193**
2017	Jan	31	0	0	0	0	**0**	**0**	**0**	**0**	**58,740**	**189**
	Feb	28	0	0	0	0	**0**	**0**	**0**	**0**	**53,900**	**193**
	Mar	31	0	0	0	0	**0**	**0**	**0**	**0**	**49,185**	**159**
	Apr	30	0	0	0	0	**0**	**0**	**0**	**0**	**42,236**	**141**
	May	31	0	0	0	0	**0**	**0**	**0**	**0**	**33,010**	**106**
	Jun	30	0	0	0	0	**0**	**0**	**0**	**0**	**27,118**	**90**
	Jul	31	0	0	0	0	**0**	**0**	**0**	**0**	**25,790**	**83**
	Aug	31	0	0	0	0	**0**	**0**	**0**	**0**	**25,280**	**82**
	Sep	30	0	0	0	0	**0**	**0**	**0**	**0**	**25,498**	**85**
	Oct	31	0	0	0	0	**0**	**0**	**0**	**0**	**29,187**	**94**
	Nov	30	0	0	0	0	**0**	**0**	**0**	**0**	**41,598**	**139**
	Dec	31	0	0	0	0	**0**	**0**	**0**	**0**	**60,009**	**194**

	A	B	C	D	E	O	P	Q	R	S	T	U	V	W	X	Y
1	**2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)**															
154	***MONTHLY FORECAST DATA***					Noncore - Electric Generatiion							Noncore	System-Wide		**System Total**
155						EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	**Total**	**Total End-Use Dmd**		**(Mdth/d)**
156	**Average Year Sales (Mth)**															
208																
209	2018	Jan	31			0	0	0	0	**0**	**0**	**0**	**0**	**58,754**		**190**
210		Feb	28			0	0	0	0	**0**	**0**	**0**	**0**	**53,902**		**193**
211		Mar	31			0	0	0	0	**0**	**0**	**0**	**0**	**49,197**		**159**
212		Apr	30			0	0	0	0	**0**	**0**	**0**	**0**	**42,233**		**141**
213		May	31			0	0	0	0	**0**	**0**	**0**	**0**	**32,996**		**106**
214		Jun	30			0	0	0	0	**0**	**0**	**0**	**0**	**27,099**		**90**
215		Jul	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,771**		**83**
216		Aug	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,266**		**82**
217		Sep	30			0	0	0	0	**0**	**0**	**0**	**0**	**25,478**		**85**
218		Oct	31			0	0	0	0	**0**	**0**	**0**	**0**	**29,175**		**94**
219		Nov	30			0	0	0	0	**0**	**0**	**0**	**0**	**41,593**		**139**
220		Dec	31			0	0	0	0	**0**	**0**	**0**	**0**	**60,031**		**194**
221																
222	2019	Jan	31			0	0	0	0	**0**	**0**	**0**	**0**	**58,646**		**189**
223		Feb	28			0	0	0	0	**0**	**0**	**0**	**0**	**53,789**		**192**
224		Mar	31			0	0	0	0	**0**	**0**	**0**	**0**	**49,106**		**158**
225		Apr	30			0	0	0	0	**0**	**0**	**0**	**0**	**42,140**		**140**
226		May	31			0	0	0	0	**0**	**0**	**0**	**0**	**32,907**		**106**
227		Jun	30			0	0	0	0	**0**	**0**	**0**	**0**	**27,017**		**90**
228		Jul	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,691**		**83**
229		Aug	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,193**		**81**
230		Sep	30			0	0	0	0	**0**	**0**	**0**	**0**	**25,398**		**85**
231		Oct	31			0	0	0	0	**0**	**0**	**0**	**0**	**29,096**		**94**
232		Nov	30			0	0	0	0	**0**	**0**	**0**	**0**	**41,497**		**138**
233		Dec	31			0	0	0	0	**0**	**0**	**0**	**0**	**59,929**		**193**
234																
235	2020	Jan	31			0	0	0	0	**0**	**0**	**0**	**0**	**58,242**		**188**
236		Feb	29			0	0	0	0	**0**	**0**	**0**	**0**	**53,889**		**192**
237		Mar	31			0	0	0	0	**0**	**0**	**0**	**0**	**48,767**		**157**
238		Apr	30			0	0	0	0	**0**	**0**	**0**	**0**	**41,831**		**139**
239		May	31			0	0	0	0	**0**	**0**	**0**	**0**	**32,649**		**105**
240		Jun	30			0	0	0	0	**0**	**0**	**0**	**0**	**26,794**		**89**
241		Jul	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,476**		**82**
242		Aug	31			0	0	0	0	**0**	**0**	**0**	**0**	**24,989**		**81**
243		Sep	30			0	0	0	0	**0**	**0**	**0**	**0**	**25,184**		**84**
244		Oct	31			0	0	0	0	**0**	**0**	**0**	**0**	**28,868**		**93**
245		Nov	30			0	0	0	0	**0**	**0**	**0**	**0**	**41,188**		**137**
246		Dec	31			0	0	0	0	**0**	**0**	**0**	**0**	**59,525**		**192**

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

MONTHLY FORECAST DATA

		Nonresidential Core		Total	Noncore - C&I			Noncore - Electric Gene			
	Residential	GN-3	G-NGV	Core	C&I (Dist.)	C&I (Trans.)	C&I (Total)	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)
Cold Year Throughput (Mth)											
2014 Jan	49,393	20,850	1,127	**71,370**	2,457	1,341	**3,797**	1,732	199	6,340	56,859
Feb	43,960	20,556	1,142	**65,659**	2,174	1,187	**3,361**	1,892	869	5,365	34,239
Mar	40,091	17,613	1,108	**58,811**	2,320	1,266	**3,587**	1,668	1,046	5,200	33,339
Apr	32,349	16,655	1,180	**50,184**	2,337	1,276	**3,613**	1,563	820	5,404	44,841
May	22,265	14,748	1,209	**38,223**	2,134	1,165	**3,299**	2,211	1,584	6,353	41,979
Jun	16,400	13,083	1,220	**30,703**	2,002	1,093	**3,095**	2,147	545	6,286	42,443
Jul	15,173	12,446	1,213	**28,832**	2,142	1,169	**3,310**	2,287	978	6,596	61,660
Aug	15,080	13,697	1,283	**30,060**	1,923	1,049	**2,972**	1,851	506	6,346	63,073
Sep	14,736	12,606	1,297	**28,640**	1,932	1,055	**2,987**	2,224	1,263	6,220	67,580
Oct	18,843	13,083	1,326	**33,252**	2,462	1,344	**3,805**	1,906	992	5,006	64,235
Nov	31,040	17,199	1,379	**49,618**	2,050	1,119	**3,169**	2,231	619	5,256	53,174
Dec	50,965	20,774	1,282	**73,020**	1,945	1,062	**3,007**	1,941	257	6,343	60,214
2015 Jan	48,871	20,820	1,192	**70,883**	2,107	1,301	**3,408**	1,970	724	6,238	47,206
Feb	43,496	20,526	1,208	**65,230**	2,189	1,351	**3,540**	1,667	321	6,273	33,885
Mar	39,667	17,589	1,171	**58,427**	2,224	1,373	**3,597**	1,757	423	6,291	40,166
Apr	32,008	16,632	1,248	**49,888**	2,230	1,377	**3,607**	1,579	222	6,249	37,724
May	22,030	14,727	1,279	**38,037**	2,224	1,373	**3,597**	1,787	433	6,261	39,698
Jun	16,227	13,067	1,291	**30,585**	2,228	1,376	**3,604**	1,717	374	6,279	39,338
Jul	15,013	12,432	1,283	**28,728**	2,230	1,377	**3,606**	2,134	955	6,310	77,358
Aug	14,921	13,680	1,357	**29,957**	2,236	1,380	**3,616**	2,261	1,150	6,278	76,892
Sep	14,580	12,591	1,372	**28,543**	2,243	1,385	**3,629**	2,194	1,055	6,317	73,189
Oct	18,644	13,067	1,403	**33,113**	2,272	1,403	**3,675**	2,445	1,411	6,313	55,222
Nov	30,712	17,175	1,459	**49,346**	2,333	1,441	**3,774**	1,959	787	6,304	49,420
Dec	50,427	20,744	1,356	**72,527**	2,426	1,498	**3,924**	1,930	664	6,365	56,682
2016 Jan	49,419	20,880	1,261	**71,560**	2,376	1,467	**3,843**	1,958	655	6,315	47,873
Feb	44,470	20,586	1,278	**66,334**	2,383	1,471	**3,854**	1,546	106	6,362	46,513
Mar	40,112	17,641	1,239	**58,992**	2,368	1,462	**3,830**	1,496	35	6,389	37,263
Apr	32,367	16,681	1,320	**50,368**	2,341	1,445	**3,786**	1,501	43	6,354	35,111
May	22,277	14,771	1,353	**38,401**	2,311	1,427	**3,738**	1,555	102	6,370	35,575
Jun	16,409	13,107	1,365	**30,881**	2,300	1,420	**3,720**	1,558	119	6,393	35,523
Jul	15,181	12,470	1,357	**29,008**	2,292	1,415	**3,707**	1,856	547	6,441	75,877
Aug	15,088	13,721	1,435	**30,244**	2,289	1,413	**3,703**	1,978	616	6,400	77,716
Sep	14,744	12,629	1,451	**28,824**	2,291	1,414	**3,705**	1,968	611	6,433	72,502
Oct	18,853	13,106	1,484	**33,443**	2,315	1,429	**3,745**	1,858	495	6,421	51,367
Nov	31,056	17,226	1,543	**49,825**	2,372	1,464	**3,836**	1,656	267	6,406	51,133
Dec	50,992	20,805	1,434	**73,231**	2,462	1,520	**3,981**	1,698	282	6,462	53,024
2017 Jan	49,749	20,681	1,334	**71,764**	2,408	1,487	**3,895**	1,618	193	6,399	40,837
Feb	44,278	20,390	1,352	**66,019**	2,413	1,490	**3,903**	1,584	120	6,445	36,106
Mar	40,381	17,473	1,310	**59,164**	2,397	1,480	**3,876**	1,514	27	6,470	37,731
Apr	32,583	16,523	1,396	**50,502**	2,368	1,462	**3,830**	1,519	45	6,436	35,891
May	22,426	14,630	1,431	**38,488**	2,337	1,443	**3,780**	1,559	75	6,448	35,866
Jun	16,519	12,983	1,444	**30,945**	2,324	1,435	**3,759**	1,556	82	6,466	35,694
Jul	15,283	12,352	1,435	**29,070**	2,315	1,429	**3,743**	1,866	466	6,509	75,178
Aug	15,189	13,590	1,518	**30,297**	2,310	1,426	**3,736**	1,959	595	6,463	75,917
Sep	14,843	12,510	1,535	**28,887**	2,310	1,426	**3,736**	1,750	357	6,492	74,409
Oct	18,979	12,982	1,569	**33,530**	2,333	1,440	**3,774**	1,683	217	6,476	50,171
Nov	31,264	17,062	1,632	**49,958**	2,388	1,475	**3,863**	1,680	235	6,455	53,330
Dec	51,333	20,607	1,517	**73,457**	2,477	1,529	**4,006**	1,622	182	6,506	55,071

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

MONTHLY FORECAST DATA

Row	Year	Month	Residential	Nonresidential Core GN-3	Nonresidential Core G-NGV	Total Core	Noncore - C&I C&I (Dist.)	Noncore - C&I C&I (Trans.)	Noncore - C&I C&I (Total)	Noncore - Electric Gene EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)
251	**Cold Year Throughput (Mth)**												
303													
304	2018	Jan	49,964	20,481	1,411	**71,856**	2,420	1,494	**3,914**	1,649	280	6,432	50,228
305		Feb	44,469	20,193	1,430	**66,092**	2,424	1,497	**3,921**	1,581	110	6,476	33,703
306		Mar	40,555	17,305	1,386	**59,246**	2,407	1,486	**3,894**	1,523	34	6,499	31,339
307		Apr	32,724	16,364	1,477	**50,565**	2,377	1,468	**3,844**	1,508	13	6,460	28,524
308		May	22,523	14,490	1,514	**38,527**	2,346	1,448	**3,794**	1,532	32	6,473	31,535
309		Jun	16,590	12,858	1,527	**30,976**	2,333	1,440	**3,774**	1,526	34	6,492	37,893
310		Jul	15,349	12,234	1,518	**29,101**	2,323	1,434	**3,757**	1,730	344	6,535	61,852
311		Aug	15,254	13,460	1,605	**30,320**	2,319	1,432	**3,750**	1,764	357	6,491	66,075
312		Sep	14,907	12,390	1,624	**28,920**	2,318	1,431	**3,749**	1,765	369	6,521	60,631
313		Oct	19,061	12,858	1,660	**33,578**	2,342	1,446	**3,788**	1,601	133	6,512	53,707
314		Nov	31,399	16,898	1,726	**50,023**	2,397	1,480	**3,877**	1,591	123	6,488	52,747
315		Dec	51,555	20,408	1,604	**73,567**	2,485	1,534	**4,019**	1,615	177	6,537	54,062
316													
317	2019	Jan	50,115	20,200	1,492	**71,808**	2,428	1,499	**3,927**	1,625	209	6,465	49,956
318		Feb	44,603	19,916	1,512	**66,031**	2,432	1,501	**3,933**	1,555	63	6,504	33,504
319		Mar	40,677	17,068	1,466	**59,212**	2,415	1,491	**3,905**	1,531	29	6,522	32,122
320		Apr	32,823	16,140	1,562	**50,524**	2,383	1,472	**3,855**	1,515	15	6,477	27,496
321		May	22,591	14,291	1,601	**38,483**	2,352	1,452	**3,804**	1,535	59	6,484	30,311
322		Jun	16,640	12,682	1,616	**30,938**	2,338	1,444	**3,782**	1,502	0	6,498	35,301
323		Jul	15,395	12,067	1,606	**29,068**	2,327	1,437	**3,763**	1,661	220	6,533	59,903
324		Aug	15,301	13,276	1,698	**30,274**	2,322	1,434	**3,756**	1,688	241	6,485	63,227
325		Sep	14,952	12,221	1,717	**28,889**	2,321	1,433	**3,754**	1,723	314	6,511	58,624
326		Oct	19,118	12,682	1,756	**33,556**	2,344	1,447	**3,791**	1,627	165	6,492	58,795
327		Nov	31,494	16,666	1,826	**49,986**	2,400	1,482	**3,881**	1,624	162	6,469	50,236
328		Dec	51,711	20,128	1,697	**73,536**	2,488	1,536	**4,024**	1,589	140	6,520	52,535
329													
330	2020	Jan	50,058	19,784	1,578	**71,420**	2,430	1,500	**3,930**	1,582	159	6,447	47,581
331		Feb	45,045	19,505	1,599	**66,150**	2,435	1,503	**3,938**	1,553	66	6,488	32,746
332		Mar	40,631	16,717	1,551	**58,898**	2,420	1,494	**3,913**	1,515	19	6,508	31,775
333		Apr	32,785	15,807	1,652	**50,245**	2,392	1,477	**3,869**	1,505	10	6,466	26,968
334		May	22,566	13,997	1,693	**38,256**	2,360	1,457	**3,817**	1,533	58	6,475	28,913
335		Jun	16,621	12,421	1,709	**30,751**	2,347	1,449	**3,795**	1,498	0	6,491	34,356
336		Jul	15,378	11,818	1,698	**28,895**	2,335	1,442	**3,777**	1,631	220	6,530	58,747
337		Aug	15,283	13,002	1,796	**30,081**	2,330	1,438	**3,768**	1,693	294	6,482	61,944
338		Sep	14,935	11,969	1,816	**28,720**	2,328	1,438	**3,766**	1,665	219	6,508	57,419
339		Oct	19,097	12,421	1,857	**33,374**	2,351	1,451	**3,802**	1,598	138	6,488	55,837
340		Nov	31,458	16,323	1,931	**49,712**	2,406	1,485	**3,891**	1,580	80	6,466	50,282
341		Dec	51,652	19,714	1,795	**73,160**	2,493	1,539	**4,033**	1,611	171	6,515	53,049

Row	Peak Day Throughput (Mth/Day)	Residential	Nonresidential Core GN-3	Nonresidential Core G-NGV	Total Core	Noncore - C&I C&I (Dist.)	Noncore - C&I C&I (Trans.)	Noncore - C&I C&I (Total)	Noncore - Electric Gene EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)
346	2014	2,857	913	41.3	**3,811**	60	37	**97**	67	8	202	1,923
347	2015	2,838	911	43.7	**3,793**	78	48	**127**	**66**	**35**	**205**	**1,808**
348	2016	2,871	914	46.3	**3,832**	79	49	**128**	**62**	**22**	**208**	**1,607**
349	2017	2,895	905	48.9	**3,849**	80	49	**129**	**62**	**14**	**210**	**1,952**
350	2018	2,913	897	51.7	**3,861**	80	49	**130**	**62**	**22**	**211**	**2,010**
351	2019	2,928	884	54.7	**3,867**	80	50	**130**	**59**	**21**	**210**	**1,951**
352	2020	2,933	866	57.9	**3,857**	80	50	**130**	**56**	**8**	**210**	**1,750**

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

MONTHLY FORECAST DATA

		ratiion			Noncore	System-Wide	System Total			Total
		EG (<3MMThms)	EG (>=3MMThms)	EG (Total)	Total	Total End-Use Dmd	(Mdth/d)	Co-Use-Fuel	"Un-Acnt'd-For" (UAF)	System Throughput
Cold Year Throughput (Mth)										
2014	Jan	1,931	63,199	65,130	68,927	140,297	453	545	754	141,596
	Feb	2,761	39,603	42,365	45,725	111,384	398	433	598	112,416
	Mar	2,714	38,539	41,254	44,840	103,651	334	403	557	104,611
	Apr	2,383	50,246	52,628	56,241	106,426	355	414	572	107,411
	May	3,794	48,332	52,126	55,425	93,647	302	364	503	94,514
	Jun	2,693	48,729	51,422	54,516	85,220	284	331	458	86,009
	Jul	3,265	68,256	71,521	74,831	103,664	334	403	557	104,624
	Aug	2,358	69,420	71,778	74,750	104,810	338	407	563	105,780
	Sep	3,487	73,800	77,287	80,274	108,914	363	423	585	109,922
	Oct	2,898	69,240	72,138	75,944	109,196	352	424	587	110,207
	Nov	2,850	58,430	61,279	64,449	114,066	380	443	613	115,122
	Dec	2,197	66,557	68,754	71,761	144,781	467	563	778	146,122
2015	Jan	2,693	53,444	56,137	59,545	130,428	421	507	701	131,635
	Feb	1,988	40,158	42,145	45,685	110,915	396	431	596	111,942
	Mar	2,181	46,457	48,638	52,235	110,662	357	430	594	111,687
	Apr	1,801	43,973	45,774	49,381	99,269	331	386	533	100,188
	May	2,220	45,959	48,179	51,777	89,813	290	349	482	90,645
	Jun	2,091	45,617	47,708	51,312	81,896	273	318	440	82,654
	Jul	3,089	83,668	86,758	90,364	119,091	384	463	640	120,194
	Aug	3,411	83,170	86,581	90,197	120,154	388	467	645	121,267
	Sep	3,249	79,505	82,754	86,383	114,926	383	447	617	115,990
	Oct	3,855	61,536	65,391	69,066	102,179	330	397	549	103,125
	Nov	2,745	55,724	58,469	62,243	111,588	372	434	599	112,622
	Dec	2,594	63,047	65,641	69,565	142,091	458	552	763	143,407
2016	Jan	2,612	54,188	56,801	60,644	132,204	426	514	710	133,428
	Feb	1,653	52,874	54,527	58,381	124,716	430	485	670	125,870
	Mar	1,530	43,652	45,183	49,013	108,005	348	420	580	109,005
	Apr	1,543	41,464	43,007	46,793	97,161	324	378	522	98,061
	May	1,656	41,945	43,601	47,339	85,741	277	333	461	86,535
	Jun	1,678	41,916	43,594	47,314	78,195	261	304	420	78,919
	Jul	2,404	82,318	84,721	88,429	117,437	379	456	631	118,524
	Aug	2,595	84,117	86,711	90,414	120,657	389	469	648	121,774
	Sep	2,579	78,935	81,513	85,218	114,043	380	443	613	115,099
	Oct	2,353	57,788	60,141	63,885	97,328	314	378	523	98,229
	Nov	1,923	57,539	59,462	63,298	113,123	377	440	608	114,171
	Dec	1,980	59,486	61,466	65,448	138,679	447	539	745	139,963
2017	Jan	1,811	47,236	49,047	52,942	124,706	402	485	670	125,860
	Feb	1,704	42,551	44,254	48,157	114,176	408	444	613	115,233
	Mar	1,541	44,202	45,743	49,619	108,783	351	423	584	109,791
	Apr	1,564	42,327	43,891	47,721	98,223	327	382	528	99,132
	May	1,633	42,314	43,948	47,728	86,215	278	335	463	87,014
	Jun	1,639	42,161	43,800	47,559	78,504	262	305	422	79,231
	Jul	2,332	81,686	84,018	87,761	116,832	377	454	628	117,913
	Aug	2,554	82,381	84,935	88,671	118,968	384	462	639	120,070
	Sep	2,107	80,901	83,007	86,743	115,631	385	449	621	116,701
	Oct	1,900	56,647	58,548	62,321	95,852	309	373	515	96,739
	Nov	1,915	59,785	61,700	65,563	115,522	385	449	620	116,591
	Dec	1,804	61,578	63,382	67,387	140,844	454	547	757	142,148

	A	B	S	T	U	V	W	Y	AA	AB	AC
1	**2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)**										
249	***MONTHLY FORECAST DATA***		ratiion			Noncore	System-Wide	**System Total**			**Total**
250			**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	**Total**	**Total End-Use Dmd**	**(Mdth/d)**	**Co-Use-Fuel**	**"Un-Acnt'd-For" (UAF)**	**System Throughput**
251	**Cold Year Throughput (Mth)**										
303											
304	2018	Jan	1,929	56,660	58,589	62,503	134,359	433	522	722	135,603
305		Feb	1,691	40,179	41,870	45,791	111,883	400	435	601	112,918
306		Mar	1,558	37,838	39,396	43,289	102,536	331	399	551	103,485
307		Apr	1,521	34,983	36,504	40,349	90,913	303	353	488	91,755
308		May	1,564	38,007	39,571	43,366	81,892	264	318	440	82,650
309		Jun	1,560	44,386	45,945	49,719	80,695	269	314	433	81,442
310		Jul	2,074	68,387	70,462	74,219	103,320	333	402	555	104,277
311		Aug	2,120	72,566	74,686	78,437	108,756	351	423	584	109,763
312		Sep	2,135	67,152	69,287	73,037	101,957	340	396	548	102,901
313		Oct	1,734	60,219	61,953	65,741	99,319	320	386	533	100,239
314		Nov	1,714	59,235	60,949	64,825	114,849	383	446	617	115,912
315		Dec	1,792	60,599	62,391	66,409	139,977	452	544	752	141,273
316											
317	2019	Jan	1,834	56,421	58,254	62,181	133,989	432	521	720	135,230
318		Feb	1,618	40,007	41,626	45,559	111,590	399	434	599	112,624
319		Mar	1,560	38,644	40,204	44,109	103,321	333	402	555	104,277
320		Apr	1,531	33,973	35,504	39,359	89,883	300	349	483	90,715
321		May	1,594	36,795	38,389	42,193	80,676	260	314	433	81,423
322		Jun	1,502	41,799	43,301	47,083	78,021	260	303	419	78,744
323		Jul	1,881	66,436	68,317	72,080	101,148	326	393	543	102,085
324		Aug	1,928	69,712	71,640	75,396	105,670	341	411	568	106,648
325		Sep	2,037	65,135	67,172	70,927	99,816	333	388	536	100,740
326		Oct	1,792	65,287	67,078	70,870	104,426	337	406	561	105,393
327		Nov	1,786	56,706	58,492	62,373	112,359	375	437	604	113,399
328		Dec	1,729	59,055	60,784	64,807	138,343	446	538	743	139,624
329											
330	2020	Jan	1,741	54,027	55,769	59,699	131,119	423	510	704	132,333
331		Feb	1,619	39,234	40,853	44,791	110,942	396	431	596	111,969
332		Mar	1,533	38,283	39,817	43,730	102,629	331	399	551	103,579
333		Apr	1,516	33,433	34,949	38,818	89,062	297	346	478	89,887
334		May	1,591	35,388	36,979	40,796	79,052	255	307	425	79,784
335		Jun	1,498	40,847	42,344	46,140	76,891	256	299	413	77,603
336		Jul	1,851	65,277	67,128	70,905	99,799	322	388	536	100,723
337		Aug	1,987	68,426	70,412	74,181	104,262	336	405	560	105,227
338		Sep	1,884	63,927	65,811	69,577	98,297	328	382	528	99,207
339		Oct	1,736	62,325	64,061	67,863	101,237	327	394	544	102,175
340		Nov	1,660	56,748	58,408	62,299	112,011	373	435	602	113,048
341		Dec	1,783	59,564	61,347	65,380	138,540	447	539	744	139,822
342											
343											
344			ratiion			Noncore	System-Wide				
345	**Peak Day Throughput (Mth/Day)**		**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	**Total**	**Total End-Use Dmd**				
346	2014		76	2,125	2,201	2,298	6,109				
347	2015		101	2,014	2,114	2,241	6,034				
348	2016		84	1,816	1,900	2,028	5,860				
349	2017		76	2,162	2,238	2,367	6,216				
350	2018		84	2,221	2,305	2,435	6,296				
351	2019		80	2,161	2,241	2,371	6,237				
352	2020		65	1,960	2,024	2,154	6,011				

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

MONTHLY FORECAST DATA

			Nonresidential Core		Total	Noncore - C&I		
		Residential	GN-3	G-NGV	**Core**	C&I (Dist.)	C&I (Trans.)	**C&I (Total)**
Forecast Number of Customers								
2014	Jan	834,140	30,053	33	**864,226**	44	8	**52**
	Feb	834,423	30,073	33	**864,529**	44	8	**52**
	Mar	835,088	30,061	33	**865,182**	44	8	**52**
	Apr	835,118	30,059	33	**865,210**	44	8	**52**
	May	835,280	30,046	33	**865,359**	44	8	**52**
	Jun	835,660	30,019	33	**865,712**	44	8	**52**
	Jul	835,591	29,982	33	**865,606**	44	8	**52**
	Aug	836,028	29,985	33	**866,046**	44	8	**52**
	Sep	836,572	29,974	33	**866,579**	44	8	**52**
	Oct	836,744	29,964	33	**866,741**	44	8	**52**
	Nov	836,974	29,953	33	**866,960**	44	8	**52**
	Dec	837,319	29,978	33	**867,330**	44	8	**52**
2015	Jan	844,421	30,035	34	**874,490**	42	10	**52**
	Feb	844,708	30,055	34	**874,797**	42	10	**52**
	Mar	845,381	30,043	34	**875,458**	42	10	**52**
	Apr	845,411	30,041	34	**875,486**	42	10	**52**
	May	845,575	30,028	34	**875,637**	42	10	**52**
	Jun	845,960	30,001	34	**875,995**	42	10	**52**
	Jul	845,890	29,964	34	**875,888**	42	10	**52**
	Aug	846,332	29,967	34	**876,334**	42	10	**52**
	Sep	846,883	29,956	34	**876,873**	42	10	**52**
	Oct	847,057	29,946	34	**877,038**	42	10	**52**
	Nov	847,290	29,935	34	**877,259**	42	10	**52**
	Dec	847,639	29,960	34	**877,634**	42	10	**52**
2016	Jan	856,717	30,089	35	**886,841**	42	10	**52**
	Feb	857,008	30,109	35	**887,151**	42	10	**52**
	Mar	857,691	30,097	35	**887,822**	42	10	**52**
	Apr	857,721	30,095	35	**887,851**	42	10	**52**
	May	857,888	30,082	35	**888,005**	42	10	**52**
	Jun	858,278	30,055	35	**888,368**	42	10	**52**
	Jul	858,207	30,018	35	**888,260**	42	10	**52**
	Aug	858,656	30,021	35	**888,712**	42	10	**52**
	Sep	859,215	30,010	35	**889,260**	42	10	**52**
	Oct	859,391	30,000	35	**889,426**	42	10	**52**
	Nov	859,628	29,989	35	**889,651**	42	10	**52**
	Dec	859,982	30,014	35	**890,031**	42	10	**52**
2017	Jan	869,691	30,191	37	**899,919**	42	10	**52**
	Feb	869,986	30,211	37	**900,234**	42	10	**52**
	Mar	870,680	30,199	37	**900,915**	42	10	**52**
	Apr	870,711	30,197	37	**900,945**	42	10	**52**
	May	870,880	30,184	37	**901,100**	42	10	**52**
	Jun	871,276	30,157	37	**901,469**	42	10	**52**
	Jul	871,204	30,119	37	**901,360**	42	10	**52**
	Aug	871,660	30,122	37	**901,819**	42	10	**52**
	Sep	872,227	30,111	37	**902,375**	42	10	**52**
	Oct	872,406	30,101	37	**902,544**	42	10	**52**
	Nov	872,646	30,090	37	**902,773**	42	10	**52**
	Dec	873,006	30,115	37	**903,158**	42	10	**52**

	A	B	F	G	I	J	L	M	N
1	**2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)**								
355	***MONTHLY FORECAST DATA***			Nonresidential Core		**Total**		Noncore - C&I	
356			Residential	GN-3	G-NGV	**Core**	C&I (Dist.)	C&I (Trans.)	**C&I (Total)**
357	**Forecast Number of Customers**								
409									
410	2018	Jan	882,860	30,304	38	**913,203**	42	10	**52**
411		Feb	883,160	30,325	38	**913,522**	42	10	**52**
412		Mar	883,864	30,313	38	**914,214**	42	10	**52**
413		Apr	883,895	30,311	38	**914,244**	42	10	**52**
414		May	884,067	30,297	38	**914,402**	42	10	**52**
415		Jun	884,469	30,270	38	**914,777**	42	10	**52**
416		Jul	884,396	30,233	38	**914,667**	42	10	**52**
417		Aug	884,859	30,236	38	**915,132**	42	10	**52**
418		Sep	885,434	30,225	38	**915,697**	42	10	**52**
419		Oct	885,616	30,215	38	**915,869**	42	10	**52**
420		Nov	885,860	30,204	38	**916,101**	42	10	**52**
421		Dec	886,225	30,229	38	**916,492**	42	10	**52**
422									
423	2019	Jan	896,224	30,423	40	**926,687**	42	10	**52**
424		Feb	896,528	30,443	40	**927,011**	42	10	**52**
425		Mar	897,243	30,431	40	**927,714**	42	10	**52**
426		Apr	897,275	30,429	40	**927,744**	42	10	**52**
427		May	897,449	30,416	40	**927,905**	42	10	**52**
428		Jun	897,857	30,388	40	**928,286**	42	10	**52**
429		Jul	897,783	30,351	40	**928,174**	42	10	**52**
430		Aug	898,253	30,354	40	**928,647**	42	10	**52**
431		Sep	898,837	30,343	40	**929,220**	42	10	**52**
432		Oct	899,022	30,333	40	**929,395**	42	10	**52**
433		Nov	899,269	30,322	40	**929,631**	42	10	**52**
434		Dec	899,640	30,347	40	**930,027**	42	10	**52**
435									
436	2020	Jan	909,562	30,551	41	**940,155**	42	10	**52**
437		Feb	909,871	30,572	41	**940,484**	42	10	**52**
438		Mar	910,596	30,560	41	**941,197**	42	10	**52**
439		Apr	910,629	30,557	41	**941,227**	42	10	**52**
440		May	910,805	30,544	41	**941,391**	42	10	**52**
441		Jun	911,220	30,517	41	**941,778**	42	10	**52**
442		Jul	911,145	30,479	41	**941,665**	42	10	**52**
443		Aug	911,621	30,482	41	**942,144**	42	10	**52**
444		Sep	912,214	30,471	41	**942,726**	42	10	**52**
445		Oct	912,402	30,461	41	**942,904**	42	10	**52**
446		Nov	912,653	30,450	41	**943,143**	42	10	**52**
447		Dec	913,029	30,475	41	**943,545**	42	10	**52**

2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

MONTHLY FORECAST DATA

		Noncore - Electric Generatiion							Noncore	System-Wide
		EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	**Total**	**Total**
Forecast Number of Customers										
2014	Jan	47	9	7	12	**56**	**19**	**75**	**127**	**864,353**
	Feb	47	9	7	12	**56**	**19**	**75**	**127**	**864,656**
	Mar	47	9	7	12	**56**	**19**	**75**	**127**	**865,309**
	Apr	47	9	7	12	**56**	**19**	**75**	**127**	**865,337**
	May	47	9	7	12	**56**	**19**	**75**	**127**	**865,486**
	Jun	47	9	7	12	**56**	**19**	**75**	**127**	**865,839**
	Jul	47	9	7	12	**56**	**19**	**75**	**127**	**865,733**
	Aug	47	9	7	12	**56**	**19**	**75**	**127**	**866,173**
	Sep	47	9	7	12	**56**	**19**	**75**	**127**	**866,706**
	Oct	47	9	7	12	**56**	**19**	**75**	**127**	**866,868**
	Nov	47	9	7	12	**56**	**19**	**75**	**127**	**867,087**
	Dec	47	9	7	12	**56**	**19**	**75**	**127**	**867,457**
2015	Jan	47	8	7	12	**55**	**19**	**74**	**126**	**874,616**
	Feb	47	8	7	12	**55**	**19**	**74**	**126**	**874,923**
	Mar	47	8	7	12	**55**	**19**	**74**	**126**	**875,584**
	Apr	47	8	7	12	**55**	**19**	**74**	**126**	**875,612**
	May	47	8	7	12	**55**	**19**	**74**	**126**	**875,763**
	Jun	47	8	7	12	**55**	**19**	**74**	**126**	**876,121**
	Jul	47	8	7	12	**55**	**19**	**74**	**126**	**876,014**
	Aug	47	8	7	12	**55**	**19**	**74**	**126**	**876,460**
	Sep	47	8	7	12	**55**	**19**	**74**	**126**	**876,999**
	Oct	47	8	7	12	**55**	**19**	**74**	**126**	**877,164**
	Nov	47	8	7	12	**55**	**19**	**74**	**126**	**877,385**
	Dec	47	8	7	12	**55**	**19**	**74**	**126**	**877,760**
2016	Jan	47	8	7	12	**55**	**19**	**74**	**126**	**886,967**
	Feb	47	8	7	12	**55**	**19**	**74**	**126**	**887,277**
	Mar	47	8	7	12	**55**	**19**	**74**	**126**	**887,948**
	Apr	47	8	7	12	**55**	**19**	**74**	**126**	**887,977**
	May	47	8	7	12	**55**	**19**	**74**	**126**	**888,131**
	Jun	47	8	7	12	**55**	**19**	**74**	**126**	**888,494**
	Jul	47	8	7	12	**55**	**19**	**74**	**126**	**888,386**
	Aug	47	8	7	12	**55**	**19**	**74**	**126**	**888,838**
	Sep	47	8	7	12	**55**	**19**	**74**	**126**	**889,386**
	Oct	47	8	7	12	**55**	**19**	**74**	**126**	**889,552**
	Nov	47	8	7	12	**55**	**19**	**74**	**126**	**889,777**
	Dec	47	8	7	12	**55**	**19**	**74**	**126**	**890,157**
2017	Jan	47	8	7	12	**55**	**19**	**74**	**126**	**900,045**
	Feb	47	8	7	12	**55**	**19**	**74**	**126**	**900,360**
	Mar	47	8	7	12	**55**	**19**	**74**	**126**	**901,041**
	Apr	47	8	7	12	**55**	**19**	**74**	**126**	**901,071**
	May	47	8	7	12	**55**	**19**	**74**	**126**	**901,226**
	Jun	47	8	7	12	**55**	**19**	**74**	**126**	**901,595**
	Jul	47	8	7	12	**55**	**19**	**74**	**126**	**901,486**
	Aug	47	8	7	12	**55**	**19**	**74**	**126**	**901,945**
	Sep	46	4	7	13	**50**	**20**	**70**	**122**	**902,497**
	Oct	46	4	7	13	**50**	**20**	**70**	**122**	**902,666**
	Nov	46	4	7	13	**50**	**20**	**70**	**122**	**902,895**
	Dec	46	4	7	13	**50**	**20**	**70**	**122**	**903,280**

	A	B	O	P	Q	R	S	T	U	V	W
1	**2016 TCAP-Phase II: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)**										
355	***MONTHLY FORECAST DATA***		Noncore - Electric Generatiion							Noncore	System-Wide
356			EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**	**Total**	**Total**
357	**Forecast Number of Customers**										
409											
410	2018	Jan	46	4	7	13	**50**	**20**	**70**	**122**	**913,325**
411		Feb	46	4	7	13	**50**	**20**	**70**	**122**	**913,644**
412		Mar	46	4	7	13	**50**	**20**	**70**	**122**	**914,336**
413		Apr	46	4	7	13	**50**	**20**	**70**	**122**	**914,366**
414		May	46	4	7	13	**50**	**20**	**70**	**122**	**914,524**
415		Jun	46	4	7	13	**50**	**20**	**70**	**122**	**914,899**
416		Jul	46	4	7	13	**50**	**20**	**70**	**122**	**914,789**
417		Aug	46	4	7	13	**50**	**20**	**70**	**122**	**915,254**
418		Sep	46	4	7	13	**50**	**20**	**70**	**122**	**915,819**
419		Oct	46	4	7	13	**50**	**20**	**70**	**122**	**915,991**
420		Nov	46	4	7	13	**50**	**20**	**70**	**122**	**916,223**
421		Dec	46	4	7	13	**50**	**20**	**70**	**122**	**916,614**
422											
423	2019	Jan	46	4	7	13	**50**	**20**	**70**	**122**	**926,809**
424		Feb	46	4	7	13	**50**	**20**	**70**	**122**	**927,133**
425		Mar	46	4	7	13	**50**	**20**	**70**	**122**	**927,836**
426		Apr	46	4	7	13	**50**	**20**	**70**	**122**	**927,866**
427		May	46	4	7	13	**50**	**20**	**70**	**122**	**928,027**
428		Jun	46	4	7	13	**50**	**20**	**70**	**122**	**928,408**
429		Jul	46	4	7	13	**50**	**20**	**70**	**122**	**928,296**
430		Aug	46	4	7	13	**50**	**20**	**70**	**122**	**928,769**
431		Sep	46	4	7	13	**50**	**20**	**70**	**122**	**929,342**
432		Oct	46	4	7	13	**50**	**20**	**70**	**122**	**929,517**
433		Nov	46	4	7	13	**50**	**20**	**70**	**122**	**929,753**
434		Dec	46	4	7	13	**50**	**20**	**70**	**122**	**930,149**
435											
436	2020	Jan	46	4	7	13	**50**	**20**	**70**	**122**	**940,277**
437		Feb	46	4	7	13	**50**	**20**	**70**	**122**	**940,606**
438		Mar	46	4	7	13	**50**	**20**	**70**	**122**	**941,319**
439		Apr	46	4	7	13	**50**	**20**	**70**	**122**	**941,349**
440		May	46	4	7	13	**50**	**20**	**70**	**122**	**941,513**
441		Jun	46	4	7	13	**50**	**20**	**70**	**122**	**941,900**
442		Jul	46	4	7	13	**50**	**20**	**70**	**122**	**941,787**
443		Aug	46	4	7	13	**50**	**20**	**70**	**122**	**942,266**
444		Sep	46	4	7	13	**50**	**20**	**70**	**122**	**942,848**
445		Oct	46	4	7	13	**50**	**20**	**70**	**122**	**943,026**
446		Nov	46	4	7	13	**50**	**20**	**70**	**122**	**943,265**
447		Dec	46	4	7	13	**50**	**20**	**70**	**122**	**943,667**

SoCalGas Noncore Retail Gas Demand

Noncore Commercial and Industrial Forecasts: End Use Model Forecasts Combined with Econometric And Other Forecasts

INTRODUCTION

The purpose of these workpapers is to describe how the results from the EUForecaster end-use models for the noncore commercial and industrial (non-refinery) market segments were obtained and used to produce the forecasts of demand for SoCalGas' noncore commercial and industrial.

The EUForecaster model's market segmentation and end-use modeling framework was used by SoCalGas to assess the impacts of equipment replacement and market scenarios on gas demand and market share. The model segments the noncore commercial and industrial markets into 14 sectors and 11 sectors by type of business activity, respectively. Business activity is determined by the NAICS (North American Industrial Classification System) code on the billing record. The final demand forecast for the noncore commercial and industrial market is taken primarily from output from the EUForecaster and reduced by CPUC-authorized energy efficiency goals. Additionally, there are some additional adjustments due to special noncore C&I programs (i.e., "Rule-38") authorized by the CPUC but whose gas demand is excluded from the gas cost allocation and rate design calculations for the 2016 TCAP. Finally, there are some small "out-of-model" adjustments that are applied due to EOR customers whose "steaming" and "cogeneration" load are billed at an approved special rate for EOR service but whose meter is also used to measure consumption of these customers that is billed at a G-30 rate.

The last two subsections under "DATA SOURCES" provide sets of key data input items for each of the Noncore Commercial and Noncore Industrial end-use models.

DATA SOURCES

A. Historical Billing Data

Monthly historical gas usage for the commercial and industrial markets were obtained from SoCalGas' billing records for 2014. The recorded usage was then further disaggregated into the 14 commercial or 11 industrial business sectors.

B. Natural Gas Price

The natural gas prices used to forecast demand were based on the price of gas at the burner-tip in each market segment, which is composed of the gas commodity cost, transportation rate (G-30 tariff rate) and Public Purpose Program surcharge. The cost of gas delivered to the SoCalGas "city gate" was used for the gas commodity cost.

Since the G-30 tariff rate is priced according to tier, calculations were made to arrive at the overall average and marginal transportation rates from historical usage in 2010. The average rate is calculated from the weighted average rate at each tier for each customer; whereas the marginal rate is calculated as the rate that applies to the last unit of gas consumed for each customer.

C. Electricity Price Data

Both average prices (cents/kWh) and marginal prices (cents/kWh) were developed as electricity price inputs. Forecasts for the SCE industrial customer class were developed based on the California Energy Commission's November 2014 updated forecast rates for California energy demand (forecast for the SCE planning area, under "Mid-Case" demand for electricity) for the SCE service area through our forecast time horizon. These were the average electricity prices for the noncore commercial & industrial market, overall.

The marginal prices were calculated by multiplying each year's respective average price by a ratio. This ratio, 0.705, was estimated from an analysis of the SCE TOU-8 rate schedule, for non-self-generation customers, posted on their web-site in March 2006.

The same set of average and marginal prices were used for each of the noncore Commercial and Industrial markets.

D. Employment

Employment, as a measure of economic activity, is used to drive the noncore commercial and industrial end-use demand forecast models. The employment forecast through our forecast time horizon is based on Global Insight's February 2015 Regional forecast. Global Insight prepares regular regional employment forecast for California and the aggregated six largest counties' Metropolitan Statistical Area (MSA) in SoCalGas' service area. (The six counties – Kern, Los Angeles, Orange, Riverside, San Bernardino, and Ventura – account for 85% of the service area's total population and employment). The historical employment data used was derived from the California Employment Development Department (EDD) for the 12 counties served by SoCalGas. The monthly employment used in the model was generally by summing the weighted employment data over the commercial and industrial NAICS codes.

E. Post-Model Adjustment

Once the EUForecaster end-use model forecast was generated, post-model adjustments were made to account for effects the model is not designed to simulate. Energy savings goals that were authorized by the CPUC in decision D.04-09-060 and expected load leaving for service by the City of Vernon were subtracted from the model forecast to arrive at final demand forecast for the commercial and industrial markets. Based on annual data (2008 through 2014) for *net* movement of customers from core (G-10) to noncore (G-30) service, we expect an average of 4,582,050 Therms of accumulated load from *net* customer migration from core to noncore through 2020. This load would be split at 36% commercial and 64% industrial and be assumed to occur evenly throughout the year (i.e., the monthly value is 1/12 of the annual amount).

F. EUForecaster Key Input data for Noncore Commercial and Noncore Industrial End-Use Models

1. Energy Price Data for both Models: The first set of input data are for energy prices. Retail prices for natural gas, electricity and alternative fuels (i.e., propane) are provided. These prices are in nominal ("current year") monetary units ($/Therm for natural gas and propane, and $/Kwh for electricity). The prices for natural gas and electricity are retail prices (at the "burner-tip") for the end-user. The remaining set of pages in this section provide data on how the natural gas prices were calculated from the commodity price projections and the forecasts for the relevant C&I rate tiers for the G-30 rate structure or the "Class Average" price for C&I customers billed under the TLS (Transmission Level Service) rate structure.

2. Input Data for the Noncore Commercial Model: This data consist of various tables of data specific to the noncore commercial EUForecaster end-use model: Employment forecasts; Equipment Saturations; Average Year of Installation for Equipment; Use per meter data; and a set of Base Year data.

3. Input Data for the Noncore Industrial Model: This data consist of various tables of data specific to the noncore industrial EUForecaster end-use model: Employment forecasts; Use per meter data; Equipment Saturations; Gas vs. Electric use shares; Electric UECs and Relative Efficiencies; "Equipment Age" per meter installation dates; and a set of Base Year data.

EUForecaster Energy Price Data for Noncore Commercial & Industrial Models

Noncore C and I Retail Natural Gas Prices ($/Therm)

Year	Com Price Deflator	Ind Price Deflator	C Non Core Average Price	C Non Core Marginal Price	I Non Core Average Price	I Non Core Marginal Price		g-30 Com: GHG $/Mmbtu (Natural Gas)	g-30 Ind: GHG $/Mmbtu (Natural Gas)
2014	**100.00**	**100.00**	0.6621	0.6457	0.6606	0.6451		0.0263	0.2370
2015	**99.45**	**99.45**	0.5518	0.5362	0.5456	0.5310		0.2122	0.3636
2016	**101.77**	**101.77**	0.6025	0.5869	0.5958	0.5813		0.2472	0.3929
2017	**104.48**	**104.48**	0.6389	0.6234	0.6326	0.6181		0.2711	0.4182
2018	**107.21**	**107.21**	0.6623	0.6465	0.6556	0.6408		0.3056	0.4553
2019	**109.85**	**109.85**	0.7082	0.6921	0.7021	0.6870		0.3411	0.5017
2020	**112.55**	**112.55**	0.8111	0.7947	0.8064	0.7909		0.3775	0.5565
	1.99%	**1.99%**	**3.44%**	**3.52%**	**3.38%**	**3.46%**	**Avg-Ann Growth Rate (2014 through 2020)** / **2014 % Mkt: "Self-Pay"**	**4.2%**	**37.6%**

Noncore C and I Retail Electric Prices ($/Kwh)

Year	C Non Core Average Price	C Non Core Marginal Price	I Non Core Average Price	I Non Core Marginal Price
2014	**10.83**	7.63	10.83	7.63
2015	**10.90**	7.68	10.90	7.68
2016	**11.38**	8.02	11.38	8.02
2017	**11.79**	8.31	11.79	8.31
2018	**12.29**	8.67	12.29	8.67
2019	**12.77**	9.00	12.77	9.00
2020	**13.28**	9.36	13.28	9.36

Noncore C and I Alternative Fuel (Propane) Prices ($/Therm)

Year	C Non Core Average Price	C Non Core Marginal Price	I Non Core Average Price	I Non Core Marginal Price
2014	2.0146	2.0146	2.0146	2.0146
2015	1.9818	1.9818	1.9818	1.9818
2016	2.0146	2.0146	2.0146	2.0146
2017	2.1131	2.1131	2.1131	2.1131
2018	2.2117	2.2117	2.2117	2.2117
2019	2.2774	2.2774	2.2774	2.2774
2020	2.3431	2.3431	2.3431	2.3431

Noncore C and I Rate Components

Annual G30 Noncore C&I Gas Rates						Nominal Dollars					Constant 2014 Dollars			
Year	Com Trsp Average ¢/Therm	Com Trsp Marginal ¢/Therm	Ind Trsp Average ¢/Therm	Ind Trsp Marginal ¢/Therm	CBSP ¢/Therm	Com B/T Average $/Dth	Com B/T Marginal $/Dth	Ind B/T Average $/Dth	Ind B/T Marginal $/Dth	CPI (Yr-2014 = 1.0000)	Com B/T Average 2014-$ /Dth	Com B/T Marginal 2014-$ /Dth	Ind B/T Average 2014-$ /Dth	Ind B/T Marginal 2014-$ /Dth
2014	**20.596**	**18.958**	**18.337**	**16.789**	**45.349**	**6.594**	**6.431**	**6.369**	**6.214**	**1.0000**	**6.594**	**6.431**	**6.369**	**6.214**
2015	21.876	20.310	19.741	18.277	31.186	5.306	5.150	5.093	4.946	0.9945	5.335	5.178	5.121	4.974
2016	22.005	20.448	19.882	18.427	35.770	5.778	5.622	5.565	5.420	1.0177	5.677	5.524	5.469	5.326
2017	22.006	20.455	19.899	18.453	39.177	6.118	5.963	5.908	5.763	1.0448	5.856	5.708	5.654	5.516
2018	22.602	21.022	20.441	18.961	40.568	6.317	6.159	6.101	5.953	1.0721	5.892	5.745	5.690	5.552
2019	23.168	21.560	20.955	19.442	44.241	6.741	6.580	6.520	6.368	1.0985	6.137	5.990	5.935	5.797
2020	23.773	22.136	21.507	19.960	53.564	7.734	7.570	7.507	7.352	1.1255	6.871	6.726	6.670	6.532
						Avg-Ann Growth Rate (2014 through 2020):					**0.7%**	**0.8%**	**0.8%**	**0.8%**

Noncore C and I Weights for Tiers in Weighted Rate Calculations

2014 G30 C&I Weight of Usage by Tier, BMW

	Service	Tier	Both	Com	Ind
Average	D	1	D1	88.39%	60.91%
Average	D	2	D2	11.61%	39.09%
Average	D	3	D3	0.00%	0.00%
Average	D	4	D4	0.00%	0.00%
Average	T	1	T1	99.16%	42.96%
Average	T	2	T2	0.84%	57.04%
Marginal	D	1	D1	70.11%	38.96%
Marginal	D	2	D2	29.89%	61.04%
Marginal	D	3	D3	0.00%	0.00%
Marginal	D	4	D4	0.00%	0.00%
Marginal	T	1	T1	93.33%	20.13%
Marginal	T	2	T2	6.67%	79.87%

2014 Volume (Therms)			Percent
Com&Ind	D&T	680,658,547	100.00%
Com&Ind	D	641,358,661	94.23%
Com&Ind	T	39,299,886	5.77%
Com	D&T	164,286,109	24.14%
Ind	D&T	516,372,438	75.86%
Com	D	158,576,954	96.52%
Com	T	5,709,155	3.48%
Ind	D	482,781,707	93.49%
Ind	T	33,590,731	6.51%

Obs	seg	service	_TYPE_	("Cust Cnt") _FREQ_	G-30 C&I (Non-Refinery) Therms	Prop/Pct.	Annual Therms/"Cust"
1			0	586	680,658,547	100.0%	1,161,533
2		D	1	557	641,358,661	94.2%	1,151,452
3		T	1	29	39,299,886	5.8%	1,355,168
4	COM		2	226	164,286,109	24.1%	726,930
5	IND		2	360	516,372,438	75.9%	1,434,368
6	COM	D	3	214	158,576,954	96.5%	741,014
7	COM	T	3	12	5,709,155	3.5%	475,763
8	IND	D	3	343	482,781,707	93.5%	1,407,527
9	IND	T	3	17	33,590,731	6.5%	1,975,925

Noncore Gas Transportation Rates and Commodity Prices

	Gas Transp. Forecast from Rate Design (Nominal Cents per Therm)						Trans Option: "Class Averge"			Trans Option: "Reservation"					
Year	PPP (¢/Thm)	Dcharge ($/mo /mtr)	D1 (¢/Thm)	D2 (¢/Thm)	D3 (¢/Thm)	D4 (¢/Thm)	Tcharge ($/mo /mtr)	T1 (¢/Thm)	T2 (¢/Thm)	Tcharge (¢/Thm/day per Mtr)	T1 (¢/Thm)	T2 (¢/Thm)	CPI	CBSP $/Dth	Price Deflator
2014	2.734	$350	18.495	12.313	8.325	5.766	$0	4.474	4.474	0.899	3.314	3.314	1.000	**4.53**	**100.00**
2015	3.66	$350	18.78	13.01	9.32	6.68	$0	5.46	5.46	0.60	4.66	4.66	0.995	**3.12**	99.45
2016	3.74	$350	18.82	13.10	9.43	6.82	$0	5.47	5.47	0.55	4.73	4.73	1.018	**3.58**	101.77
2017	3.84	$350	18.71	13.03	9.39	6.79	$0	5.58	5.58	0.57	4.81	4.81	1.045	**3.92**	104.48
2018	3.94	$350	19.24	13.39	9.64	6.97	$0	5.72	5.72	0.57	4.94	4.94	1.072	**4.06**	107.21
2019	4.04	$350	19.74	13.73	9.88	7.13	$0	5.84	5.84	0.58	5.05	5.05	1.098	**4.42**	109.85
2020	4.14	$350	20.28	14.10	10.15	7.33	$0	6.00	6.00	0.58	5.20	5.20	1.126	**5.36**	112.55

Example Calculation for 2018 Noncore Industrial

Example of Calculations: 2018 Noncore Industrial *Average* Gas Price:

Transportation Charge (¢/Thm):	20.441	= + (93.49% Ind Dist of total Ind) * { [(100 ¢/$ *12 Mo/Yr)*($350.00 /mo/mtr)/(1,407,527 Thm/Mtr Ind Dist)] + (60.91%*19.24 ¢/Thm + 39.39%* 13.39 ¢/Thm + 0.00%* 9.64 ¢/Thm + 0.00%* 6.97 ¢/Thm) } + (6.51% Ind Trans of total Ind) * { [(100 ¢/$ *12 Mo/Yr)*($0.00 /mo/mtr)/(1,975,925 Thm/Mtr Ind Trans)] + (42.96%* 5.72 ¢/Thm+57.04%* 5.72¢/Thm) } + PPP Surcharge (¢/Thm): 3.94¢/Thm, in 2018
Gas Commodity Price (¢/Thm):	40.568	= ("CBSP", market price of gas at the SoCalGas City Gate)
Gas Transp + Cmdty (¢/Thm):	61.009	= (at "GasPrices" worksheet AVERAGE price)
GHG "Adder" (¢/Thm):	4.553	= (37.46% of 2014 Noncore Ind Mkt "Self-Pay" * $13.87 CO2/ MT Nat Gas, in 2018, * 0.05302 Emissions MT/ Dth * 1 Dth/ 10 Th) + (62.54% of 2018 Noncore Ind Mkt as "SCG Managed" * 2.87 ¢/ Thm)
Customer's "Burner-Tip" Price:	65.562	= (20.441 + 40.568 + 4.553) ¢/Thm

Example of Calculations: 2018 Noncore Industrial *Marginal* Gas Price:

Transportation Charge (¢/Thm):	18.961	= + (93.49% Ind Dist of total Ind) * {(38.96%* 19.24 ¢/Thm + 61.04%* 13.39 ¢/Thm + 0.00%* 9.64 ¢/Thm + 0.00%* 6.97 ¢/Thm) } + (6.51% Ind Trans of total Ind) * { (20.13%* 5.72¢/Thm+79.87%* 5.72¢/Thm) } + PPP Surcharge (¢/Thm):
Gas Commodity Price (¢/Thm):	40.568	= ("CBSP", market price of gas at the SoCalGas City Gate)
Gas Transp + Cmdty (¢/Thm):	59.529	= (at "GasPrices" worksheet MARGINAL price)
GHG "Adder" (¢/Thm):	4.553	= (37.46% of 2014 Noncore Ind Mkt "Self-Pay" * $13.87 CO2/ MT Nat Gas, in 2018, * 0.05302 Emissions MT/ Dth * 1 Dth/ 10 Th) + (62.54% of 2018 Noncore Ind Mkt as "SCG Managed" * 2.87 ¢/ Thm)
Customer's "Burner-Tip" Price:	64.082	= (18.961 + 40.568 + 4.553) ¢/Thm

EUForecaster Noncore Commercial Data

Noncore Commercial: Annual Employment (millions) by Business Types

YEAR	Office	Restaurant	Retail	Laundry	Warehouse	School	College	Health	Lodging
2014	1.59919	0.67657	0.97532	0.09057	0.45568	0.61518	0.20506	1.09993	0.13370
2015	1.64691	0.68763	0.99129	0.09102	0.46526	0.61490	0.20497	1.13556	0.13718
2016	1.70270	0.69468	1.00147	0.09101	0.47623	0.61612	0.20537	1.17013	0.13860
2017	1.72971	0.69482	1.00167	0.09054	0.48609	0.62549	0.20850	1.19603	0.14065
2018	1.73553	0.69274	0.99867	0.09011	0.49338	0.63587	0.21196	1.21404	0.14273
2019	1.75683	0.69176	0.99724	0.08985	0.50026	0.64684	0.21561	1.22999	0.14399
2020	1.79578	0.69098	0.99612	0.08966	0.50631	0.65746	0.21915	1.24184	0.14478
AvgAnn Gwth (2014-2020)	6.1%	0.5%	0.5%	0.1%	2.0%	2.6%	2.6%	4.7%	2.3%

Noncore Commercial: Annual Employment (millions) by Business Types

YEAR	Misc	Governmer	TCU	Constructic	Agriculture	EMPLTOT
2014	0.21787	0.61127	0.52987	0.34653	0.23293	7.78966
2015	0.21895	0.61096	0.54597	0.36937	0.24022	7.96020
2016	0.21892	0.61008	0.55841	0.39311	0.24524	8.12209
2017	0.21781	0.61584	0.56455	0.42238	0.24756	8.24163
2018	0.21676	0.62225	0.57088	0.44970	0.24829	8.32291
2019	0.21613	0.62960	0.57629	0.46970	0.24890	8.41298
2020	0.21567	0.64428	0.58306	0.48958	0.24998	8.52467
AvgAnn Gwth (2014-2020)	0.1%	1.8%	3.1%	10.0%	1.7%	3.5%

Noncore Commercial: EUForecaster Equipment Saturations for End-Uses by Business Types

zname	bname	nname	SAT	SOURCE
Commercial	Agriculture	Drying	1.0000	Assumed
Commercial	Agriculture	Engine	0.5000	Assumed
Commercial	Agriculture	Other	1.0000	DEFAULT
Commercial	Agriculture	Space_Heat	0.7200	CI_1996_STUDY
Commercial	Agriculture	Water_Heat	0.6900	CI_1996_STUDY
Commercial	College	AC_Compressor	0.8850	CBECS
Commercial	College	Cook_top	0.1470	CBECS
Commercial	College	Fryer	0.1470	CBECS
Commercial	College	Griddle	0.1470	CBECS
Commercial	College	Other	1.0000	DEFAULT
Commercial	College	Other_Cooking	0.1470	CBECS
Commercial	College	Space_Heat	0.7630	SDGE_EUI_STUDY
Commercial	College	Water_Heat	0.9550	SDGE_EUI_STUDY
Commercial	Construction	Other	1.0000	DEFAULT
Commercial	Construction	Space_Heat	0.7200	CI_1996_STUDY
Commercial	Construction	Water_Heat	0.6900	CI_1996_STUDY
Commercial	Government	AC_Compressor	0.8880	CBECS
Commercial	Government	Cook_top	0.1960	CBECS
Commercial	Government	Fryer	0.1960	CBECS
Commercial	Government	Griddle	0.1960	CBECS
Commercial	Government	Other	1.0000	DEFAULT
Commercial	Government	Other_Cooking	0.1960	CBECS
Commercial	Government	Space_Heat	0.8720	SDGE_EUI_STUDY
Commercial	Government	Water_Heat	0.7000	CI_1996_STUDY
Commercial	Grocery	AC_Compressor	0.8560	CBECS
Commercial	Grocery	Cook_top	0.2450	CBECS
Commercial	Grocery	Fryer	0.2450	CBECS
Commercial	Grocery	Griddle	0.2450	CBECS
Commercial	Grocery	Other	1.0000	DEFAULT
Commercial	Grocery	Other_Cooking	0.2450	CBECS
Commercial	Grocery	Space_Heat	0.6470	SDGE_EUI_STUDY
Commercial	Grocery	Water_Heat	0.9300	CI_1996_STUDY
Commercial	Health	AC_Compressor	0.7920	CBECS
Commercial	Health	Cook_top	0.1020	CBECS
Commercial	Health	Drying	0.8200	CI_1996_STUDY
Commercial	Health	Fryer	0.1020	CBECS
Commercial	Health	Griddle	0.1020	CBECS
Commercial	Health	Other	1.0000	DEFAULT
Commercial	Health	Other_Cooking	0.1020	CBECS
Commercial	Health	Space_Heat	0.9360	SDGE_EUI_STUDY
Commercial	Health	Water_Heat	1.0000	CI_1996_STUDY
Commercial	Laundry	Drying	1.0000	CI_1996_STUDY
Commercial	Laundry	Other	1.0000	CI_1996_STUDY
Commercial	Laundry	Space_Heat	0.7200	CI_1996_STUDY
Commercial	Laundry	Water_Heat	1.0000	CI_1996_STUDY
Commercial	Lodging	AC_Compressor	0.7950	CBECS
Commercial	Lodging	Cook_top	0.0840	CBECS
Commercial	Lodging	Drying	0.8200	CI_1996_STUDY

Noncore Commercial: EUForecaster Equipment Saturations for End-Uses by Business Types

zname	bname	nname	SAT	SOURCE
Commercial	Lodging	Fryer	0.0840	CBECS
Commercial	Lodging	Griddle	0.0840	CBECS
Commercial	Lodging	Other	1.0000	CI_1996_STUDY
Commercial	Lodging	Other_Cooking	0.0840	CBECS
Commercial	Lodging	Space_Heat	0.8950	SDGE_EUI_STUDY
Commercial	Lodging	Water_Heat	1.0000	CI_1996_STUDY
Commercial	Misc	AC_Compressor	0.7310	CBECS
Commercial	Misc	Cook_top	0.0210	CBECS
Commercial	Misc	Fryer	0.0210	CBECS
Commercial	Misc	Griddle	0.0210	CBECS
Commercial	Misc	Other	1.0000	CI_1996_STUDY
Commercial	Misc	Other_Cooking	0.0210	CBECS
Commercial	Misc	Space_Heat	0.6950	SDGE_EUI_STUDY
Commercial	Misc	Water_Heat	0.6900	CI_1996_STUDY
Commercial	Office	AC_Compressor	0.9310	CBECS
Commercial	Office	Cooking	0.0820	CBECS
Commercial	Office	Other	1.0000	CI_1996_STUDY
Commercial	Office	Space_Heat	0.8720	SDGE_EUI_STUDY
Commercial	Office	Water_Heat	0.7000	CI_1996_STUDY
Commercial	Restaurant	AC_Compressor	0.8710	CBECS
Commercial	Restaurant	Cook_top	0.7500	SCG_COOKING_STUDY
Commercial	Restaurant	Fryer	0.7290	SCG_COOKING_STUDY
Commercial	Restaurant	Griddle	0.5740	SCG_COOKING_STUDY
Commercial	Restaurant	Other	1.0000	CI_1996_STUDY
Commercial	Restaurant	Other_Cooking	0.9000	CI_1996_STUDY
Commercial	Restaurant	Space_Heat	0.8180	SDGE_EUI_STUDY
Commercial	Restaurant	Water_Heat	0.9600	CI_1996_STUDY
Commercial	Retail	Cooking	0.2450	CBECS
Commercial	Retail	Other	1.0000	CI_1996_STUDY
Commercial	Retail	Space_Heat	0.7710	SDGE_EUI_STUDY
Commercial	Retail	Water_Heat	0.6200	CI_1996_STUDY
Commercial	School	AC_Compressor	0.8850	CBECS
Commercial	School	Cook_top	0.1470	CBECS
Commercial	School	Fryer	0.1470	CBECS
Commercial	School	Griddle	0.1470	CBECS
Commercial	School	Other	1.0000	CI_1996_STUDY
Commercial	School	Other_Cooking	0.1470	CBECS
Commercial	School	Space_Heat	0.9670	SDGE_EUI_STUDY
Commercial	School	Water_Heat	0.9000	CI_1996_STUDY
Commercial	TCU	Engine	0.5000	Assumed
Commercial	TCU	Other	1.0000	CI_1996_STUDY
Commercial	TCU	Space_Heat	0.7200	CI_1996_STUDY
Commercial	TCU	Water_Heat	0.6900	CI_1996_STUDY
Commercial	Warehouse	Engine	0.2500	Assumed
Commercial	Warehouse	Other	1.0000	DEFAULT
Commercial	Warehouse	Space_Heat	0.2310	SDGE_EUI_STUDY
Commercial	Warehouse	Water_Heat	0.8800	SDGE_EUI_STUDY

Noncore Commercial: EUForecaster Average Equipment Age for End-Uses by Business Types

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other
Office	.	.	.	.	.	.	.	.	.	.	1966
Restaurant	1972	.	.	.	.	.	.	.	.	.	1974
Retail											
Laundry	1965	1980	.	.	.	.	.	2001	1983	.	1984
Warehouse	.	.	.	.	.	.	.	.	.	.	.
School	.	.	.	.	.	.	.	.	.	.	.
College	1974	1975	.	.	.	.	1988	1981	.	.	1968
Health	1975	1973	1973	1979	1983	1980	1975	1985	1972	.	1974
Lodging	1985	1978	1990	1986	1986	1990	1990	1953	1989	.	1991
Misc	.	1996	.	.	.	.	.	.	.	.	1991
Government	1979	1980	1976	1982	1979	1979	1982	1987	1980	1965	1976
TCU	1976	1969	.	.	.	.	.	.	.	1975	1977
Construction	.	.	.	.	.	.	.	.	.	.	.
Agriculture	1992	1991	.	.	.	.	1998	.	1970	1975	1992

(Year Equipment Installed)

Noncore Commercial: EUForecaster Use per Meter Data for End-Uses by Business Types

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other	Total Building
Office	218260	90617	11052	3674	2803	11432	2452	3741	10880	3108	217621	575643
Restaurant	36253	70171	117119	48181	92527	102374	24928	1444	646	0	23006	516650
Retail	127752	77596	28253	4705	31470	54248	33547	7443	14305	1143	177022	557485
Laundry	2195	34893	286	44	71	415	2	66	350522	0	326387	714881
Warehouse	91796	26668	3794	1057	9143	10514	13441	10445	30527	9068	295377	501831
School	0	0	0	0	0	0	0	0	0	0	0	0
College	450116	222331	21719	6407	11139	26736	6180	28134	6824	9562	306131	1095279
Health	273007	171067	27417	5311	7448	21084	11925	4941	37555	2800	288653	851210
Lodging	86642	176970	24427	5962	7634	29745	14641	1432	46105	30	200020	593607
Misc	43847	26779	5422	1082	1784	4457	1424	4515	1734	333	29593	120971
Government	280803	163246	14347	7070	4197	11810	6406	7496	3787	41474	110035	650670
TCU	115574	41549	3660	909	1726	3205	2189	5646	356	181332	191703	547848
Construction	89016	27820	2234	13	332	1241	761	2639	16643	57	131321	272077
Agriculture	142319	34481	5856	977	12180	27084	24623	334	35893	235332	475179	994258

Noncore Commercial: EUForecaster Historical Base Year Data

Segment	2014 Therm Sales	2014 Meter Count	2014 Meter Count, Existing/Old customers	2014 Meter Count New Customers	Avg Use Per Meter Existing Customers	Avg Use Per Meter New Customers	Price Elasticity	Employ-ment Elasticities	MAS SQFT ADJ
Office	575643	1	1	0	575643	0	-0.046000	0.474000	3786510
Restaurant	1033300	2	2	0	516650	0	-0.046000	0.474000	373813
Retail	1114970	2	2	0	557485	0	-0.046000	0.474000	2667893
Laundry	10008334	14	14	0	714881	0	-0.046000	0.474000	53150
Warehouse	1003662	2	2	0	501831	0	-0.046000	0.474000	5697150
School	0	0	0	0	0	0	-0.046000	0.474000	0
College	17524463	16	16	0	1095279	0	-0.046000	0.474000	4367776
Health	70650397	83	83	0	851210	0	-0.046000	0.474000	1707720
Lodging	10091323	17	17	0	593607	0	-0.046000	0.474000	447289
Misc	**120971**	**1**	1	0	120971	0	-0.046000	0.474000	14289582
Government	22122776	34	34	0	650670	0	-0.046000	0.474000	3533422
TCU	17531144	32	32	0	547848	0	-0.046000	0.474000	2992940
Construction	272077	1	1	0	272077	0	-0.046000	0.474000	946000
Agriculture	20879419	21	21	0	994258	0	-0.046000	0.474000	1625346
Total	172928479	226							

Adjustment for Normal Year Year

Normal Year HDD	**1,351**	HDD
Actual **2014** HDD	**766**	HDD
HDD Difference	585	HDD
Load per HDD	14,773	Therm/HDD
Temperature Adj.	8,642,370	Therms

	Actual 2014	Ratio
Office	546,874	0.33%
Restaurant	981,659	0.60%
Retail	1,059,248	0.64%
Laundry	9,508,152	5.79%
Warehouse	953,502	0.58%
School	0	0.00%
College	16,648,651	10.13%
Health	67,119,533	40.86%
Lodging	9,586,993	5.84%
Misc	**114,925**	0.07%
Government	21,017,156	12.79%
TCU	16,654,998	10.14%
Construction	258,480	0.16%
Agriculture	19,835,938	12.07%
G30 Commercial	164,286,109	172,928,479

EUForecaster Noncore Industrial Data

Noncore Industrial: Annual Employment (thousands) by Business Types

YEAR	Mining	Food	Textile	Wood_Pape	Chemical	Petroleum	Stone	Prim_Metal	Fab_Metal	Transport	Misc	EMPLTOT
2014	19.45118	114.04772	35.14721	20.27996	34.30611	5.50478	16.61267	7.72638	84.59019	80.26176	342.45815	760.38610
2015	18.77332	114.89587	34.10829	21.81546	34.63576	5.32012	17.09546	7.89350	88.78442	82.56571	342.26420	768.15210
2016	18.22979	116.10524	32.95188	22.79203	35.03864	5.16947	17.31081	8.02677	91.84768	81.26287	342.43182	771.16700
2017	17.80653	117.41346	32.03198	23.36264	35.35831	5.03632	17.33794	8.06105	92.41131	78.73943	343.83247	771.39144
2018	17.21324	118.10711	31.23450	23.72965	35.32716	4.91483	17.33807	8.01404	91.75929	77.28614	344.56402	769.48804
2019	16.48775	118.09426	30.32097	23.85515	35.07268	4.77003	17.29492	8.02813	92.23422	76.54728	344.34970	767.05508
2020	15.78153	117.86507	29.23279	23.88978	34.83186	4.61745	17.15855	8.05646	92.80604	75.59508	343.56782	763.40243
AvgAnn Gwth (2014-2020)	-6.3%	-0.5%	-6.7%	1.4%	-1.8%	-8.7%	-1.6%	-5.4%	-1.3%	-3.7%	-1.7%	-2.0%

Noncore Industrial: EUForecaster Use per Meter for End-Uses by Business Types

Segment	Fire_Tube_Boil	Wat_Tube_Boil	Space_Heat	Water_Heat	Dryer	Furnace_Oven_ Kiln	AC	Engine	Misc_Other	Total
Mining	67718	268074	3485	2075	179949	471597	0	19558	9401	1021858
Food	879689	238082	9519	12401	327015	80205	905	2641	62989	1613447
Textile	560488	77133	4628	14721	256323	81211	0	8489	34582	1037575
Wood_Paper	246297	618500	105	431	91963	52850	0	0	38463	1048609
Chemical	601409	188221	4224	2937	0	29106	9672	0	350978	1186547
Petroleum	40838	0	18329	1413	154717	492374	0	0	50966	758636
Stone	71370	0	11063	2003	44939	1860452	0	0	89732	2079558
Prim_Metal	60776	218124	6848	787	71991	2689972	246	0	259677	3308422
Fab_Metal	135417	14225	18418	1912	2994	808240	61	1125	160165	1142556
Transport	85271	127864	25969	2719	1516	714173	201	0	125232	1082946
Misc	249152	82574	10109	10572	18520	171671	3	0	158890	701492

Noncore Industrial: EUForecaster Equipment Saturations for End-Uses by Business Types

Segment	Fire_Tube_Boil	Wat_Tube_Boil	Space_Heat	Water_Heat	Dryer	Furnace_Oven_ Kiln	AC	Engine	Misc_Other
Mining	0.01	0.01	0.73	0.73	0.03	0.06	0.64	0.87	1.00
Food	0.45	0.45	0.60	0.85	0.12	0.33	0.73	0.70	1.00
Textile	0.26	0.26	0.70	0.71	0.14	0.09	0.72	0.46	1.00
Wood_Paper	0.01	0.01	0.62	0.77	0.09	0.07	0.71	0.50	1.00
Chemical	0.14	0.14	0.73	0.73	0.12	0.10	0.74	0.70	1.00
Petroleum	0.14	0.14	0.73	0.73	0.12	0.10	0.74	0.70	1.00
Stone	0.01	0.01	0.73	0.73	0.03	0.06	0.64	0.87	1.00
Prim_Metal	0.07	0.07	0.73	0.76	0.15	0.10	0.68	0.86	1.00
Fab_Metal	0.07	0.07	0.73	0.76	0.15	0.10	0.68	0.86	1.00
Transport	0.14	0.14	0.73	0.73	0.12	0.10	0.74	0.70	1.00
Misc	0.14	0.14	0.73	0.73	0.12	0.10	0.74	0.70	1.00

Noncore Industrial: EUForecaster Shares of Gas and Electric for End-Uses by Business Types

Segment	Fire_Tube_Boil	Wat_Tube_Boil	Space_Heat	Water_Heat	Dryer	Furnace_Oven_ Kiln	AC	Engine	Misc_Other	Source
Mining	0.75	0.75	0.61	0.59	0.32	0.62	0.11	0.01	1.00	
Food	0.79	0.79	0.61	0.59	0.32	0.62	0.11	0.01	1.00	CI 1996
Textile	0.79	0.79	0.61	0.59	0.32	0.62	0.11	0.01	1.00	
Wood_Paper	0.75	0.75	0.61	0.59	0.32	0.62	0.11	0.01	1.00	
Chemical	0.79	0.79	0.61	0.59	0.32	0.62	0.11	0.01	1.00	
Petroleum	0.79	0.79	0.61	0.59	0.32	0.62	0.11	0.01	1.00	
Stone	0.79	0.79	0.61	0.59	0.32	0.62	0.11	0.01	1.00	
Prim_Metal	0.79	0.79	0.61	0.59	0.32	0.62	0.11	0.01	1.00	
Fab_Metal	0.79	0.79	0.61	0.59	0.32	0.62	0.11	0.01	1.00	
Transport	0.75	0.75	0.61	0.59	0.32	0.62	0.11	0.01	1.00	
Misc	0.79	0.79	0.61	0.59	0.32	0.62	0.11	0.01	1.00	

Gas share unadjusted	Fire_Tube_Boil	Wat_Tube_Boil	Space_Heat	Water_Heat	Dryer	Furnace_Oven_ Kiln	AC	Engine	Misc_Other	Source
Mining	75%	75%	65%	60%	33%	65%	11%	1%	100%	
Food	75%	75%	65%	60%	33%	65%	11%	1%	100%	CI 1996
Textile	75%	75%	65%	60%	33%	65%	11%	1%	100%	
Wood_Paper	75%	75%	65%	60%	33%	65%	11%	1%	100%	
Chemical	75%	75%	65%	60%	33%	65%	11%	1%	100%	
Petroleum	75%	75%	65%	60%	33%	65%	11%	1%	100%	
Stone	75%	75%	65%	60%	33%	65%	11%	1%	100%	
Prim_Metal	75%	75%	65%	60%	33%	65%	11%	1%	100%	
Fab_Metal	75%	75%	65%	60%	33%	65%	11%	1%	100%	
Transport	75%	75%	65%	60%	33%	65%	11%	1%	100%	
Misc	75%	75%	65%	60%	33%	65%	11%	1%	100%	

electric share unadjusted	Fire_Tube_Boil	Wat_Tube_Boil	Space_Heat	Water_Heat	Dryer	Furnace_Oven_ Kiln	AC	Engine	Misc_Other	Source
Mining	25%	25%	41%	41%	71%	40%	91%	99%	100%	
Food	20%	20%	41%	41%	71%	40%	91%	99%	100%	CI 1996
Textile	20%	20%	41%	41%	71%	40%	91%	99%	100%	
Wood_Paper	25%	25%	41%	41%	71%	40%	91%	99%	100%	
Chemical	20%	20%	41%	41%	71%	40%	91%	99%	100%	
Petroleum	20%	20%	41%	41%	71%	40%	91%	99%	100%	
Stone	20%	20%	41%	41%	71%	40%	91%	99%	100%	
Prim_Metal	20%	20%	41%	41%	71%	40%	91%	99%	100%	
Fab_Metal	20%	20%	41%	41%	71%	40%	91%	99%	100%	
Transport	25%	25%	41%	41%	71%	40%	91%	99%	100%	
Misc	20%	20%	41%	41%	71%	40%	91%	99%	100%	

Noncore Industrial: EUForecaster Electric UECs and Relative Efficiencies for End-Uses by Business Types

Segment	Fire_Tube_Boil	Wat_Tube_Boil	Space_Heat	Water_Heat	Dryer	Furnace_Oven_ Kiln	AC	Engine	Misc_Other
Mining	311700114	1233912930	266299	116921	647124219	711126534	0	76883217	0
Food	41425664	11211568	407510	276223	135353440	10123645	180794	5940873	0
Textile	63761817	8774796	237011	547934	126927638	52461093	0	40558119	0
Wood_Paper	799504539	2007713563	6645	16232	77743050	48173085	0	0	0
Chemical	70902822	22190185	115757	59317	0	9442740	1484152	0	0
Petroleum	21161884	0	2207800	125491	219234462	702122971	0	0	0
Stone	284092939	0	731195	97568	139757861	2426118904	0	0	0
Prim_Metal	6940624	24909971	90900	7398	8992590	422681228	19874	0	0
Fab_Metal	39062748	4103358	617510	45371	944518	320793120	12490	1963343	0
Transport	16679997	25011535	1180812	91137	810979	384433232	51172	0	0
Misc	57873838	19180472	545807	420788	11763220	109733850	1046	0	0

Relative Efficiency Gas to Electric	Fire_Tube_Boil	Wat_Tube_Boil	Space_Heat	Water_Heat	Dryer	Furnace_Oven_ Kiln	AC	Engine
Mining	70%	70%	70%	50%	70%	70%	70%	70%
Food	70%	70%	70%	50%	70%	70%	70%	70%
Textile	70%	70%	70%	50%	70%	70%	70%	70%
Wood_Paper	70%	70%	70%	50%	70%	70%	70%	70%
Chemical	70%	70%	70%	50%	70%	70%	70%	70%
Petroleum	70%	70%	70%	50%	70%	70%	70%	70%
Stone	70%	70%	70%	50%	70%	70%	70%	70%
Prim_Metal	70%	70%	70%	50%	70%	70%	70%	70%
Fab_Metal	70%	70%	70%	50%	70%	70%	70%	70%
Transport	70%	70%	70%	50%	70%	70%	70%	70%
Misc	70%	70%	70%	50%	70%	70%	70%	70%

Noncore Industrial: EUForecaster Average Equipment Age for End-Uses by Business Types

Segment	Fire_Tube_Boil	Wat_Tube_Boil	Space_Heat	Water_Heat	Dryer	Furnace_Oven_Kiln	AC	Engine	Misc_Other
Mining	1978.50	1976.00	1971.00	1989.00	1972.60	1971.75	.	1984.50	1971.50
Food	1981.14	1979.00	1978.44	1979.54	1983.50	1977.64	1998.50	1988.50	1976.33
Textile	1977.00	1975.25	.	1980.00	1988.00	1975.00	1990.00	.	1971.00
Wood_Paper	1979.60	1974.64	1975.00	1975.00	1981.40	1977.00	.	1968.00	1980.80
Chemical	1985.20	1976.00	1978.14	1985.00	1986.00	1979.00	1996.00	.	1983.21
Petroleum	1970.00	.	1980.25	1981.50	1967.87	1988.00	.	.	1967.86
Stone	1976.00	.	1984.33	1982.00	1978.25	1975.50	.	.	1966.50
Prim_Metal	1989.50	1974.83	1974.20	1982.88	1988.50	1982.13	1975.00	.	1978.73
Fab_Metal	1973.50	1972.00	1975.50	1981.33	1976.00	1980.05	1998.00	.	1978.05
Transport	1976.50	1989.00	1970.33	1976.00	.	1981.20	1976.00	.	1982.00
Misc	1979.92	1978.00	1978.31	1981.80	1984.33	1979.77	.	.	1983.71

Data for these inputs came from "Industrial End Use Level Data 050804.xls"
The year the meter was installed.

Noncore Industrial: EUForecaster Historical Base Year Data

Segment	2014 Therm Sales	2014 Meter Count	2014 Meter Count, Existing/Old customers	2014 Meter Count New Customers	Avg Use Per Meter Existing Customers	Avg Use Per Meter New Customers	Price Elasticity	Emp Elasticity	MAS SQFT ADJ	Initial SQFT Calibration	Initial SQFT
Mining	20437161	20	20	0	1021858	.	-0.071000	0.474000	13.2900	177.2025	8539
Food	185032910	95	95	0	1613447	.	-0.071000	0.474000	12.7700	116.3474	2356
Textile	23864234	23	23	0	1037575	.	-0.071000	0.474000	13.0200	271.4589	11002
Wood_Paper	31458260	30	30	0	1048609	.	-0.071000	0.474000	8.3700	11.8754	3237
Chemical	33223327	28	28	0	1186547	.	-0.071000	0.474000	17.2700	728.2737	17662
Petroleum	30345450	40	40	0	758636	.	-0.071000	0.474000	3.7300	0.3081	47145
Stone	35352487	17	17	0	2079558	.	-0.071000	0.474000	6.2300	40.1230	42397
Prim_Metal	72785275	22	22	0	3308422	.	-0.071000	0.474000	20.0200	184.5367	15764
Fab_Metal	47987369	42	42	0	1142556	.	-0.071000	0.474000	9.0100	16.8171	21333
Transport	16244196	15	15	0	1082946	.	-0.071000	0.474000	7.9900	966.3551	6969
Misc	19641769	28	28	0	701492	.	-0.071000	0.474000	9.4800	226.5333	17929
Total	516,372,438	360									

No temperature adjustment since the weather coefficient is "small" and statistically not significant (i.e., Coeff=1,500 Therms/HDD & ABS(T-Stat) = 1.89 and < 2.00).
(Soruce: See tab "g30Ind-Reg#2(w_HDD)" of file: "S:\End_Use_Model\BMW\2010Cgr\SoCalGas-g30-g50\g30-g50_LoadWeatherSensitivity.xls")

Segment	Actual 2014 Therm Sales	Ratio from ZB Level Calibration Check				Old Initial SQFT Calibration	
Mining	20,437,161	Mining	-0.3290	177.2025	13.2900	133.3352	10
Food	185,032,910	Food	-0.2770	116.3474	12.7700	91.1099	10
Textile	23,864,234	Textile	-0.3020	271.4589	13.0200	208.4938	10
Wood_Paper	31,458,260	Wood_Paper	0.1630	11.8754	8.3700	14.1881	10
Chemical	33,223,327	Chemical	-0.7270	728.2737	17.2700	421.6987	10
Petroleum	30,345,450	Petroleum	0.6270	0.3081	3.7300	0.8259	10
Stone	35,352,487	Stone	0.3770	40.1230	6.2300	64.4029	10
Prim_Metal	72,785,275	Prim_Metal	-1.0020	184.5367	20.0200	92.1762	10
Fab_Metal	47,987,369	Fab_Metal	0.0990	16.8171	9.0100	18.6649	10
Transport	16,244,196	Transport	0.2010	966.3551	7.9900	1209.4557	10
Misc	19,641,769	Misc	0.0520	226.5333	9.4800	238.9591	10

FORECAST RESULTS

A. Noncore Commercial

The annual results from the EUForecaster end-use model are shown below for this segment of the noncore market.

Forecast of

Scenario 10 -
Base Case

			Therms/Yr		(These are *subtractions* to EUF Dmd)		(These are ***addittions*** to EUF Dmd)
Sector	**Fuel Type**	**Year (Base = 2014)**	**Forecast for Scenario 10**	Noncore **Com**/NonRefinery	Accum. Migr. to COV	Accum. EE/DSM Scg Pgm Savings	Annual Migration from g10 **Com** to g30 **Com**
				MDth/Yr	MDth/Yr	MDth/Yr	MDth/Yr
ComNonCore	Natural_Gas	2014	**172,928,479**	17,292.8	0.0	**0.0**	**0.0**
		2015	**175,809,279**	17,580.9	1.1	157.8	165.0
		2016	**176,652,375**	17,665.2	2.3	315.7	165.0
		2017	**177,447,999**	17,744.8	3.4	473.5	165.0
		2018	**178,139,923**	17,814.0	4.6	631.4	165.0
		2019	**178,499,913**	17,850.0	5.7	789.2	165.0
		2020	**178,263,077**	17,826.3	6.9	947.1	165.0

These respective annual values were proportioned into monthly values using the following set of "weather-adjusted" proportions from the second column of percentages:

Monthly Proportions of Annual Total Load

Month	**Use 2009 "Fitted"**	**Wea-Adj Prop.**
1	**9.53%**	**10.1250%**
2	**9.14%**	**8.9049%**
3	**9.13%**	**9.0187%**
4	**8.25%**	**8.1137%**
5	**7.43%**	**7.5824%**
6	**6.90%**	**6.8563%**
7	**7.08%**	**7.0401%**
8	**7.54%**	**7.5092%**
9	**8.54%**	**8.5165%**
10	**8.20%**	**8.1126%**
11	**8.12%**	**8.2563%**
12	**10.13%**	**9.9643%**
	100.00%	**100.00%**

The value for August 2018 would be:

1,302.3 MDth = (17,814.0 – 4.6 – 631.4 + 165.0) x (0.075092)
= (17,343.0) x (0.075092).

A final adjustment to the noncore commercial load forecast was done to account for "Rule-38" gas load. A constant monthly amount of 77.8 MDth/mo was calculated from 2014 Rule-38 eligible G-30 customer load, of this total about 0.7% was commercial NAICS business type.

Using the August 2018 data example, the resulting G-30 commercial forecast of demand would be:

1,301.8 MDth = (1,302.3) – (77.8 x 0.007).

B. Noncore Industrial (Non-Refinery)

The annual results from the EUForecaster end-use model are shown below for this segment of the noncore market.

Forecast of

Scenario 10 - Base Case

			Therms/Yr		(These are *subtractions* to EUF Dmd)		(These are ***additions*** to EUF Dmd)
				Noncore **Ind**/NonRefinery	Accum. Migr. to COV	Accum. EE/DSM Scg Pgm Savings	Annual Migration from g10 **Ind** to g30 **Ind**
Sector	**Fuel Type**	**Year (Base = 2014)**	**Forecast for Scenario 10**	MDth/Yr	MDth/Yr	MDth/Yr	MDth/Yr
IndNonCore	Natural_Gas	2014	**516,372,438**	51,637.2	0.0	**0.0**	**0.0**
		2015	**516,076,149**	51,607.6	47.4	579.9	293.3
		2016	**525,523,788**	52,552.4	94.8	1,159.8	293.3
		2017	**523,797,240**	52,379.7	142.3	1,739.8	293.3
		2018	**521,573,306**	52,157.3	189.7	2,319.7	293.3
		2019	**519,773,246**	51,977.3	237.1	2,899.6	293.3
		2020	**516,446,614**	51,644.7	284.5	3,479.5	293.3

These respective annual values were proportioned into monthly values using the following set of percentages:

Month	**Monthly Proportions of Annual Total Load**
1	**8.5782%**
2	**7.7938%**
3	**8.7547%**
4	**8.3289%**
5	**8.4988%**
6	**7.9901%**
7	**8.8529%**
8	**9.8298%**
9	**9.1284%**
10	**8.4519%**
11	**7.1729%**
12	**6.6195%**
	100.00%

The value for August 2018 would be:

4,909.1 MDth = (52,157.3 – 189.7 - 2,319.7 + 293.3) x (0.098298)
= (49,941.2) x (0.098298).

A final adjustment to the noncore commercial load forecast was done to account for "Rule-38" gas load. A constant monthly amount of 77.8 MDth/mo was calculated from 2014 Rule-38 eligible G-30 customer load, of this total about 99.3% was industriial NAICS business type.

Using the August 2014 data example, the resulting G-30 industrial forecast of demand would be:

4,831.8 MDth = (4,909.1) – (77.8 x 0.993).

C. Noncore Industrial (Refinery)

The noncore industrial refinery gas demand receives G-30 rate treatment. It is basically the non-cogeneration gas load at refinery facilities served by SoCalGas. The details of how the gas demand forecast for total gas demand at refineries is provided in a separate document below. In this part of the noncore C&I only the refinery load billed at G-30 rates is discussed.

Continuing with the August 2018 month as an example and using the data from the following two tables, the G-30 industrial refinery demand was projected to be:

7,108.4 MDth = (7,366.7) – (258.3).

The reduction of 258 MDth is the accumulated EE/DSM program impact for refineries.

Industrial Refinery G-30 Gas Demand (2014-2016)

	Cal. Days per Month	Ref **G30**, Base Econ. Fcst	Accum. EE/DSM Scg Pgm Savings for **Refinery G-30**
	(#Days)	MDth	MDth
2014 Jan	31	8,067	0
2014 Feb	28	6,109	0
2014 Mar	31	6,505	0
2014 Apr	30	7,680	0
2014 May	31	7,772	0
2014 Jun	30	7,377	0
2014 Jul	31	7,124	0
2014 Aug	31	6,951	0
2014 Sep	30	7,287	0
2014 Oct	31	7,147	0
2014 Nov	30	6,917	0
2014 Dec	31	8,149	0
2015 Jan	31	7,357	-65
2015 Feb	28	6,859	-58
2015 Mar	31	7,503	-65
2015 Apr	30	7,361	-62
2015 May	31	7,604	-65
2015 Jun	30	7,268	-62
2015 Jul	31	7,404	-65
2015 Aug	31	7,395	-65
2015 Sep	30	7,310	-62
2015 Oct	31	7,531	-65
2015 Nov	30	7,464	-62
2015 Dec	31	7,628	-65
2016 Jan	31	7,382	-129
2016 Feb	29	7,092	-120
2016 Mar	31	7,479	-129
2016 Apr	30	7,335	-125
2016 May	31	7,592	-129
2016 Jun	30	7,257	-125
2016 Jul	31	7,390	-129
2016 Aug	31	7,381	-129
2016 Sep	30	7,306	-125
2016 Oct	31	7,533	-129
2016 Nov	30	7,466	-125
2016 Dec	31	7,638	-129

Industrial Refinery G-30 Gas Demand (2017-2020)

	Cal. Days per Month	Ref **G30**, Base Econ. Fcst	Accum. EE/DSM Scg Pgm Savings for **Refinery G-30**
	(#Days)	MDth	MDth
2017 Jan	31	7,374	-194
2017 Feb	28	6,800	-175
2017 Mar	31	7,425	-194
2017 Apr	30	7,313	-187
2017 May	31	7,584	-194
2017 Jun	30	7,245	-187
2017 Jul	31	7,373	-194
2017 Aug	31	7,366	-194
2017 Sep	30	7,286	-187
2017 Oct	31	7,511	-194
2017 Nov	30	7,454	-187
2017 Dec	31	7,622	-194
2018 Jan	31	7,354	-258
2018 Feb	28	6,790	-233
2018 Mar	31	7,415	-258
2018 Apr	30	7,306	-250
2018 May	31	7,581	-258
2018 Jun	30	7,244	-250
2018 Jul	31	7,373	-258
2018 Aug	31	7,367	-258
2018 Sep	30	7,286	-250
2018 Oct	31	7,510	-258
2018 Nov	30	7,453	-250
2018 Dec	31	7,621	-258
2019 Jan	31	7,350	-323
2019 Feb	28	6,778	-292
2019 Mar	31	7,397	-323
2019 Apr	30	7,283	-312
2019 May	31	7,550	-323
2019 Jun	30	7,209	-312
2019 Jul	31	7,337	-323
2019 Aug	31	7,331	-323
2019 Sep	30	7,247	-312
2019 Oct	31	7,466	-323
2019 Nov	30	7,403	-312
2019 Dec	31	7,573	-323

D. "Out-of-Model" Gas Demand Forecasts

This final category of gas demand for the G-30 load is associated with customers who are included in the large cogeneration, EWG or UEG market segment but who have gas consumption not used to generate electricity. This gas consumption is charged under our G-30 rates rather than the electric generation rate that applies for most of their consumption.

The following table shows the monthly load for year 2014. These values were used as the profile for these customers for each year of 2015 through 2020.

Year	Date	MDth
2014	Jan	119.5
2014	Feb	68.9
2014	Mar	187.6
2014	Apr	54.0
2014	May	129.3
2014	Jun	32.8
2014	Jul	61.6
2014	Aug	48.9
2014	Sep	46.0
2014	Oct	144.3
2014	Nov	47.5
2014	Dec	88.9

For example, the projected G-30 "out-of-model" gas demand for August 2018 would simply be: 48.9 MDth.

E. Combined G-30 Gas Demand Forecast

The resulting gas demand for SoCalGas' G-30 C&I load is the sum of the above market segment forecasts. Using the August 2018 example we have:

13,290.9 MDth = 1,301.8 MDth (G-30 Com)
+ 4,831.8 MDth (G-30 Ind-NonRefinery
+ 7,108.4 MDth (G-30 Ind-Refinery)
+ 48.9 MDth (G-30 "Out-of-Model")

This value checks with the value (132,909 MTh) shown in the SoCalGas consolidated gas demand forecast work papers for August 2018.

Refinery Non-Cogeneration and Cogeneration Gas Demand

INTRODUCTION

Gas demand for refineries is developed from a base econometric forecast for both non-cogeneration (rate class G-30) load and cogeneration (rate class G-50) load. The separation into G-30 and G-50 categories is based on the historical 2014 monthly proportions of each rate class.

As part of the base forecast, adjustments are made to both the natural gas burner-tip price and the butane price to include GHG (Green House Gas) price adders for each fuel to capture added costs for refiners due to implementation of new emission regulations per AB32 and Low Carbon Fuel Standards (LCFS) beginning in 2012. The table below shows the estimated GHG price adders (in current-year $/MMBtu) for these fuels:

Year	GHG $/Mmbtu (Natural Gas)	GHG $/Mmbtu (Propane)
2012	0.61	0.71
2013	1.04	1.21
2014	0.63	0.73
2015	0.65	0.75
2016	0.67	0.77
2017	0.69	0.80
2018	0.74	0.85
2019	0.80	0.93
2020	0.89	1.03

BASE FORECAST EQUATION

The base econometric forecast is generated from an equation that uses the natural logarithm of average daily monthly refinery gas consumption as the dependent variable. The key explanatory variable is the natural logarithm of the monthly ratio of 2-month average burner-tip natural gas rates (e.g., transportation rate + commodity price + GHG price adder) relative to the 2-month average of propane prices. The second component of the forecast equation is a constant term.

The base forecast equation is shown below:

$$LN(Ref\_MDth/d) = 5.62945 + LN(G/B) \times (-0.095978),$$

where

G = Average of current month's and prior month's burner-tip gas price, and
B = Average of current month's and prior month's butane price.

The parameters of this equation were estimated from monthly data for Feb-1997 through Dec-2014.

EXAMPLE OF FORECAST CALCULATIONS

The refinery gas demand in a particular month is calculated as:

Ref_MDth/mo = (#days in month) x EXP[LN(Ref_MDth/d)].

For example, the calculation of total refinery gas demand for August 2018 are as follows:

LN[Ref_MDth/d] = 5.62945 + LN[((5.436+5.428)/2) / ((13.1573+12.36908)/2)]
x (-0.095978),
LN[Ref_MDth/d] = 5.71144

(9,371.5 MDth) = (31) x (EXP[5.71144]) = (31) x (302.307 MDth/d)

This total refinery gas demand was "split" between G-30 and G-50 load using the 2014 monthly proportions that the G-30 load represented relative to the total refinery load. The table below provides these proportions.

Date	2014 Monthly %G-30 of Total Ref.
Jan-14	77.788%
Feb-14	79.010%
Mar-14	78.491%
Apr-14	80.226%
May-14	80.503%
Jun-14	79.833%
Jul-14	78.889%
Aug-14	78.608%
Sep-14	79.908%
Oct-14	79.478%
Nov-14	81.564%
Dec-14	81.090%

Based on the August 2014 proportion in the table above, the total refinery gas demand for August 2018 is split into G-30 and G-50 values:

Ref_G-30 = (7,366.7 MDth) = (9,371.5 MDth) x (0.78608), and
Reg_G-50 = (2,004.8 MDth) = (9,371.5MDth) x (0.21392).

The table below shows the entire base refinery gas demand forecast and the split into G-30 and G-50 rate class component loads.

Base Forecast of Refinery Gas Demand (2014-2016)

	2016 Tcap-Phase II	2016 Tcap-Phase II								Total Ref	
	Ref g-30	Ref g-50 (CoGen)			Total Ref	Total Ref				Burner tip	
Date	Mdth	Mdth	#Days per Month	Month	Mdth	Mdth/Day	ln(mdtd)	ln(G/P): Moving 2-Mo Avg	Burner Tip Gas /Propane (2-Mo MA)	Burner tip Gas $/dth	Propane $/dth
Jan-14	8,067	2,304	31	1	10,371	335	5.8128	-1.0659	0.3444	5.749	18.7424
Feb-14	6,109	1,623	28	2	7,732	276	5.6209	-1.0259	0.3585	7.739	18.8848
Mar-14	6,505	1,783	31	3	8,287	267	5.5885	-0.8610	0.4227	6.117	13.8921
Apr-14	7,680	1,893	30	4	9,572	319	5.7654	-0.8190	0.4409	5.761	13.0490
May-14	7,772	1,882	31	5	9,655	311	5.7412	-0.8069	0.4462	5.572	12.3483
Jun-14	7,377	1,864	30	6	9,241	308	5.7302	-0.7705	0.4628	5.843	12.3154
Jul-14	7,124	1,906	31	7	9,030	291	5.6743	-0.7922	0.4529	5.416	12.5454
Aug-14	6,951	1,892	31	8	8,843	285	5.6533	-0.8477	0.4284	5.239	12.3264
Sep-14	7,287	1,832	30	9	9,120	304	5.7170	-0.8824	0.4138	5.152	12.7862
Oct-14	7,147	1,846	31	10	8,993	290	5.6702	-0.9123	0.4016	4.885	12.2059
Nov-14	6,917	1,563	30	11	8,480	283	5.6443	-0.8433	0.4303	5.252	11.3519
Dec-14	8,149	1,900	31	12	10,050	324	5.7813	-0.7671	0.4643	4.543	9.7424
Jan-15	7357.4	2100.8	31	1	9458.2	305.1	5.7206	-0.9502	0.3867	4.360	13.2828
Feb-15	6859.3	1822.3	28	2	8681.5	310.1	5.7367	-1.1179	0.3270	4.386	13.4676
Mar-15	7503.0	2056.0	31	3	9559.0	308.4	5.7313	-1.0607	0.3462	4.171	11.2461
Apr-15	7360.7	1814.2	30	4	9174.9	305.8	5.7230	-0.9750	0.3772	4.167	10.8572
May-15	7604.4	1841.7	31	5	9446.1	304.7	5.7194	-0.9368	0.3919	4.188	10.4634
Jun-15	7267.7	1835.9	30	6	9103.6	303.5	5.7152	-0.8937	0.4091	4.226	10.1037
Jul-15	7403.6	1981.3	31	7	9384.9	302.7	5.7129	-0.8691	0.4193	4.375	10.4100
Aug-15	7395.4	2012.6	31	8	9408.0	303.482	5.7153	-0.8947	0.4087	4.405	11.0711
Sep-15	7310.0	1838.1	30	9	9148.1	304.9	5.7201	-0.9445	0.3889	4.389	11.5426
Oct-15	7530.7	1944.5	31	10	9475.3	305.7	5.7225	-0.9690	0.3795	4.347	11.4794
Nov-15	7463.9	1687.1	30	11	9151.0	305.0	5.7204	-0.9478	0.3876	4.527	11.4162
Dec-15	7628.0	1778.8	31	12	9406.8	303.4	5.7152	-0.8934	0.4093	4.769	11.2995
Jan-16	7382.2	2107.9	31	1	9490.2	306.1	5.7240	-0.9853	0.3733	4.908	14.6234
Feb-16	7092.2	1884.1	29	2	8976.4	309.5	5.7351	-1.1003	0.3328	4.893	14.8276
Mar-16	7479.3	2049.5	31	3	9528.8	307.4	5.7281	-1.0277	0.3578	4.840	12.3717
Apr-16	7334.8	1807.8	30	4	9142.7	304.8	5.7195	-0.9383	0.3913	4.674	11.9418
May-16	7591.8	1838.7	31	5	9430.5	304.2	5.7177	-0.9196	0.3987	4.675	11.5065
Jun-16	7256.9	1833.2	30	6	9090.0	303.0	5.7137	-0.8782	0.4155	4.723	11.1088
Jul-16	7389.7	1977.6	31	7	9367.2	302.2	5.7110	-0.8495	0.4276	4.923	11.4474
Aug-16	7381.0	2008.6	31	8	9389.7	302.9	5.7134	-0.8744	0.4171	4.932	12.1782
Sep-16	7305.6	1836.9	30	9	9142.5	304.7	5.7195	-0.9381	0.3914	4.805	12.6995
Oct-16	7532.6	1945.0	31	10	9477.6	305.7	5.7227	-0.9715	0.3785	4.783	12.6297
Nov-16	7465.9	1687.5	30	11	9153.5	305.1	5.7207	-0.9506	0.3865	4.953	12.5598
Dec-16	7638.1	1781.2	31	12	9419.3	303.8	5.7165	-0.9072	0.4036	5.134	12.4308

Base Forecast of Refinery Gas Demand (2017-2020)

	2016 Tcap-Phase II	2016 Tcap-Phase II								Total Ref	
	Ref g-30	Ref g-50 (CoGen)			Total Ref	Total Ref				Burner tip	
Date	Mdth	Mdth	#Days per Month	Month	Mdth	Mdth/Day	ln(mdtd)	ln(G/P): Moving 2-Mo Avg	Burner Tip Gas /Propane (2-Mo MA)	Burner tip Gas $/dth	Propane $/dth
Jan-17	7373.5	2105.4	31	1	9478.9	305.8	5.7228	-0.9730	0.3779	5.341	15.2846
Feb-17	6800.0	1806.5	28	2	8606.4	307.4	5.7281	-1.0274	0.3579	5.677	15.4981
Mar-17	7425.1	2034.7	31	3	9459.8	305.2	5.7208	-0.9520	0.3860	5.296	12.9306
Apr-17	7312.8	1802.4	30	4	9115.2	303.8	5.7165	-0.9070	0.4037	4.964	12.4812
May-17	7583.6	1836.7	31	5	9420.3	303.9	5.7166	-0.9084	0.4032	4.917	12.0261
Jun-17	7245.4	1830.3	30	6	9075.6	302.5	5.7122	-0.8617	0.4225	5.069	11.6104
Jul-17	7372.9	1973.1	31	7	9345.9	301.5	5.7087	-0.8258	0.4379	5.255	11.9643
Aug-17	7366.3	2004.7	31	8	9371.0	302.3	5.7114	-0.8537	0.4258	5.261	12.7284
Sep-17	7286.5	1832.1	30	9	9118.6	304.0	5.7169	-0.9108	0.4022	5.197	13.2733
Oct-17	7511.3	1939.5	31	10	9450.9	304.9	5.7199	-0.9421	0.3898	5.122	13.2003
Nov-17	7454.2	1684.9	30	11	9139.1	304.6	5.7191	-0.9342	0.3929	5.222	13.1273
Dec-17	7621.9	1777.4	31	12	9399.3	303.2	5.7144	-0.8851	0.4127	5.558	12.9924
Jan-18	7354.3	2099.9	31	1	9454.2	305.0	5.7202	-0.9458	0.3884	5.622	15.7947
Feb-18	6789.7	1803.8	28	2	8593.5	306.9	5.7266	-1.0117	0.3636	5.944	16.0150
Mar-18	7415.5	2032.0	31	3	9447.5	304.8	5.7195	-0.9384	0.3913	5.552	13.3660
Apr-18	7306.4	1800.8	30	4	9107.2	303.6	5.7156	-0.8978	0.4075	5.151	12.9023
May-18	7581.1	1836.1	31	5	9417.2	303.8	5.7163	-0.9049	0.4046	5.099	12.4328
Jun-18	7244.0	1829.9	30	6	9074.0	302.5	5.7120	-0.8597	0.4233	5.245	12.0038
Jul-18	7372.9	1973.1	31	7	9346.0	301.5	5.7087	-0.8258	0.4379	5.428	12.3690
Aug-18	7366.7	2004.8	31	8	9371.5	302.3	5.71144	-0.8543	0.4256	5.436	13.1573
Sep-18	7286.2	1832.1	30	9	9118.2	303.9	5.7168	-0.9104	0.4023	5.378	13.7196
Oct-18	7510.4	1939.3	31	10	9449.7	304.8	5.7198	-0.9409	0.3903	5.302	13.6442
Nov-18	7453.0	1684.6	30	11	9137.6	304.6	5.7190	-0.9325	0.3936	5.408	13.5689
Dec-18	7621.0	1777.2	31	12	9398.2	303.2	5.7143	-0.8839	0.4132	5.747	13.4298
Jan-19	7349.9	2098.7	31	1	9448.5	304.8	5.7196	-0.9395	0.3908	5.885	16.3347
Feb-19	6778.0	1800.7	28	2	8578.7	306.4	5.7248	-0.9938	0.3702	6.293	16.5617
Mar-19	7397.2	2027.0	31	3	9424.2	304.0	5.7170	-0.9127	0.4014	5.908	13.8312
Apr-19	7283.1	1795.1	30	4	9078.1	302.6	5.7124	-0.8645	0.4213	5.543	13.3532
May-19	7549.7	1828.4	31	5	9378.1	302.5	5.7121	-0.8616	0.4225	5.535	12.8693
Jun-19	7209.0	1821.1	30	6	9030.1	301.0	5.7071	-0.8093	0.4452	5.726	12.4271
Jul-19	7337.0	1963.5	31	7	9300.5	300.0	5.7038	-0.7750	0.4607	5.898	12.8036
Aug-19	7331.1	1995.1	31	8	9326.2	300.8	5.7066	-0.8037	0.4477	5.929	13.6161
Sep-19	7246.9	1822.2	30	9	9069.1	302.3	5.7114	-0.8541	0.4256	5.909	14.1957
Oct-19	7465.7	1927.7	31	10	9393.4	303.0	5.7138	-0.8786	0.4154	5.851	14.1180
Nov-19	7402.7	1673.3	30	11	9076.0	302.5	5.7122	-0.8620	0.4223	6.040	14.0403
Dec-19	7573.0	1766.0	31	12	9339.0	301.3	5.7080	-0.8180	0.4413	6.289	13.8969
Jan-20	7279.2	2078.5	31	1	9357.7	301.9	5.7100	-0.8388	0.4322	6.994	16.8361
Feb-20	6916.1	1837.3	29	2	8753.5	301.8	5.7099	-0.8383	0.4325	7.668	17.0689
Mar-20	7288.2	1997.2	31	3	9285.4	299.5	5.7022	-0.7581	0.4686	7.015	14.2688
Apr-20	7182.8	1770.4	30	4	8953.2	298.4	5.6986	-0.7201	0.4867	6.636	13.7786
May-20	7443.2	1802.7	31	5	9245.9	298.3	5.6979	-0.7136	0.4899	6.621	13.2823
Jun-20	7109.2	1795.9	30	6	8905.1	296.8	5.6932	-0.6640	0.5148	6.821	12.8289
Jul-20	7243.6	1938.5	31	7	9182.1	296.2	5.6910	-0.6415	0.5265	6.891	13.2149
Aug-20	7245.9	1971.9	31	8	9217.8	297.3	5.6949	-0.6819	0.5057	6.895	14.0482
Sep-20	7163.1	1801.1	30	9	8964.2	298.8	5.6998	-0.7330	0.4805	6.891	14.6425
Oct-20	7378.8	1905.3	31	10	9284.1	299.5	5.7021	-0.7566	0.4693	6.814	14.5629
Nov-20	7315.2	1653.5	30	11	8968.6	299.0	5.7003	-0.7381	0.4780	7.070	14.4832
Dec-20	7491.8	1747.1	31	12	9238.9	298.0	5.6972	-0.7057	0.4937	7.159	14.3362

ADJUSTMENTS TO THE BASE FORECAST

A. Energy Efficiency/DSM Program Savings

Adjustments for energy efficiency/DSM (EE/DSM) programs for refinery customers are applied to the G-30 load portion of the refinery gas demand. The cogeneration (G-50) load is exempt from participating in these programs. The values applied to the refinery G-30 load have been noted in the earlier discussion of the overall G-30 load forecast.

B. Refinery Industrial G-30 Gas Demand

For the discussion of how the G-30 refinery gas demand is calculated see the discussion under the work papers for the Noncore C&I, section Noncore Industrial (Refinery).

C. Refinery Cogeneration Gas Demand by EG Rate Tiers

Cogeneration (G-50) refinery gas demand is billed according to the two-tiered EG rate structure. The projected refinery cogeneration gas demand by tier assigns 98.50297% of the base refinery cogeneration to tier 2. The cogeneration gas demand to tier 1 is 1.49703% of the base refinery cogeneration demand.

Using August 2018 as an example:

Tier 2: (1,974.8 MDth) = (2,004.8 MDth) x (0. 9850297)

= (1,974.8)

Tier 1: (30.0 MDth) = (2,004.8 MDth) x (0. 149703)

Refinery Cogeneration Gas Demand by EG Rate Tier (2014-2016)

MONTHLY FORECAST DATA		Total (Refinery CoGeneration)	Refinery CoGen (Tier 1)	Refinery CoGen (Tier 2)
		(MDth)	(MDth)	(MDth)
Year	Month			
2014	Jan	2,304	34	2,269
2014	Feb	1,623	24	1,599
2014	Mar	1,783	27	1,756
2014	Apr	1,893	28	1,864
2014	May	1,882	28	1,854
2014	Jun	1,864	28	1,836
2014	Jul	1,906	29	1,878
2014	Aug	1,892	28	1,863
2014	Sep	1,832	27	1,805
2014	Oct	1,846	28	1,818
2014	Nov	1,563	23	1,540
2014	Dec	1,900	28	1,872
2015	Jan	2,101	31	2,069
2015	Feb	1,822	27	1,795
2015	Mar	2,056	31	2,025
2015	Apr	1,814	27	1,787
2015	May	1,842	28	1,814
2015	Jun	1,836	27	1,808
2015	Jul	1,981	30	1,952
2015	Aug	2,013	30	1,982
2015	Sep	1,838	28	1,811
2015	Oct	1,945	29	1,915
2015	Nov	1,687	25	1,662
2015	Dec	1,779	27	1,752
2016	Jan	2,108	32	2,076
2016	Feb	1,884	28	1,856
2016	Mar	2,050	31	2,019
2016	Apr	1,808	27	1,781
2016	May	1,839	28	1,811
2016	Jun	1,833	27	1,806
2016	Jul	1,978	30	1,948
2016	Aug	2,009	30	1,979
2016	Sep	1,837	27	1,809
2016	Oct	1,945	29	1,916
2016	Nov	1,688	25	1,662
2016	Dec	1,781	27	1,755

Refinery Cogeneration Gas Demand by EG Rate Tier (2017-2020)

MONTHLY FORECAST DATA		Total (Refinery CoGeneration) (MDth)	Refinery CoGen (Tier 1) (MDth)	Refinery CoGen (Tier 2) (MDth)
Year	Month			
2017	Jan	2,105	32	2,074
2017	Feb	1,806	27	1,779
2017	Mar	2,035	30	2,004
2017	Apr	1,802	27	1,775
2017	May	1,837	27	1,809
2017	Jun	1,830	27	1,803
2017	Jul	1,973	30	1,944
2017	Aug	2,005	30	1,975
2017	Sep	1,832	27	1,805
2017	Oct	1,940	29	1,910
2017	Nov	1,685	25	1,660
2017	Dec	1,777	27	1,751
2018	Jan	2,100	31	2,069
2018	Feb	1,804	27	1,777
2018	Mar	2,032	30	2,002
2018	Apr	1,801	27	1,774
2018	May	1,836	27	1,809
2018	Jun	1,830	27	1,803
2018	Jul	1,973	30	1,944
2018	Aug	2,005	30	1,975
2018	Sep	1,832	27	1,805
2018	Oct	1,939	29	1,910
2018	Nov	1,685	25	1,659
2018	Dec	1,777	27	1,751
2019	Jan	2,099	31	2,067
2019	Feb	1,801	27	1,774
2019	Mar	2,027	30	1,997
2019	Apr	1,795	27	1,768
2019	May	1,828	27	1,801
2019	Jun	1,821	27	1,794
2019	Jul	1,963	29	1,934
2019	Aug	1,995	30	1,965
2019	Sep	1,822	27	1,795
2019	Oct	1,928	29	1,899
2019	Nov	1,673	25	1,648
2019	Dec	1,766	26	1,740
2020	Jan	2,078	31	2,047
2020	Feb	1,837	28	1,810
2020	Mar	1,997	30	1,967
2020	Apr	1,770	27	1,744
2020	May	1,803	27	1,776
2020	Jun	1,796	27	1,769
2020	Jul	1,938	29	1,909
2020	Aug	1,972	30	1,942
2020	Sep	1,801	27	1,774
2020	Oct	1,905	29	1,877
2020	Nov	1,653	25	1,629
2020	Dec	1,747	26	1,721

Small Cogeneration (Capacity < 20 Mw)
Gas Demand

INTRODUCTION

The gas demand forecast for small cogeneration (capacity < 20 Mw) is based primarily on an econometric relationship from analysis of annual historical data together with a monthly profile of how the annual consumption is split over the months of a year. In addition to the econometric projection, there is a contribution of gas demand expected from the Self Generation Incentive Program (SGIP) attributed to noncore gas customers who are expected to participate.

Although these customers are associated with G-50 transportation rates their gas demand in total is split into two tiers based on a customer's annual consumption (tier 1 for ≤ 3,000,000 Thm/yr; and tier 2 for > 3,000,000 Thm/yr). As electric generation customers their consumption is billed at the EG rate structure.

BASE ECONOMETRIC EQUATION TO FORECAST ANNUAL DEMAND

The base forecast equation for annual demand is shown below:

LN(SmCoGen_MDth/yr) = 7.82882 + LN(#Cust) x (0.42865)
+ LN(G/E) x (-0.25090), where

#Cust = Number of active meters/customers,
G =SCG's "EG tier1" Burner-Tip Price converted to ¢/Kwh
at 87.60 Thm/Yr per Kw, and
E = SCE-Retail Ind Elec. Price. ¢/Kwh

The small cogeneration gas demand in a particular year is calculated as:

SmCoGen_MDth/yr = EXP[LN(SmCoGen_MDth/yr)].

For example, the calculations of total econometric small cogeneration gas demand for 2018 are as follows:

LN[SmCoGen_MDth/yr] = 7.82882 + LN(213) x (0. 42865)
+ LN[(14.990 ¢/Kwh)/(12.204 ¢/Kwh)] x (-0. 25090)
LN[SmCoGen_MDth/yr] = 10.0749

(23,740 MDth/yr) = (EXP[10.0749])

The table below shows the entire annual small cogeneration gas demand forecast.

Base Annual Forecast of Small Cogeneration Gas Demand

Year	Annual (Cal Yr) Load	Cust	Avg. Annual Monthly Load per Cust		LN(Cust)	LN (G/E)	Gas/Elec. (G/E) Price Ratio	SCE-Retail Ind Elec. Price	SCG's "EG tier1" Burner-Tip Price cnv. to ¢/Kwh at 87.60 Thm/Yr per Kw	SCG's "EG tier1" Burner-Tip Price
(YYYY)	(MDth)	(cnt)	(Therms/ cust)	LN(Ann.M DTh /Yr)	(cnt)			(Nom ¢/Kw h)	(Nom ¢/Kwh-Equiv.)	(Nom ¢/Thm)
2014	24,336	212	95,662	10.10	5.36	0.1800	1.20	10.72	12.84	53.481
2015	24,938	212	97,835	10.1241	5.36	0.0064	1.01	11.030	11.101	46.253
2016	24,324	213	95,053	10.0992	5.36	0.1124	1.12	11.456	12.819	53.414
2017	23,770	213	92,863	10.0762	5.36	0.2047	1.23	11.779	14.455	60.228
2018	23,740	213	92,971	10.0749	5.36	0.2056	1.23	12.204	14.990	62.458
2019	23,475	212	92,227	10.0637	5.36	0.2449	1.28	12.603	16.101	67.086
2020	22,786	211	89,950	10.0339	5.35	0.3554	1.43	13.044	18.611	77.545

FORECAST OF ANNUAL DEMAND FROM NONCORE SGIP

The table below shows the annual demand forecasted by accumulated program years for noncore SGIP:

	Summary From GENERIC Program Assumptions											
	8,060	"Expected" Annual Kw for NG SGIP for Noncore G-50 (Include w/Small CoGen/EG Load).										
	80%	= Assumed Load-Factor of Installed Capacity (KW)										
	56,483	= Assumed/Est'd Therm/yr of Installed Capacity (KW)										
	15	=Assumed Useful lifetime of Program Year Kw										
					Annual MDth:	5.648	5.648	5.648	5.648	5.648	5.648	5.648
Forecast for SGIP G50 Added Load in MDth			Average Daily Load (MDth/d)		Cal-Yr	PY-2014	PY-2015	PY-2016	PY-2017	PY-2018	PY-2019	PY-2020
	G-50 SGIP											
Year	(MDth)											
2014	2.82		0.01		2014	2.8						
2015	7.34		0.02		2015	4.5	2.8					
2016	12.99		0.04		2016	5.6	4.5	2.8				
2017	18.64		0.05		2017	5.6	5.6	4.5	2.8			
2018	24.29		0.07		2018	5.6	5.6	5.6	4.5	2.8		
2019	29.94		0.08		2019	5.6	5.6	5.6	5.6	4.5	2.8	
2020	35.58		0.10		2020	5.6	5.6	5.6	5.6	5.6	4.5	2.8

The forecast approach assumes a generic program of the same amount of KW natural gas consuming capacity installed that generates electricity at 50% of installed capacity in the first year, then 80% in the second year and at 100% in year three and afterwards. This generic program was assumed to have a "useful life" of 15 years.

The Therms/Yr assumed for the expected KW of electric generation was calculated as:

Thm/yr = [(LF x KW-Capacity) x (Heat-Rate)] x (24 x 365 Hrs/Yr), where Heat-Rate = (10,000 MBtu/hr) / (1 KW), and

10 Therm = 1 MMBtu; 1 Therm = (1/10)x(1,000) MBtu

TOTAL ANNUAL DEMAND FOR SMALL COGENERATION

The table below shows the total (econometric + noncore SGIP) combined gas demand for small cogeneration gas demand:

Year	Total Small CoGen Load Therms/Yr	Econometric Model Fcst (Thm/yr)	SGIP (g-50) Fcst (Thm/yr)
2014	243,393,027	243,364,786	28,241
2015	249,452,973	249,379,545	73,428
2016	243,371,101	243,241,190	129,910
2017	237,890,367	237,703,974	186,393
2018	237,638,265	237,395,389	242,876
2019	235,048,207	234,748,848	299,359
2020	228,219,197	227,863,356	355,842

MONTHLY DEMAND FOR SMALL COGENERATION

This total (econometric + noncore SGIP) annual small cogeneration gas demand was "split" into monthly load using the monthly proportions in the table below.

Month	Date	*Smoothed* Monthly Load as %of Annual (2012-2014)
(mm)	(mmm)	(%of Ann. Tot.)
1	Jan	8.1449%
2	Feb	7.2732%
3	Mar	7.9062%
4	Apr	8.0719%
5	May	8.1498%
6	Jun	8.3409%
7	Jul	9.0645%
8	Aug	9.4156%
9	Sep	8.9723%
10	Oct	8.5239%
11	Nov	8.0967%
12	Dec	8.0401%
Check-Sum Total:		100.0000%

FORECAST RESULTS

Based on the year 2018 example above, the August 2018 small cogeneration (G-50) gas demand is calculated as:

SmCoGen_G-50 = (237,638,265/10,000 MDth/yr) x (0.094156)
= (2,237.5 MDth) = (23,763.8 MDth/yr) x (0.094156)

Small cogeneration (G-50) gas demand is billed according to the two-tiered EG rate structure. The projected gas demand by tier assigns 64.4926% of the total cogeneration demand to tier 2; the remaining 35.5074% is assigned to tier 1.

Using August 2018 as an example:

Tier 2: (1,443.0MDth) = (2,237.5 MDth) x (0. 644926)

Tier 1: (794.5 MDth) = (2,237.5 MDth) x (0. 355074)

The tables below show the small cogeneration gas demand forecast, monthly, from 2014 through 2020 by total and by EG rate tiers.

Small Cogeneration Gas Demand (2014-2016)

MONTHLY FORECAST DATA		Total (Small CoGeneration)	Small CoGen (Tier 1)	Small CoGen (Tier 2)
		(MDth)	(MDth)	(MDth)
Year	Month			
2014	Jan	1,982	704	1,279
2014	Feb	1,770	629	1,142
2014	Mar	1,924	683	1,241
2014	Apr	1,965	698	1,267
2014	May	1,984	704	1,279
2014	Jun	2,030	721	1,309
2014	Jul	2,206	783	1,423
2014	Aug	2,292	814	1,478
2014	Sep	2,184	775	1,408
2014	Oct	2,075	737	1,338
2014	Nov	1,971	700	1,271
2014	Dec	1,957	695	1,262
2015	Jan	2,032	721	1,310
2015	Feb	1,814	644	1,170
2015	Mar	1,972	700	1,272
2015	Apr	2,014	715	1,299
2015	May	2,033	722	1,311
2015	Jun	2,081	739	1,342
2015	Jul	2,261	803	1,458
2015	Aug	2,349	834	1,515
2015	Sep	2,238	795	1,443
2015	Oct	2,126	755	1,371
2015	Nov	2,020	717	1,303
2015	Dec	2,006	712	1,293
2016	Jan	1,982	704	1,278
2016	Feb	1,770	629	1,142
2016	Mar	1,924	683	1,241
2016	Apr	1,964	698	1,267
2016	May	1,983	704	1,279
2016	Jun	2,030	721	1,309
2016	Jul	2,206	783	1,423
2016	Aug	2,291	814	1,478
2016	Sep	2,184	775	1,408
2016	Oct	2,074	737	1,338
2016	Nov	1,970	700	1,271
2016	Dec	1,957	695	1,262

Small Cogeneration Gas Demand (2017-2020)

MONTHLY FORECAST DATA		Total (Small CoGeneration)	Small CoGen (Tier 1)	Small CoGen (Tier 2)
		(MDth)	(MDth)	(MDth)
Year	Month			
2017	Jan	1,938	688	1,250
2017	Feb	1,730	614	1,116
2017	Mar	1,881	668	1,213
2017	Apr	1,920	682	1,238
2017	May	1,939	688	1,250
2017	Jun	1,984	705	1,280
2017	Jul	2,156	766	1,391
2017	Aug	2,240	795	1,445
2017	Sep	2,134	758	1,377
2017	Oct	2,028	720	1,308
2017	Nov	1,926	684	1,242
2017	Dec	1,913	679	1,234
2018	Jan	1,936	687	1,248
2018	Feb	1,728	614	1,115
2018	Mar	1,879	667	1,212
2018	Apr	1,918	681	1,237
2018	May	1,937	688	1,249
2018	Jun	1,982	704	1,278
2018	Jul	2,154	765	1,389
2018	Aug	2,238	794	1,443
2018	Sep	2,132	757	1,375
2018	Oct	2,026	719	1,306
2018	Nov	1,924	683	1,241
2018	Dec	1,911	678	1,232
2019	Jan	1,914	680	1,235
2019	Feb	1,710	607	1,103
2019	Mar	1,858	660	1,198
2019	Apr	1,897	674	1,224
2019	May	1,916	680	1,235
2019	Jun	1,961	696	1,264
2019	Jul	2,131	757	1,374
2019	Aug	2,213	786	1,427
2019	Sep	2,109	749	1,360
2019	Oct	2,004	711	1,292
2019	Nov	1,903	676	1,227
2019	Dec	1,890	671	1,219
2020	Jan	1,859	660	1,199
2020	Feb	1,660	589	1,071
2020	Mar	1,804	641	1,164
2020	Apr	1,842	654	1,188
2020	May	1,860	660	1,200
2020	Jun	1,904	676	1,228
2020	Jul	2,069	735	1,334
2020	Aug	2,149	763	1,386
2020	Sep	2,048	727	1,321
2020	Oct	1,945	691	1,255
2020	Nov	1,848	656	1,192
2020	Dec	1,835	652	1,183

Large Cogeneration (Capacity > 20 Mw), Utility Electric Generation (UEG) and Exempt Wholesale Generation (EWG) Gas Demand

The gas demand forecasts for large cogeneration (capacity > 20 Mw), utility electric generation (UEG) and exempt wholesale generation (EWG) are provided by Mr. Huang based on the results of the model he uses. This model produces forecasts of natural gas demand based on an analysis of the operation of power plants in the Western U.S. electric market using a production costing model. This forecast uses Ventyx's Market Analytics model. Further details are discussed by Mr. Huang in his prepared testimony and his work papers.

The tables provided below summarize the gas demand forecasts provided by Mr. Huang for the large cogeneration market segment and the combined UEG/EWG segment. The tables are separated by EG rate tier.

Large Cogeneration, UEG/EWG Gas Demand (2014-2016) Tier 1

MONTHLY FORECAST DATA		Total (LgCoGen/ UEG/EWG)	G-50 Large CoGen	G-50 UEG/EWG
		(MDth)	(MDth)	(MDth)
Year	Month			
2014	Jan	105	0	105
2014	Feb	361	0	361
2014	Mar	163	0	163
2014	Apr	112	0	112
2014	May	128	0	128
2014	Jun	130	0	130
2014	Jul	267	0	267
2014	Aug	265	0	265
2014	Sep	229	0	229
2014	Oct	168	0	168
2014	Nov	182	0	182
2014	Dec	69	0	69
2015	Jan	288	0	288
2015	Feb	178	0	178
2015	Mar	180	0	180
2015	Apr	109	0	109
2015	May	159	0	159
2015	Jun	180	0	180
2015	Jul	475	0	475
2015	Aug	513	0	513
2015	Sep	394	0	394
2015	Oct	441	0	441
2015	Nov	258	0	258
2015	Dec	270	0	270
2016	Jan	207	0	207
2016	Feb	82	0	82
2016	Mar	72	0	72
2016	Apr	74	0	74
2016	May	89	0	89
2016	Jun	89	0	89
2016	Jul	267	0	267
2016	Aug	272	0	272
2016	Sep	229	0	229
2016	Oct	189	0	189
2016	Nov	114	0	114
2016	Dec	125	0	125

Large Cogeneration, UEG/EWG Gas Demand (2017-2020) Tier 1

MONTHLY FORECAST DATA		Total (LgCoGen/ UEG/EWG)	G-50 Large CoGen	G-50 UEG/EWG
		(MDth)	(MDth)	(MDth)
Year	Month			
2017	Jan	109	0	109
2017	Feb	89	0	89
2017	Mar	77	0	77
2017	Apr	74	0	74
2017	May	87	0	87
2017	Jun	87	0	87
2017	Jul	260	0	260
2017	Aug	233	0	233
2017	Sep	167	0	167
2017	Oct	131	0	131
2017	Nov	118	0	118
2017	Dec	111	0	111
2018	Jan	129	0	129
2018	Feb	82	0	82
2018	Mar	73	0	73
2018	Apr	69	0	69
2018	May	77	0	77
2018	Jun	71	0	71
2018	Jul	197	0	197
2018	Aug	189	0	189
2018	Sep	187	0	187
2018	Oct	107	0	107
2018	Nov	112	0	112
2018	Dec	106	0	106
2019	Jan	120	0	120
2019	Feb	78	0	78
2019	Mar	74	0	74
2019	Apr	70	0	70
2019	May	81	0	81
2019	Jun	68	0	68
2019	Jul	177	0	177
2019	Aug	166	0	166
2019	Sep	173	0	173
2019	Oct	123	0	123
2019	Nov	115	0	115
2019	Dec	105	0	105
2020	Jan	99	0	99
2020	Feb	79	0	79
2020	Mar	68	0	68
2020	Apr	71	0	71
2020	May	83	0	83
2020	Jun	69	0	69
2020	Jul	166	0	166
2020	Aug	169	0	169
2020	Sep	171	0	171
2020	Oct	111	0	111
2020	Nov	99	0	99
2020	Dec	133	0	133

Large Cogeneration, UEG/EWG Gas Demand (2014-2016) Tier 2

MONTHLY FORECAST DATA		Total (LgCoGen/ UEG/EWG)	G-50 Large CoGen	G-50 UEG/EWG
		(MDth)	(MDth)	(MDth)
Year	Month			
2014	Jan	17,493	4,317	13,176
2014	Feb	19,791	4,190	15,602
2014	Mar	16,825	4,263	12,561
2014	Apr	19,306	4,053	15,253
2014	May	19,707	4,212	15,494
2014	Jun	18,086	4,560	13,527
2014	Jul	28,378	4,936	23,442
2014	Aug	28,432	4,886	23,545
2014	Sep	30,713	4,643	26,070
2014	Oct	31,611	4,551	27,060
2014	Nov	18,962	4,489	14,473
2014	Dec	19,019	4,540	14,479
2015	Jan	20,820	4,284	16,536
2015	Feb	15,259	3,675	11,584
2015	Mar	14,926	4,156	10,770
2015	Apr	14,373	3,931	10,443
2015	May	17,251	4,207	13,044
2015	Jun	19,369	4,251	15,118
2015	Jul	29,461	4,671	24,791
2015	Aug	30,079	4,727	25,352
2015	Sep	26,242	4,495	21,747
2015	Oct	23,834	4,518	19,317
2015	Nov	20,084	4,218	15,866
2015	Dec	23,629	4,420	19,210
2016	Jan	19,018	4,331	14,687
2016	Feb	16,216	3,943	12,273
2016	Mar	13,139	4,141	8,998
2016	Apr	12,742	3,881	8,861
2016	May	14,740	4,105	10,635
2016	Jun	16,944	4,131	12,814
2016	Jul	26,059	4,646	21,412
2016	Aug	27,558	4,671	22,887
2016	Sep	23,918	4,434	19,483
2016	Oct	20,042	4,484	15,558
2016	Nov	17,791	4,241	13,550
2016	Dec	19,076	4,388	14,688

Large Cogeneration, UEG/EWG Gas Demand (2017-2020) Tier 2

MONTHLY FORECAST DATA		Total (LgCoGen/ UEG/EWG)	G-50 Large CoGen	G-50 UEG/EWG
		(MDth)	(MDth)	(MDth)
Year	Month			
2017	Jan	17,573	4,300	13,272
2017	Feb	13,621	3,821	9,799
2017	Mar	13,572	4,135	9,438
2017	Apr	13,253	3,932	9,321
2017	May	14,629	4,116	10,513
2017	Jun	17,115	4,152	12,963
2017	Jul	25,482	4,600	20,882
2017	Aug	26,841	4,630	22,211
2017	Sep	22,967	4,400	18,566
2017	Oct	18,816	4,470	14,346
2017	Nov	18,056	4,201	13,855
2017	Dec	19,501	4,391	15,110
2018	Jan	17,962	4,346	13,615
2018	Feb	14,196	3,771	10,424
2018	Mar	13,375	4,162	9,212
2018	Apr	12,644	3,943	8,701
2018	May	14,382	4,064	10,318
2018	Jun	16,708	4,139	12,569
2018	Jul	25,543	4,616	20,927
2018	Aug	26,358	4,629	21,729
2018	Sep	23,326	4,405	18,920
2018	Oct	18,662	4,457	14,205
2018	Nov	17,874	4,180	13,693
2018	Dec	19,710	4,411	15,299
2019	Jan	18,670	4,315	14,356
2019	Feb	14,104	3,843	10,261
2019	Mar	13,326	4,124	9,201
2019	Apr	12,585	3,903	8,682
2019	May	14,116	4,075	10,041
2019	Jun	16,375	4,129	12,246
2019	Jul	24,551	4,605	19,946
2019	Aug	26,264	4,647	21,617
2019	Sep	23,015	4,410	18,606
2019	Oct	19,700	4,493	15,207
2019	Nov	19,241	4,143	15,098
2019	Dec	19,958	4,418	15,539
2020	Jan	18,087	4,309	13,779
2020	Feb	14,012	3,938	10,074
2020	Mar	13,304	4,137	9,167
2020	Apr	12,667	3,882	8,785
2020	May	14,213	4,096	10,117
2020	Jun	16,517	4,155	12,362
2020	Jul	24,805	4,626	20,179
2020	Aug	26,120	4,623	21,497
2020	Sep	23,167	4,435	18,732
2020	Oct	20,219	4,487	15,732
2020	Nov	18,461	4,157	14,305
2020	Dec	20,048	4,397	15,651

Gas Demand Forecasts for the Combined, Electric Generation Rate Group By EG Rate Tier

The over-all gas demand forecasts for electric generation (under the EG rate category) are aggregated from the following previous individual market segment forecasts together with a final adjustment to this total to account for "Rule-38" eligible G-50 gas load. A constant monthly amount of 106.8 MDth/mo was calculated from 2014 Rule-38 eligible G-50 customer load. Of this total about 35.76% was identified as EG-tier1 consumption while 64.26% was associated with EG-tier2. These percentages were used to calculate the EG-tier1 value of 38.2 MDth/mo and tier2 value of 68.6 MDth/mo that were subtracted from the respective tier totals of gas demand forecasted for Refinery Cogeneration, Small Cogeneration and combined Large Cogeneration and UEG/EWG gas demand.

Using the August 2018 data as an example, the resulting EG-tier1 and EG-tier 2 forecasts of gas demand would be:

<u>Tier 1:</u>

EG-Tier1_MDth = (794 MDth for SmCoGen)
+ (30 MDth for RefCoGen)
+ (189 MDth for LgCoGen/UEG/EWG)
- (38.2 MDth for Rule-38 Elligible G-50 load)
EG-Tier1_MDth = (974.8 MDth).

<u>Tier 2:</u>

EG-Tier2_MDth = (1,443 MDth for SmCoGen)
+ (1,975 MDth for RefCoGen)
+ (26,358 MDth for LgCoGen/UEG/EWG)
- (68.6 MDth for Rule-38 Elligible G-50 load)
EG-Tier2_MDth = (29,707.4 MDth).

These results (noting that 1 MDth = 10 MTherms) check reasonably well with the values 9,749 MTherms and data 297,072 MTherms, respectively, for tier1 and tier2 gas demand shown in the SoCalGas consolidated gas demand forecast work papers for August 2018.

ENHANCED OIL RECOVERY

GAS DEMAND FORECAST

Enhanced Oil Recovery Forecasting Methodology

The EOR market is using about 23,000 Mdth/year. The demand in this market has been increasing over the last several years, mainly due to the high levels of oil prices in $90 to $100/barrel range. However, oil prices have fallen to a $50/barrel range and, based on futures prices, are expected to remain at that level. This should result in oil production remain at or near current levels. The forecast reflects this by holding the EOR demand at 2014 amounts during the TCAP period.

2016 Tcap-Phase II - SoCalgas EOR G40-Steaming & CoGen Template for Gas Demand Forecast Summary (MDth)

Vlookup-Col#	1	2	3	4	5	6	7
MONTHLY FORECAST DATA				Average Year Throughput (MDth)			
			Medium Pressure	High Pressure	Trans--Local	Trans--BB	Total
		Svc-Press %'s	0.5%	58.9%	40.6%	100.0%	
2014 Jan			9.5	1,159.3	797.9	1,966.8	1,967
2014 Feb			8.6	1,047.1	720.7	1,776.4	1,776
2014 Mar			9.5	1,159.3	797.9	1,966.8	1,967
2014 Apr			9.2	1,121.9	772.2	1,903.3	1,903
2014 May			9.5	1,159.3	797.9	1,966.8	1,967
2014 Jun			9.2	1,121.9	772.2	1,903.3	1,903
2014 Jul			9.5	1,159.3	797.9	1,966.8	1,967
2014 Aug			9.5	1,159.3	797.9	1,966.8	1,967
2014 Sep			9.2	1,121.9	772.2	1,903.3	1,903
2014 Oct			9.5	1,159.3	797.9	1,966.8	1,967
2014 Nov			9.2	1,121.9	772.2	1,903.3	1,903
2014 Dec			9.5	1,159.3	797.9	1,966.8	1,967
2015 Jan			9.5	1,159.3	797.9	1,966.8	1,967
2015 Feb			8.6	1,047.1	720.7	1,776.4	1,776
2015 Mar			9.5	1,159.3	797.9	1,966.8	1,967
2015 Apr			9.2	1,121.9	772.2	1,903.3	1,903
2015 May			9.5	1,159.3	797.9	1,966.8	1,967
2015 Jun			9.2	1,121.9	772.2	1,903.3	1,903
2015 Jul			9.5	1,159.3	797.9	1,966.8	1,967
2015 Aug			9.5	1,159.3	797.9	1,966.8	1,967
2015 Sep			9.2	1,121.9	772.2	1,903.3	1,903
2015 Oct			9.5	1,159.3	797.9	1,966.8	1,967
2015 Nov			9.2	1,121.9	772.2	1,903.3	1,903
2015 Dec			9.5	1,159.3	797.9	1,966.8	1,967
2016 Jan			9.5	1,159.3	797.9	1,966.8	1,967
2016 Feb			8.6	1,047.1	720.7	1,776.4	1,776
2016 Mar			9.5	1,159.3	797.9	1,966.8	1,967
2016 Apr			9.2	1,121.9	772.2	1,903.3	1,903
2016 May			9.5	1,159.3	797.9	1,966.8	1,967
2016 Jun			9.2	1,121.9	772.2	1,903.3	1,903
2016 Jul			9.5	1,159.3	797.9	1,966.8	1,967
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2016 Sep			9.2	1,121.9	772.2	1,903.3	1,903
2016 Oct			9.5	1,159.3	797.9	1,966.8	1,967
2016 Nov			9.2	1,121.9	772.2	1,903.3	1,903
2016 Dec			9.5	1,159.3	797.9	1,966.8	1,967

2016 Tcap-Phase II - SoCalgas EOR G40-Steaming & CoGen Template for Gas Demand Forecast Summary (MDth)

Vlookup-Col#	1	2	3	4	5	6	7
MONTHLY FORECAST DATA				Average Year Throughput (MDth)			
			Medium Pressure	High Pressure	Trans--Local	Trans--BB	Total
		Svc-Press %'s	0.5%	58.9%	40.6%	100.0%	
2017 Jan			9.5	1,159.3	797.9	1,966.8	1,967
2017 Feb			8.6	1,047.1	720.7	1,776.4	1,776
2017 Mar			9.5	1,159.3	797.9	1,966.8	1,967
2017 Apr			9.2	1,121.9	772.2	1,903.3	1,903
2017 May			9.5	1,159.3	797.9	1,966.8	1,967
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2017 Jul			9.5	1,159.3	797.9	1,966.8	1,967
2017 Aug			9.5	1,159.3	797.9	1,966.8	1,967
2017 Sep			9.2	1,121.9	772.2	1,903.3	1,903
2017 Oct			9.5	1,159.3	797.9	1,966.8	1,967
2017 Nov			9.2	1,121.9	772.2	1,903.3	1,903
2017 Dec			9.5	1,159.3	797.9	1,966.8	1,967
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2018 Mar			9.5	1,159.3	797.9	1,966.8	1,967
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2018 Aug			9.5	1,159.3	797.9	1,966.8	1,967
2018 Sep			9.2	1,121.9	772.2	1,903.3	1,903
2018 Oct			9.5	1,159.3	797.9	1,966.8	1,967
2018 Nov			9.2	1,121.9	772.2	1,903.3	1,903
2018 Dec			9.5	1,159.3	797.9	1,966.8	1,967
2019 Jan			9.5	1,159.3	797.9	1,966.8	1,967
2019 Feb			8.6	1,047.1	720.7	1,776.4	1,776
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2019 Apr			9.2	1,121.9	772.2	1,903.3	1,903
2019 May			9.5	1,159.3	797.9	1,966.8	1,967
2019 Jun			9.2	1,121.9	772.2	1,903.3	1,903
2019 Jul			9.5	1,159.3	797.9	1,966.8	1,967
2019 Aug			9.5	1,159.3	797.9	1,966.8	1,967
2019 Sep			9.2	1,121.9	772.2	1,903.3	1,903
2019 Oct			9.5	1,159.3	797.9	1,966.8	1,967
2019 Nov			9.2	1,121.9	772.2	1,903.3	1,903
2019 Dec			9.5	1,159.3	797.9	1,966.8	1,967
2020 Jan			9.5	1,159.3	797.9	1,966.8	1,967
2020 Feb			8.6	1,047.1	720.7	1,776.4	1,776
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2020 Apr			9.2	1,121.9	772.2	1,903.3	1,903
2020 May			9.5	1,159.3	797.9	1,966.8	1,967
2020 Jun			9.2	1,121.9	772.2	1,903.3	1,903
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2020 Oct			9.5	1,159.3	797.9	1,966.8	1,967
2020 Nov			9.2	1,121.9	772.2	1,903.3	1,903
2020 Dec			9.5	1,159.3	797.9	1,966.8	1,967

2016 Tcap-Phase II - SoCalgas EOR G40-Steaming & CoGen Template for Gas Demand Forecast Summary (MDth)

Vlookup-Col#	1	2	20	21	22	23	24	25
MONTHLY FORECAST DATA					Forecast Number of Customers			
				Medium Pressure	High Pressure	Trans--Local	Trans--BB	Total
		Svc-Press %'s		15.2%	48.5%	36.4%	100.0%	
2014 Jan				2.0	15.0	12.0	33.0	33
2014 Feb				2.0	15.0	12.0	33.0	33
2014 Mar				2.0	15.0	12.0	33.0	33
2014 Apr				2.0	15.0	12.0	33.0	33
2014 May				2.0	15.0	12.0	33.0	33
2014 Jun				2.0	15.0	12.0	33.0	33
2014 Jul				2.0	15.0	12.0	33.0	33
2014 Aug				2.0	15.0	12.0	33.0	33
2014 Sep				2.0	15.0	12.0	33.0	33
2014 Oct				2.0	15.0	12.0	33.0	33
2014 Nov				2.0	15.0	12.0	33.0	33
2014 Dec				2.0	15.0	12.0	33.0	33
2015 Jan				2.0	15.0	12.0	33.0	33
2015 Feb				2.0	15.0	12.0	33.0	33
2015 Mar				2.0	15.0	12.0	33.0	33
2015 Apr				2.0	15.0	12.0	33.0	33
2015 May				2.0	15.0	12.0	33.0	33
2015 Jun				2.0	15.0	12.0	33.0	33
2015 Jul				2.0	15.0	12.0	33.0	33
2015 Aug				2.0	15.0	12.0	33.0	33
2015 Sep				2.0	15.0	12.0	33.0	33
2015 Oct				2.0	15.0	12.0	33.0	33
2015 Nov				2.0	15.0	12.0	33.0	33
2015 Dec				2.0	15.0	12.0	33.0	33
2016 Jan				2.0	15.0	12.0	33.0	33
2016 Feb				2.0	15.0	12.0	33.0	33
2016 Mar				2.0	15.0	12.0	33.0	33
2016 Apr				2.0	15.0	12.0	33.0	33
2016 May				2.0	15.0	12.0	33.0	33
2016 Jun				2.0	15.0	12.0	33.0	33
2016 Jul				2.0	15.0	12.0	33.0	33
2016 Aug				2.0	15.0	12.0	33.0	33
2016 Sep				2.0	15.0	12.0	33.0	33
2016 Oct				2.0	15.0	12.0	33.0	33
2016 Nov				2.0	15.0	12.0	33.0	33
2016 Dec				2.0	15.0	12.0	33.0	33

2016 Tcap-Phase II - SoCalgas EOR G40-Steaming & CoGen Template for Gas Demand Forecast Summary (MDth)

Vlookup-Col#	1	2	20	21	22	23	24	25
MONTHLY FORECAST DATA					Forecast Number of Customers			
				Medium Pressure	High Pressure	Trans--Local	Trans--BB	Total
		Svc-Press %'s		15.2%	48.5%	36.4%	100.0%	
2017 Jan				2.0	15.0	12.0	33.0	33
2017 Feb				2.0	15.0	12.0	33.0	33
2017 Mar				2.0	15.0	12.0	33.0	33
2017 Apr				2.0	15.0	12.0	33.0	33
2017 May				2.0	15.0	12.0	33.0	33
2017 Jun				2.0	15.0	12.0	33.0	33
2017 Jul				2.0	15.0	12.0	33.0	33
2017 Aug				2.0	15.0	12.0	33.0	33
2017 Sep				2.0	15.0	12.0	33.0	33
2017 Oct				2.0	15.0	12.0	33.0	33
2017 Nov				2.0	15.0	12.0	33.0	33
2017 Dec				2.0	15.0	12.0	33.0	33
2018 Jan				2.0	15.0	12.0	33.0	33
2018 Feb				2.0	15.0	12.0	33.0	33
2018 Mar				2.0	15.0	12.0	33.0	33
2018 Apr				2.0	15.0	12.0	33.0	33
2018 May				2.0	15.0	12.0	33.0	33
2018 Jun				2.0	15.0	12.0	33.0	33
2018 Jul				2.0	15.0	12.0	33.0	33
2018 Aug				2.0	15.0	12.0	33.0	33
2018 Sep				2.0	15.0	12.0	33.0	33
2018 Oct				2.0	15.0	12.0	33.0	33
2018 Nov				2.0	15.0	12.0	33.0	33
2018 Dec				2.0	15.0	12.0	33.0	33
2019 Jan				2.0	15.0	12.0	33.0	33
2019 Feb				2.0	15.0	12.0	33.0	33
2019 Mar				2.0	15.0	12.0	33.0	33
2019 Apr				2.0	15.0	12.0	33.0	33
2019 May				2.0	15.0	12.0	33.0	33
2019 Jun				2.0	15.0	12.0	33.0	33
2019 Jul				2.0	15.0	12.0	33.0	33
2019 Aug				2.0	15.0	12.0	33.0	33
2019 Sep				2.0	15.0	12.0	33.0	33
2019 Oct				2.0	15.0	12.0	33.0	33
2019 Nov				2.0	15.0	12.0	33.0	33
2019 Dec				2.0	15.0	12.0	33.0	33
2020 Jan				2.0	15.0	12.0	33.0	33
2020 Feb				2.0	15.0	12.0	33.0	33
2020 Mar				2.0	15.0	12.0	33.0	33
2020 Apr				2.0	15.0	12.0	33.0	33
2020 May				2.0	15.0	12.0	33.0	33
2020 Jun				2.0	15.0	12.0	33.0	33
2020 Jul				2.0	15.0	12.0	33.0	33
2020 Aug				2.0	15.0	12.0	33.0	33
2020 Sep				2.0	15.0	12.0	33.0	33
2020 Oct				2.0	15.0	12.0	33.0	33
2020 Nov				2.0	15.0	12.0	33.0	33
2020 Dec				2.0	15.0	12.0	33.0	33

SDG&E Noncore Retail Gas Demand

San Diego Gas & Electric Company
Noncore Commercial/Industrial and Cogeneration Gas Demand Forecast

Noncore Commercial, Industrial and Cogeneration Forecasts

Forecasts of gas demand for these market segments were calculated from relationships developed from monthly consumption data and employment in the San Diego area.

The estimated equations are provided in the next page followed by the historical and calculated forecasts.

SDG&E Non-Core Demand Equations - before DSM adjustments

Cogeneration (Mdth)

```
Monthly data for 96 periods from JAN 2007 to DEC 2014
Modeled by SAS - PROC AUTOREG

Cogeneration =  15.7636 * eisd/1000 + 1666.00 * dum2009novdec
                (61.33)               (12.33)

AR_0 = 0.3892 * AR_1
       (3.67)
```

Maximum Likelihood Estimates			
SSE	2076510.63	DFE	93
MSE	22328	Root MSE	149.42581
SBC	1244.55122	AIC	1236.85817
MAE	111.839341	AICC	1237.11904
MAPE	7.41423314	HQC	1239.96783
Log Likelihood	-615.42909	Regress R-Square	0.9781
Durbin-Watson	2.0724	Total R-Square	0.9915
		Observations	96

****

Commercial (Mdth)

```
Monthly data for 96 periods from JAN 2007 to DEC 2014
Modeled by SAS - PROC AUTOREG

Commercial =  0.1583 * ecsd/1000 + 0.0843 HDD
              (23.50)              (2.36)

AR_0 = 0.6545 * AR_1
       (8.14)
```

Maximum Likelihood Estimates			
SSE	55536.3166	DFE	93
MSE	597.16469	Root MSE	24.43695
SBC	897.291106	AIC	889.598062
MAE	19.1788169	AICC	889.858931
MAPE	9.94019516	HQC	892.707716
Log Likelihood	-441.79903	Regress R-Square	0.8961
Durbin-Watson	2.3071	Total R-Square	0.9860
		Observations	96

Industrial (Mdth)

```
Monthly data for 96 periods from JAN 2007 to DEC 2014
Modeled by SAS - PROC AUTOREG

Industrial =  1.6420 * eisd/1000 – 22.2106 * dumDec
             (18.77)                (3.96)

AR_0 = 0.7732 * AR_1
       (11.90)
```

Maximum Likelihood Estimates			
SSE	35369.603	DFE	93
MSE	380.31831	Root MSE	19.50175
SBC	854.328915	AIC	846.635871
MAE	14.9459047	AICC	846.89674
MAPE	9.73282151	HQC	849.745525
Log Likelihood	-420.31794	Regress R-Square	0.7942
Durbin-Watson	2.4913	Total R-Square	0.9862
		Observations	96

SDGE Noncore Commercial, Industrial and Cogeneration Gas Demand (Annual)

ANNUAL SUMMARY

SDG&E Noncore Commercial & Industrial Demand (MDth)							San Diego County Employment		Cumulative	Cumulative	Carbon Fee Impact	
	Adjusted with DSM and Carbon-Fee Impacts			Unadjusted (from regression equations)			Commercial	Industrial	DSM Cmcl	DSM Indl.	Cogen	Industrial
	Cogeneration	Commercial	Industrial	Cogeneration	Commercial	Industrial	ECSD	EISD	(MDth)	(MDth)	(MDth)	(MDth)
2007	19,920	2,560	1,483	19,920	2,560	1,483	1,227,758	102,850	0	0	0	0
2008	18,929	2,546	1,886	18,929	2,546	1,886	1,219,117	103,158	0	0	0	0
2009	23,606	2,536	1,670	23,606	2,536	1,670	1,159,917	95,667	0	0	0	0
2010	17,480	2,559	1,912	17,480	2,559	1,912	1,153,600	93,300	0	0	0	0
2011	17,046	2,525	2,019	17,046	2,525	2,019	1,162,200	93,542	0	0	0	0
2012	17,541	2,390	2,262	17,541	2,390	2,262	1,194,292	94,725	0	0	0	0
2013	17,976	2,193	2,162	17,976	2,193	2,162	1,226,767	94,983	0	0	0	0
2014	17,452	1,912	2,088	17,452	1,912	2,088	1,258,758	97,092	0	0	0	0
2015	18,580	2,484	1,874	18,730	2,487	1,910	1,297,646	98,992	-3	-25	-150	-11
2016	18,892	2,626	1,919	19,031	2,631	1,980	1,329,461	100,604	-6	-51	-139	-10
2017	19,094	2,672	1,918	19,227	2,681	2,003	1,355,300	101,641	-8	-76	-133	-8
2018	19,180	2,707	1,901	19,314	2,718	2,012	1,374,913	102,103	-11	-102	-134	-9
2019	19,191	2,741	1,877	19,318	2,755	2,012	1,394,492	102,125	-14	-127	-128	-8
2020	19,167	2,782	1,848	19,292	2,799	2,010	1,417,357	101,987	-17	-153	-125	-8

SDGE Noncore Commercial, Industrial and Cogeneration Gas Demand (Monthly)

SDG&E Noncore Commercial & Industrial Demand (MDth)							San Diego County Employment		Cumulative	Cumulative	Carbon Fee Impact		
	Adjusted with DSM and Carbon-Fee Impacts			Unadjusted (from regression equations)			Commercial	Industrial	DSM Cmcl	DSM Indl.	Cogen	Industrial	Monthly
Month	Cogeneration	Commercial	Industrial	Cogeneration	Commercial	Industrial	ECSD	EISD	(MDth)	(MDth)	(MDth)	(MDth)	HDD
Jan-07	1,806.8	235.9	100.4	1,806.8	235.9	100.4	1,206,000	103,000	0.0	0.0	0.0	0.0	364.6
Feb-07	1,746.5	274.8	127.9	1,746.5	274.8	127.9	1,215,300	102,800	0.0	0.0	0.0	0.0	225.2
Mar-07	1,542.7	236.5	97.4	1,542.7	236.5	97.4	1,223,300	103,100	0.0	0.0	0.0	0.0	155.3
Apr-07	1,523.2	263.3	123.3	1,523.2	263.3	123.3	1,222,800	102,000	0.0	0.0	0.0	0.0	139.1
May-07	1,640.0	228.3	122.3	1,640.0	228.3	122.3	1,231,600	102,100	0.0	0.0	0.0	0.0	63.7
Jun-07	1,757.6	207.0	123.9	1,757.6	207.0	123.9	1,239,800	102,200	0.0	0.0	0.0	0.0	20.0
Jul-07	1,634.3	169.5	118.6	1,634.3	169.5	118.6	1,229,400	103,100	0.0	0.0	0.0	0.0	0.0
Aug-07	1,739.6	167.8	127.4	1,739.6	167.8	127.4	1,230,600	102,800	0.0	0.0	0.0	0.0	0.0
Sep-07	1,768.7	172.0	141.3	1,768.7	172.0	141.3	1,230,600	102,500	0.0	0.0	0.0	0.0	3.9
Oct-07	1,739.9	162.9	118.7	1,739.9	162.9	118.7	1,228,900	103,100	0.0	0.0	0.0	0.0	27.8
Nov-07	1,599.3	201.1	140.0	1,599.3	201.1	140.0	1,235,200	103,500	0.0	0.0	0.0	0.0	111.7
Dec-07	1,421.7	240.6	142.0	1,421.7	240.6	142.0	1,239,600	104,000	0.0	0.0	0.0	0.0	340.0
Jan-08	1,726.7	244.4	138.1	1,726.7	244.4	138.1	1,209,200	103,000	0.0	0.0	0.0	0.0	331.2
Feb-08	1,629.8	263.2	147.7	1,629.8	263.2	147.7	1,218,500	103,000	0.0	0.0	0.0	0.0	277.6
Mar-08	1,576.5	233.0	165.5	1,576.5	233.0	165.5	1,223,800	103,400	0.0	0.0	0.0	0.0	186.8
Apr-08	1,578.0	234.3	164.5	1,578.0	234.3	164.5	1,224,000	103,300	0.0	0.0	0.0	0.0	131.0
May-08	1,530.6	192.1	166.6	1,530.6	192.1	166.6	1,228,000	103,400	0.0	0.0	0.0	0.0	89.5
Jun-08	1,443.4	208.4	171.5	1,443.4	208.4	171.5	1,231,600	103,700	0.0	0.0	0.0	0.0	16.2
Jul-08	1,552.3	171.2	169.1	1,552.3	171.2	169.1	1,219,800	103,500	0.0	0.0	0.0	0.0	0.0
Aug-08	1,611.5	182.4	172.7	1,611.5	182.4	172.7	1,219,300	103,700	0.0	0.0	0.0	0.0	0.0
Sep-08	1,551.3	196.6	170.8	1,551.3	196.6	170.8	1,216,000	103,300	0.0	0.0	0.0	0.0	0.0
Oct-08	1,453.5	209.0	150.2	1,453.5	209.0	150.2	1,214,700	103,200	0.0	0.0	0.0	0.0	13.1
Nov-08	1,553.0	238.4	145.6	1,553.0	238.4	145.6	1,214,300	102,500	0.0	0.0	0.0	0.0	58.5
Dec-08	1,722.6	172.6	124.2	1,722.6	172.6	124.2	1,210,200	101,900	0.0	0.0	0.0	0.0	287.2
Jan-09	1,753.0	216.3	117.6	1,753.0	216.3	117.6	1,173,400	101,400	0.0	0.0	0.0	0.0	177.1
Feb-09	1,717.4	224.2	123.4	1,717.4	224.2	123.4	1,170,800	100,300	0.0	0.0	0.0	0.0	246.7
Mar-09	1,287.6	232.7	149.7	1,287.6	232.7	149.7	1,169,700	99,200	0.0	0.0	0.0	0.0	201.5
Apr-09	1,617.9	235.2	143.8	1,617.9	235.2	143.8	1,165,200	97,300	0.0	0.0	0.0	0.0	141.3
May-09	1,284.3	274.0	118.7	1,284.3	274.0	118.7	1,168,600	96,100	0.0	0.0	0.0	0.0	30.0
Jun-09	1,822.4	181.9	110.2	1,822.4	181.9	110.2	1,167,800	95,600	0.0	0.0	0.0	0.0	11.0
Jul-09	1,728.2	176.4	147.9	1,728.2	176.4	147.9	1,144,800	94,200	0.0	0.0	0.0	0.0	0.0
Aug-09	1,923.2	174.7	146.0	1,923.2	174.7	146.0	1,145,600	93,700	0.0	0.0	0.0	0.0	0.0
Sep-09	1,694.0	204.6	159.0	1,694.0	204.6	159.0	1,141,400	93,200	0.0	0.0	0.0	0.0	0.0
Oct-09	2,133.5	204.3	146.9	2,133.5	204.3	146.9	1,153,000	92,500	0.0	0.0	0.0	0.0	40.5
Nov-09	3,441.1	198.1	171.5	3,441.1	198.1	171.5	1,159,000	92,200	0.0	0.0	0.0	0.0	123.6
Dec-09	3,203.8	214.1	135.5	3,203.8	214.1	135.5	1,159,700	92,300	0.0	0.0	0.0	0.0	290.8
Jan-10	1,578.7	223.0	144.0	1,578.7	223.0	144.0	1,130,400	92,600	0.0	0.0	0.0	0.0	240.1
Feb-10	1,580.9	220.6	138.3	1,580.9	220.6	138.3	1,134,800	92,500	0.0	0.0	0.0	0.0	212.1
Mar-10	1,457.6	206.2	128.2	1,457.6	206.2	128.2	1,139,300	92,900	0.0	0.0	0.0	0.0	194.6
Apr-10	1,700.8	207.0	157.0	1,700.8	207.0	157.0	1,152,300	93,900	0.0	0.0	0.0	0.0	178.4
May-10	1,462.0	202.3	142.8	1,462.0	202.3	142.8	1,163,400	93,700	0.0	0.0	0.0	0.0	88.2
Jun-10	1,325.2	221.2	169.0	1,325.2	221.2	169.0	1,165,200	93,500	0.0	0.0	0.0	0.0	24.0
Jul-10	1,350.5	204.3	178.4	1,350.5	204.3	178.4	1,153,100	93,300	0.0	0.0	0.0	0.0	10.2
Aug-10	1,424.6	216.1	169.4	1,424.6	216.1	169.4	1,156,200	93,600	0.0	0.0	0.0	0.0	1.1
Sep-10	1,497.0	207.9	177.2	1,497.0	207.9	177.2	1,155,100	93,300	0.0	0.0	0.0	0.0	2.4
Oct-10	1,345.8	199.5	176.3	1,345.8	199.5	176.3	1,160,900	93,200	0.0	0.0	0.0	0.0	31.0
Nov-10	1,392.5	228.3	176.5	1,392.5	228.3	176.5	1,165,000	93,300	0.0	0.0	0.0	0.0	181.2
Dec-10	1,364.1	223.0	155.0	1,364.1	223.0	155.0	1,167,500	93,800	0.0	0.0	0.0	0.0	238.4

SDGE Noncore Commercial, Industrial and Cogeneration Gas Demand (Monthly)

SDG&E Noncore Commercial & Industrial Demand (MDth)							San Diego County Employment		Cumulative	Cumulative	Carbon Fee Impact		
	Adjusted with DSM and Carbon-Fee Impacts			Unadjusted (from regression equations)			Commercial	Industrial	DSM Cmcl	DSM Indl.	Cogen	Industrial	Monthly
Month	Cogeneration	Commercial	Industrial	Cogeneration	Commercial	Industrial	ECSD	EISD	(MDth)	(MDth)	(MDth)	(MDth)	HDD
Jan-11	1,514.2	246.1	144.0	1,514.2	246.1	144.0	1,146,000	93,300	0.0	0.0	0.0	0.0	219.9
Feb-11	1,518.4	229.5	168.8	1,518.4	229.5	168.8	1,154,000	93,100	0.0	0.0	0.0	0.0	277.5
Mar-11	1,340.9	226.4	167.9	1,340.9	226.4	167.9	1,158,200	93,300	0.0	0.0	0.0	0.0	196.0
Apr-11	1,559.1	223.0	165.2	1,559.1	223.0	165.2	1,160,600	93,200	0.0	0.0	0.0	0.0	96.4
May-11	1,389.4	196.6	152.3	1,389.4	196.6	152.3	1,163,400	93,500	0.0	0.0	0.0	0.0	74.7
Jun-11	1,430.9	197.8	175.0	1,430.9	197.8	175.0	1,166,500	93,900	0.0	0.0	0.0	0.0	19.6
Jul-11	1,403.5	189.0	179.9	1,403.5	189.0	179.9	1,155,600	93,500	0.0	0.0	0.0	0.0	0.0
Aug-11	1,382.0	203.0	186.5	1,382.0	203.0	186.5	1,157,800	93,700	0.0	0.0	0.0	0.0	0.0
Sep-11	1,532.9	186.9	190.3	1,532.9	186.9	190.3	1,161,500	93,800	0.0	0.0	0.0	0.0	0.4
Oct-11	1,356.7	186.4	169.1	1,356.7	186.4	169.1	1,167,400	93,600	0.0	0.0	0.0	0.0	25.2
Nov-11	1,181.2	235.3	176.8	1,181.2	235.3	176.8	1,176,700	93,600	0.0	0.0	0.0	0.0	172.1
Dec-11	1,437.1	205.2	143.1	1,437.1	205.2	143.1	1,178,700	94,000	0.0	0.0	0.0	0.0	339.9
Jan-12	1,653.7	211.5	178.1	1,653.7	211.5	178.1	1,156,900	92,900	0.0	0.0	0.0	0.0	232.3
Feb-12	1,465.8	199.7	191.4	1,465.8	199.7	191.4	1,166,000	93,100	0.0	0.0	0.0	0.0	239.3
Mar-12	1,563.5	216.2	193.5	1,563.5	216.2	193.5	1,172,800	93,200	0.0	0.0	0.0	0.0	230.2
Apr-12	1,406.6	194.9	192.6	1,406.6	194.9	192.6	1,190,200	94,100	0.0	0.0	0.0	0.0	129.2
May-12	1,450.1	193.8	204.5	1,450.1	193.8	204.5	1,199,500	94,400	0.0	0.0	0.0	0.0	36.7
Jun-12	1,424.4	181.4	184.8	1,424.4	181.4	184.8	1,206,800	94,800	0.0	0.0	0.0	0.0	13.2
Jul-12	1,444.8	183.3	201.1	1,444.8	183.3	201.1	1,190,400	95,700	0.0	0.0	0.0	0.0	0.0
Aug-12	1,544.6	170.2	213.0	1,544.6	170.2	213.0	1,196,000	95,800	0.0	0.0	0.0	0.0	0.0
Sep-12	1,606.9	153.4	187.7	1,606.9	153.4	187.7	1,196,000	95,700	0.0	0.0	0.0	0.0	0.0
Oct-12	1,397.9	207.1	195.8	1,397.9	207.1	195.8	1,211,200	95,400	0.0	0.0	0.0	0.0	16.1
Nov-12	1,100.8	246.2	175.4	1,100.8	246.2	175.4	1,221,500	95,700	0.0	0.0	0.0	0.0	102.1
Dec-12	1,482.3	231.9	144.1	1,482.3	231.9	144.1	1,224,200	95,900	0.0	0.0	0.0	0.0	267.6
Jan-13	1,479.4	261.6	180.2	1,479.4	261.6	180.2	1,200,700	94,900	0.0	0.0	0.0	0.0	323.3
Feb-13	1,365.1	222.7	174.0	1,365.1	222.7	174.0	1,208,600	95,200	0.0	0.0	0.0	0.0	269.4
Mar-13	1,544.7	205.1	189.7	1,544.7	205.1	189.7	1,217,000	95,300	0.0	0.0	0.0	0.0	150.3
Apr-13	1,306.5	210.2	199.8	1,306.5	210.2	199.8	1,223,600	95,200	0.0	0.0	0.0	0.0	104.4
May-13	1,592.2	165.6	181.8	1,592.2	165.6	181.8	1,228,500	94,900	0.0	0.0	0.0	0.0	23.2
Jun-13	1,553.4	144.9	195.6	1,553.4	144.9	195.6	1,234,600	94,700	0.0	0.0	0.0	0.0	6.1
Jul-13	1,610.0	138.9	182.3	1,610.0	138.9	182.3	1,222,400	95,000	0.0	0.0	0.0	0.0	0.0
Aug-13	1,608.5	140.7	195.8	1,608.5	140.7	195.8	1,228,200	95,100	0.0	0.0	0.0	0.0	0.3
Sep-13	1,583.8	149.1	126.8	1,583.8	149.1	126.8	1,227,300	95,100	0.0	0.0	0.0	0.0	0.0
Oct-13	1,402.5	158.8	202.2	1,402.5	158.8	202.2	1,239,200	94,700	0.0	0.0	0.0	0.0	39.6
Nov-13	1,392.2	198.8	183.2	1,392.2	198.8	183.2	1,245,500	94,700	0.0	0.0	0.0	0.0	104.2
Dec-13	1,537.6	196.8	150.5	1,537.6	196.8	150.5	1,245,600	95,000	0.0	0.0	0.0	0.0	240.8
Jan-14	1,564.7	176.7	203.1	1,564.7	176.7	203.1	1,226,800	95,100	0.0	0.0	0.0	0.0	158.1
Feb-14	1,324.0	171.6	164.5	1,324.0	171.6	164.5	1,236,100	96,000	0.0	0.0	0.0	0.0	140.4
Mar-14	1,283.4	215.1	143.6	1,283.4	215.1	143.6	1,248,300	96,600	0.0	0.0	0.0	0.0	80.2
Apr-14	1,333.8	171.6	189.7	1,333.8	171.6	189.7	1,251,400	96,500	0.0	0.0	0.0	0.0	77.7
May-14	1,567.9	142.8	187.1	1,567.9	142.8	187.1	1,257,400	96,700	0.0	0.0	0.0	0.0	19.7
Jun-14	1,551.5	131.4	178.0	1,551.5	131.4	178.0	1,263,900	97,000	0.0	0.0	0.0	0.0	0.7
Jul-14	1,627.8	132.8	198.2	1,627.8	132.8	198.2	1,256,300	97,300	0.0	0.0	0.0	0.0	0.0
Aug-14	1,566.3	131.7	165.5	1,566.3	131.7	165.5	1,261,200	97,000	0.0	0.0	0.0	0.0	0.0
Sep-14	1,535.0	122.9	175.8	1,535.0	122.9	175.8	1,258,100	97,800	0.0	0.0	0.0	0.0	0.0
Oct-14	1,235.4	189.5	191.0	1,235.4	189.5	191.0	1,272,300	98,200	0.0	0.0	0.0	0.0	0.0
Nov-14	1,297.1	152.7	164.3	1,297.1	152.7	164.3	1,287,100	98,000	0.0	0.0	0.0	0.0	44.2
Dec-14	1,565.4	173.1	127.6	1,565.4	173.1	127.6	1,286,200	98,900	0.0	0.0	0.0	0.0	170.3

SDGE Noncore Commercial, Industrial and Cogeneration Gas Demand (Monthly)

SDG&E Noncore Commercial & Industrial Demand (MDth)							San Diego County Employment		Cumulative	Cumulative	Carbon Fee Impact		
	Adjusted with DSM and Carbon-Fee Impacts			Unadjusted (from regression equations)			Commercial	Industrial	DSM Cmcl	DSM Indl.	Cogen	Industrial	Monthly
Month	Cogeneration	Commercial	Industrial	Cogeneration	Commercial	Industrial	ECSD	EISD	(MDth)	(MDth)	(MDth)	(MDth)	HDD
Jan-15	1,535.5	192.5	148.3	1,547.9	192.7	151.2	1,266,847	98,037	-0.2	-2.1	-12.4	-0.8	
Feb-15	1,544.1	202.4	151.5	1,556.5	202.7	154.5	1,276,298	98,681	-0.2	-2.1	-12.5	-0.9	
Mar-15	1,548.7	205.9	153.8	1,561.2	206.1	156.8	1,288,974	99,014	-0.2	-2.1	-12.5	-0.9	
Apr-15	1,538.3	206.7	154.0	1,550.7	206.9	157.0	1,293,176	98,361	-0.2	-2.1	-12.4	-0.9	
May-15	1,541.2	204.4	155.3	1,553.6	204.6	158.3	1,298,490	98,554	-0.2	-2.1	-12.4	-0.9	
Jun-15	1,545.8	203.8	156.6	1,558.2	204.0	159.6	1,304,148	98,848	-0.2	-2.1	-12.5	-0.9	
Jul-15	1,553.4	202.6	158.0	1,565.9	202.8	161.0	1,295,466	99,338	-0.2	-2.1	-12.5	-0.9	
Aug-15	1,545.4	203.9	157.7	1,557.9	204.2	160.7	1,299,542	98,826	-0.2	-2.1	-12.5	-0.9	
Sep-15	1,554.9	203.8	159.0	1,567.5	204.1	162.0	1,295,345	99,435	-0.2	-2.1	-12.5	-0.9	
Oct-15	1,554.1	208.3	159.2	1,566.6	208.6	162.2	1,309,029	99,382	-0.2	-2.1	-12.5	-0.9	
Nov-15	1,551.7	218.2	159.2	1,564.2	218.4	162.2	1,323,132	99,232	-0.2	-2.1	-12.5	-0.9	
Dec-15	1,566.8	231.5	160.9	1,579.4	231.8	163.9	1,321,301	100,195	-0.2	-2.1	-12.6	-0.9	
Jan-16	1,554.5	226.7	157.6	1,565.9	227.2	162.7	1,300,349	99,337	-0.5	-4.2	-11.4	-0.8	
Feb-16	1,566.1	226.5	158.9	1,577.6	227.0	164.0	1,309,333	100,077	-0.5	-4.2	-11.5	-0.8	
Mar-16	1,572.7	223.3	159.7	1,584.3	223.8	164.8	1,321,884	100,501	-0.5	-4.2	-11.6	-0.8	
Apr-16	1,564.0	219.8	158.8	1,575.5	220.2	163.9	1,325,478	99,945	-0.5	-4.2	-11.5	-0.8	
May-16	1,568.1	214.5	159.3	1,579.6	215.0	164.4	1,330,477	100,207	-0.5	-4.2	-11.5	-0.8	
Jun-16	1,573.8	212.1	159.9	1,585.4	212.6	165.0	1,335,910	100,573	-0.5	-4.2	-11.6	-0.8	
Jul-16	1,585.4	209.6	161.2	1,597.1	210.0	166.3	1,326,526	101,315	-0.5	-4.2	-11.6	-0.9	
Aug-16	1,575.5	210.1	160.2	1,587.1	210.6	165.2	1,330,600	100,682	-0.5	-4.2	-11.6	-0.8	
Sep-16	1,583.5	209.5	161.0	1,595.1	209.9	166.1	1,326,218	101,192	-0.5	-4.2	-11.6	-0.9	
Oct-16	1,580.7	213.7	160.7	1,592.3	214.2	165.8	1,340,780	101,010	-0.5	-4.2	-11.6	-0.8	
Nov-16	1,576.8	223.3	160.3	1,588.4	223.8	165.4	1,354,314	100,764	-0.5	-4.2	-11.6	-0.8	
Dec-16	1,590.7	236.4	161.8	1,602.3	236.8	166.9	1,351,664	101,648	-0.5	-4.2	-11.7	-0.9	
Jan-17	1,575.2	231.3	158.1	1,586.1	232.0	165.2	1,329,905	100,621	-0.7	-6.4	-11.0	-0.7	
Feb-17	1,586.5	231.0	159.3	1,597.5	231.7	166.4	1,338,153	101,342	-0.7	-6.4	-11.0	-0.7	
Mar-17	1,592.8	227.7	160.0	1,603.8	228.4	167.0	1,350,197	101,744	-0.7	-6.4	-11.1	-0.7	
Apr-17	1,584.3	223.9	159.1	1,595.3	224.6	166.2	1,352,763	101,203	-0.7	-6.4	-11.0	-0.7	
May-17	1,587.2	218.6	159.4	1,598.3	219.3	166.5	1,357,241	101,390	-0.7	-6.4	-11.0	-0.7	
Jun-17	1,591.8	216.0	159.9	1,602.9	216.7	167.0	1,362,145	101,681	-0.7	-6.4	-11.1	-0.7	
Jul-17	1,602.2	213.4	161.0	1,613.3	214.1	168.0	1,352,085	102,346	-0.7	-6.4	-11.2	-0.7	
Aug-17	1,591.1	213.8	159.8	1,602.1	214.5	166.9	1,355,511	101,635	-0.7	-6.4	-11.1	-0.7	
Sep-17	1,598.0	213.1	160.5	1,609.1	213.8	167.6	1,350,271	102,078	-0.7	-6.4	-11.1	-0.7	
Oct-17	1,594.2	217.2	160.1	1,605.3	217.9	167.2	1,364,158	101,838	-0.7	-6.4	-11.1	-0.7	
Nov-17	1,589.0	226.7	159.6	1,600.1	227.4	166.7	1,377,246	101,505	-0.7	-6.4	-11.1	-0.7	
Dec-17	1,601.6	239.6	160.9	1,612.8	240.4	168.0	1,373,928	102,311	-0.7	-6.4	-11.1	-0.7	

SDGE Noncore Commercial, Industrial and Cogeneration Gas Demand (Monthly)

SDG&E Noncore Commercial & Industrial Demand (MDth)							San Diego County Employment		Cumulative	Cumulative	Carbon Fee Impact		
	Adjusted with DSM and Carbon-Fee Impacts			Unadjusted (from regression equations)			Commercial	Industrial	DSM Cmcl	DSM Indl.	Cogen	Industrial	Monthly
Month	Cogeneration	Commercial	Industrial	Cogeneration	Commercial	Industrial	ECSD	EISD	(MDth)	(MDth)	(MDth)	(MDth)	HDD
Jan-18	1,583.3	234.5	156.9	1,594.4	235.5	166.1	1,351,511	101,143	-0.9	-8.5	-11.1	-0.7	
Feb-18	1,594.1	234.1	158.0	1,605.3	235.0	167.2	1,359,268	101,834	-0.9	-8.5	-11.1	-0.7	
Mar-18	1,599.9	230.7	158.6	1,611.1	231.7	167.8	1,371,105	102,204	-0.9	-8.5	-11.2	-0.7	
Apr-18	1,590.1	226.9	157.6	1,601.2	227.8	166.8	1,372,988	101,576	-0.9	-8.5	-11.1	-0.7	
May-18	1,593.3	221.5	157.9	1,604.4	222.5	167.1	1,377,340	101,781	-0.9	-8.5	-11.1	-0.7	
Jun-18	1,598.1	218.9	158.4	1,609.3	219.9	167.6	1,382,013	102,090	-0.9	-8.5	-11.2	-0.7	
Jul-18	1,608.7	216.2	159.5	1,619.9	217.2	168.7	1,371,502	102,764	-0.9	-8.5	-11.2	-0.7	
Aug-18	1,597.9	216.6	158.4	1,609.1	217.6	167.6	1,374,665	102,077	-0.9	-8.5	-11.2	-0.7	
Sep-18	1,605.3	215.8	159.2	1,616.5	216.7	168.4	1,368,937	102,549	-0.9	-8.5	-11.2	-0.7	
Oct-18	1,603.0	219.8	158.9	1,614.2	220.8	168.1	1,382,087	102,401	-0.9	-8.5	-11.2	-0.7	
Nov-18	1,597.1	229.3	158.3	1,608.3	230.3	167.5	1,395,408	102,026	-0.9	-8.5	-11.2	-0.7	
Dec-18	1,609.2	242.3	159.6	1,620.4	243.2	168.8	1,392,135	102,795	-0.9	-8.5	-11.2	-0.7	
Jan-19	1,591.4	237.2	155.6	1,602.0	238.3	166.9	1,369,789	101,625	-1.2	-10.6	-10.6	-0.7	
Feb-19	1,600.9	236.8	156.6	1,611.6	237.9	167.9	1,377,791	102,235	-1.2	-10.6	-10.7	-0.7	
Mar-19	1,605.4	233.5	157.0	1,616.1	234.7	168.3	1,389,970	102,523	-1.2	-10.6	-10.7	-0.7	
Apr-19	1,594.4	229.6	155.9	1,605.0	230.8	167.2	1,391,900	101,820	-1.2	-10.6	-10.6	-0.7	
May-19	1,596.2	224.3	156.1	1,606.8	225.5	167.4	1,396,539	101,931	-1.2	-10.6	-10.6	-0.7	
Jun-19	1,599.6	221.8	156.4	1,610.2	223.0	167.7	1,401,442	102,147	-1.2	-10.6	-10.6	-0.7	
Jul-19	1,608.2	219.0	157.3	1,618.9	220.2	168.6	1,390,710	102,700	-1.2	-10.6	-10.7	-0.7	
Aug-19	1,596.4	219.5	156.1	1,607.0	220.7	167.4	1,394,313	101,946	-1.2	-10.6	-10.6	-0.7	
Sep-19	1,602.7	218.7	156.8	1,613.4	219.9	168.1	1,388,900	102,350	-1.2	-10.6	-10.7	-0.7	
Oct-19	1,598.0	222.9	156.3	1,608.6	224.1	167.6	1,403,019	102,045	-1.2	-10.6	-10.6	-0.7	
Nov-19	1,592.5	232.4	155.7	1,603.1	233.6	167.0	1,416,429	101,695	-1.2	-10.6	-10.6	-0.7	
Dec-19	1,604.9	245.4	157.0	1,615.5	246.6	168.3	1,413,108	102,486	-1.2	-10.6	-10.7	-0.7	
Jan-20	1,587.0	240.0	153.0	1,597.4	241.5	166.4	1,389,395	101,333	-1.4	-12.7	-10.4	-0.7	
Feb-20	1,597.0	239.8	154.0	1,607.5	241.3	167.4	1,398,684	101,974	-1.4	-12.7	-10.4	-0.7	
Mar-20	1,602.1	236.8	154.5	1,612.5	238.2	168.0	1,412,401	102,294	-1.4	-12.7	-10.5	-0.7	
Apr-20	1,591.6	233.4	153.4	1,602.0	234.8	166.9	1,417,542	101,627	-1.4	-12.7	-10.4	-0.7	
May-20	1,593.9	228.1	153.7	1,604.3	229.5	167.1	1,421,734	101,770	-1.4	-12.7	-10.4	-0.7	
Jun-20	1,597.7	225.5	154.1	1,608.2	226.9	167.5	1,426,170	102,019	-1.4	-12.7	-10.4	-0.7	
Jul-20	1,607.5	222.6	155.1	1,618.0	224.0	168.5	1,414,653	102,642	-1.4	-12.7	-10.5	-0.7	
Aug-20	1,595.7	223.0	153.9	1,606.1	224.4	167.3	1,417,797	101,886	-1.4	-12.7	-10.4	-0.7	
Sep-20	1,601.9	222.1	154.5	1,612.4	223.5	168.0	1,411,711	102,287	-1.4	-12.7	-10.5	-0.7	
Oct-20	1,597.2	226.2	154.0	1,607.6	227.6	167.5	1,425,159	101,982	-1.4	-12.7	-10.4	-0.7	
Nov-20	1,591.6	235.7	153.4	1,602.0	237.1	166.9	1,438,337	101,625	-1.4	-12.7	-10.4	-0.7	
Dec-20	1,603.8	248.6	154.7	1,614.3	250.0	168.2	1,434,707	102,409	-1.4	-12.7	-10.5	-0.7	

Gas Demand Forecasts for the Combined, Electric Generation Rate Group By EG Rate Tier

The over-all gas demand forecasts for electric generation (under the EG rate category) are aggregated from the individual market segment forecasts for Cogeneration and Power Plant gas demand.

Cogeneration gas demand is billed according to the two-tiered EG rate structure. The projected gas demand by tier assigns 90.6259% of the total cogeneration demand to tier 2; the remaining 9.3741% is assigned to tier 1. Tables 1a and 1b show the monthly forecasts of cogeneration gas demand by EG rate tier.

Power plant gas demand is also billed at the EG rate structure; Tables 2a and 2b show the monthly forecasts of power pland gas demand by EG rate tier

Using the August 2018 data as an example, the resulting EG-tier1 and EG-tier 2 forecasts of gas demand would be:

<u>Tier 1:</u>

EG-Tier1_MDth = (150 MDth forCoGen)
+ (62 MDth for Power Plant)
EG-Tier1_MDth = (212 MDth).

<u>Tier 2:</u>

EG-Tier2_MDth = (1,448 MDth for CoGen)
+ (5,808 MDth for Power Plant)
EG-Tier2_MDth = (7,256 MDth).

These results (noting that 1 MDth = 10 MTherms) check reasonably well with the values 2,120 MTherms and data 72,566 MTherms, respectively, for tier1 and tier2 gas demand shown in the SDG&E consolidated gas demand forecast work papers for August 2018.

Table 1a Cogeneration Gas Demand (2014-2016)

MONTHLY FORECAST DATA		Total Cogeneration	SDG&E Cogeneration: Tier 1	SDG&E Cogeneration: Tier 2
		(MDth)	(MDth)	(MDth)
Year	Month			
2014	Jan	1,565	168	1,396
2014	Feb	1,324	142	1,182
2014	Mar	1,283	138	1,145
2014	Apr	1,334	143	1,190
2014	May	1,568	169	1,399
2014	Jun	1,552	167	1,385
2014	Jul	1,628	175	1,453
2014	Aug	1,566	168	1,398
2014	Sep	1,535	165	1,370
2014	Oct	1,235	133	1,103
2014	Nov	1,297	140	1,158
2014	Dec	1,565	168	1,397
2015	Jan	1,535	144	1,392
2015	Feb	1,544	145	1,399
2015	Mar	1,549	145	1,404
2015	Apr	1,538	144	1,394
2015	May	1,541	144	1,397
2015	Jun	1,546	145	1,401
2015	Jul	1,553	146	1,408
2015	Aug	1,545	145	1,401
2015	Sep	1,555	146	1,409
2015	Oct	1,554	146	1,408
2015	Nov	1,552	145	1,406
2015	Dec	1,567	147	1,420
2016	Jan	1,554	146	1,409
2016	Feb	1,566	147	1,419
2016	Mar	1,573	147	1,425
2016	Apr	1,564	147	1,417
2016	May	1,568	147	1,421
2016	Jun	1,574	148	1,426
2016	Jul	1,585	149	1,437
2016	Aug	1,576	148	1,428
2016	Sep	1,584	148	1,435
2016	Oct	1,581	148	1,433
2016	Nov	1,577	148	1,429
2016	Dec	1,591	149	1,442

Table 1b Cogeneration Gas Demand (2017-2020)

MONTHLY FORECAST DATA		Total Cogeneration	SDG&E Cogeneration: Tier 1	SDG&E Cogeneration: Tier 2
		(MDth)	(MDth)	(MDth)
Year	Month			
2017	Jan	1,575	148	1,428
2017	Feb	1,586	149	1,438
2017	Mar	1,593	149	1,443
2017	Apr	1,584	149	1,436
2017	May	1,587	149	1,438
2017	Jun	1,592	149	1,443
2017	Jul	1,602	150	1,452
2017	Aug	1,591	149	1,442
2017	Sep	1,598	150	1,448
2017	Oct	1,594	149	1,445
2017	Nov	1,589	149	1,440
2017	Dec	1,602	150	1,452
2018	Jan	1,583	148	1,435
2018	Feb	1,594	149	1,445
2018	Mar	1,600	150	1,450
2018	Apr	1,590	149	1,441
2018	May	1,593	149	1,444
2018	Jun	1,598	150	1,448
2018	Jul	1,609	151	1,458
2018	Aug	1,598	150	1,448
2018	Sep	1,605	150	1,455
2018	Oct	1,603	150	1,453
2018	Nov	1,597	150	1,447
2018	Dec	1,609	151	1,458
2019	Jan	1,591	149	1,442
2019	Feb	1,601	150	1,451
2019	Mar	1,605	150	1,455
2019	Apr	1,594	149	1,445
2019	May	1,596	150	1,447
2019	Jun	1,600	150	1,450
2019	Jul	1,608	151	1,457
2019	Aug	1,596	150	1,447
2019	Sep	1,603	150	1,453
2019	Oct	1,598	150	1,448
2019	Nov	1,592	149	1,443
2019	Dec	1,605	150	1,454
2020	Jan	1,587	149	1,438
2020	Feb	1,597	150	1,447
2020	Mar	1,602	150	1,452
2020	Apr	1,592	149	1,442
2020	May	1,594	149	1,444
2020	Jun	1,598	150	1,448
2020	Jul	1,608	151	1,457
2020	Aug	1,596	150	1,446
2020	Sep	1,602	150	1,452
2020	Oct	1,597	150	1,447
2020	Nov	1,592	149	1,442
2020	Dec	1,604	150	1,453

Table 2a Power Plant Gas Demand (2014-2016)

MONTHLY FORECAST DATA		Total Pow er Plant	SDG&E Pow er Plant: Tier 1	SDG&E Pow er Plant: Tier 2
		(MDth)	(MDth)	(MDth)
Year	Month			
2014	Jan	4,948	25	4,924
2014	Feb	2,912	134	2,779
2014	Mar	2,842	133	2,709
2014	Apr	3,929	95	3,834
2014	May	3,645	211	3,434
2014	Jun	3,591	102	3,488
2014	Jul	5,524	151	5,373
2014	Aug	5,611	67	5,544
2014	Sep	6,194	184	6,010
2014	Oct	5,978	157	5,822
2014	Nov	4,831	145	4,685
2014	Dec	5,310	51	5,259
2015	Jan	4,078	125	3,953
2015	Feb	2,670	54	2,616
2015	Mar	3,315	73	3,242
2015	Apr	3,039	36	3,003
2015	May	3,277	78	3,199
2015	Jun	3,225	64	3,161
2015	Jul	7,122	163	6,959
2015	Aug	7,113	196	6,917
2015	Sep	6,720	179	6,541
2015	Oct	4,985	240	4,745
2015	Nov	4,295	129	4,166
2015	Dec	4,997	112	4,885
2016	Jan	4,126	116	4,010
2016	Feb	3,887	18	3,868
2016	Mar	2,946	6	2,940
2016	Apr	2,737	8	2,729
2016	May	2,792	19	2,773
2016	Jun	2,786	20	2,765
2016	Jul	6,887	92	6,795
2016	Aug	7,096	112	6,984
2016	Sep	6,568	109	6,458
2016	Oct	4,433	87	4,346
2016	Nov	4,369	44	4,325
2016	Dec	4,556	49	4,507

Table 2b Power Plant Gas Demand (2017-2020)

MONTHLY FORECAST DATA		Total Pow er Plant	SDG&E Pow er Plant: Tier 1	SDG&E Pow er Plant: Tier 2
		(MDth)	(MDth)	(MDth)
Year	Month			
2017	Jan	3,330	33	3,296
2017	Feb	2,839	22	2,817
2017	Mar	2,982	5	2,977
2017	Apr	2,805	8	2,797
2017	May	2,808	15	2,793
2017	Jun	2,788	15	2,774
2017	Jul	6,800	83	6,717
2017	Aug	6,902	106	6,796
2017	Sep	6,703	61	6,642
2017	Oct	4,261	41	4,220
2017	Nov	4,581	43	4,538
2017	Dec	4,737	30	4,706
2018	Jan	4,276	44	4,231
2018	Feb	2,593	20	2,573
2018	Mar	2,340	6	2,334
2018	Apr	2,060	3	2,057
2018	May	2,364	7	2,357
2018	Jun	2,996	6	2,990
2018	Jul	5,437	57	5,381
2018	Aug	5,871	62	5,808
2018	Sep	5,323	63	5,260
2018	Oct	4,592	23	4,569
2018	Nov	4,498	22	4,476
2018	Dec	4,630	28	4,602
2019	Jan	4,234	34	4,200
2019	Feb	2,562	12	2,550
2019	Mar	2,415	5	2,409
2019	Apr	1,956	4	1,952
2019	May	2,243	10	2,233
2019	Jun	2,731	0	2,730
2019	Jul	5,223	37	5,186
2019	Aug	5,568	43	5,524
2019	Sep	5,115	53	5,061
2019	Oct	5,110	29	5,081
2019	Nov	4,257	29	4,227
2019	Dec	4,474	22	4,451
2020	Jan	3,990	25	3,965
2020	Feb	2,488	12	2,476
2020	Mar	2,380	3	2,376
2020	Apr	1,903	2	1,901
2020	May	2,104	10	2,094
2020	Jun	2,637	0	2,637
2020	Jul	5,105	34	5,071
2020	Aug	5,446	49	5,397
2020	Sep	4,979	38	4,941
2020	Oct	4,809	24	4,785
2020	Nov	4,249	17	4,232
2020	Dec	4,531	28	4,503

SoCalGas Other Wholesale Gas Demand

Gas Demand Forecast for Wholesale Customers Other than SDG&E

Work papers for SDG&E are provided in separate sections as indicated in the table of contents. The supporting material provided below are for the following additional wholesale customers of SoCalGas: City of Long Beach, Southwest Gas (SWG), City of Vernon (COV) and ECOGAS, a wholesale customer located in Mexicali, Mexico.

CITY OF LONG BEACH

The forecast developed by City of Long Beach's gas demand for this TCAP is provided below. The tables below show the monthly data from 2015 through 2020 for core and noncore market segments. The gas consumption shown for 2014 in the consolidated gas demand tables are recorded (billing month basis) deliveries to City of Long Beach by SoCalGas.

Table CLB-1a City of Long Beach Gas Demand (2015-2020) Average Year HDD:

Market	Temp	Year	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6
Core	Avg HDD	2015	669.6	655.1	672.1	549.1	433.1	348.4
NonCore	Avg HDD	2015	126.6	127.5	116.1	116.1	101.3	100.1
Core	Avg HDD	2016	671.0	673.7	675.7	550.9	435.4	350.3
NonCore	Avg HDD	2016	128.4	115.8	106.9	107.8	99.6	98.0
Core	Avg HDD	2017	674.4	660.9	678.1	553.1	436.1	351.2
NonCore	Avg HDD	2017	114.1	115.8	101.2	106.7	97.1	95.6
Core	Avg HDD	2018	675.0	664.6	680.8	555.1	438.1	352.4
NonCore	Avg HDD	2018	122.2	126.7	110.8	111.9	101.8	99.3
Core	Avg HDD	2019	678.9	665.8	683.9	557.3	439.2	353.8
NonCore	Avg HDD	2019	121.3	123.9	104.8	106.6	96.6	97.2
Core	Avg HDD	2020	679.5	684.3	685.9	559.6	441.2	354.7
NonCore	Avg HDD	2020	121.1	121.0	106.6	109.4	98.1	97.2

Table CLB-1b City of Long Beach Gas Demand (2015-2020) Average Year HDD:

Market	Temp	Year	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
Core	Avg HDD	2015	342.8	325.9	354.8	372.0	556.1	749.7	6028.6
NonCore	Avg HDD	2015	102.3	117.8	100.1	100.8	115.2	137.2	1361.2
Core	Avg HDD	2016	344.9	327.3	356.4	373.3	560.2	749.6	6068.8
NonCore	Avg HDD	2016	84.1	97.5	83.8	89.0	92.0	113.5	1216.3
Core	Avg HDD	2017	345.6	328.2	357.1	374.4	561.3	754.2	6074.7
NonCore	Avg HDD	2017	92.7	104.9	88.7	93.0	100.9	123.7	1234.3
Core	Avg HDD	2018	347.1	329.2	358.4	375.6	564.3	755.1	6095.6
NonCore	Avg HDD	2018	93.3	109.4	94.0	94.2	104.9	124.9	1293.4
Core	Avg HDD	2019	348.0	330.4	359.4	376.8	565.7	759.2	6118.3
NonCore	Avg HDD	2019	89.5	102.5	87.0	91.1	98.9	120.2	1239.7
Core	Avg HDD	2020	349.4	331.3	360.7	377.9	568.2	760.7	6153.2
NonCore	Avg HDD	2020	92.8	106.3	90.7	93.4	102.3	123.7	1262.5

Table CLB-2a City of Long Beach Gas Demand (2015-2020) Cold Year HDD:

Market	Temp	Year	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6
Core	Cold HDD	2015	773.9	754.9	759.4	606.9	458.8	361.4
NonCore	Cold HDD	2015	130.1	131.0	119.3	119.3	104.1	102.8
Core	Cold HDD	2016	775.7	774.3	763.3	609.0	461.2	363.4
NonCore	Cold HDD	2016	131.9	119.0	109.9	110.7	102.3	100.7
Core	Cold HDD	2017	779.5	761.4	766.0	611.4	461.9	364.4
NonCore	Cold HDD	2017	117.2	118.9	104.0	109.7	99.7	98.2
Core	Cold HDD	2018	780.4	765.6	769.0	613.5	464.0	365.6
NonCore	Cold HDD	2018	125.5	130.1	113.8	114.9	104.6	102.0
Core	Cold HDD	2019	784.7	767.1	772.4	616.0	465.2	367.0
NonCore	Cold HDD	2019	124.6	127.3	107.7	109.5	99.3	99.8
Core	Cold HDD	2020	785.6	786.4	774.7	618.5	467.3	368.0
NonCore	Cold HDD	2020	124.4	124.3	109.5	112.3	100.7	99.8

Table CLB-2b City of Long Beach Gas Demand (2015-2020) Cold Year HDD:

Market	Temp	Year	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
Core	Cold HDD	2015	353.6	336.2	366.1	390.1	617.0	868.5	6646.8
NonCore	Cold HDD	2015	105.1	121.0	102.8	103.6	118.3	140.9	1398.3
Core	Cold HDD	2016	355.8	337.7	367.7	391.5	621.4	868.7	6689.7
NonCore	Cold HDD	2016	86.4	100.1	86.1	91.4	94.5	116.5	1249.6
Core	Cold HDD	2017	356.5	338.6	368.5	392.7	622.7	873.8	6697.3
NonCore	Cold HDD	2017	95.2	107.7	91.1	95.5	103.7	127.1	1268.0
Core	Cold HDD	2018	358.0	339.6	369.8	393.8	625.9	875.0	6720.3
NonCore	Cold HDD	2018	95.8	112.4	96.5	96.8	107.8	128.3	1328.6
Core	Cold HDD	2019	358.9	340.8	370.8	395.1	627.5	879.6	6745.2
NonCore	Cold HDD	2019	91.9	105.3	89.4	93.6	101.6	123.5	1273.5
Core	Cold HDD	2020	360.4	341.8	372.1	396.3	630.2	881.5	6782.7
NonCore	Cold HDD	2020	95.4	109.2	93.2	96.0	105.1	127.0	1296.9

SOUTHWEST GAS

The gas demand and forecasts for Southwest Gas (SWG) sponsored by SoCalGas were developed from a forecast provided by SWG for 2015 through 2020; the gas consumption shown for 2014 in the consolidated gas demand tables are recorded deliveries (billing month basis and reduced by estimates to reflect non-exchange deliveries) to SWG by SoCalGas. The gas demand shown for SWG represents the gas deliveries that SoCalGas makes to SWG and does not include gas transacted under the exchange agreement between SoCalGas and SWG.

The segmentation (into core sales, core transportation and noncore transportation) is imputed based on the gas demand forecast provided by SWG.

Table SWG -1a SoCalGas Deliveries to Southwest Gas (2015-2020) Average Year HDD:

			1	2	3	4	5	6
Market	Temp	Year	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6
Core	Avg HDD	2015	985.0	824.9	645.4	477.3	273.2	216.2
NonCore	Avg HDD	2015	49.2	49.7	46.0	42.9	38.6	39.3
Core	Avg HDD	2016	994.2	843.6	651.4	481.8	275.7	218.2
NonCore	Avg HDD	2016	49.2	49.7	46.0	42.9	38.6	39.3
Core	Avg HDD	2017	1003.5	840.3	657.5	486.3	278.2	220.2
NonCore	Avg HDD	2017	49.2	49.7	46.0	42.9	38.6	39.3
Core	Avg HDD	2018	1013.0	848.2	663.6	490.8	280.7	222.2
NonCore	Avg HDD	2018	49.2	49.7	46.0	42.9	38.6	39.3
Core	Avg HDD	2019	1022.4	856.1	669.8	495.4	283.4	224.3
NonCore	Avg HDD	2019	49.2	49.7	46.0	42.9	38.6	39.3
Core	Avg HDD	2020	1031.8	875.4	675.9	500.0	285.9	226.3
NonCore	Avg HDD	2020	49.2	49.7	46.0	42.9	38.6	39.3

Table SWG -1b SoCalGas Deliveries to Southwest Gas (2015-2020) Average Year HDD:

Market	Temp	Year	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
Core	Avg HDD	2015	200.8	200.7	195.4	280.0	586.5	976.8	5862.2
NonCore	Avg HDD	2015	36.8	36.9	34.2	40.2	44.0	51.3	509.1
Core	Avg HDD	2016	202.7	202.5	197.3	282.6	592.0	985.8	5927.9
NonCore	Avg HDD	2016	36.8	36.9	34.2	40.2	44.0	51.3	509.1
Core	Avg HDD	2017	204.6	204.4	199.1	285.2	597.5	995.1	5971.8
NonCore	Avg HDD	2017	36.8	36.9	34.2	40.2	44.0	51.3	509.1
Core	Avg HDD	2018	206.5	206.3	200.9	287.9	603.1	1004.4	6027.6
NonCore	Avg HDD	2018	36.8	36.9	34.2	40.2	44.0	51.3	509.1
Core	Avg HDD	2019	208.4	208.2	202.7	290.6	608.7	1013.6	6083.4
NonCore	Avg HDD	2019	36.8	36.9	34.2	40.2	44.0	51.3	509.1
Core	Avg HDD	2020	210.3	210.1	204.6	293.2	614.3	1022.9	6150.7
NonCore	Avg HDD	2020	36.8	36.9	34.2	40.2	44.0	51.3	509.1

Table SWG -2a SoCalGas Deliveries to Southwest Gas (2015-2020) Cold Year HDD:

Market	Temp	Year	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6
Core	Cold HDD	2015	985.9	825.4	646.2	477.8	273.3	216.3
NonCore	Cold HDD	2015	53.8	53.0	52.4	47.7	40.3	40.1
Core	Cold HDD	2016	995.1	844.2	652.2	482.3	275.8	218.3
NonCore	Cold HDD	2016	53.8	53.0	52.4	47.7	40.3	40.1
Core	Cold HDD	2017	1004.4	840.9	658.3	486.7	278.3	220.2
NonCore	Cold HDD	2017	53.8	53.0	52.4	47.7	40.3	40.1
Core	Cold HDD	2018	1013.9	848.8	664.5	491.3	280.9	222.3
NonCore	Cold HDD	2018	53.8	53.0	52.4	47.7	40.3	40.1
Core	Cold HDD	2019	1023.3	856.6	670.6	495.9	283.5	224.3
NonCore	Cold HDD	2019	53.8	53.0	52.4	47.7	40.3	40.1
Core	Cold HDD	2020	1032.7	876.0	676.8	500.5	286.1	226.4
NonCore	Cold HDD	2020	53.8	53.0	52.4	47.7	40.3	40.1

Table SWG -2b SoCalGas Deliveries to Southwest Gas (2015-2020) Cold Year HDD:

Market	Temp	Year	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
Core	Cold HDD	2015	200.8	200.7	195.5	280.1	587.2	977.3	5866.5
NonCore	Cold HDD	2015	36.8	36.9	35.3	42.4	49.4	54.9	542.9
Core	Cold HDD	2016	202.7	202.5	197.3	282.8	592.6	986.4	5932.2
NonCore	Cold HDD	2016	36.8	36.9	35.3	42.4	49.4	54.9	542.9
Core	Cold HDD	2017	204.6	204.4	199.1	285.3	598.2	995.7	5976.1
NonCore	Cold HDD	2017	36.8	36.9	35.3	42.4	49.4	54.9	542.9
Core	Cold HDD	2018	206.5	206.3	201.0	288.0	603.7	1004.9	6031.9
NonCore	Cold HDD	2018	36.8	36.9	35.3	42.4	49.4	54.9	542.9
Core	Cold HDD	2019	208.4	208.2	202.8	290.7	609.3	1014.2	6087.7
NonCore	Cold HDD	2019	36.8	36.9	35.3	42.4	49.4	54.9	542.9
Core	Cold HDD	2020	210.3	210.1	204.6	293.4	614.9	1023.4	6155.0
NonCore	Cold HDD	2020	36.8	36.9	35.3	42.4	49.4	54.9	542.9

CITY OF VERNON

The two tables below show the monthly forecast for Vernon's gas demand.

Table COV-1 City of Vernon Demand (2015-2020):

Year	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6
2015	778.96	705.91	753.20	758.60	775.15	748.27
2016	791.82	732.21	769.51	769.39	784.23	762.46
2017	806.10	729.51	775.83	780.88	801.23	775.09
2018	813.46	740.81	792.03	794.65	806.89	786.87
2019	827.46	751.81	803.36	803.19	826.72	795.17
2020	836.24	780.59	820.03	807.23	841.65	809.25

Table COV-2 City of Vernon Demand (2015-2020):

Year	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2015	810.26	808.14	774.71	823.50	603.87	784.05	9124.63
2016	808.45	804.31	775.65	838.13	612.09	796.06	9244.30
2017	818.65	813.25	794.13	842.73	628.75	805.22	9371.38
2018	833.55	825.96	803.56	858.28	640.88	816.36	9513.30
2019	840.39	838.22	818.85	866.46	652.37	832.54	9656.55
2020	855.41	846.87	831.29	884.14	656.53	848.30	9817.52

ECOGAS

The monthly data for year 2014 shown in the consolidated gas demand tables are from SoCalGas' recorded data; the monthly forecasts for years 2015 through 2020 were provided from this wholesale customer's staff. These values are the same as those shown in the SoCalGas Consolidated Gas Demand Forecast work papers above.

Table ECOGAS -1 ECOGAS Demand (2015-2020):

Year	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6
2015	704.3	629.6	720.6	687.3	671.3	655.0
2016	787.5	712.4	803.9	770.5	754.4	738.0
2017	791.5	716.0	807.9	774.3	758.1	741.7
2018	795.4	719.5	811.9	778.2	761.9	745.4
2019	799.4	723.1	816.0	782.1	765.7	749.1
2020	803.4	726.8	820.1	786.0	769.6	752.9

Table ECOGAS -2 ECOGAS Demand (2015-2020):

Year	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2015	725.7	717.1	720.8	734.4	748.4	756.8	8471.4
2016	743.1	734.5	738.2	751.9	752.1	760.6	9047.1
2017	746.8	738.1	741.9	755.7	755.9	764.4	9092.3
2018	750.5	741.8	745.6	759.5	759.7	768.2	9137.8
2019	754.3	745.5	749.4	763.3	763.5	772.1	9183.5
2020	758.1	749.3	753.1	767.1	767.3	775.9	9229.4

SoCalGas Company Use Fuel, UAF and "Dth/Mcf" Conversion

Conversion of Energy to Volume, Percentages of Company Use Fuel and Un-Accounted-For Gas for SoCalGas

July 2015

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IV. Calculations of Company Use Fuel and Un-Accounted-For Load . . . . ___

I. Conversion Between Energy and Volumetric Units

The estimated conversion of Dth to Mcf was calculated from SoCalGas' system-wide gas consumption for year 2014. The value we've used is 1.0300.

This conversion factor is used to develop a volumetric (e.g., Mcf unit) load estimate from the gas demand forecasts which are developed on an energy (e.g., Dth unit) basis.

II. Company-Use-Fuel (Co-Use-Fuel) as Percent of Receipts

For SoCalGas, data on gas consumed for Company uses is tracked via the SoCalGas gas accounting system. Three categories of use are identified: Transmission, Storeage and "Other." Further, to facilitate the calculations of gas consumed for Company uses, a simple percentage is calculated using the total gas available for disposition as the denominator. These percentages were calculated over the time frame of April 2012 through March 2015. Table 1, below, shows the monthly data and the summary calculations.

Table 1

Company Use Fuel Data as Percentage of Receipts

Southern California Gas Company

Date (MMM-yy)	Trans-mission (Dth)	Storage (Dth)	"Other" (Dth)	Total (Dth)	"Receipts" PGA: Net Avail.-for Disposition (Dth)
Apr-12	208,411	229,149	15,913	453,474	84,632,270
May-12	196,598	331,040	15,856	543,493	82,282,507
Jun-12	220,479	393,691	24,660	638,830	74,527,054
Jul-12	142,127	203,374	15,715	361,216	79,934,684
Aug-12	167,675	127,968	11,702	307,345	94,357,328
Sep-12	205,653	149,295	19,496	374,444	85,203,907
Oct-12	299,648	374,644	32,651	706,943	83,086,417
Nov-12	220,473	129,305	12,904	362,681	84,605,690
Dec-12	183,427	70,893	15,447	269,768	102,605,078
Jan-13	113,937	31,431	17,019	162,386	114,365,507
Feb-13	151,805	34,976	13,049	199,831	95,306,981
Mar-13	151,658	86,278	14,456	252,392	82,121,732
Apr-13	219,467	172,169	12,158	403,793	74,586,837
May-13	210,339	455,513	10,767	676,619	76,567,380
Jun-13	235,334	394,093	56,258	685,685	76,944,006
Jul-13	228,959	238,850	19,325	487,134	82,823,641
Aug-13	212,458	175,973	15,225	403,657	84,448,334
Sep-13	228,076	234,986	57,047	520,108	82,534,915
Oct-13	158,427	136,122	13,132	307,681	77,068,132
Nov-13	154,349	72,867	20,332	247,548	85,458,429
Dec-13	91,979	33,081	85,717	210,777	108,038,319
Jan-14	74,889	25,489	14,555	114,933	97,399,985
Feb-14	86,295	28,988	13,184	128,468	84,232,362
Mar-14	142,383	112,016	21,108	275,508	78,862,637
Apr-14	209,201	307,128	13,185	529,514	78,106,520
May-14	276,646	410,591	16,259	703,496	73,073,302
Jun-14	269,920	427,678	49,020	746,618	69,227,030
Jul-14	243,445	309,209	12,566	565,220	80,986,011
Aug-14	241,963	357,527	12,327	611,817	81,260,951
Sep-14	219,217	304,802	40,551	564,570	82,919,054
Oct-14	205,475	306,108	23,135	534,718	86,474,391
Nov-14	100,257	84,088	13,504	197,850	78,668,090
Dec-14	108,248	87,753	25,140	221,141	97,770,065
Jan-15	98,510	53,298	39,004	190,812	93,802,908
Feb-15	99,486	93,423	-2,802	190,107	73,003,305
Mar-15	158,468	240,612	25,072	424,151	77,573,816
36-Month (Apr'12-Mar'15) Total:	6,535,681	7,224,408	814,637	14,574,726	3,044,859,574
As %-of-Receipts:	0.215%	0.237%	0.027%	0.479%	

III. Un-Accounted-For (UAF) as a Percent of Receipts

The data in Table 2, below provide monthly data to calculate UAF. UAF is calculated from this data as: UAF = Recorded Receipts – Recorded Deliveries. The percentage we use is based on the 36-month sums of the respective component terms of the formula above.

Table 2

Southern California Gas Company

Month	Total Receipts (MMBtu)	Total Deliveries (MMBtu)	UAF (MMBtu)	UAF % of Receipts (%)
Apr-12	84,632,270	84,973,898	(341,628)	-0.40%
May-12	82,282,507	81,840,447	442,060	0.54%
Jun-12	74,527,054	74,359,654	167,400	0.22%
Jul-12	78,612,014	79,483,522	(871,507)	-1.11%
Aug-12	95,679,999	95,055,330	624,669	0.65%
Sep-12	85,203,907	85,644,632	(440,725)	-0.52%
Oct-12	83,086,417	82,304,414	782,003	0.94%
Nov-12	84,605,690	84,079,486	526,204	0.62%
Dec-12	102,605,078	101,909,007	696,071	0.68%
Jan-13	114,365,507	111,307,831	3,057,676	2.67%
Feb-13	95,306,981	96,403,696	(1,096,715)	-1.15%
Mar-13	82,121,732	82,342,202	(220,469)	-0.27%
Apr-13	74,586,837	73,095,126	1,491,711	2.00%
May-13	76,567,380	76,042,813	524,567	0.69%
Jun-13	76,944,006	76,505,940	438,066	0.57%
Jul-13	82,823,641	82,921,538	(97,897)	-0.12%
Aug-13	84,448,334	84,055,746	392,588	0.46%
Sep-13	82,534,915	82,165,063	369,852	0.45%
Oct-13	77,068,132	76,600,789	467,343	0.61%
Nov-13	85,458,429	84,234,375	1,224,054	1.43%
Dec-13	108,038,319	106,443,715	1,594,604	1.48%
Jan-14	97,399,985	91,407,425	5,992,560	6.15%
Feb-14	84,232,362	86,164,515	(1,932,153)	-2.29%
Mar-14	78,862,637	77,655,438	1,207,199	1.53%
Apr-14	78,106,520	76,528,421	1,578,099	2.02%
May-14	73,073,302	72,924,550	148,752	0.20%
Jun-14	69,227,030	68,381,075	845,956	1.22%
Jul-14	80,986,011	80,963,015	22,996	0.03%
Aug-14	81,260,951	81,217,159	43,792	0.05%
Sep-14	82,919,054	81,915,616	1,003,438	1.21%
Oct-14	86,474,391	85,484,654	989,737	1.14%
Nov-14	78,668,090	77,256,022	1,412,067	1.79%
Dec-14	97,770,065	97,090,652	679,413	0.69%
Jan-15	93,802,908	90,698,431	3,104,477	3.31%
Feb-15	73,003,305	73,957,723	(954,418)	-1.31%
Mar-15	77,573,816	76,018,127	1,555,689	2.01%
Totals	**3,044,859,577**	**3,019,432,046**	**25,427,531**	**0.835%**

IV. Calculations of Company Use and Un-Accounted-For Load

SoCalGas prepares forecasts of gas demand—gas received through customers' meters. Consequently, to calculate the projected quantities of Co-Use-Fuel and UAF, the basis for the percentages developed above needs to be changed so they represent gas load as a *percentage of gas demand*—not gas receipts (or gas available for disposition).

The equation below states an identity:

(1) $Q_{out} = Q_{in} -$ (Co-Use-Fuel) – (UAF), where

Q_{out} = Gas Demand through customers' meters,

Q_{in} = Gas Available for Disposition ("receipts"),

Co-Use-Fuel = F x Q_{in} ,

UAF = U x Q_{in} ,

F = Co-Use-Fuel as a proportion (or %) of Q_{in}, and

U = UAF as a proportion (or %) of Q_{in}.

By substituting the relationships for Co-Use-Fuel and UAF into equation (1), the following result yields a relationship between Q_{out} and Q_{in}:

(2) $Q_{out} = Q_{in} (1 - F - U)$, and

(3) $Q_{in} = Q_{out} [1 / (1 - F - U)]$.

These equations will be used to change the basis of the percentages of Co-Use-Fuel and UAF from a "receipts basis" to a "demand basis."

The total amount of gas load for Co-Use-Fuel or UAF is numerically the same regardless of the basis for the respective percentages:

(4) Co-Use-Fuel = $F \times Q_{in} = f \times Q_{out}$, and substituting for Q_{in} from (3)yields,

(5) $F \times Q_{out} [1 / (1 - F - U)] = f \times Q_{out}$,

(5') $[F / (1 - F - U)] \times Q_{out} = f \times Q_{out}$.

Consequently, the percentage of gas demand to use to calculate Co-Use-Fuel is:

(6) $f = [F / (1 - F - U)]$; similarly,

the percentage of gas demand to use to calculate Co-Use-Fuel is:

(7) $u = [U / (1 - F - U)]$.

Since Co-Use-Fuel is separated into several components (denoted with subscript "c" in the formulas below), the component loads also can be calculated from gas demand using the following formula:

(8) $f_c = [F_c / (1 - F - U)]$; where $F = \sum_{i=1, ..., N} (F_i)$, or

(9) $f_c = (F_c / F) \times f$.

Example: From the Co-Use-Fuel percentages in Table 1 and the UAF percentage, 0.752%, of Table 2, we calculate:

$f = 0.485\% = [0.479\% / (100\% - 0.479\% - 0.835\%)]$,

$u = 0.846\% = [0.835\% / (100\% - 0.479\% - 0.835\%)]$, and

$f_c = (F_c / F) \times f = 0.218\% = (0.215\% / 0.479\%) \times 0.485\%$,

where "c" means the *transmission* fuel component of company use fuel.

SDG&E Company Use Fuel, UAF and “Dth/Mcf” Conversion

Conversion of Energy to Volume, Percentages of Company Use Fuel and Un-Accounted-For Gas for SDG&E

July 2015

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IV. Calculations of Company Use Fuel and Un-Accounted-For Load . . . . ___

I. Conversion Between Energy and Volumetric Units

The estimated conversion of Dth to Mcf was calculated from SDG&E's system-wide gas consumption for year 2014. The value is 1.0351 Dth/Mcf.

This conversion factor is used to develop a volumetric (e.g., Mcf unit) load estimate from the gas demand forecasts which are developed on an energy (e.g., Dth unit) basis.

II. Company-Use-Fuel (Co-Use-Fuel) as Percent of Receipts

For SDG&E, data on gas consumed for Company uses is tracked via the SDG&E gas accounting system. Three categories of use are identified: Transmission, Storage and "Other." Further, to facilitate the calculations of gas consumed for Company uses, a simple percentage is calculated using the total gas available for disposition as the denominator. These percentages were calculated over the time frame of April 2012 through March 2015. Table 1, below, shows the monthly data and the summary calculations.

Table 1

Company Use Fuel Data as Percentage of "Receipts"

San Diego Gas & Electric Company

Date (MMM-yy)	Trans-mission (Dth)	Storage (Dth)	"Other" (Dth)	Total (Dth)	"Receipts" PGA: Net Avail.-for Disposition (Dth)
Apr-12	41,409	0	4,604	46,013	12,070,263
May-12	27,994	0	3,825	31,819	11,555,330
Jun-12	33,090	0	3,673	36,763	10,445,633
Jul-12	53,957	0	3,586	57,543	10,847,003
Aug-12	65,127	0	3,949	69,076	12,548,282
Sep-12	60,458	0	4,727	65,186	11,897,988
Oct-12	55,399	0	5,931	61,330	11,596,268
Nov-12	61,508	0	5,452	66,960	12,315,720
Dec-12	75,600	0	5,497	81,097	13,514,454
Jan-13	81,259	0	6,779	88,038	15,304,059
Feb-13	63,562	0	6,618	70,181	12,858,462
Mar-13	34,676	0	5,978	40,653	10,053,712
Apr-13	38,174	0	6,003	44,177	9,927,372
May-13	32,378	0	5,613	37,991	10,085,108
Jun-13	34,732	0	5,733	40,464	9,945,692
Jul-13	41,749	0	5,591	47,340	10,635,256
Aug-13	38,852	0	5,647	44,499	10,668,783
Sep-13	41,487	0	4,135	45,621	10,820,847
Oct-13	23,842	0	6,792	30,634	11,102,830
Nov-13	39,027	0	6,184	45,211	12,162,902
Dec-13	60,264	0	6,136	66,399	14,360,369
Jan-14	44,609	0	6,537	51,146	12,376,658
Feb-14	31,892	0	6,354	38,246	9,362,326
Mar-14	6,438	0	5,971	12,409	8,790,155
Apr-14	8,323	0	6,200	14,524	9,425,118
May-14	16,333	0	5,777	22,110	8,762,271
Jun-14	2,796	0	6,022	8,818	8,344,170
Jul-14	29,254	0	5,876	35,130	10,279,012
Aug-14	17,309	0	6,561	23,870	10,178,204
Sep-14	19,925	0	6,656	26,581	10,550,238
Oct-14	24,347	0	6,201	30,548	10,569,594
Nov-14	22,700	0	6,239	28,939	10,203,737
Dec-14	40,752	0	5,910	46,663	12,659,182
Jan-15	40,055	0	6,768	46,823	12,877,050
Feb-15	7,950	0	5,757	13,707	9,344,405
Mar-15	15,173	0	4,846	20,020	10,517,280
36-Month (Apr'12-Mar'15) Total:	1,332,401	0	204,125	1,536,526	398,955,732
As %-of-Receipts:	0.334%	0.000%	0.051%	0.385%	

III. Un-Accounted-For (UAF) as a Percent of Receipts

The data in Table 2, below provide monthly data to calculate UAF. UAF is calculated from this data as: UAF = Recorded Receipts – Recorded Deliveries.

(1) Un-Adjusted-UAF = Recorded Receipts – Recorded Deliveries,

(2) Adjusted-UAF = Un-Adjusted-UAF + Billing Adjustments-to-UAF.

The UAF percentages in Table 2 are calculated as Adjusted-UAF relative to Recorded Receipts. The percentage we use is based on the sums of the respective component terms of the formulas above for all months of the data.

Table 2

San Diego Gas & Electric Company

Month	Total Receipts (MMBtu)	Total Deliveries (MMBtu)	Adjustments to LUAF (MMBtu)	UAF (MMBtu)	UAF % of Receipts (%)
Apr-12	12,070,263	13,454,252	1,370,125	(13,864)	-0.11%
May-12	11,555,330	11,709,721	126,409	(27,982)	-0.24%
Jun-12	10,445,633	11,171,569	753,619	27,683	0.27%
Jul-12	10,847,003	10,785,271	(39,741)	21,991	0.20%
Aug-12	12,548,282	10,805,525	(1,766,516)	(23,760)	-0.19%
Sep-12	11,897,988	11,870,005	(61,956)	(33,973)	-0.29%
Oct-12	11,596,268	12,337,164	924,086	183,189	1.58%
Nov-12	12,315,720	11,938,965	(378,938)	(2,183)	-0.02%
Dec-12	13,514,454	12,651,568	(779,128)	83,758	0.62%
Jan-13	15,304,059	15,436,396	699,241	566,904	3.70%
Feb-13	12,858,462	13,575,739	631,824	(85,453)	-0.66%
Mar-13	10,053,712	10,542,294	511,135	22,553	0.22%
Apr-13	9,927,372	10,368,299	365,725	(75,202)	-0.76%
May-13	10,085,108	10,191,844	100,916	(5,820)	-0.06%
Jun-13	9,945,692	10,390,292	499,137	54,537	0.55%
Jul-13	10,635,256	10,644,435	(40,681)	(49,861)	-0.47%
Aug-13	10,668,783	10,504,969	(141,799)	22,015	0.21%
Sep-13	10,820,847	10,272,044	(492,704)	56,100	0.52%
Oct-13	11,102,830	11,169,915	259,313	192,228	1.73%
Nov-13	12,162,902	10,619,459	(1,322,011)	221,432	1.82%
Dec-13	14,360,369	13,457,911	(560,408)	342,050	2.38%
Jan-14	12,376,658	13,099,031	729,991	7,618	0.06%
Feb-14	9,362,326	10,484,254	1,087,568	(34,360)	-0.37%
Mar-14	8,790,155	9,231,470	552,277	110,963	1.26%
Apr-14	9,425,118	8,836,677	(599,085)	(10,644)	-0.11%
May-14	8,762,271	8,416,599	(319,814)	25,858	0.30%
Jun-14	8,344,170	9,114,010	673,944	(95,896)	-1.15%
Jul-14	10,279,012	9,704,367	(490,413)	84,232	0.82%
Aug-14	10,178,204	10,567,081	416,516	27,640	0.27%
Sep-14	10,550,238	10,052,553	(560,975)	(63,289)	-0.60%
Oct-14	10,569,594	10,547,221	119,823	142,196	1.35%
Nov-14	10,203,737	10,075,198	(59,270)	69,269	0.68%
Dec-14	12,659,182	11,080,061	(1,484,313)	94,808	0.75%
Jan-15	12,877,050	13,394,893	766,077	248,233	1.93%
Feb-15	9,344,405	10,592,034	1,064,985	(182,645)	-1.95%
Mar-15	10,517,280	10,810,239	515,851	222,891	2.12%
Totals	**398,955,732**	**399,903,324**	**3,070,811**	**2,123,219**	**0.532%**

IV. Calculations of Company Use and Un-Accounted-For Load

SDG&E prepares forecasts of gas demand—gas received through customers' meters. Consequently, to calculate the projected quantities of Co-Use-Fuel and UAF, the basis for the percentages developed above needs to be changed so they represent gas load as a *percentage of gas demand*—not gas receipts (or gas available for disposition).

The equation below states an identity:

(1) $Q_{out} = Q_{in} -$ (Co-Use-Fuel) – (UAF), where

Q_{out} = Gas Demand through customers' meters,
Q_{in} = Gas Available for Disposition ("receipts"),
Co-Use-Fuel = F x Q_{in} ,
UAF = U x Q_{in} ,
F = Co-Use-Fuel as a proportion (or %) of Q_{in}, and
U = UAF as a proportion (or %) of Q_{in}.

By substituting the relationships for Co-Use-Fuel and UAF into equation (1), the following result yields a relationship between Q_{out} and Q_{in}:

(2) $Q_{out} = Q_{in}\ (1 - F - U)$, and
(3) $Q_{in} = Q_{out}\ [1 / (1 - F - U)]$.

These equations will be used to change the basis of the percentages of Co-Use-Fuel and UAF from a "receipts basis" to a "demand basis."

The total amount of gas load for Co-Use-Fuel or UAF is numerically the same regardless of the basis for the respective percentages:

(4) Co-Use-Fuel = $F \times Q_{in} = f \times Q_{out}$, and substituting for Q_{in} from (3) yields,

(5) $F \times Q_{out} [1 / (1 - F - U)] = f \times Q_{out}$,

(5') $[F / (1 - F - U)] \times Q_{out} = f \times Q_{out}$.

Consequently, the percentage of gas demand to use to calculate Co-Use-Fuel is:

(6) $f = [F / (1 - F - U)]$; similarly,

the percentage of gas demand to use to calculate Co-Use-Fuel is:

(7) $u = [U / (1 - F - U)]$.

Since Co-Use-Fuel is separated into several components (denoted with subscript "c" in the formulas below), the component loads also can be calculated from gas demand using the following formula:

(8) $f_c = [F_c / (1 - F - U)]$; where $F = \sum_{i=1, \ldots, N} (F_i)$, or

(9) $f_c = (F_c / F) \times f$.

<u>Example:</u> From the Co-Use-Fuel percentages in Table 1 and the UAF percentage, 1.178%, of Table 2, we calculate:

$f = 0.389\% = [0.385\% / (100\% - 0.385\% - 0.532\%)]$,

$u = 0.537\% = [0.532\% / (100\% - 0.385\% - 0.532\%)]$, and

$f_c = (F_c / F) \times f = 0.337\% = (0.334\% / 0.385\%) \times 0.389\%$,

where "c" means the *transmission* fuel component of company use fuel.

EUForecaster User’s Guide

I. Introduction

End Use Forecaster is a market-segmentation and modeling framework that forecasts the impacts of competitive strategies and market scenarios on sales, revenues, and market shares. **EUForecaster is used to prepare the demand forecasts for the residential, core commercial and industrial, and noncore commercial and industrial markets.**

The object of this chapter is to familiarize you with the overall End Use Forecaster modeling structure and to describe how the system relates to common business issues concerning demand forecasting and market assessment. This chapter also serves to explain how the various modules within End Use Forecaster relate to one another. Subsequent chapters define the contents and features of each individual module.

End Use Forecaster: An Overview

End Use Forecaster, formerly known as Quant.sim, is a market segmentation, competitive assessment, and sales projection application developed to respond to market needs and overcome the limitations of existing demand forecasting and market planning tools. The application, originally developed in 1993, is constructed using SAS software.

We have found that each utility's market structure and competitive environment is unique and that a major shortcoming of other tools has been an inability to accurately capture this diversity. End Use Forecaster's Market Segmentation module provides the ability to update the model to reflect new strategies without writing SAS programming code. Unique market conditions translate into an inherently flexible, dynamic modeling framework that can rapidly adapt to new market conditions.

This flexibility is afforded through a model development approach that separates specific market issues from theoretical modeling constructs:

- ***Logic and theory***, the portion of the system comprised of the programming code and data structures, is stored and managed in one location
- ***Market data***, which are unique for every company and strategy, are stored in a separate location

This structure makes market segmentation and analyses relatively easy tasks compared to adapting spreadsheet models or rewriting "black box" programming code. As an example, consider the "DSM planning" and "competitive assessment" market dimensions in the Table 1 below. The DSM dimensions show a standard end-use forecast model design for the utility industry, while the competitive assessment dimensions illustrate another way to set up End Use Forecaster to analyze new retail competition if retail choice is present in the jurisdiction.

Table 1. Alternative Market Segmentation Designs – Utility Industry Example

Market Dimension	DSM Planning	Competitive Assessment
Dimension 1	Market sector (residential, commercial, industrial, agricultural)	Risk of switching
Dimension 2	Customer type (dwelling, building, industry segments)	Customer value (to energy provider)
Dimension 3	End uses	Products and services
Dimension 4	Fuel types	Provider choices
Dimension 5	Efficiency levels	Product choices

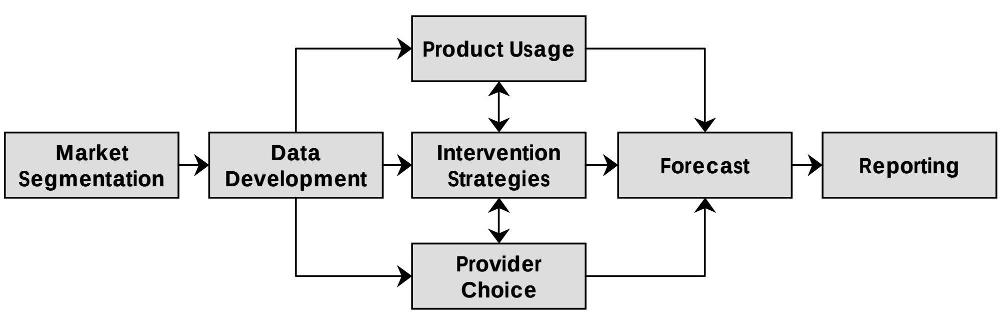
End Use Forecaster has other dimensions that capture factors affecting product demands. Perhaps the most important of these is End Use Forecaster's "vintaging" capability. Vintaging refers to product or service turnover that is a function of either physical lives or contract period. Accurate assessments of product turnover are crucial to obtaining accurate forecasts for any product where purchases are derived from a fraction of the population in the market at a moment of time. An example of vintaging would be accounting for energy-consuming equipment such as motors, boilers, water heaters, chillers, etc., where demand over a given time interval is the sum of demands from new customers plus those customers replacing existing equipment.

The effective use of the inherent multidimensionality of most business forecasting issues is a key strength of the End Use Forecaster framework. Critical dimensions of business issues (e.g., geography, customers, products, competitors, equipment lives, etc.) are included in every forecast, along with dimensions users can modify to resolve a variety of business issues. For example, forecasters may be interested in the price elasticity of demand, marketing staff may want to study market shares across various scenarios, and corporate finance may need the bottom line revenue forecast. All these (and more) are immediately available in every forecast due to the concentration of rich and flexible dimensionality.

Seven primary modules form the heart of the End Use Forecaster framework: Market Segmentation, Data Development, Product Usage, Provider Choice, Intervention Strategies, Forecasting, and Reporting. .

Figure 1 depicts the relationships between these modules. Each is summarized below and in the remaining chapters of this Reference Guide.

Figure 1. End Use Forecaster Modules and Structure



Interface Design

The user interface to the End Use Forecaster model is constructed using SAS/AF (Applications Facility). SAS/AF software provides dozens of predefined "classes" that enabled the development of End Use Forecaster. These classes include a wide selection of both visual and non-visual aspects. The visual classes, or widgets, define objects that are placed on the screen, including icons, push buttons, text boxes tables, etc. The non-visual classes use screen control language (SCL) that define the objects controlling End Use Forecaster behind the scenes. Figure 2 and Figure 3 show the first two screens users see after starting End Use Forecaster.

Figure 2. Welcome Screen

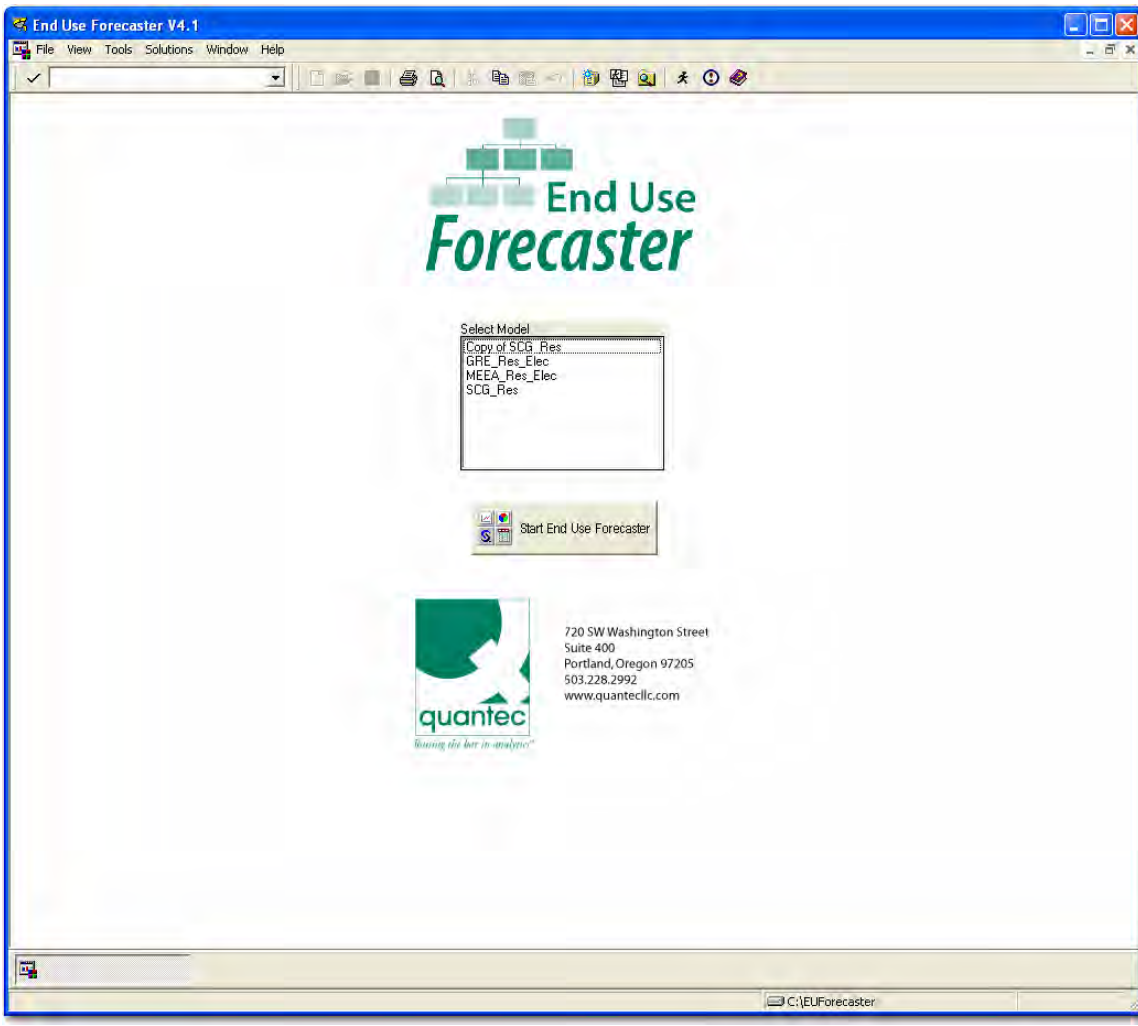
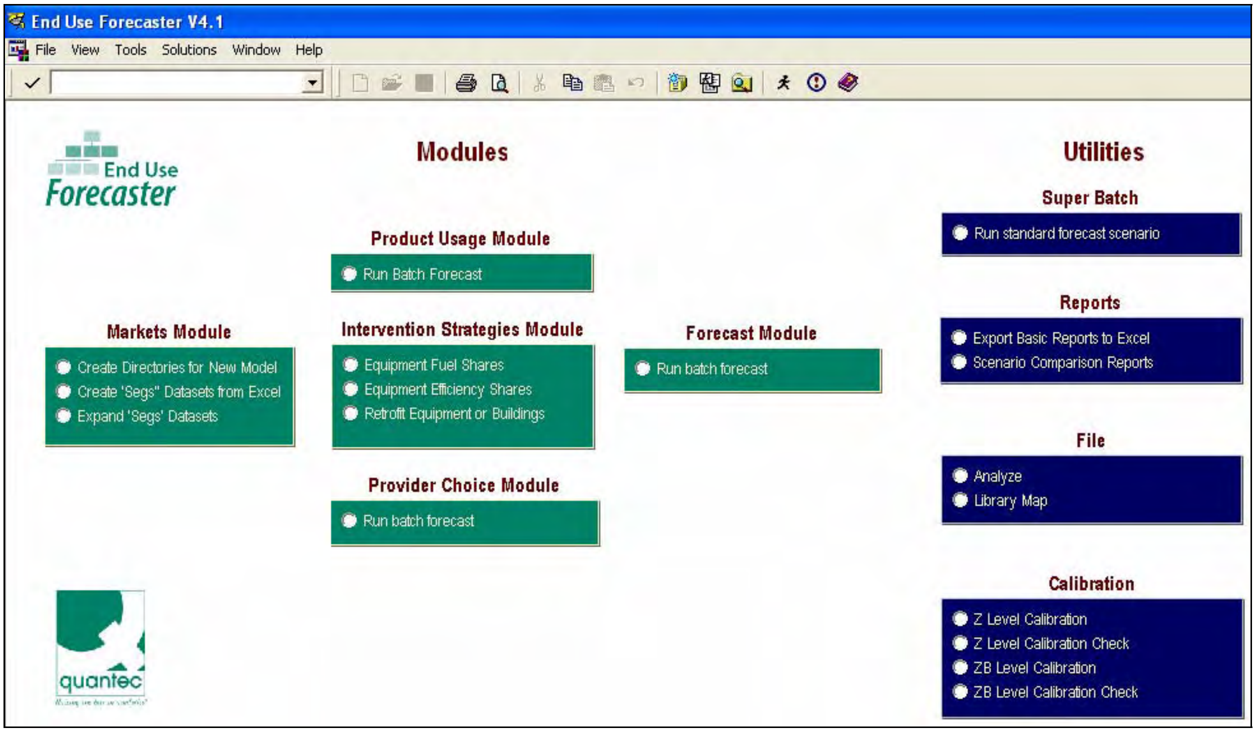


Figure 3. Main Dashboard



The interface is the only part of the End Use Forecaster framework that is compiled. All of the mathematical operations are in open SAS code, and End Use Forecaster's SAS/AF interface can also be edited and recompiled. This is a true "open architecture" design that allows users to modify and extend the End Use Forecaster framework.

In addition to End Use Forecaster's customized sets of tools, there is also a wide variety of data management, analysis, and reporting tools that are packaged with the SAS System.

Data Exchange

End Use Forecaster uses SAS/ACCESS software to provide direct and transparent access to various databases such as:

- DB2 Under UNIX and PC Hosts
- ORACLE
- SYBASE
- SQL/DS
- ODBC
- PC File Formats (Excel, Access)
- SYSTEM 2000 software

Since data access functions are separated from End Use Forecaster's logic, underlying data sources may change, but the model's capabilities will not be affected.

Market Segmentation

Market Segments

The primary goal of any market segmentation design in End Use Forecaster is to disaggregate the overall market into meaningful portions of customer types that behave similarly in terms of product demands and the set of choices they face. These disaggregations are arranged hierarchically, with Dimension 1 at the top of the "tree." Each Dimension 1 class can have one or more Dimension 2 classes, each Dimension 2 class can have one or more Dimension 3 classes, and so on.

Strategic Information Needs

A secondary goal of the market segmentation design is to designate groups of customers and products for which sufficient data are available to be fed into End Use Forecaster's forecasting framework. It may not be desirable to disaggregate the market into segments for which little or no data are available or where there is little distinction between two or more groups. Every new market segment requires additional disk storage space and more time to assemble the required End Use Forecaster data inputs. The objective should be to ***optimize*** the number of market segments: create enough market sectors to provide differentiation on answers to important questions but not so many that they become a burden to the overall process.

Data Development and Entry

Successful implementation of the End Use Forecaster model relies on highly integrated sets of information. Data entry is closely related to the market segmentation process, and both are addressed in this Reference Guide. Each set of input data uses different dimensions, so highly structured templates were designed to minimize redundancy and eliminate error at the same time.

End Use Forecaster uses market segmentation information and templates to set up all the required SAS datasets such that they are entirely consistent with the segmentation design.

Data Entry Formats

End Use Forecaster's datasets can be populated in several ways. The most common methods are:

- Exporting/importing data using SAS/ACCESS for PC file formats
- Programmatic data entry through simple SAS programs

As users gradually increase the number of distinct market segments from dozens to hundreds to thousands, it is anticipated that they will take advantage of SAS/ACCESS links to other company databases. Such links would allow for real-time forecast updates as database information is updated.

Product Usage Module: Modeling Equipment Consumption

End Use Forecaster tracks consumption of resources (such as natural gas, electricity, water, minutes of telephone or Internet use, gasoline, etc.) through the Product Usage module. This module is only used when there are secondary, derived demands from customers' product choices. For example, a utility would be interested in the use of energy from appliances to generate natural gas or electricity forecasts, but other types of manufacturers may not need this information to develop sales forecasts. If certain parts of the model are not needed in a given application, you may assign default values (usually a 0 or 1) that essentially turn off that portion of the model.

Product usage can vary with a variety of factors such as weather, non-weather seasonal factors, customer characteristics, prices, and other product attributes. Several modeling techniques explain and predict product usage, including scalars (exogenous estimates), econometric functions, and other statistical models.

Regardless of the approach taken, the Product Usage module provides a forecast of the predicted consumption by combining (1) a forecast of consumption factors or drivers (i.e., independent or exogenous variables) and (2) a set of coefficients associated with each exogenous variable.

Provider Choice Module: Modeling Customer Service and Purchase Decisions

Types of Choices: The Provider Choice module analyzes customer choice decisions among competitors and product options. For example, a commercial building operator chooses between fuel (provider) types for HVAC systems, and then from various equipment efficiency levels (product options) within the fuel type. Purchase decisions are represented by a nested structure of provider and product option choices.

Modes of Choice Modeling

The Provider Choice module is designed for two types of modeling: (1) the estimation of choice parameters, and (2) the forecast of market shares given these choice parameters. More specifically, the Provider Choice Module:[1]

- ***Simulates parameter estimates*** relating to customer choice in markets where micro-(customer) level information is not available, but aggregate cost and market share figures are known, or
- ***Uses parameter estimates*** from the application of logistic regression, or other models of customer choice, to micro-level customer data.

[1] The Provider Choice Module can be bypassed in some applications such as DSM potential analysis. In this type of framework, the base line fuel and efficiency shares are held constant and are determined outside the model. The Intervention Strategies Module is then used to view alternate market shares associated with, for example, technical and achievable DSM potential.

If primary market research is used to develop the micro data necessary for parameter estimates, the Provider Choice module essentially transforms a "static" market research report into a dynamic what-if analysis structure. This can significantly extend the usefulness and life of company market research resources.

After model parameters are simulated or input into the Provider Choice Module, it then forecasts the market share associated with each product and service alternative over the planning horizon.

Average versus Marginal Shares

The comparison of average versus marginal shares and associated trends is a key result of incorporating dynamic choice functions in the End Use Forecaster forecasting framework.

For example, the infusion of new energy consumption technologies (such as condensing furnaces) may be reaching 35% of new construction buildings, but if new construction in a given year only represents 2% of the total market, then the total impact on the market is merely 0.7%. As these rates of change accelerate and decelerate through the future, and as simulated what-if scenarios impact these forecasts of consumer choice, markedly different forecasts are possible over the longer term, while at the same time maintaining a realistic short-term profile.

Intervention Strategies Module: Analyzing Marketing Scenarios and DSM Potential

The Intervention Strategies module – a generic term to apply to activities typically associated with demand-side management (DSM) – is intended to capture the impacts of marketing, energy efficiency potential, and other programs designed to influence customer behavior. This module makes available a series of program designs that simulate the "what-if" impacts on the market shares, usage, and the resulting demand forecast. Three general types of program designs are available:

- ***Provider (fuel) substitution scenarios***. These scenarios modify the forecasted choices or market shares among provider (fuel) sources. Separate sets of assumptions apply to existing buildings and new construction buildings, permitting different types of programs to be designed.
- ***Product option (equipment efficiency) scenarios***. These scenarios modify efficiency or product option shares. For example, an efficiency program usually favors the highest available efficiency level for each market sector. These impacts affect choices at the point of new construction or replacement of existing end uses, and different assumptions can apply to each market. A technical potential scenario normally assigns a 100% share to the most efficient option. An achievable potential scenario assigns less than a 100% share to the most efficient option, with the level determined by experience with similar program designs or market research.
- ***Usage retrofit program scenarios***. These programs encourage consumers to change their product usage given the equipment they already have (e.g., improve the efficiency of existing equipment by installing efficiency measures or through better O&M procedures).

Examples include measures to tighten residential and commercial building envelopes, industrial process changes, and pipe and duct insulation.

Intervention strategies are incorporated directly into the relevant Product Usage or Provider Choice forecasts.

Forecast Module: Putting It All Together

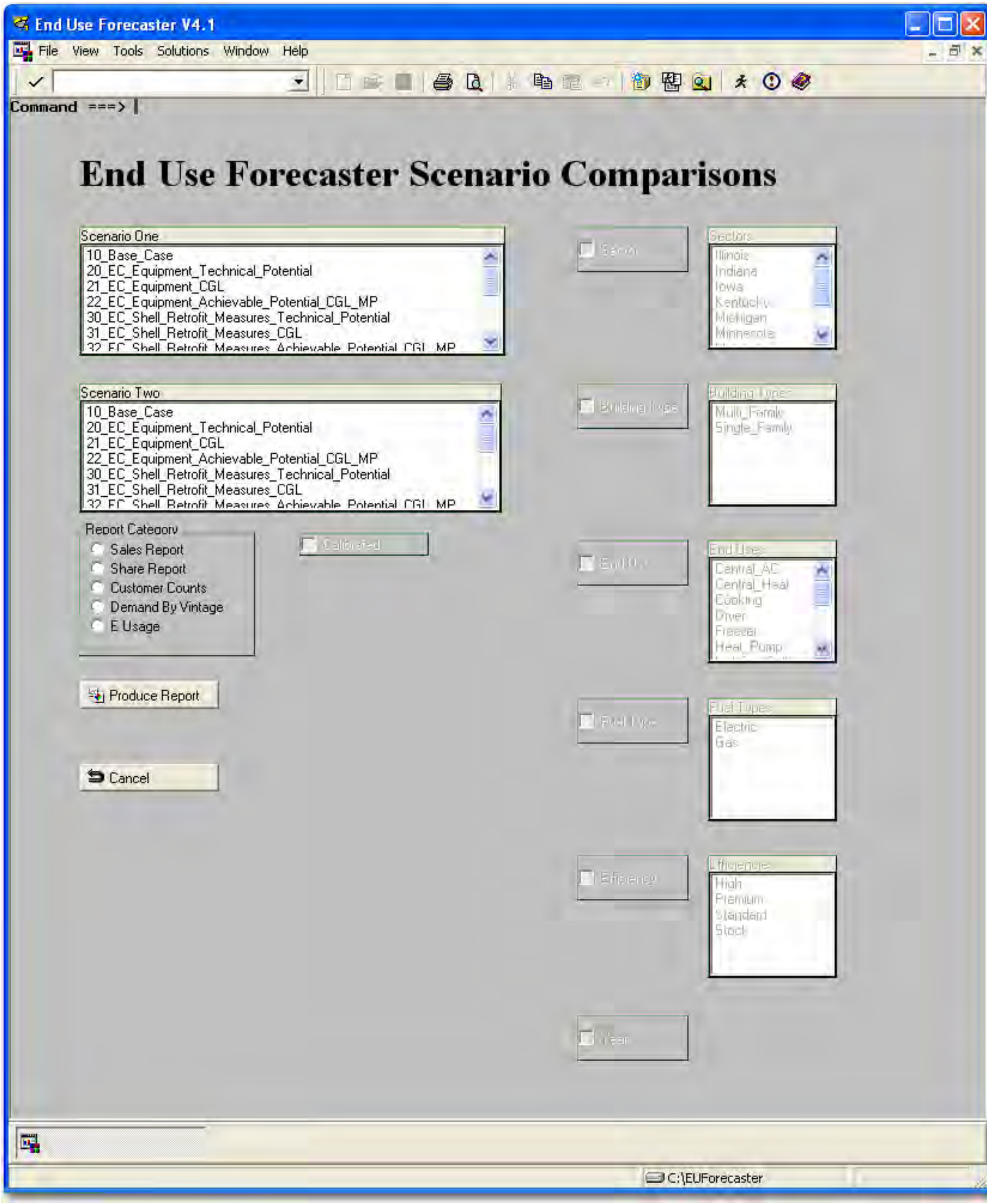
The Forecast Module incorporates all the information compiled from the other modules – Usage, Choice, and Intervention Strategies – related to the overall economic growth of the market segment and equipment lifetime (decay) functions to create the final forecast for a given scenario.

This module produces sales and market share reports that provide quick access to all forecast details. The reports produce forecast outputs in a “flat” matrix format, providing the ability to review the data for reasonability before pronouncing the forecast final.

Reporting: Getting the Projections Out to Decision-Makers

End Use Forecaster also produces reports that can be customized based upon the user’s choice of segmentation combinations to analyze. These reports summarize and/or compare forecasts for two forecast scenarios specified by the user in the Scenario Comparison interface, as shown in Figure 4.

Figure 4. Report Customization



The user specifies the Report Category (sales, market share, customer counts or demand by vintage) and, based on the category selected, the user is given the option of selecting different combinations of segments to summarize and/or compare. Additionally, the user is given the option of summarizing the forecast data across all years within the forecast horizon or generating results on a year-by-year basis.

II. Application Structure

A solid understanding of how End Use Forecaster is organized will help users to understand the logic of the model and greatly improve the efficiency with which they use the application. The latest revisions to End Use Forecaster focused almost exclusively on consolidating libraries and datasets to make the model easier to use; the model's logic, repeatedly validated over its history, was left intact. Underlying the updates was an emphasis on consistency in the naming and organization of datasets and variables so as to maximize the intuitiveness of the model. This Chapter describes the model's organization with the intent of helping the user be a more effective modeler.

Hardware and Software

End Use Forecaster is a Windows application developed in PC-SAS. The code and datasets can easily be migrated to other platforms (UNIX, etc.), should the user desire, but the interfaces will not provide the same functionality on other systems. If a user desires a non-PC hardware/software solution, The Cadmus Group, formerly known as Quantec, will work with the SAS Institute to ensure compatibility and develop a customized solution.

Hardware

The minimum recommended hardware configuration slightly exceeds SAS Institute requirements to ensure that forecast simulations can be performed in a timely manner. The vast majority of PCs purchased since 2000 exceed these recommendations:

- Pentium 866 MHZ CPU
- 512 MB RAM
- SVGA compatible color monitor
- 10 GB hard disk drive of free space
- CD-ROM drive (for installation purposed only)

End Use Forecaster's performance (i.e., speed) increases significantly if the system is equipped with more advanced processors (e.g., Pentium III or better), additional RAM (1 GB RAM or more), and additional disk space (for storage).

Software

End Use Forecaster is designed for the Microsoft Windows operating system (compatible with Windows 95 and 98, Windows NT Workstation 4.0, Windows XP, and Windows 2000 Professional). It is currently configured for SAS version 9.1 and version 8.2. Seven SAS software products are required:

- Base SAS

- Full Screen Product (SAS/FSP)
- Econometrics and Time Series (SAS/ETS)
- Statistics (SAS/STAT)
- High-Resolution Graphics (SAS/GRAPH)
- Interactive Data Analysis (SAS/INSIGHT)
- Direct Database Access (SAS/ACCESS)

An additional module, Applications Facility (SAS/AF), is used in developing End Use Forecaster's graphical user interface. These modules are based on a special SAS code subset called SAS Control Language (SCL). This portion of End Use Forecaster is stored (compiled) within the model and does not require user modification.

If any of the required SAS products are missing from the site license, the software can be added for little additional cost. For organizations that do not yet have SAS, The Cadmus Group (Quantec) will be happy to work with the SAS Institute to ensure that you obtain a solution that will allow End Use Forecaster to run smoothly and cost effectively.

Installation of End Use Forecaster is site-specific because it is dependent on the location of SAS on your PCs. However, there is minimal customization. For each user we only need to modify two files in the End Use Forecaster\Config directory: autoexec.sas and EUForecaster.cfg. These files 'point' End Use Forecaster to your SAS installation and take advantage of the hard drive on your computer with the most disk space. These customized files are developed during installation, consistent with the installation of SAS on individual workstations.

Conventions

The majority of the nomenclature in this documentation comes directly from the SAS application in which End Use Forecaster was developed. The various components of SAS and the conventions used in referring to them throughout the documentation are:

- ***SAS libraries***, the logical names that refer to the physical locations where SAS datasets are stored, are referred to using all uppercase letters (CONFIG, MODELCODE, etc.).
- ***SAS code***, which contain the routines for End Use Forecaster's modules, are referred to in normal text using the 'camelBack' syntax with the .sas suffix appended, such as choiceBatch.sas.
- ***SAS datasets*** are referred to using bold-face type using the 'camelBack' syntax, such as **equipmentAge_10**.
- ***SAS variables*** are referred to in italic type using the 'camelBack' syntax, such as *usageEquationStatus*.

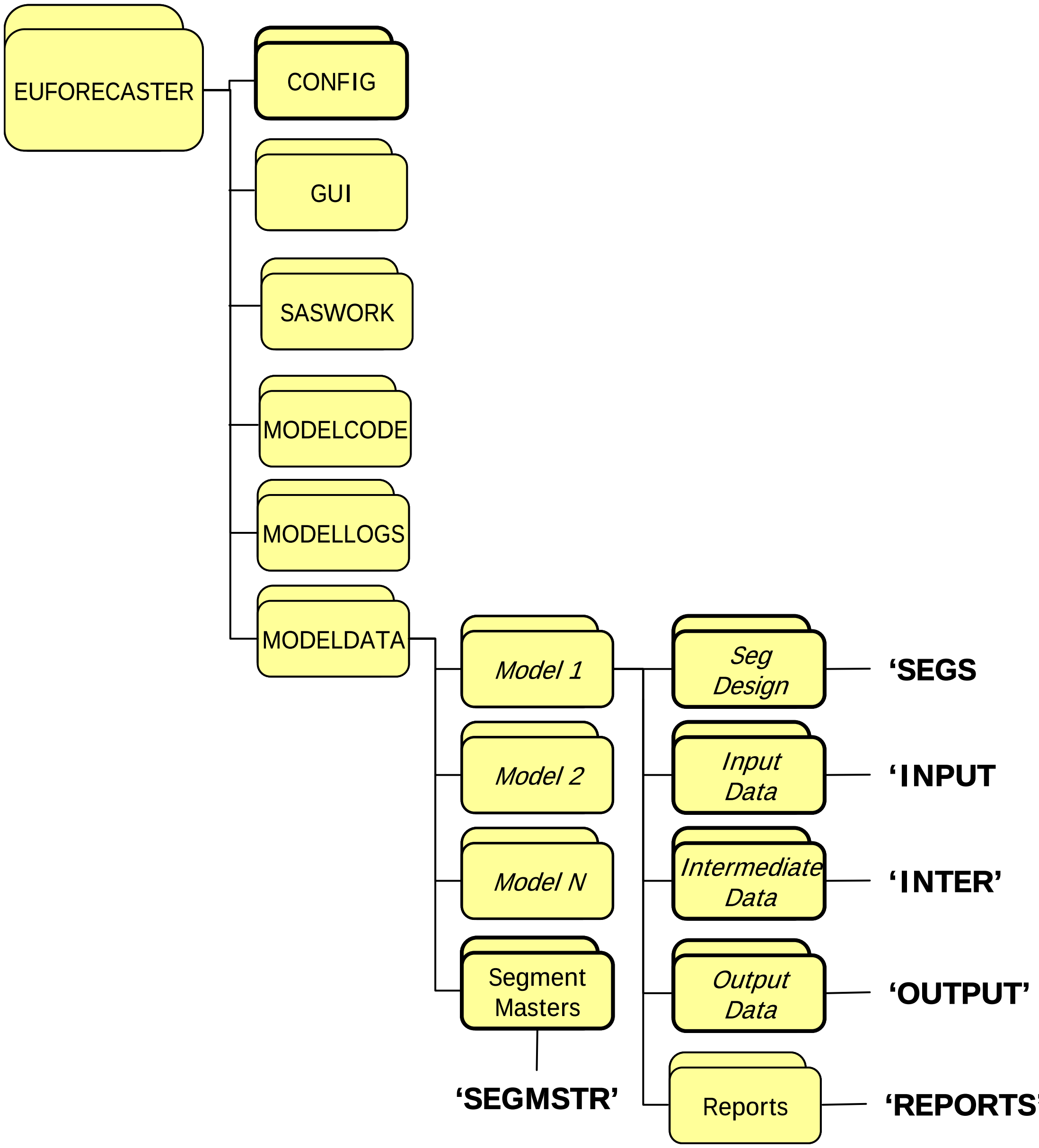
End Use Forecaster's modules run user-specified scenarios. To differentiate among these scenarios, scenario-specific datasets have a numeric suffix, such as **priceForecast_10**. In general cases, where the documentation does not refer to a specific scenario, datasets are referred to with an **"_xx"** suffix, such as **saturations_xx**.

Model Organization

The logic and theory underlying End Use Forecaster are separated from the data, which vary by individual segmentation design (model). This differentiation drives the structural organization of the model as well, and these two components are stored in different physical locations. The initial organization takes place in the underlying Windows folder structure, which serves as the basis for the SAS libraries that hold both the datasets and catalogs that dictate the model logic and data structure, as well as those datasets specific to individual segmentation designs.

As shown in Figure 5, the folder hierarchy begins with the folder 'EUFORECASTER.' With the exception of the SAS application itself, the entire model – all code, interfaces, and datasets – resides within this folder. Folders with bold outlines represent the physical locations of SAS libraries, the names of which are designated in single quotes. The folders with names in italics – note that they are all within the data folder – represent those libraries that will vary by individual model. The 'MODELDATA' folder will contain individual folders for every model created by a user. Each of these individual model folders will also contain the same set of subfolders as those shown within 'Model 1.' Because these folder serve as SAS libraries, the group of folders that will serve as 'Segs,' 'Input,' etc., will depend on which model the operator happens to be working with in a given session. The data for individual models will not be available at the same time.

Figure 5. End Use Forecaster Folder Structure



This organization can have implications for the user. For example, if a user has a data source that applies to more than one model, the 'MODELCODE' library can serve as a good place to store the raw data to avoid keeping copies in each of the model-specific libraries. Detailed descriptions of these folders and their contents are provided in Table 2.

Table 2. End Use Forecaster Folders

Folder	Full Path	SAS Library	Description
EUFORECASTER	EUFORECASTER	N/A	Root application folder.
GUI	EUFORECASTER\ GUI	App	Folder containing all the underlying application catalogs and GUIs.
MODELLOGS	EUFORECASTER\ MODELLOGS	N/A	Directory where logs of model operations are stored.
MODELCODE	EUFORECASTER\ MODELCODE	N/A	Contains all the SAS code underlying the different End Use Forecaster modules.
CONFIG	EUFORECASTER\ CONFIG	N/A	Contains SAS configuration files in which site-specific modifications are established.
MODELDATA	EUFORECASTER\ MODELDATA	N/A	Contains data for all of the user-created segmentation designs.
“Model_Name”	EUFORECASTER\ MODELDATA \ “Model_Name”	N/A	A folder with all data for a model based on a user-defined name.
SegDesign	EUFORECASTER\ MODELDATA \ “Model_Name” \ segDesign	SEGS	For each model, contains the SAS datasets that establish the specific segmentation design.
InputData	EUFORECASTER \MODELDATA\ “Model_Name”\ inputData	INPUT	For each model, contains all of the user-populated datasets that are necessary to run the different modules.
IntermediateData	EUFORECASTER\ MODELDATA \ “Model_Name”\ intermediateData	INTER	For each model, contains all of the intermediate, model-generated outputs from the usage and choice modules that are necessary to run other modules.
OutputData	EUFORECASTER\ MODELDATA \ “Model_Name”\ outputData	OUTPUT	For each model, contains the various final output sets generated by the forecast module.
Reports	EUFORECASTER\ MODELDATA \ “Model_Name”\ Reports	N/A	Contains the reports and excel files created by End Use Forecaster’s Reporting Engine.
SegmentMasters	EUFORECASTER\ MODELDATA \ segmentMasters	SEGMSTR	Contains datasets with all of the necessary variables and structure for every model dataset. A SAS program combines these datasets with a specific segmentation design to generate all the datasets (unpopulated) necessary for a given model.

III. Market Segmentation and Data Entry Modules

End Use Forecaster's Market Segmentation module governs two distinct tasks: 1) the development of customized market segmentation designs; and 2) the population of the model with the necessary data. While the first consists of formal, specific steps, the nature of the second depends on a number of factors, including the complexity of the segmentation design, the format of the various data sources, as even as the technical skills of the operator. This chapter provides extensive detail on the first followed by a brief discussion of issues surrounding the second.

Development of Market Segmentation Design

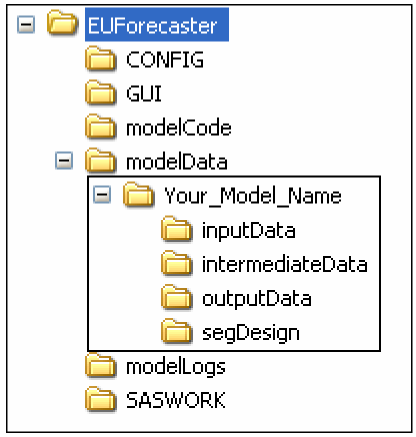
The execution of the first task – creation of a customized market segmentation design – is based on four steps, listed briefly below and then described in greater detail.

1) ***Creation of Model Data Folders*** – Creation of a specific directory structure for each model is necessary to perform subsequent steps.
2) ***Population of the Excel workbook*** **Seg_Design_Template.xls** – A step to define the various segments and their relationship with one another.
3) ***Creation of the Segs Library Datasets*** – This takes the Excel workbook and populates the "segs" library with the necessary segmentation design data sets.
4) ***Expansion of the Segmentation Design*** – This takes the segmentation design data sets in the "segs" library and merges them with the data set templates in the "segmstr" library, expanding them to create all the necessary – but still unpopulated! – data sets to run the basecase ("10") scenario in End Use Forecaster.

Creation of Model Data Folders

A prerequisite to setting up a new model is the creation of the necessary folders to contain the model-specific segmentation design and data. This means that within the c:\EUForecaster\modelData directory, you must have a folder with your model's name and within that folder you must have four folders called "inputData," "intermediateData," "outputData," and "segDesign," as shown in the interior boxed portion of Figure 6 below.

Figure 6. Data Folder Structure



There are multiple ways to create these folders. First, the user can manually create them in Windows Explorer. Alternately, one can copy the folder for an existing model and rename the root data folder to the preferred name, in which case subsequent steps will overwrite the existing datasets for the from model that was copied. Finally, the interface has an option in the Markets Module called "Create Directories for New Model." Selection of this option will prompt the user to enter the name for the new model and End Use Forecaster will create the desired folders.

Population of Seg_Design_Template.xls

The file ***Seg_Design_Template.xls***, a read-only file located in the root directory for End Use Forecaster (generally C:\EUForecaster) is the starting point for creating a custom segmentation design. It is here where you define the levels for the five primary dimensions that must exist in every segmentation design. While the experienced user will be very familiar with these dimensions, they deserve detailed discussion here. Starting at the top of the hierarchy, Dimensions 1 through 3 identify unique market segments. Dimensions 4 and 5 refer to the available product/service suppliers competing in the marketplace and product/service options, respectively. Although the actual use of these dimensions can vary, in and energy model the general use is as follows:

- Dimension 1: geographic region or sector
- Dimension 2: customer segment (home type, business type, or SIC)
- Dimension 3: end use
- Dimension 4: fuel type
- Dimension 5: efficiency level

In all designs, the first three dimensions define the basic market segmentation structure.

Dimension 1 always refers to geography, customer size, customer behavior, customer class, and/or any other features that separate groups of customers. Note that all of the aforementioned factors can be used within Dimension 1 (e.g., north-residential, north-commercial, south-residential, south-commercial, etc.).

Dimension 2 is reserved for factors that affect a particular group of customers in a similar manner, such as an exogenous rate of economic growth, building lives, or contract lives. In an end-use model, for example, this dimension might include various types of residential (single family, duplexes, multifamily, etc.) and commercial (office buildings, restaurants, hospitals, etc.) customers.

Dimension 3 refers to the products and services being marketed to each customer type, such as heating, cooling, or water heating. In a telecom model, this dimension would refer to basic service, Internet service, custom calling features, etc. As with the second dimension, each third dimension level has an associated physical or contract life. In an end-use energy model, each equipment type has a life span.

Dimensions 4 and 5 describe the product/competitive options within the major market categories that are defined by Dimensions 1 – 3. In an end-use model, fuel types are typically represented as Dimension 4 and various efficiency levels are represented by Dimension 5. In a competitive energy market, the fifth dimension could be used to represent various levels of retail services such as power quality or equipment maintenance offered by a provider.

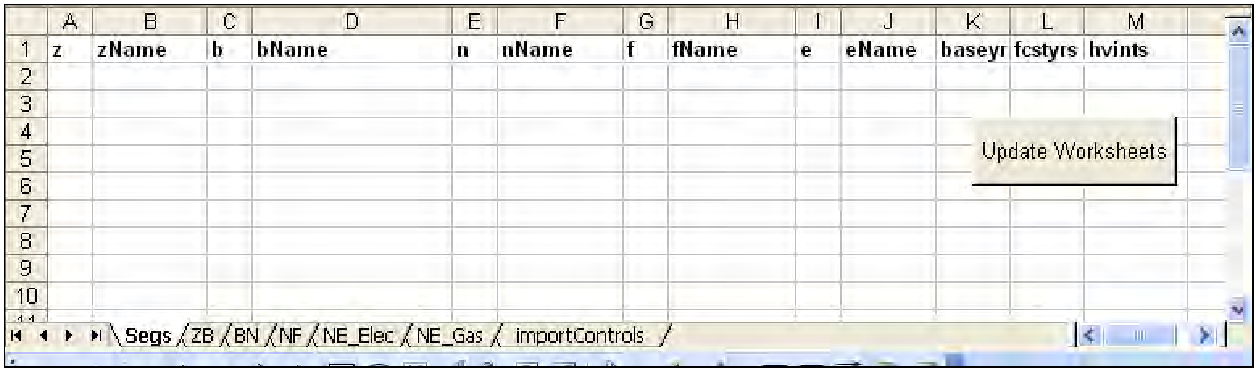
Table 3 summarizes the intended use of each of these dimensions. Note that while the model must include all five dimension, you are not required to use all of them. For example, suppose you want a design with alternative providers at Dimension 4 and do not wish to complicate the model with product/service options. In this case, you would assign only one alternative to Dimension 5, which effectively eliminates this dimension from the analysis. You could assign the same name to the single Dimension 5 alternative as that of the Dimension 4 to signify that in the design, this dimension has essentially been eliminated.

Table 3. End Use Forecaster Dimension Use Summary

Dimension	End Use Forecaster Dimension Name	End Use Forecaster Descriptive Name	End Use Forecaster Function	Special Features	No. Segment Levels in End Use Forecaster
One	z	zName	Factors that separate groups of customers		999
Two	b	bName	Additional factors that separate groups of customers	Building or contract life can be used to allow existing customers to decay over time	999
Three	n	nName	Equipment, products, services potentially purchased by Dimensions 1 – 2	Equipment or contract life can be used to allow existing equipment to decay over time	999
Four	f	fName	Providers of Dimension 3	Provider Choice module forecasts market shares	4
Five	e	eName	Service Options within Dimension 4	Provider Choice module forecasts product option shares	4

Open ***Seg_Design_Template.xls***. Excel will prompt you to either enable or disable macros and ***you will want to enable the macros***. Of the workbooks seven tabs, the first of interest is called "Segs," which is used for the definition of the different dimensions (z, b, n, f, and e) as well as the base year and years in the forecast horizon. That sheet should look like the image below, with no values for any of the dimensions:

Figure 7. Empty "Segs" Tab in Seg_Design_Template.xls



On this tab, first establish the base year of the forecast, the number of forecast years, and the number of historical vintages in columns K, L, and M below the headers baseyr, fcstyrs, and hvints, respectively. Next, the recommended first step is to fill in the columns for zName, bName, nName, fName, and eName with whatever zones, segments, end uses, fuels, and efficiency levels (or however you want to define the dimensions) that you want to include in the segmentation design. Once you have filled in the desired descriptive names, they then need to have their corresponding model values. ***These format for these is critical***. For z, b, and n the format is three-character numeric values. That is, they are a numeric values from 1 to 999 with leading zeros for all values below 100. In Excel, it is necessary to type an apostrophe (" ' ") prior to entering the value or else Excel will convert the cell to a numeric value and you will lose the leading zeros. For f and e, these are one-character numeric values. That is, they will have value of 1, 2, 3, or 4, but they must be in a character format. Again, a leading apostrophe will tell Excel to make these character. Figure 8 shows a fully populated "Segs" tab.

> A Note on Naming Conventions – It is best to restrict the names of the different levels in each dimension used in the segmentation design to valid SAS variable names. According to SAS documentation, these names "can be up to 32 characters long. The first character must be a letter (A, B, C, . . . , Z) or underscore (_). Other characters can be letters, numbers (0, 1, . . . , 9), or underscores. Blanks cannot appear in SAS names, and special characters (for example, $, @, #), except underscores, are not allowed." While it is not an explicit requirement, using these names will greatly facilitate the process of model population because it will allow for the import and manipulation of data using names that need no modification to be applied directly to the model.

Figure 8. Example of Populated “Segs” Tab in Seg_Design_Template.xls

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	z	zName	b	bName	n	nName	f	fName	e	eName	baseyr	fcstyrs	hvints
2	001	Residential	001	Single_Family	001	Space_Heat	1	Natural_Gas	1	Stock	2003	22	3
3			002	MF2_2_TO_4_Un	002	Water_Heat	2	Electric	2	Standard			
4			003	MF3_GE_5_Units	003	Cooking			3	High			
5			004	MM_Master_Met	004	Drying			4	Premium			
6			005	SM_Sub_Meter	005	Pool							
7					006	Spa							
8					007	Fireplace							
9					008	Barbecue							
10					009	Other							
11													
12													

Update Worksheets

Segs / ZB / BN / NF / NE_Elec / NE_Gas / importControls

Once you have completed the “Segs” tab, selecting the Update Worksheets button will then populate the tabs “ZB,” “BN,” “NF,” “NE_Elec,” and “NE_Gas” with the desired segments in the correct format for the user to then fill out. For example, Figure 9 shows the “BN” tab as it will appear after activation of the Update Worksheets button.

Figure 9. Example of Unpopulated “BN” Tab in Seg_Design_Template.xls

Seg_Design_Template.xls [Read-Only]

	A	B	C	D	E	F
1	nName	Single_Family	MF2_2_TO_4_Units	MF3_GE_5_Units	MM_Master_Meter	SM_Sub_Meter
2	Space_Heat					
3	Water_Heat					
4	Cooking					
5	Drying					
6	Pool					
7	Spa					
8	Fireplace					
9	Barbecue					
10	Other					
11						

Segs / ZB / BN / NF / NE_Elec / NE_Gas / importControls

Again, the segmentation is hierarchical. The purpose of the newly-populated tabs (“ZB,” “BN,” “NF,” “NE_Elec,” and “NE_Gas”) is to allow the specification of which dimensions belong together – starting at the top of the hierarchy and moving down – in the segmentation design. For example, with the ZB tab, the purpose might be to define which building belong in each geographic area. The key here is that the design need not be symmetrical. You might have Z represent two geographic areas, one extremely urban that would not have manufactured housing and rural that would need this home type.

The population of these tabs is based on filling the relevant cells with “TRUE” or “FALSE,” with the former indicating where the dimensional relationship should exist in the segmentation design. The relationships defined in these tabs is as follows:

- **ZB** – Define which levels of the second (b) dimension belong in each level of the first (z) dimension.
- **BN** – Define which levels of the third (n) dimension belong in each level of the second (b) dimension.
- **NF** – Define which levels of the fourth (f) dimension belong in each level of the third (n) dimension.
- **NE_Elec** – Define which levels of the fifth (e) dimension belong in each level of the third (n) dimension for the electric fuel type.
- **NE_Gas** – Define which levels of the fifth (e) dimension belong in each level of the third (n) dimension for the gas fuel type.

Figure 10 presents a fully-populated "NE_Elec" tab. Note the pattern of "TRUE" and "FALSE" indicating which of the efficiency levels apply to the different end uses.

Figure 10. Example of Populated "NE_Elec" Tab in Seg_Design_Template.xls

	A	B	C	D	E
1	**nName**	**Stock**	**Standard**	**High**	**Premium**
2	**Space_Heat**	TRUE	FALSE	FALSE	FALSE
3	**Water_Heat**	TRUE	TRUE	TRUE	TRUE
4	**Cooking**	TRUE	TRUE	FALSE	FALSE
5	**Drying**	TRUE	TRUE	FALSE	FALSE
6	**Pool**	TRUE	FALSE	FALSE	FALSE
7	**Spa**	TRUE	FALSE	FALSE	FALSE
8	**Fireplace**	TRUE	FALSE	FALSE	FALSE
9	**Barbecue**	TRUE	FALSE	FALSE	FALSE
10	**Other**	TRUE	FALSE	FALSE	FALSE
11					

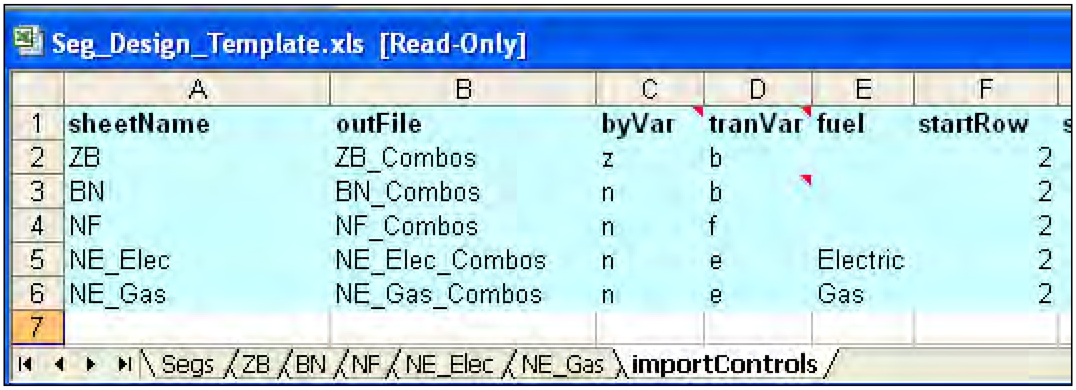
Segs / ZB / BN / NF / **NE_Elec** / NE_Gas / imp

Note that in filling in all of these sheets, make every effort to keep the data "clean." That is, there can be no data in adjoining rows or columns that is extraneous to the segmentation design. If there has been any work done in cells, it might be best to delete all the rows to the right of the last relevant column and all the rows below the last relevant row.

Finally, the last tab - importControls – tells SAS in the next step how to bring in the data contained on various tabs in the segmentation design workbook. Other than two cells, this entire workbook will populated itself dynamically based on the other tabs. Those two cells are E5 and

E6 – shown in Figure 11 with the values “Electric” and “Gas,” respectively – and the values the contain must be identical to whatever you have specified on the original “Segs” tab. That is, if you’ve called your fuels “Electricity” and “Natural Gas,” the values in those cells must be identical.

Figure 11. A portion of the importControls Tab in Seg_Design_Template.xls


Seg_Design_Template.xls [Read-Only]

	A	B	C	D	E	F
1	sheetName	outFile	byVar	tranVar	fuel	startRow
2	ZB	ZB_Combos	z	b		2
3	BN	BN_Combos	n	b		2
4	NF	NF_Combos	n	f		2
5	NE_Elec	NE_Elec_Combos	n	e	Electric	2
6	NE_Gas	NE_Gas_Combos	n	e	Gas	2
7						

Segs / ZB / BN / NF / NE_Elec / NE_Gas / importControls

Once you are done populating Seg_Design_Template.xls, you will have to save the workbook with a very specific name in the data folder for the model under creation (C:\EUForecaster\modelData*yourModelname*). That name must be whatever your model name is with “_Segments” appended at the end. For example, if you’ve created the a model for small commercial customers for a utililty’s end-use model, you might call the model “Small_Com.” Accordingly, you’d save the workbook as “Small_Com_Segments.xls.” Again, the file is read-only, so it will prompt you to save it under another name should you try to save it normally.

Creation of the Segs Library Datasets

After completing the Seg_Design_Template.xls and workbook and saving it under another name, the next step is convert this information into the various Segs library datasets. To do this, under the Market Module on the main dashboard, select the “Create ‘Segs’ Datasets from Excel” option. The interface will prompt you to say ‘OK’ or to cancel. If you are confident in your segmentation design, select ‘OK.” To check that this code has run correctly, you should see the all of the segmentation design datasets in the “Segs” library, as shown in Figure 12, and they should all have a modified date reflecting the time when the code was submitted.

Figure 12. Contents of Segs Library

Contents of 'Segs'

Name	Size	Type	D.	Modified
B_dim	5.0KB (2 Cols X 14 Rows...	Table		10Jan06:10:19:30
E_dim	5.0KB (2 Cols X 4 Rows) ...	Table		10Jan06:10:19:32
F_dim	5.0KB (2 Cols X 2 Rows) ...	Table		10Jan06:10:19:32
Initparm	5.0KB (2 Cols X 1 Rows) ...	Table		10Jan06:10:19:28
N_dim	5.0KB (2 Cols X 11 Rows...	Table		10Jan06:10:19:31
Z	5.0KB (3 Cols X 1 Rows) ...	Table		10Jan06:10:19:40
Zb	5.0KB (6 Cols X 14 Rows...	Table		13Jan06:10:43:41
Zbn	9.0KB (8 Cols X 87 Rows...	Table		13Jan06:10:43:41
Zbnf	17.0KB (10 Cols X 160 R...	Table		11Jan06:16:49:08
Zbnfe	33.0KB (11 Cols X 376 R...	Table		10Jan06:10:19:39
Z_dim	5.0KB (2 Cols X 1 Rows) ...	Table		10Jan06:10:19:29

Expansion on the Segmentation Design

Once the Segs library is populated with the desired segmentation design, the next step is to expand the Segs library datasets to create all of datasets necessary to run the model. Select "Expand 'Segs' Datasets" under the Markets Module on the main dashboard and say 'OK." Once this code has run, you should be able to look in the "Input" library and see datasets it has created, as shown in Figure 13.

Figure 13. Contents of the Input Library

Contents of 'Input'

Name	Size	Type	Modified
Accountdecay_10	17.0KB (10 Cols X 115 R...	Table	08Feb06:13:44:38
Calibrationzb_10	9.0KB (7 Cols X 105 Row...	Table	08Feb06:13:44:40
Calibrationz_10	5.0KB (5 Cols X 21 Rows...	Table	08Feb06:13:44:40
Choicebatchcontrol	9.0KB (10 Cols X 1 Rows...	Table	08Feb06:13:44:39
Choicedrivers_10	301.0KB (15 Cols X 2646...	Table	08Feb06:13:44:38
Choiceparameters_10	65.0KB (21 Cols X 282 R...	Table	08Feb06:13:44:38
Customercountsactual_10	9.0KB (9 Cols X 15 Rows...	Table	08Feb06:13:44:39
Customercountsforecast_10	17.0KB (9 Cols X 100 Ro...	Table	08Feb06:13:44:39
Dsmechoice_10	49.0KB (17 Cols X 183 R...	Table	08Feb06:13:44:38
Dsmfchoice_10	33.0KB (14 Cols X 99 Ro...	Table	08Feb06:13:44:38
Dsmretrofit_10	33.0KB (20 Cols X 122 R...	Table	08Feb06:13:44:38
Echoicestatus_10	9.0KB (10 Cols X 61 Row...	Table	08Feb06:13:44:39
Equipmentage_10	17.0KB (9 Cols X 99 Row...	Table	08Feb06:13:44:39
Equipmentdecay_10	25.0KB (14 Cols X 122 R...	Table	08Feb06:13:44:38
Esharesinitial_10	25.0KB (15 Cols X 126 R...	Table	08Feb06:13:44:39
Fchoicestatus_10	9.0KB (8 Cols X 33 Rows...	Table	08Feb06:13:44:39
Forecastbatchcontrol	9.0KB (11 Cols X 1 Rows...	Table	08Feb06:13:44:39
Fsharesinitial_10	9.0KB (12 Cols X 61 Row...	Table	08Feb06:13:44:39
Intro	5.0KB (2 Cols X 1 Rows) ...	Table	08Feb06:13:44:39
Priceforecast_10	105.0KB (10 Cols X 1281...	Table	08Feb06:13:44:38
Saturations_10	641.0KB (9 Cols X 9009 ...	Table	08Feb06:13:44:38
Usagebatchcontrol	5.0KB (4 Cols X 1 Rows) ...	Table	08Feb06:13:44:39
Usagedrivers_10	7.9MB (33 Cols X 31752 ...	Table	08Feb06:13:44:39
Usageparameters_10	769.0KB (34 Cols X 2898...	Table	08Feb06:13:44:39

Note that this step will often be used more than once, as it also serves as a means of "refreshing" the model. Throughout the process of populating the model, any number of operator error-based issues can corrupt the structure of these input data sets, which will lead to questionable results during operation of the model. For example, necessary rows might be lost during an incorrect merge or a typo will lead to an incorrect variable name. When this happens, the easiest to way to recover is to perform this step, which will re-create all the datasets in the required structure.

Model Population

Once the starting datasets in the Input library have been created, you must enter data into the SAS datasets that were automatically created by building the segment master. Table 4 shows all the datasets that are created in the INPUT library and the module with which they are associated. The table also provides a brief outline of the information to be entered in each dataset with more detailed information provided in subsequent chapters.

Table 4. Starting Datasets in INPUT Library

Module	Dataset	Contents
Usage	usageBatchControl	See Batch Control Usage below
Usage	usageDrivers_10	Equipment usage equation forecast drivers
Usage	usageParameters_10	Coefficients describing how usage varies by weather, customer characteristics, prices, and other variables
Choice	choiceBatchControl	See Batch Control Usage below
Choice	choiceDrivers_10	Choice forecast drivers, including capital costs for equipment in existing, conversion, and new construction buildings, plus future availability of each equipment type
Choice	choiceParameters_10	Provider Choice function initialization parameters for Dimension 4 and 5 purchase choices
Choice	eChoiceStatus_10	A status variable that tells the Choice Module how to model shares for Dimension 5. Set this variable to "1" to hold the initial market shares constant over the forecast horizon.
Choice	eSharesInitial_10	Average and marginal market shares for existing, conversion, and new customers for Dimension 5
Choice	fChoiceStatus_10	A status variable that tells the Choice Module how to model shares for Dimension 4. Set this variable to "1" to hold the initial market shares constant over the forecast horizon.
Choice	fSharesInitial_10	Average and marginal market shares for existing, conversion, and new customers for Dimension 4
Choice	priceForecast_10	Fuel, product, or service price forecasts in native units (e.g., therms, kWh, gallons, cubic meters)
Forecast	ForecastBatchControl	See Batch Control Usage below
Forecast	accountDecay_10	Decay functional form indicator and parameters for existing, conversion, and new accounts
Forecast	customerCountsActual_10	Number of existing accounts, non-accounts on main, and non-accounts off main
Forecast	customerCountsForecast_10	Forecast of new construction (economic activity driving demand), capture rates, units per account, and number of units (i.e., units are a scale of measurement consistent with results of the usage forecast, such as buildings, square footage, apartments, etc.)
Forecast	equipmentAge_10	Mean age of end uses by historical vintage in the baseline (i.e., 0th) year of the forecast, used to initialize the age dimension in the turnover/vintage module
Forecast	equipmentDecay_10	Decay functional form indicator and parameters for equipment (end-uses) in existing, conversion, and new buildings
Forecast	saturations_10	Saturation (percentage of accounts that have the equipment) independent of fourth dimension market shares
N/A	calibrationZ_10	Total actual sales in base year for Dimension 1
N/A	calibrationZB_10	Total actual sales in base year for Dimension 2
Intervention Strategies	dsmEChoice_10	Exogenous parameters that change Dimension 5 market shares for existing, conversion, and/or new customers through 'what if' intervention strategies
Intervention Strategies	dsmFChoice_10	Exogenous parameters that change Dimension 4 market shares for existing, conversion, and/or new customers through 'what if'' intervention strategies
Intervention Strategies	dsmRetrofit_10	Exogenous parameters that adjust product usage through 'what if' convention strategies

The method for populating these datasets, however, depends on the interaction of several factors. If the operators SAS skills are limited and the overall segmentation design is simple enough that that datasets do not exceed Excel's row limits, the data can be exported, populated manually, and then re-imported. If the data that will go into the model already exist in an electronic format and the operator has SAS skills that cover basic merges and data manipulation, the datasets can be populated via SAS code. Another option is to create data entry templates that conform to the format of the various data sources that will then be imported into SAS, manipulated to take on the correct format for the model, and then used to populate the datasets via SAS code. The final and best solution will often be a combination of multiple methods.

Batch Control Usage

The INPUT library includes three "batch processing" datasets that describe how various datasets (input scenarios, or the "**_xx**" suffix) are jointly processed within End Use Forecaster forecast output scenarios. These datasets are:

- **usageBatchControl**: selects input scenarios for each set of input files for forecasting equipment purchase choices
- **choiceBatchControl**: "packages" sets of expected market shares as a result of customer service programs with those segments that are unaffected by these activities into one cohesive group
- **forecastBatchControl**: combines chosen product usage equations, usage drivers, and historical vintage adjustment scenarios

End Use Forecaster automatically creates the base case scenario, denoted by "_10," for each of these datasets. Additional scenarios can be designated in each batch dataset by:

- Adding a new row worksheet in each dataset through SAS/FSP and changing the relevant scenario indicators
- Writing SAS code to create the datasets with the desired scenario inputs
- Managing the batch controls in an Excel workbook and importing them via SAS

Batch processing datasets allow the user to specify all the input datasets for a given scenario. The strength of this approach is that it allows the analyst to mix and match datasets from different scenarios, which avoids having to keep identical datasets for different scenarios. Figure 14 presents a hypothetical **choiceBatchControl** dataset. In the example, the user has set up three different scenarios (10, 20, and 30), which pull mostly the same datasets, with a couple of exceptions. First, Scenario 20 pulls an alternate price forecast, ostensibly one with high gas prices. Second, Scenario 30 utilizes the price forecast produced for Scenario 20 and also pulls in an alternate usage forecast.

Figure 14. Example choiceBatchControl Dataset

scenario	choiceDrivers	priceForecast	choiceParameters	usageAnnual	eSharesInitial	fSharesInitial	eChoiceStatus	fChoiceStatus	scenarioName
10	10	10	10	10	10	10	10	10	Base Case
20	10	20	10	10	10	10	10	10	High Gas Price Forecast
30	10	20	10	30	10	10	10	10	Low Usage

Scenario 20 pulls a different price scenario.

Scenario 30 pulls different usage and price forecasts, but utilizes the same dataset used for Scenario20.

IV. Product Usage Module

End Use Forecaster tracks consumption of resources (natural gas, electricity, etc.) through the Product Usage module. The module provides a forecast of the predicted consumption by combining (1) a monthly forecast of consumption factors or drivers (i.e., independent or exogenous variables), stored in the SAS dataset **usageDrivers_xx**, and (2) a set of coefficients associated with each exogenous variable, stored in **usageParameters_xx**.

The Product Usage module merges the **usageParameters_xx** dataset with the usage forecast drivers (**usageDrivers_xx**) and sums the results over all variables in order to obtain usage forecasts at the unit level (e.g., per customer, per square foot). The results then become inputs into the Provider Choice and Forecast modules.

If the *usageEquationStatus* variable in **usageParameters_xx** equals 1, usage is a linear combination of the coefficients and forecast drivers:

(1) $$usageMonthly\_xx_m = \Sigma_c\ usageParameters\_xx_c * usageDrivers\_xx_{cm}$$

where:

- **usageParameters_xx** $_c$ = usage coefficients c, where the default has 21 slots (B0 through B20)
- **usageDrivers_xx** $_{cm}$ is the monthly forecast (m) of each forecast driver (independent variable) associated with coefficient c (X0 through X20)

If *usageEquationStatus* is set equal to 2, then the Product Usage Module assigns a log-log function:

(2) $$usageMonthly\_xx_m = exp(\Sigma_c\ usageParameters\_xx_c * log(usageDrivers\_xx_{cm}))$$

The default structure is a linear model with *usageEquationStatus* equal to 1.[2]

The final step in this module is to aggregate usage to an annual figure (usageAnnual_xx). Both monthly and annual forecasts for a given scenario are stored in the INTER library.

The **usageBatchControl** dataset in the INPUT library has the following variables that define the input datasets associated with each output scenario:

- *scenario*: The Product Usage module output scenario
- *usageParameters*: The input scenario associated with the product usage equations (**usageParameters_xx**)

---

[2] As discussed further below under Calibration, End Use Forecaster's automatic sales calibration routine is designed to work with the linear model where *usageEquationStatus* is set equal to 1. Calibration routines for more complex usage equation structures defined by the log-log or other status indicators (3, 4, etc.) can be developed by The Cadmus Group (Quantec) on request.

- *usageDrivers*: The input scenario associated with the product usage drivers (**usageDrivers_xx**)

Figure 15 shows the program flow, including input and output datasets. Table 5 describes the data sets and their key attributes in more detail.

Figure 15. Product Usage Module Program Flow for "usageBatch.sas"

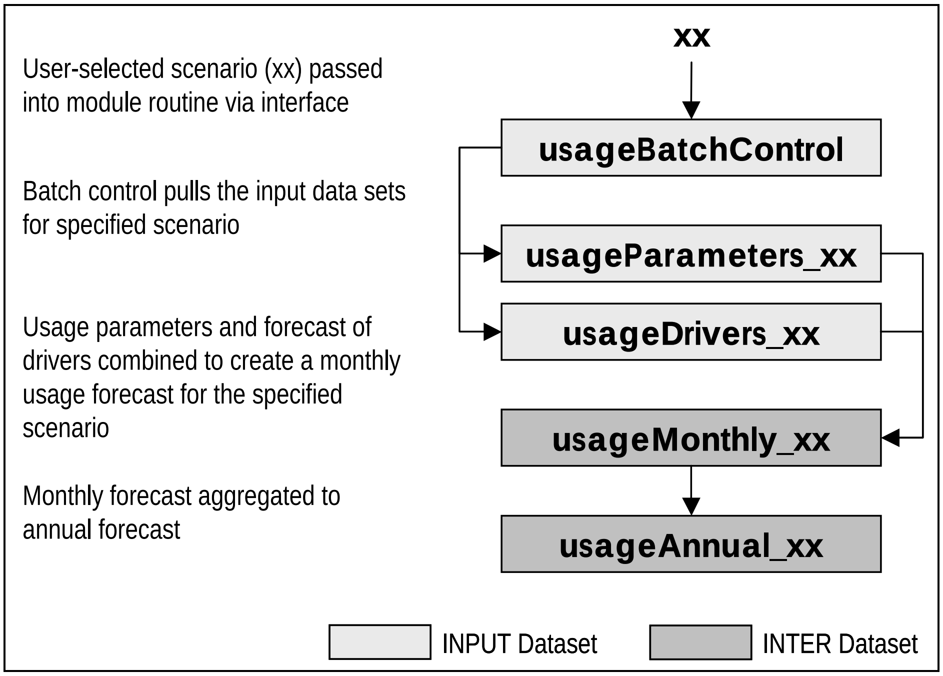


Table 5. Product Usage Module Data Library

Library	Dataset	Description	File/Record Dimensions	Variables/Attributes
INPUT	usageBatchControls	Usage forecast input scenarios	1 record per Output scenario	Usage equation input scenario, forecast driver input scenario, vintage adjustment input scenario, output scenario
INPUT	UsageParameters_xx	Usage forecast equation parameters	Dimensions 1, 2, 3, 4, 5, and vintage	Usage equation parameters B0 through B0 for input scenario S<u>xx</u>
INPUT	usageDrivers_xx	Usage forecast drivers	Dimensions 1, 2, 3, 4, and 5, year, month	Usage forecast drivers X0 through X0 for input scenario S<u>xx</u>

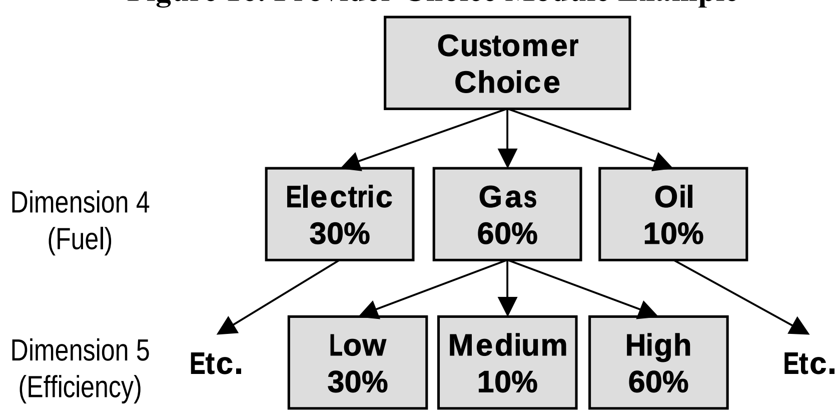
V. Provider Choice Module

The Provider Choice module analyzes customer choice decisions among competitors and product options. For example, customers choose their end-use equipment from various fuel types and efficiency levels. Purchase decisions are represented by a nested structure of provider (fuel) and product (efficiency) option choices.

The nested structure of the Provider Choice module is illustrated in Figure 16 below. This figure represents fourth and fifth dimension choices. The customer in this example faces a choice of gas vs. electricity vs. oil at the fourth dimension, and low vs. medium vs. high efficiency at the fifth dimension. Analysts often think of this problem as "efficiency choice conditional on fuel choice," hence the downward arrows in the figure. But customer choice theory and the Provider Choice Module actually work in the opposite direction, with the fourth dimension conditional upon fifth dimension choices. In reality, the customer makes a simultaneous choice across these dimensions, and the model structure shown in Figure 16 is just a convenient way of modeling this behavior.

The Provider Choice module first estimates the fifth dimension (efficiency) parameters and forecasts its market shares. The model then calculates the weighted average operating and capital costs for each fourth dimension (fuel) alternative, estimates the choice equation coefficients, and then produces a forecast for the fourth dimension.

Figure 16. Provider Choice Module Example



Note that the structure of the tree need not be symmetric. For example, single fuel energy companies and water utilities may want to focus on multiple efficiency levels for customers using their products. A single efficiency level can be specified for the remaining fuels.

The application of choice coefficients and forecast drivers form a discrete choice-type model that is applied to individual customer data. These models are analogous to regression models for equipment usage. The estimated discrete choice model parameters describe how equipment costs, operating costs, equipment characteristics, and customer characteristics affect equipment choices. For each choice level there are capital and operating cost parameters (called betas) and alternative-specific intercepts (called alphas).

The alphas and betas are developed through one or more of the available Provider Choice algorithms in End Use Forecaster:

1. Using individual customer level survey and equipment usage data, discrete choice models consistent with the segmentation design are estimated. Note that like usage equation modeling, this estimation is conducted outside of End Use Forecaster, but may be conducted using the same SAS procedures as those used by End Use Forecaster.
2. If individual customer data are not available for discrete choice modeling, End Use Forecaster can use aggregate market data to simulate a simple choice model from equipment capital costs and operating costs.
3. If individual customer data are not available for discrete choice modeling, End Use Forecaster can calculated use apply approximate, solutions calculated using Mathematica. [Note: this feature is not currently available, but will be added by May 2006]

These alternatives are summarized in Table 6.

Table 6. Provider Choice Equation Status Variable Definitions

Status Variable	Description	Beta Parameters	Alpha (Intercept) Parameters	Potential Applicability to Choice Model
1	Exogenous Market Shares Specified	N/A	N/A	Yes
2	Logit: estimated	Estimated Outside End Use Forecaster	Estimated Outside End Use Forecaster	Yes
3	Logit: estimated	Estimated	Starting values: to be calibrated	Yes
4	Logit: simulated	Starting values: to be estimated & calibrated	Starting values: to be estimated & calibrated	Yes
5	Logit: calculated	Calculated	Calculated	Yes

Model Parameterization

Estimation Mode (Status 2 and 3)

Customer choice parameters can be estimated when sufficient micro-level customer choice data are available to estimate regression coefficients for actual consumer decisions. The Cadmux Group (Quantec) customizes and estimates choice equations for companies who request this approach or uses choice model parameters from previous research conduct by the company.

The choice equation status variables are set equal to 2 or 3 if this approach is used. If status equals 2, all parameters have been estimated outside the model, and no further calibration is necessary. If status equals 3, a logit functional form has been used to estimate operating and capital cost parameters and the model is being calibrated to base year market shares by adjusting the intercept terms.

Simulation Mode (Status 4)

The simulation of consumer choice is useful when customer-level data are not available. Most users of End Use Forecaster find themselves in this position before they can conduct primary market research. In simulation mode, this module estimates parameters of the choice function based on available data for:

- Operating and capital costs
- Marginal (most recent) equipment market shares
- Customer discount rates
- An estimate of the proportion of customer preferences or "utility" that is related to non-price factors

Provider Choice module coefficients are developed by solving a system of equations within the SAS Model procedure.

Exogenous Mode (Status 1)

If neither micro-level customer choice data nor aggregate data are available, or if poor data quality prevents choice equations from being estimated (simulated), the status variable can be set equal to 1 in order to bypass the Provider Choice Module. In such a cases, market shares are set equal to the values in **fSharesInitial_xx** and **eSharesInitial_xx**.

Forecasting

The Provider Choice model produces forecasts over the planning horizon by applying a forecast of equipment capital costs, equipment energy consumption (from the Product Usage module), and fuel price forecasts to the estimated (simulated) choice parameters.

If modes 2 through 4 are used, these variables will affect market shares over the forecast horizon. If the exogenous mode (status 1) is used, market shares are held constant at their base year values over the forecasting horizon. Exogenous forecasts can also be modified via alternative market share forecast scenarios that are specified in the Intervention Strategies module (see Chapter VI).

Market Availability

End Use Forecaster can adjust forecasted efficiency market shares to reflect changes in regulations by removing the market availability of specified alternatives in the future. In this adjustment procedure, End Use Forecaster shifts any market shares designated for efficiency alternatives to be removed from the market to the remaining alternatives, proportional to their *a priori* market shares. This approach to market availability can also be adapted to situations where an efficiency level has become obsolescent in the market, such as the market availability of alternatives of superior consumer value at lower cost.

End Use Forecaster includes a variable called *available* that is entered in the **choiceDrivers_xx** dataset. *Available* is equal to 1 when the configuration is available on the market and zero when it is no longer available. When the choice model finds an unavailable configuration, it will reassign that configuration's shares (at the efficiency level) to the remaining configurations.

Provider Choice Module Analysis and Data Flow

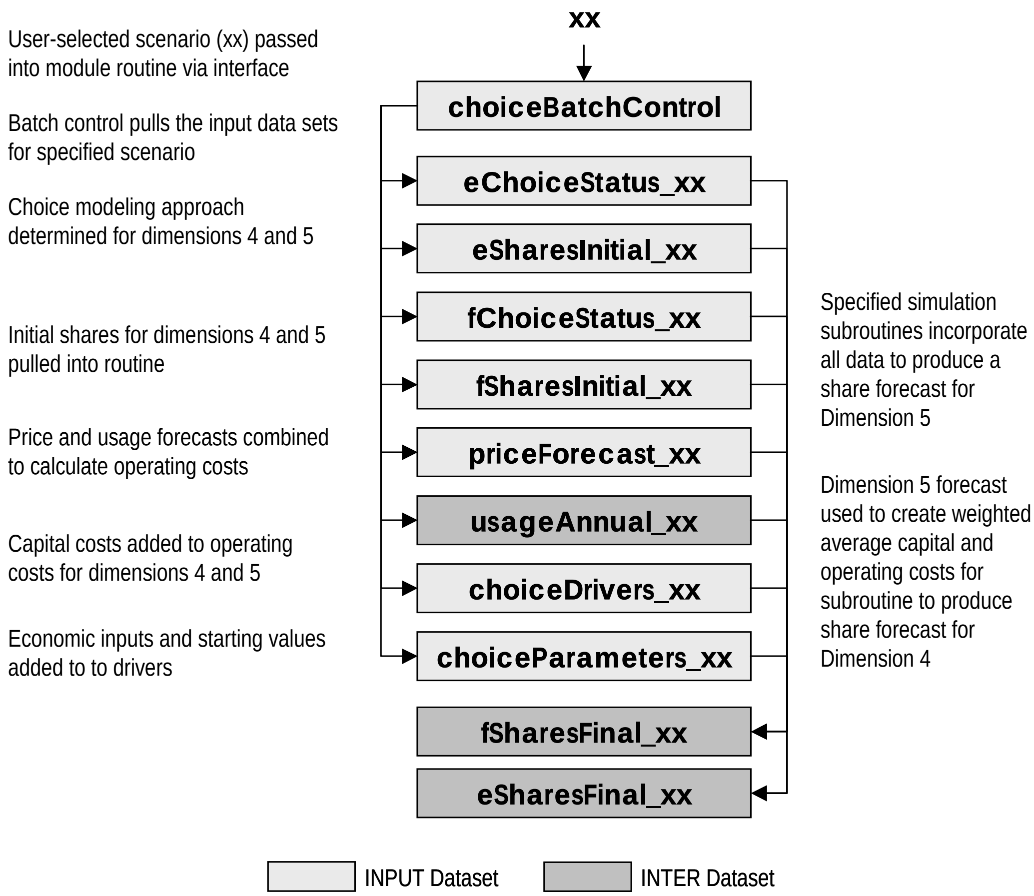
Figure 17 shows the data and analysis flow through the Provider Choice Module.

The dataset **choiceBatchControl** in the input library describes any scenario in terms of the following:

- Equipment capital costs and future availability (**choiceDrivers_xx**)
- Initial simulation (or estimation) parameters (**choiceParameters_xx**)
- Forecasted energy prices (**priceForecast_xx**)
- Product Usage output forecast scenario (**usageAnnual_xx**)
- Initial base-year efficiency (dimension 5) shares (**eSharesInitial_xx**)
- Initial base-year fuel (dimension 4) shares (**fSharesInitial_xx**)
- Indicator for efficiency (dimension 5) choice simulation (**eChoiceStatus_xx**)
- Indicator for fuel (dimension 4) choice simulation (**fChoiceStatus_xx**)

The simulation subroutines in choiceBatch.sas calibrate Provider Choice module coefficients to the baseline market shares in **fSharesInitial_xx** and **eSharesInitial_xx**. The program derives a simultaneous solution for all the qualitative choice coefficients using PROC MODEL from SAS/ETS. The first step in this subroutine is to integrate usage module information (consumption per configuration) with forecasted prices per unit of use to generate forecasted operating costs. Along with forecasted capital costs and other variables used in the qualitative choice models, this information serves as the forecast dataset for choice for each market segment. End Use Forecaster's default choice structure considers up to four alternatives at each level of the nest. The Cadmus Group (Quantec) can customize and modify the code if more than four alternatives are needed.

Figure 17. Provider Choice Module Program Flow for "choiceBatch.sas"



Initial Values

The initial value datasets from **choiceParameters_xx** are merged with the other datasets described above. Initial values and other parameters include:

- Equipment life
- Customer discount rate
- Share of customer preferences ("utility") associated with non-price attributes
- Initial values for alternative-specific constants and model coefficients

In some cases, the subroutine can be sensitive to the initial values, particularly for capital and operating cost coefficients. This problem can generally be mitigated by using initial values that are very small numbers, such as $1E^{-8}$.

Single-Alternative Choices

Choice estimation is not required for one-alternative situations; the choice forecasting routine assigns a 100% market share to these single alternative situations in the choice nest.

Confirming Calibration Results (Status 3 or 4)

A final step in the choice calibration process is to confirm that all equation coefficients have been solved correctly and that the coefficient values are reasonable. The nature of "solving" each choice equation for the appropriate coefficients requires an iterative process, where PROC MODEL begins with user-specified starting values of each coefficient and iterates toward a solution based on the input assumptions.

If the coefficient starting values are inappropriate, the calibration process may not reach a solution or it may reach one that is not in an economically feasible region. For example, starting values of coefficients need to be sufficiently low, such that, when they are multiplied by the independent variables, the result is not "out of the ballpark." Additionally, if the relative comparison of operating costs and capital costs are contrary to the user-specified discount rate, the calibration routine may find a solution where one of the coefficients may be positive (i.e., indicating that as costs rise, so do purchases, which is a clearly non-economic decision).

To check calibration results:

Certain files require inspecting as part of the forecasting process. Missing values in these forecasted market shares indicate a calibration problem.

- Look for the problem segment(s) in the EUFORECASTER\MODELLOGS directory. The choiceBatch.log file will let you know whether the model was ever "in the ballpark" by noting at what point in the solution-seeking process the SAS/ETS MODEL procedure failed.
- If there is a problem with the scale of a variable, the model will fail at iteration zero and the "hill climbing" optimization never begins.
- If the model fails during subsequent iterations, a systematic change in the initial parameters in **choiceDrivers_xx** is recommended until convergence is achieved. Using the final parameter values from another, similar, segment can help in the calibration process.

Table 7 summarizes the Provider Choice Module along with a description of the data and libraries.

Table 7. Provider Choice Module Data Libraries and Files

Library	Dataset	Description
INPUT	choiceBatchControl	Choice parameter input scenario, choice forecast driver input scenario, fuel price input scenario, output scenario
INPUT	choiceDrivers_xx	Capital cost equipment replacement, capital cost equipment conversion, capital cost new construction equipment, availability
INPUT	priceForecast_xx	Price forecast
INPUT	choiceParameters_xx	Description, NumAlternatives, Lifetime, Discount Rate, PriceShare, Alpha, A1-A4, B1-B2
INTER	usageAnnual_xx	Usage forecast
INPUT	eSharesInitial_xx	Dimension 5 base year average stock share, base year marginal share existing/replacement, base year marginal share conversion, base year marginal share new construction
INPUT	fSharesInitial_xx	Dimension 4 base year average stock share, base year marginal share existing/replacement, base year marginal share conversion, base year marginal share new construction
INPUT	fChoiceStatus_xx	Indicator for method of estimation/simulation for dimension 4 (fuel).
INPUT	eChoiceStatus_xx	Indicator for method of estimation/simulation for dimension 5 (efficiency)
INTER	fSharesFinal_xx	Shares forecast for dimension 4 (fuel) for existing, conversion, and new customers
INTER	eSharesFinal_xx	Shares forecast for dimension 5 (efficiency) for existing, conversion, and new customers

VI. Intervention Strategies Module

The Intervention Strategies module is intended to capture the impacts of a customer rebate or marketing program. These strategies are modeled as "what-if" scenarios. Depending upon the design of the service or program, these impacts combine specified market acceptance patterns with equipment characteristics to estimate impacts on forecasted choices and per-unit usage.

Substitution Programs

Provider (fuel) substitution strategies encourage consumers to purchase equipment from one provider over other providers. For existing equipment, this change can be done either immediately (early replacement) or at the point of existing equipment retirement (normal replacement). The **dsmFChoice_xx** dataset in the input directory controls how a market intervention will affect shares for a given scenario. The inputs in this dataset, summarized in Table 8, vary by the first, second, and third dimensions and can apply differently to existing, conversion, and new customers.

Table 8. Provider (Fuel) Substitution Program Drivers

Variable	Description	Minimum Value	Maximum Value
yearIntroduced	Year of program introduction activity	1	Last year of forecast horizon
programLife	Duration of program (years)	1	Years in forecast horizon
adoptionPath	Years to Full Adoption	1	7
applicability	Percent of customers to which the program applies	0*	1
marketShare	Percent of market share (%)	0*	1
earlyReplacement	Binary flag for whether early adoption applies to program	0	1
description	Program Description	{text}	{text}

* A zero value implies that the program will have no market impact, so the smallest practical value is 0.01 (1%).

** Early adoption applies to existing buildings only. A value of 1 implies that all applicable consumers (applicability * market share * adoption path %) switch immediately, whether or not the equipment fails. A zero implies that all adoption follows the normal equipment and/or building retirement schedule.

Equipment Efficiency Programs

Product (efficiency) option strategies encourage consumers to purchase a particular option (e.g., equipment with a certain efficiency rating). Either early or normal replacement may apply to existing equipment. Table 9 presents the drivers of purchasing programs and their usage.

Table 9. Product (Efficiency) Program Drivers

Variable	Description	Minimum Value	Maximum Value
yearIntroduced	Year of program introduction activity	1	Last year of forecast horizon
programLife	Duration of program (years)	1	Years in forecast horizon
adoptionPath	Years to Full Adoption	1	7
applicability	Percent of customers to which the program applies	0*	1
eLevel	Efficiency level to which program applies	1	4
marketShare	Percent of market share (%)	0*	1
earlyReplacement	Binary flag for whether early adoption applies to program	0	1
description	Program Description	{text}	{text}

* A zero value implies that the program will have no market impact, so the smallest practical value is 0.01 (1%).

** This represents the maximum efficiency level affected by the program for each end use, and is a supplementary type of applicability factor. The variable EL should be specified to be less than or equal to the maximum number of efficiency levels available for that market sector.

*** This represents the maximum vintage level affected by the program for each end use, and is a supplementary type of applicability factor. The variable V should be specified to be less than or equal to the maximum number of vintages for that market sector. Usually it is set equal to zero to denote an existing building or equipment retrofit strategy.

Equipment Retrofit and Operating & Maintenance (O&M) Service Programs

Usage retrofit strategies encourage consumers to change their product usage given the equipment they already have (e.g., improve the efficiency of existing equipment by installing measures such as weatherization or water heater retrofit kits). Table 10 presents the drivers of these programs.

Table 10. Equipment Efficiency Retrofit and O&M Program Drivers

Variable Name	Description	Minimum Value	Maximum Value
yearIntroduced	Year of program introduction activity	1	Last year of forecast horizon
programLife	Duration of program (years)	1	Years in forecast horizon
adoptionPath	Years to full adoption	1	7
applicability	Percent of customers to which the program applies	0*	1
eLevel	Lowest efficiency level to which program applies	1	4
marketShare	Percent of market share (%)	0*	1
eImprovement	Efficiency improvement (%)	0*	1
MeasureLife	Measure life (years)	1	Years in forecast horizon
vintageApplicability	Applicable vintages***	Lowest vintage	Years (vintages) in forecast horizon
description	Program Description	{text}	{text}

* A zero value implies that the program will have no market impact, so the smallest practical value is 0.01 (1%).

** This represents the maximum efficiency level affected by the program for each end use, and is a supplementary type of applicability factor. The variable EL should be specified to be less than or equal to the maximum number of efficiency levels available for that market sector.

*** This represents the maximum vintage level affected by the program for each end use, and is a supplementary type of applicability factor. The variable V should be specified to be less than or equal to the maximum number of vintages for that market sector. Usually it is set equal to zero to denote an existing building or equipment retrofit strategy.

Intervention Strategies Module Operations

You can create many types of Intervention Strategies programs for all market sectors sequentially and automatically, rather than creating each one manually. This batch processing is done via the following datasets, where the scenario indicator "yy" denotes a scenario that differs from "xx."

- **dsmFChoice_yy** – Dimension 4 (fuel) choice substitution for existing, conversion, and/or new customers, based on user specifications
- **dsmEChoice_yy** – Dimension 5 (efficiency) choice substitution for existing, conversion, and/or new customers, based on user specifications
- **dsmRetrofit_yy** – Equipment retrofit or O&M programs

Each of these files contains a row for each Dimension 1 – 3 combination and data inputs associated with Table 24 (**dsmFChoice_xx**), Table 23 (**dsmEChoice_xx**), or Table 25 (**dsmRetrofit_xx**).

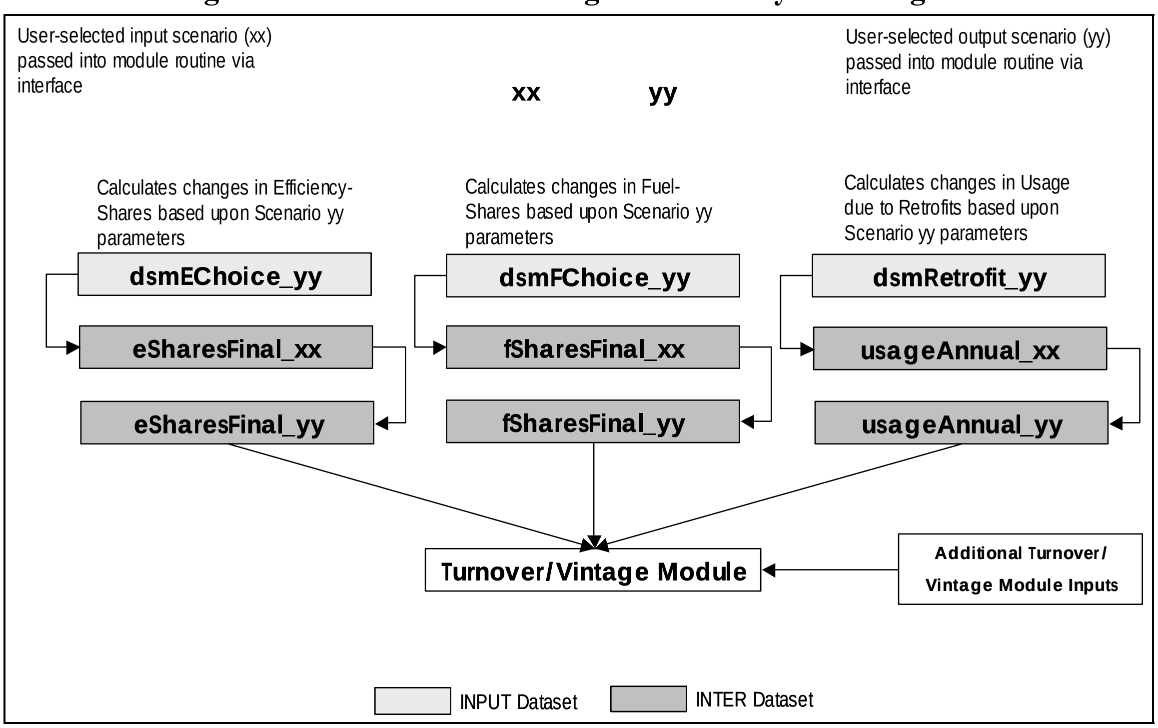
The Market Segmentation module creates base case files ("_10" files) where there is no intervention for each of these program categories. These files serve as templates that allow the user to create different scenarios of interest. To create strategies, you must copy these files to another scenario number and then make changes consistent with the desired intervention strategy over the forecast horizon. It is recommended that these designs be completed by individuals with marketing or demand-side management experience. Alternatively, The Cadmus Group (Quantec**)** can assist with the development of the first set of intervention strategies.

Figure 18 illustrates how the Intervention Strategies module modifies the Product Usage and/or Provider Choice output files and how these outputs are then used to develop an alternative forecast. Table 11 summarizes the data files used by this module.

Table 11. Intervention Strategies Module Data Library and Files

Directory	File Name	Description	File/Record Dimensions	Variables/Attributes
INPUT	dsmEChoice_xx	Existing/New Dimension 5 (efficiency) program parameters	Dimensions 1-4	Year introduced, program life, applicability, market share, adoption path, early adoption
INPUT	dsmFChoice_xx	Existing/New Dimension 4 (fuel choice) program parameters	Dimensions 1-4	Year introduced, program life, applicability, market share, adoption path, early adoption
INPUT	dsmRetrofit_xx	Product Usage retrofit parameters	Dimensions 1-4	Year introduced, program life, applicability, market share, adoption path, measure life, efficiency improvement, efficiency levels affected, vintages affected

Figure 18. Intervention Strategies Module System Diagram



VII. Forecast Module

The Forecast module serves several analytical and system functions, including forecasts of new construction and conversion accounts, decay or turnover of buildings and equipment, integration of Product Usage, Provider Choice and Intervention Strategies module results, and "internal" forecast reports for use by the End Use Forecaster analyst. Other reports from End Use Forecaster are described in Chapter 8.

The analytical portion of this module uses information on equipment saturation, average and marginal market shares, building and equipment decay, building account stocks and decay, customer conversions, and new construction to determine changes in the usage mix over time. The final forecast is equal to the number of units [indexed by year, building vintage, equipment age, fuel (provider), and efficiency (product)] multiplied by the consumption per the indexed equipment configuration.

Forecast Inputs

There are several sets of inputs in each Turnover/Vintage module forecast, which are described in Table 12 below. Alternative forecast scenarios using new estimates (scenarios) for new construction, account conversion, usage, choice, account decay, building decay, and any combinations of these can be conducted using the Turnover/Vintage module.

Table 12. Turnover/Vintage Forecast Inputs

Input Type	Dataset
Account Decay Parameters	accountDecay_xx
Equipment Decay Parameters	equipmentDecay_xx
Existing Equipment Age	equipmentAge_xx
Dimension 3 (End Use) Saturation	saturations_xx
Historical Accounts	customerCountsActual_xx
Account Forecast	customerCountsForecast_xx
Product Usage Forecast	usageAnnual_xx
Dimension 4 (Fuel) Shares Forecast	fSharesFinal_xx
Dimension 5 (Efficiency) Shares Forecast	eSharesFinal_xx

Historical and New Construction Building Stocks

Historical accounts are segmented into the number of total accounts in the base year and their distribution among the historical vintages as determined by the user in the segmentation design. Accounts are defined in terms of both buildings and building units (i.e., accounts, apartments, square feet, etc.). Building units are the level of measurement at which the Product Usage module estimates are rendered.

The total building stock in any forecast year is not the simple difference between the total building stock in the current year and the previous year because some buildings will have been destroyed, completely gutted, or removed from the system in the course of a year. The number of existing buildings replaced each year is dependent on the stock of vintages and the overall decay rate.

Forecasting Equipment Stocks

Dimension 3 (i.e., end use) equipment stocks are forecasted through similar methods as buildings. Initial base year equipment stock levels are estimated utilizing equipment saturation estimates for existing and new construction building vintages in the **saturations_xx** dataset. Market shares of new equipment over the forecast horizon are generated in the Provider Choice or Intervention Strategies module and passed to the Turnover/Vintage module via the series of market share forecasts in the **eSharesInitial_xx** and **fSharesInitial_xx** datasets. You may provide the average age of equipment in existing buildings in the base year in order to initialize the equipment age dimension (**equipmentAge_xx**). Generally, this average age is specified as the mean technical lifetime of the equipment.

The forecast simulation then estimates equipment stocks for Dimensions 3-5 (i.e., end use, fuel, and efficiency level) for each Dimension 1-2 combination. The new equipment stock installed each year is dependent on the growth and decay of building stocks, the natural replacement cycle of the equipment, the saturation rates of the end use in new construction, and the market shares of technology types.

End Use Forecaster contains a vintage hierarchy where Dimension 2 (buildings) dominates Dimension 3 (end uses). For example, an older dwelling may have a relatively new furnace and water heater, but these end uses effectively “disappear” if the building is demolished or undergoes a major renovation.

Building and Equipment Decay Functions

The user may specify decay rates of existing stocks of buildings and equipment, as well as new stock constructed or installed in subsequent years. Decay functions and parameters can differ for the existing and new stocks. Some analysts specify different decay functions for existing and new building stocks as the existing base year building stock is an amalgam of unknown vintages and new building stock is tracked as discreet homogenous annual blocks.

There are two datasets with decay rate data for each market segmentation design (**accountDecay_xx** and **equipmentDecay_xx**). In each of these decay data files, there are two sets of information to be entered: decay functions and decay parameters.

A numeric indicator ranging from 1 to 3 indicates the selected function. Available functions include exponential (1), logistic (2), and Weibull (3). Exponential functions have one parameter, logistic functions have four, and Weibull functions have two.[3] The logistic and exponential functions tend to be the most popular and are described in more detail below. The

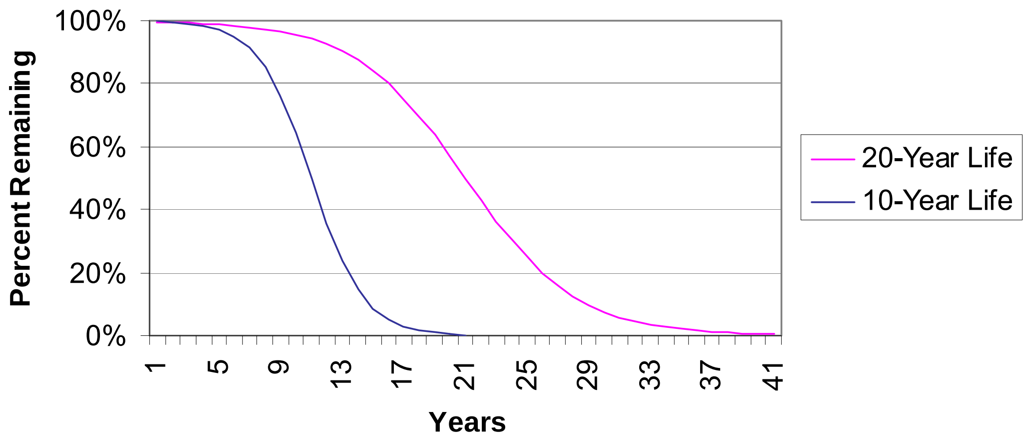
[3] These are discrete analogs to the continuous time distributions.

equipmentAge_xx dataset describes the average age of existing equipment in existing facilities. It tells the model where to start the equipment decay function.

Logistic Decay Function

End Use Forecaster uses the logistic function as the recommended decay mechanism for equipment decay construction, as shown in Figure 19. The logistic function is an S-shaped curve that results in a small decay rate for the first years, then increases over time before tapering off.

Figure 19. End Use Forecaster End Use Decay Functions



You may specify the periods and percentages of stock remaining for any two years in the appropriate SAS dataset. For example, to specify that 99% of the building stock remains 20 years after construction and that, 100 years after construction, only 50% of the buildings remain:

- In the SAS dataset, set the functional form indicator to 2
- Set the first parameter to the percent remaining after year X (0.99)
- Set the second parameter to year X (20)
- Set the third parameter to the percent remaining after year Y (0.50)
- Set the fourth parameter to year Y (100)

Exponential Decay Function

An exponential decay function can be used to represent a constant percentage decline for customers, buildings, or equipment. For example, a decay rate of 0.05 would cause 5% of the remaining stock to be removed each year. Since the base becomes progressively smaller, so does the absolute level of decay. If you choose an exponential decay rate:

- Set the functional form indicator equal to 1
- Set the first parameter equal to the specified decay rate
- Set the remaining three parameters equal to zero

Zero Decay

In some cases, decay rates may not be relevant information. This can occur in non end-use End Use Forecaster representations or in certain markets such as "miscellaneous consumption." In these instances, choose the exponential function and set all parameters to zero.

Early Replacement

In some instances, you may specify the "early replacement" of existing equipment within an Intervention Strategies scenario. In these situations, the variable *earadop*, contained in **eChoiceFinal_xx** dataset, will effectively override the equipment decay functions if it is set equal to 1. The default value for *earadop* is zero (no early adoption).

Forecast Operations

The heart of this module is a SAS program called forecastBatch.sas, which completes the following tasks:

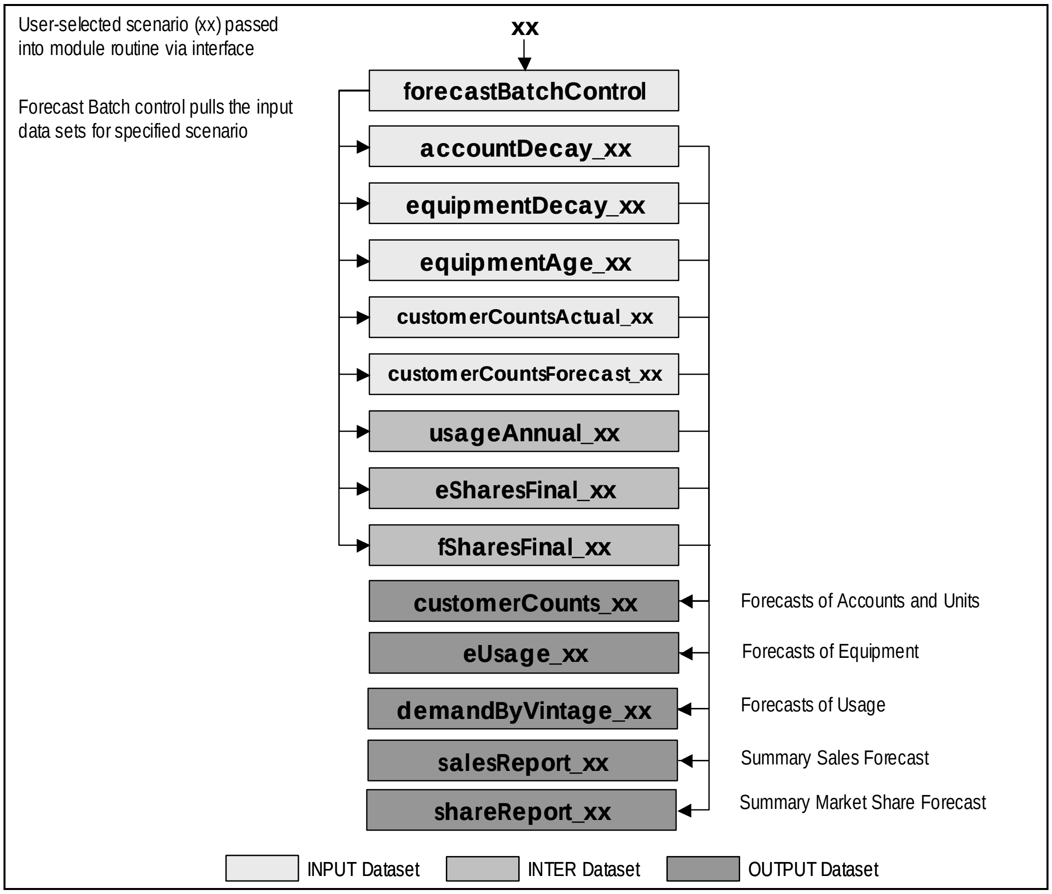
1. Merges all input data across Dimensions 1-3, including:
    - Existing accounts, plus a distribution of accounts across historical building vintages
    - New construction forecast, plus capture rates for new and conversion buildings
    - Dimension 3 saturation, equal to the number of Dimension 2 customers with Dimension 3 divided by total Dimension 2 customers
    - Decay rates for buildings (indexed by year and building vintage) and equipment (indexed by Dimension 4 and equipment age)
    - Product usage forecast (potentially modified by an intervention strategies scenario)
    - Provider choice forecast (potentially modified by an intervention strategies scenario)
2. Solves for output arrays that contain information on number of market segments units per year, indexed by the specified dimensions (e.g., building vintage, equipment age, fuel, and efficiency)
3. Stores the results in datasets of varying dimensions
4. Multiplies the number of units by the respective consumption estimate per unit, again indexed by the appropriate dimension.
5. Summarizes these results in standard report formats

Figure 20 illustrates how the operation of the Turnover module. Table 13 summarizes the programs developed for the Turnover/Vintage module, and Table 13 summarizes the data files used in this module.

Table 13. Forecast Module Data Library and Files

Library	Dataset Name	Description	Record Dimensions	Attributes/Variables
INPUT	ForecastBatchControl	Forecast module input control	One record per output scenario	Account history, distribution and new construction scenarios; decay scenarios; usage scenario, saturation scenarios, and equipment mean age scenario.
INPUT	accountDecay_xx	Decay parameters for Dimension 2	Dimensions 1 and 2, forecast vintages	Decay Function, Decay Parameters 1-4
INPUT	equipmentDecay_xx	New construction Dimension 3 (end use) decay	Dimensions 1, 2, 3 and 4	Decay Function, Decay Parameters 1-4
INPUT	saturations_xx	Existing Dimension 3 (end use) saturation	Dimensions 1, 2, and 3 Year, historical vintages	Saturation
INPUT	customerCountsActual_xx	Base year accounts and non-accounts (potential customers)	Dimensions 1 and 2	Accounts, non accounts
INPUT	equipmentAge_xx	Dimension 3 (end use) mean age in base year	Dimensions 1, 2, and 3, historical vintage	Dimension 3 (end use) mean age in base year
INPUT	customerCountsForecast_xx	New construction / economic driver forecast	Dimensions 1 and 2, Year	Forecasted new construction, capture rate, conversion rate, units per account,
INTER	usageAnnual_xx	Product Usage module output	Dimensions 1, 2, 3, 4 and 5, year, vintage	Annual usage
INTER	eSharesFinal_xx	Provider Choice module output – existing Dimension 5 market share forecast	Dimensions 1, 2, 3, 4 and 5, year	Market share for replacement, early replacement indicator
INTER	fSharesFinal_xx	Provider Choice module output – existing Dimension 4 market share forecast	Dimensions 1, 2, 3 and 4, year	Market share for replacement, early replacement indicator
OUTPUT	customerCounts_xx	Forecast of accounts and units (square footage)	Dimensions 1 and 2, year, vintage	(E/C/N) Accounts, (E/C/N) units, units per account, remaining nonconversion potential
OUTPUT	eUsage__xx	Forecast of equipment (end-uses)	Dimensions 1, 2, 3, 4 and 5, year, vintage	Total number of Dimension 3 (end uses)
OUTPUT	demandByVintage_xx	Forecast of usage (e.g., kWh, therms)	Dimensions 1, 2, 3, 4 and 5, year, vintage	(E/C/N) Accounts, (E/C/N) units, units per account, remaining nonconversion potential; Total number of Dimension 3 (end uses); Break out of dimension 3 by replacement, conversion, and new construction.
OUTPUT	salesReport_xx	Summary Sales Forecast	Dimensions 1, 2, 3 and 4, year	Total usage and equipment sales by Dimension 5
OUTPUT	shareReport_xx	Summary Market Share Forecast	Dimensions 1, 2, 3 and 4, year	Market shares for Dimensions 4 and 5, by existing, conversion, and new construction

Figure 20. Turnover (Vintage) Module System Diagram



VIII. End Use Forecaster Utilities

The main End Use Forecaster analysis modules – Product Usage, Provider Choice, Intervention Strategies, and Forecast – are typically run separately during the calibration and testing phase of any market segmentation and forecasting process. Once this process is complete, however, you can run these modules jointly and generate all relevant analyses with a single click of the mouse (after data are prepared, of course).

This chapter describes the various utilties available in End Use Forecaster: Super Batch, Calibration, Analysis of Data Files, and Reporting.

Super Batch Processing

Some forecasting scenarios lend themselves to super batch processing. When the Product Usage, Provider Choice, and Forecast modules all have the same scenario indicator value, the that scenario can be run across all modules by selecting it in the Super Batch frame.

Calibration

End Use Forecaster can be calibrated to base year energy usage data for the "primary" fuel of interest in the model (f='1'). Calibration may proceed at the Z-Level, or at the Z-B-Level. Base year sales data must be available in the \INPUT**calibrationZ_xx or calibrationZB_xx** datasets. To calibrate the model apply the following procedure:

- Select the level at which the forecasts will be calibrated (the Z-Level vs. the Z-B-Level) from the Calibration Utility
- Select the scenario to be calibrated and the percent of usage to be assigned to the miscellaneous usage category.

The calibration routine works as follows:

1. Residual energy is attributed to the miscellaneous end use. This value should be greater than or equal to zero but generally does not exceed 10% of forecasted energy sales. In fact, the upper limit available through the model interface is 10%. Errors larger than this generally indicate a more fundamental data problem where an investigation of data inputs is required rather than this automated calibration process
2. When non-calibrated total usage is on the high side (miscellaneous would then be negative), the next step is to reduce the per-unit energy usage (i.e., customer or square foot) for each market segment, end use, and efficiency combination. Note that the *relative* energy usage across efficiency levels is unchanged. Conversely, when non-calibrated total usage is on the low side, simply let miscellaneous equal zero (the default value). All other end uses will be adjusted proportionately. Again, we recommend avoiding this procedure if the adjustment is larger than 10%.

The relative size of the calibration adjustment which is ultimately applied to the \INPUT**usageParameters_xx** datasetc can be found in \INTER**initialCalibrationRatio**.[4] The variable (*Zfratio* (*ZBfratio*) shows the percent error results, and how much End Use Forecaster had to change parameters through the calibration routine to match base year sales.

If additional calibration is needed beyond the base year to, for example, match an external econometric forecast over the duration of the forecast horizon, a post-processing adjustment using either SAS or Excel can be applied.[5]

After running the calibration routine, it is necessary to run the Usage, Choice, and Forecast modules (or Super Batch) and produce a new forecast. One can then click on the appropriate "Calibration: Calibration Check" routine to make sure the calibration worked as intended.

Analysis of Data Files

All SAS datasets in across End Use Forecaster libraries can be accessed directly from End Use Forecaster for further analysis in real time by following these steps:

- Click on "File: Analyze" to access SAS/INSIGHT
- Select the library and dataset of interest and perform desired analysis

  OR
- SAS/FSP software tools can also be used to browse the SAS datasets via the pull-down menu item "File: Library Map"

Reporting

Five default SAS output dataset reports are created in the OUTPUT directory by the Forecast module:

- A summary sales report (**salesReport_xx**)
- A summary market share report (**shareReport_xx**)
- Detailed account stock forecast (**customerCounts_xx**)
- Detailed market segment/end use equipment sales forecast (**eUsage_xx**)
- Detailed sales projections (**demandByVintage_xx**)

These reports can be browsed directly as described above, or exported to Excel. To accomplish the latter simply click on "Reports: Export Basic Reports to Excel" and select the Forecast module scenario to export.

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4 Notice that there is no scenario indicator on the **initialCalibrationRatio** dataset. This is because only one scenario per Model should be calibrated; all other scenarios within that model can then be developed from the calibrated **usageParameters_xx** or successor datasets.

5 Please contact The Cadmus Group (Quantec) for more information or to obtain a customized calibration routine

End Use Forecaster also produces reports that can be customized based upon the user's choice of segmentation combinations to analyze. These reports summarize and/or compare forecasts for two forecast scenarios specified by clicking on "Reports: Scenario Comparison Reports." The user specifies the Report Category (sales, market share, customer counts or demand by vintage) and, based on the category selection, is given the option of selecting different combinations of segments to summarize and/or compare.

Appendix: Variable Glossary

This glossary provides definitions for each End Use Forecaster SAS variable, and is organized by the model's libraries and datasets as defined in Chapter III.

Table 14. INPUT\accountDecay_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
vintage	Building vintage
accountDecayIndicator	Account decay indicator
accountDecayParm1	Account decay parameter 1
accountDecayParm2	Account decay parameter 2
accountDecayParm3	Account decay parameter 3
accountDecayParm4	Account decay parameter 4

Table 15. INPUT\calibrationZ

Variable Name	Description
z	The indicator for Dimension 1
year	Year of forecast (0 to rorecast horizon)
actualSales	Actual sales in base year

Table 16. INPUT\calibrationZB

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
year	Year
actualSales	Actual sales in base year

Table 17. INPUT\choiceBatchControl

Variable Name	Description
scenarioName	Descriptive name of the scenario
scenario	Output scenario number
choiceDrivers	Scenario to select for the choiceDrivers_xx dataset
priceForecast	Scenario to select for the priceForecast_xx dataset
choiceParameters	Scenario to select for the choiceParameters_xx dataset
usageAnnual	Scenario to select for the usageAnnual_xx dataset
eSharesInitial	Scenario to select for the eSharesInitial_xx dataset
fSharesInitial	Scenario to select for the fSharesInitial_xx dataset
eChoiceStatus	Scenario to select for the eChoiceStatus_xx dataset
fChoiceStatus	Scenario to select for the fChoiceStatus_xx dataset

Table 18. INPUT\choiceDrivers_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
e	The indicator for Dimension 5
year	Year
available	Binary switch to indicate availability of the alternative in any given year of the forecast
capitalCostExisting	Capitial cost for equipment in existing (replacement) construction
capitalCostConversion	Capital cost for equipment for conversion customers
capitalCostNew	Capital costs for equipment for new construction

Table 19. INPUT\choiceParameters_xx

Variable Name	Description
Z	The indicator for Dimension 1
B	The indicator for Dimension 2
N	The indicator for Dimension 3
f	The indicator for Dimension 4
eIndicator	Binary switch for choice modeling to indicate the dimension modeled (0 = Dimension 4 and 1 = Dimension 5)
conType	Type of construction or customer (new, existing, or conversion)
lifetime	Equipment or measure lifetime (years)
alpha	Constant
description	Description of Choice
discountRate	Implicit discount rate
priceShare	Price share of customer utility function
a1	Intercept for alternative 1
a2	Intercept for alternative 2
a3	Intercept for alternative 3
a4	Intercept for alternative 4
b1	Operating cost coefficient
b2	Capital cost coefficient

Table 20. INPUT\customerAccountsActual_xx

Variable Name	Description
Z	The indicator for Dimension 1
B	The indicator for Dimension 2
vintage	Building vintage
unitsPerAccount	Units per Dimension 1-2 and vintage combination (square footage, number of apartments, etc.). This should be set to 1 if the unit is the customer
accounts	Number of accounts.
onMainAccounts	Number of accounts on main.
offMainAccounts	Number of accounts off main.

Table 21. INPUT\customerAccountsForecast_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
year	Year
unitsPerAccount	Units per Dimension 1-2 and vintage combination (square footage, number of apartments, etc.). This should be set to 1 if the unit is the customer
newConstructionAccounts	New Construction accounts.
newConstructionCaptureRate	The “capture” rate of NEWCONST = the share of new buildings that are customers
conversionCaptureRate	The share (%) of existing non-customers converting or becoming a customer each year

Table 22. INPUT\dimens

Variable Name	Description
DIM	Dimension
DIMNAME	Dimension Name
DIMNUM	Starting Levels

Table 23. INPUT\dsmEChoice_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
conType	Type of construction or customer (new, existing, or conversion)
yearIntroduced	Year of Program Introduction
programLife	Duration of Program (Years)
adoptionPath	Years to Full Adoption
applicability	Percent of Customers Applicable
eLevel	e Level to Which Program Applies
marketShare	Market Share Percent
earlyReplacement	Early Replacement (binary)
description	Program Description

Table 24. INPUT\dsmFChoice_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
conType	Type of construction or customer (new, existing, or conversion)
yearIntroduced	Year of Program Introduction
programLife	Duration of Program (Years)
adoptionPath	Years to Full Adoption
applicability	Percent of Customers Applicable
marketShare	Market Share Percent
earlyReplacement	Early Replacement (binary)
description	Program Description

Table 25. INPUT\dsmRetrofit_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
yearIntroduced	Year of Program Introduction
programLife	Duration of Program (Years)
measureLife	The average life of Dimension 3 equipment
eImprovement	The efficiency improvement (%) as reflected by the reduction in equipment energy usage.
adoptionPath	Years to Full Adoption
vintageApplicability	Vintages to Which Programs Apply
applicability	Percent of Customers Applicable
marketShare	Market Share Percent
earlyReplacement	Early Replacement (binary)
eLevel	Lowest e Level to Which Program Applies
description	Program Description

Table 26. INPUT\eChoiceStatus_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
eChoiceStatus	This is a “status” variable for Dimension 5. It tells the Provider Choice module which of several possible equation/modeling processing should be followed.
eAlternatives	The number of choice alternatives for Dimension 5, which ranges from 1-4

Table 27. INPUT\eSharesInitial_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
e	The indicator for Dimension 5
baseAvgEShare	The average market share in the historical stock at Dimension 5
baseMargEShareExisting	The marginal (i.e., most recent) market share associated with the replacement of the product or service option by existing customers
baseMargEShareConversion	The marginal market share associated with conversion customers
baseMargEShareNew	The marginal market share associated with the new construction customers
peakDayLoadFactor	The peak demand or peak day load factor associated with annual usage for each Dimension 1-5 combination.

Table 28. INPUT\equipmentAge_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
equipmentMaxAge	The maximum age of existing equipment for each Dimension 1-3 combination regardless of the historical vintage
equipmentMeanAge	The average age of existing equipment for each Dimension 1-3 combination and each historical vintage
vintage	Building vintage

Table 29. INPUT\equipmentDecay_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
conType	Type of construction or customer (new, existing, or conversion)
equipmentDecayIndicator	Equipment decay indicator
equipmentDecayParm1	Equipment decay paramater 1
equipmentDecayParm2	Equipment decay paramater 2
equipmentDecayParm3	Equipment decay paramater 3
equipmentDecayParm4	Equipment decay paramater 4

Table 30. INPUT\fChoiceStatus_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
fChoiceStatus	This is a “status” variable for Dimension 4. It tells the Provider Choice module which of several possible equation/modeling processing should be followed.
fAlternatives	The number of choice alternatives for Dimension 4, which ranges from 1-4

Table 31. INPUT\forecastBatchControl

Variable Name	Description
scenarioName	Descriptive name of the output scenario
scenario	Output scenario number
accountDecay	Scenario to select for the accountDecay_xx dataset
equipmentDecay	Scenario to select for the equipmentDecay_xx dataset
equipmentAge	Scenario to select for the equipmentAge_xx dataset
saturations	Scenario to select for the saturations_xx dataset
customerCountsActual	Scenario to select for the customerCountsActual_xx dataset
customerCountsForecast	Scenario to select for the customerCountsForecast_xx dataset
usageAnnual	Scenario to select for the usageAnnual_xx dataset
eSharesFinal	Scenario to select for the eSharesFinal_xx dataset
fSharesFinal	Scenario to select for the fSharesFinal_xx dataset

Table 32. INPUT\fsharesInitial_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
baseAvgFShare	The average market share in the historical stock at Dimension 4.
baseMargFShareExisting	The marginal (i.e., most recent) market share associated with the replacement of the product or service by existing customers
baseMargFShareConversion	The marginal market share associated with the conversion customers
baseMargFShareNew	The marginal market share associated with the new construction customers

Table 33. INPUT\initParm

Variable Name	Description
BASEYR	Base Year
FCSTYRS	Forecast Years

Table 34. INPUT\priceForecast_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
year	Year
price	Price (Native Units)

Table 35. INPUT\saturations_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
year	Year
vintage	Building vintage
saturation	Presence of End Use (Percent)

Table 36. INPUT\scenarioDescriptions

Variable Name	Description
scenario	Output scenario number
scenarioName	Descriptive name of the scenario

Table 37INPUT\usageBatchControl

Variable Name	Description
scenarioName	Descriptive name of the scenario
scenario	Output scenario number
usageParameters	Scenario to select for the usageParameters_xx dataset
usageDrivers	Scenario to select for the usageDrivers_xx dataset

Table 38. INPUT\usageDrivers_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
e	The indicator for Dimension 5
year	Year
month	Month
X0 - X20	Product Usage module forecast drivers

Table 39. INPUT\usageParameters_xx

Variable Name	Description
Z	The indicator for Dimension 1
B	The indicator for Dimension 2
N	The indicator for Dimension 3
F	The indicator for Dimension 4
E	The indicator for Dimension 5
Vintage	Building vintage
B0 - B20	Product Usage module coefficients
usageEquationStatus	This is a “status” variable for the Product Usage module.

Table 40. INTER\eSharesFinal_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
e	The indicator for Dimension 5
year	Year
eshare	Share for Dimension 5
earadop	A 0/1 binary variable where a value of 1 indicates that the marginal market shares apply to all existing customers, not just those who need to replace retired equipment. The default value is 0; a one will be used if specified in the Intervention Strategies CSFUELE\Sxx dataset.
conType	Type of construction or customer (new, existing, or conversion)

Table 41. INTER\fSharesFinal_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
year	Year
fshare	Fuel Share
earadop	A 0/1 binary variable where a value of 1 indicates that the marginal market shares apply to all existing customers, not just those who need to replace retired equipment. The default value is 0; a one will be used if specified in the Intervention Strategies CSFUELE\Sxx dataset.
conType	Type of construction or customer (new, existing, or conversion)

Table 42. INTER\usageAnnual_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
year	Year
vintage	Building vintage
f	The indicator for Dimension 4
e	The indicator for Dimension 5
use	Annual usage from the usage module for each Dimension 1-5 combination by year and vintage

Table 43. INTER\usageMonthly_xx

Variable Name	Description
vintage	Building vintage
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
e	The indicator for Dimension 5
year	Year
month	Month
use	Monthly usage from the usage module for each Dimension 1-5 combination by year and vintage

Table 44. OUTPUT\customerCounts_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
year	Year
unitsPerAccount	Units per Dimension 1-2 and vintage combination (square footage, number of apartments, etc.). This should be set to 1 if the unit is the customer
vintage	Building vintage
remain	All customers and non-customers remaining for each vintage
totalAccounts	The sum of existing, conversion, and new construction customers
cAccounts	Conversion customers
nAccounts	New construction customers
totalUnits	totalAccounts * units per account
cUnits	cAccounts * units per account
nUnits	nAccounts * units per account

Table 45. OUTPUT\demandByVintage_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
vintage	Building vintage
year	Year
n	The indicator for Dimension 3
f	The indicator for Dimension 4
e	The indicator for Dimension 5
fuelSpecificUnits	The energy usage associated with a single unit at the full dimension 1 through 5 (zbnfe) level.
unitsPerAccount	Units per Dimension 1-2 and vintage combination (square footage, number of apartments, etc.). This should be set to 1 if the unit is the customer
use	Annual usage from the usage module for each Dimension 1-5 combination by year and vintage
peakDayLoadFactor	The peak demand or peak day load factor associated with annual usage for each Dimension 1-5 combination.
ereplcs	The total number of new Dimension 3 equipment sales from existing customers (who are replacing retired equipment) by year and vintage for each Dimension 1-5 combination
ceus	The total number of new Dimension 3 equipment sales from conversion customers by year and vintage for each Dimension 1-5 combination
neus	The total number of new Dimension 3 equipment sales from new construction customers by year and vintage for each Dimension 1-5 combination
totalUsage	Annual usage from the usage module for each Dimension 1-5 combination by year and vintage
cUsage	The total number of new Dimension 3 equipment sales from conversion customers by year and vintage for each Dimension 1-5 combination
nUsage	The total number of new Dimension 3 equipment sales from new construction customers by year and vintage for each Dimension 1-5 combination
usagePerUnit	Total usage per unit (e.g., square foot, customer, apartment, etc.) for each Dimension 1-5 combination by year and vintage = USE * EEUS
cuseunit	Total conversion usage per unit (e.g., square foot, customer, apartment, etc.) for each Dimension 1-5 combination by year and vintage = USE * CEUS
nuseunit	Total new construction usage per unit (e.g., square foot, customer, apartment, etc.) for each Dimension 1-5 combination by year and vintage = USE * NEUS

Table 46. OUTPUT\eUsage_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
vintage	Building vintage
year	Year
n	The indicator for Dimension 3
f	The indicator for Dimension 4
e	The indicator for Dimension 5
fuelSpecificUnits	The energy usage associated with a single unit at the full dimension 1 through 5 (zbnfe) level.

Table 47. OUTPUT\salesReport_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
year	Year
totalAccounts	The sum of existing, conversion, and new construction customers
totalUnits	totalAccounts * units per account
fuelSpecificUnits	The energy usage associated with a single unit at the full dimension 1 through 5 (zbnfe) level.
totalUsage	Annual usage from the usage module for each Dimension 1-5 combination by year and vintage
peakUsage	Annual peak usage from the usage module for each Dimension 1-5 combination by year and vintage
effeeus1 - effeeus4	This is the average number of fuel specific end-uses (FEUS) across the possible Dimension 5 (efficiency) levels, and is identical to AVGEU(1-4) in VNTFMKSH\Sxx
effuec1 - effuec4	The annual usage for each Dimension 5 level associated with each Dimension 1-4 combination. These estimates come directly from USE is USEANN\Sxx
effuse1 - effuse4	The total usage for each Dimension 1-5 combination by year and vintage. These estimates come directly from EUSE in VNTFDEMD\\Sxx
unitsPerAccount	Units per Dimension 1-2 and vintage combination (square footage, number of apartments, etc.). This should be set to 1 if the unit is the customer
uec	Sales per End Use Unit
fuelSpecificUnitsPerAccount	Fuel-Specific End-Use Units per Account
totalUsagePerAccount	Sales per Account

Table 48. OUTPUT\shareReport_xx

Variable Name	Description
z	The indicator for Dimension 1
b	The indicator for Dimension 2
n	The indicator for Dimension 3
f	The indicator for Dimension 4
year	Year
totalAccounts	The sum of existing, conversion, and new construction customers
totalUnits	totalAccounts * units per account
fuelSpecificUnits	The energy usage associated with a single unit at the full dimension 1 through 5 (zbnfe) level.
effeeus1 - effeeus4	This is the average number of fuel specific end-uses (FEUS) across the possible Dimension 5 (efficiency) levels, and is identical to AVGEU(1-4) in VNTFMKSH\Sxx
averageShareEff1 - averageShareEff4	The average stock share of Dimension 5 for each Dimension 1-4 combination
fshareExisting	The fourth dimension (fuel) market share for existing (replacement equipment) customers
fshareNew	The fourth dimension (fuel) market share for new construction customers
fshareConversion	The fourth dimension (fuel) market share for conversion customers
marginalShareExisting1 - marginalShareExisting4	The marginal (existing equipment) share of Dimension 5 for each Dimension 1-4 combination
marginalShareNew1 - marginalShareNew4	The marginal (new equipment) share of Dimension 5 for each Dimension 1-4 combination
marginalShareConversion1 - marginalShareConversion4	The marginal (conversion equipment) share of Dimension 5 for each Dimension 1-4 combination

The End Use Forecaster's data requirements are extensive and diverse; in practically every case, the set of sources necessary to fulfill them are equally varied. For the five Gas Company models, the data sources fell into four categories.

- Company-specific primary research – Studies conducted by or for the Gas Company help to characterize the market for different segments.
- Company databases – The Gas Company's MAS, for example, and other internal data sources have indispensable historical data on the customer counts and consumption patterns.
- Secondary data sources – Recent state projects by CALMAC, for example, have information on baseline end-use consumption and equipment costs.
- Assumptions – Professional judgment or assumptions based on previous model inputs are necessary to fill in those areas where other data sources are insufficient.

For nearly every input, more than one source was considered during the process of populating the model. The principal criterion for selection of the final source was the "reasonableness" of the results. In cases where alternative source produced similar results, preference was given to more recent and company-specific data. In some cases, multiple sources were used where one complemented another. The specific sources for each individual input are documented in Excel workbooks used during data development or in the SAS code used to populate the model. The final values used in the model are available in the SAS data sets for the various modules.

Residential Model

The residential model had the most consistent and robust set of sources. An analysis of raw data from the Gas Company's most recent RASS provided customized inputs for many of the customer characteristics. Data from CALMAC were available for unit energy consumption and equipment costs for the primary end uses. Gas Company data on customer counts, consumption, and meter forecasts were easily produced in a format consistent with the chosen segmentation design.

Usage Module - Residential

Data Set	Variable	Source	Notes
Input.UsageParameters_10	B0 (UEC)	CALMAC California Statewide Residential Sector Energy Efficiency Potential Study, Volume II: Appendices	Stock or standard efficiency UECs taken from “Base Tech UEC” inputs. UECs for higher efficiencies based on “Energy Savings” inputs.
	B1 (Price Elasticity)	SoCal Gas econometric model outputs	
Input.UsageDrivers_10	X0 (UEC)	Default values.	Forecast drivers
	X1 (Price)	SoCal Gas price forecasts	Marginal price forecast applied in usage module.
Input.UsageParameters_10	ADJUST	SoCal Gas historical customer data	Adjustment to UECs by vintage based on SoCal Gas historical use per customer.

Choice Module - Residential

Data Set	Variable	Source	Notes
Input.ChoiceParameters_10	Lifetime	SoCal Gas RASS	
	DiscountRate	Default	
	PriceShare	Default	
	A1, A2, A3, B1, B2	Default Starting Values	Some initial parameters changed during operation of choice module to allow calibration.
Input.ChoiceDrivers_10	CapitalCostExisting, CapitalCostNew, CapitalCostConversion	CALMAC California Statewide Residential Sector Energy Efficiency Potential Study, Volume II: Appendices	Where costs were not available from CALMAC, values from previous SoCal Gas residential model were adapted to accommodate additional efficiency level in current version
	Available	Assumptions	Stock efficiency level assumed unavailable after base year.
Input.FSharesInitial_10	BaseAvgFShare, BaseMargFShareExisting, BaseMargFShareConversion, BaseMargFShareNew	SoCal Gas RASS	
Input.ESharesInitial_10	BaseAvgEShare, BaseMargEShareExisting, BaseMargEShareConversion, BaseMargEShareNew	Assumptions, previous residential model, and CALMAC *California Statewide Residential Sector Energy Efficiency Potential Study, Volume II: Appendices*	

Forecast Module - Residential

Data Set	Variable	Source	Notes
Input.CustomerCountsActual_10	ACCTSY0	SoCal Gas historical customer data	
Input.CustomerCountsForecast_10	NEWCONST	SoCal Gas residential meter forecasts	
	UPA	Default	Units Per Account: set to one for single- and multi-family dwellings. Master- and sub-metered adjusted to account for customer counts per meter.
Input.AccountDecay_10	AccountDecayIndicator, AccountDecayParm1-4	SoCal Gas	No decay applied to new construction.
Input.EquipmentDecay_10	EquipmentDecayIndicator, EquipmentDecayParm1-4	Assumptions	Exponential decay function applied based on measure life assumptions. Logistic decay function applied based on measure life assumptions.
Input.EquipmentAge_10	EquipmentMeanAge, EquipmentMaxAge	SoCal Gas RASS	
Input.Saturations_10	SAT	SoCal Gas RASS	

Commercial Core and Non-Core Models

The Core and Non-Core Commercial models share the same sources for data. For most of the inputs, these sources provide identical values for both models. That is the sources for data do not show any distinction in the end use intensity (EUI) values, end-use saturations, and fuel and efficiency shares for the two models. The fundamental difference in the models is the Gas Company's customer counts for the different building types. Less significantly, price forecasts, which have an influence on both usage and choice modules, are also different for the two models.

Usage Module – Commercial Core and Noncore

End Use Forecaster's Library and Data Set	End Use Forecaster Variable(s)	Source	Notes
Input.UsageParameters_10	B0 (EUI)	SDG&E 2000 Commercial EUI Study, CALMAC *California Statewide Commercial Sector Natural Gas Energy Efficiency Potential Study, Volume II: Appendices*	Stock efficiency EUIs taken from SDG&E study. EUIs for higher efficiencies based on "Energy Savings" inputs from CALMAC.
	B1 (Price Elasticity)	SoCal Gas econometric model outputs	
Input.UsageDrivers_10	X0 (EUI)	Default values	Forecast drivers
	X1 (Price)	SoCal Gas price forecasts	Marginal price forecast applied in usage module.

Choice Module – Commercial Core and Noncore

Data Set	Variable	Source	Notes
Input. ChoiceParameters_10	Lifetime	So Cal Gas MAS, Assumptions	
	DiscountRate	Default Assumptions – 25%	The 25% customer discount rate stems from the implicit discount rate literature.
	PriceShare	Default Assumptions – 50%	The 50% price share assumption on previous Cadmus Group (formerly Quantec) research on how customers trade off price vs. non price attributes
	A1, A2, A3, B1, B2	Default Starting Values	Some initial parameters changed during operation of choice module to allow calibration.
Input. ChoiceDrivers_10	CapitalCostExisting, CapitalCostConversion, CapitalCostNew	So Cal Gas Average Price Forecast, Assumptions	Operating costs based on equipment usage data and SoCal Gas price forecast, with capital costs calculated based on assumed ratios of operating to capital costs.
	Available	Assumptions	Stock efficiency level assumed unavailable after base year.
Input. FSharesInitial_10	BaseAvgFShare, BaseMargFShareExisting, BaseMargFShareConversion, BaseMargFShareNew	SDG&E 2000 Commercial EUI Study, 1996 SoCal Gas Commercial & Industrial Energy Equipment Market Share Study	
Input. ESharesInitial_10	BaseAvgEShare, BaseMargEShareExisting, BaseMargEShareConversion, BaseMargEShareNew	Assumptions	10% high efficiency share(s) based on professional judgment and DSM free ridership literature.

Forecast Module – Commercial Core and Noncore

Data Set	Variable	Source	Notes
Input.CustomerCountsActual_10	ACCTSY0	SoCal Gas historical customer data	Base year accounts data.
Input.CustomerCountsForecast_10	NEWCONST	SoCal Gas historical customer data, SoCal Gas employment forecasts, and SoCal Gas employment elasticity from econometric model	New Construction.
	UPA	MAS	Units Per Account.
Input.AccountDecay_10	AccountDecayIndicator, AccountDecayParm1-4	Assumptions	No decay applied to existing accounts. No decay applied to new construction.
Input.EquipmentDecay_10	EquipmentDecayIndicator, EquipmentDecayParm1-4	Assumptions	Exponential decay function applied based on measure life assumptions. Logistic decay function applied based on measure life assumptions
Input.EquipmentAge_10	EquipmentMaxAge, EquipmentMeanAge	SoCal Gas MAS	
Input.Saturations_10	SAT	SDG&E 2000 Commercial EUI Study	

Industrial Core and Non-Core Models

The Core and Non-Core Industrial models also share the same data sources. Unlike the sources for the commercial models, the data from the Gas Company's MAS – one of the primary inputs into to calculation of the UECs – are different for core and non-core sectors. Consequently, the final UEC for a given building's end use can vary significantly between the models. As with the commercial models, the Gas Company's historical customer counts also drive differences in the forecasts.

Usage Module – Industrial Core and Noncore

Data Set	Variable	Source	Notes
Input.UsageParameters_10	B0 (EUI)	SoCal Gas MAS, SoCal Gas Commercial & Industrial Energy Equipment Market Share Study	UECs based on a top-down calculation based on historical use per customer, end-use saturations, and fuel shares.
	B1 (Price Elasticity)	SoCal Gas econometric model outputs	
Input.UsageDrivers_10	X0 (EUI)	Default values.	Forecast drivers
	X1 (Price)	SoCal Gas price forecasts	Marginal price forecast applied in usage module.

Choice Module – Industrial Core and Noncore

Data Set	Variable	Source	Notes
Input.ChoiceParameters_10	Lifetime	So Cal Gas MAS, Assumptions	
	DiscountRate	Default	
	PriceShare	Default	
	A1, A2, A3, B1, B2	Default Starting Values	Some initial parameters changed during operation of choice module to allow calibration.
Input.ChoiceDrivers_10	CapitalCostExisting, CapitalCostNew, CapitalCostConversion	So Cal Gas Average Price Forecast, Assumptions	Operating costs based on equipment usage data and SoCal Gas price forecast, with capital costs calculated based on assumed ratios of operating to capital costs.
	Available	Assumptions	Stock efficiency level assumed unavailable after base year.
Input.FSharesInitial_10	BaseAvgFShare, BaseMargFShareExisting, BaseMargFShareConversion, BaseMargFShareNew	SoCal Gas Commercial & Industrial Energy Equipment Market Share Study	
Input.ESharesInitial_10	BaseAvgEShare, BaseMargEShareExisting, BaseMargEShareConversion, BaseMargEShareNew	Assumptions.	

Forecast Module – Industrial Core and Noncore

Data Set	Variable	Source	Notes
Input.CustomerCountsActual_10	ACCTSY0	SoCal Gas historical customer data	
Input.CustomerCountsForecast_10	NEWCONST	SoCal Gas historical customer data, SoCal Gas employment forecasts, and SoCal Gas employment elasticity from econometric model	
	UPA	MAS	Units Per Account
Input.AccountDecay_10	AccountDecayIndicator, AccountDecayParm1-4	Assumptions	No decay applied to existing accounts.
Input.EquipmentDecay_10	EquipmentDecayIndicator, EquipmentDecayParm1-4	Assumptions	Exponential decay function applied based on measure life assumptions. Logistic decay function applied based on measure life assumptions.
Input.EquipmentAge_10	EquipmentMaxAge, EquipmentMeanAge	SoCal Gas MAS	
Input.Saturations_10	SAT	SoCalGas RASS	

Core Storage Asset Allocation

Gas Demand Forecast Measures Used to Allocate Storage Inventory and Withdrawal Capacity Among Core Rate Classes

In general the allocation of core storage inventory and core withdrawal capacity among each respective Company's core rate classes is performed based on core gas demand forecast results for the 3-year TCAP period 2017-2019.

To allocate storage inventory, a gas demand measure we call "Excess Winter Gas Demand" is calculated for each Company's core rate class.

$$(\text{Excess Winter Gas Demand})_{\mathbf{t}}$$

$$= (\text{Cold-Year Gas Demand})_{\mathbf{t}} - (\text{TCAP Period Cold-Year Gas Demand per Month}),$$

where the subscript "t" is a date specified as *month-year* combination (e.g., Dec-2018) from Jan-2017 through Dec-2019. For example, using the December 2018 specific month and the residential core market segment for each Company the following specific results are obtained:

<u>SoCalGas' Residential Core:</u>

$$\begin{aligned}(\text{Residential Excess Winter Gas Demand})_{\textbf{Dec-2018}} &= (\text{Cold-Year Gas Demand})_{\textbf{Dec-2018}} - (\text{TCAP Period Cold-Year Gas Demand per Month})\\ &= (402{,}637\ \text{MTherms}) - (2{,}686{,}467\ \text{MTherms} / 12)\\ &= (402{,}637\ \text{MTherms}) - (223{,}872\ \text{MTherms})\\ &= (178{,}765\ \text{MTherms})_{\textbf{Dec-2018}}\end{aligned}$$

<u>SDG&E's Residential Core:</u>

$$\begin{aligned}(\text{Residential Excess Winter Gas Demand})_{\textbf{Dec-2018}} &= (\text{Cold-Year Gas Demand})_{\textbf{Dec-2018}} - (\text{TCAP Period Cold-Year Gas Demand per Month})\\ &= (51{,}555\ \text{MTherms}) - (354{,}198\ \text{MTherms} / 12)\\ &= (51{,}555\ \text{MTherms}) - (29{,}517\ \text{MTherms})\\ &= (22{,}038\ \text{MTherms})_{\textbf{Dec-2018}}\end{aligned}$$

The data in Table 1 and Table 2, below show the Excess Winter Gas Demand calculation results for SoCalGas and for SDG&E, respectively, by each Company's core market segments. The monthly gas demand forecasts for Cold-Year HDD design conditions are provided in the Consolidated Gas Demand material of these work papers.

Table 1: SoCalGas Excess Winter Gas Demand

			Nonresidential Core				Total
		Residential	G-10	G-AC	G-GE	G-NGV	Core
Excess Winter Demand--EWD (Mth)							
2017	Jan	162,003	32,868	0	0	0	**194,871**
	Feb	114,095	23,540	0	0	0	**137,635**
	Mar	70,505	10,504	0	0	0	**81,009**
	Apr	15,256	0	0	0	0	**15,256**
	May	0	0	0	97	0	**97**
	Jun	0	0	13	505	0	**518**
	Jul	0	0	25	522	0	**547**
	Aug	0	0	42	640	0	**682**
	Sep	0	0	42	234	44	**320**
	Oct	0	0	19	287	164	**470**
	Nov	24,401	12,233	0	0	0	**36,634**
	Dec	180,193	30,231	0	0	0	**210,424**
2018	Jan	160,639	31,837	0	0	0	**192,476**
	Feb	112,900	22,581	0	0	0	**135,482**
	Mar	69,465	9,641	0	0	47	**79,153**
	Apr	14,411	0	0	0	0	**14,411**
	May	0	0	0	115	499	**614**
	Jun	0	0	13	528	0	**540**
	Jul	0	0	25	544	180	**749**
	Aug	0	0	42	664	293	**998**
	Sep	0	0	42	254	802	**1,098**
	Oct	0	0	19	307	929	**1,255**
	Nov	23,523	11,368	0	0	0	**34,892**
	Dec	178,765	29,245	0	0	0	**208,010**
2019	Jan	158,891	30,423	0	0	0	**189,314**
	Feb	111,370	21,264	0	0	0	**132,634**
	Mar	68,131	8,449	0	0	805	**77,385**
	Apr	13,328	0	0	0	734	**14,062**
	May	0	0	0	133	1,283	**1,417**
	Jun	0	0	13	550	662	**1,225**
	Jul	0	0	25	567	946	**1,537**
	Aug	0	0	42	688	1,065	**1,794**
	Sep	0	0	42	274	1,603	**1,919**
	Oct	0	0	19	327	1,738	**2,084**
	Nov	22,399	10,183	0	0	259	**32,841**
	Dec	176,935	27,908	0	0	625	**205,468**
TCAP Period:							
	Total EWD:	738,429	133,415	140	3,259	10,419	**885,661**
	Storage Inventory (Bcf)	71.7	13.0	0.0	0.3	1.0	**86.0**

Table 2: SDG&E Excess Winter Gas Demand

		Residential	Nonresidential Core GN-3	Nonresidential Core G-NGV	**Total Core**
Excess Winter Demand--EWD (Mth)					
2017	Jan	20,233	4,873	0	**25,106**
	Feb	14,761	4,582	0	**19,344**
	Mar	10,864	1,666	0	**12,530**
	Apr	3,067	716	0	**3,782**
	May	0	0	0	**0**
	Jun	0	0	0	**0**
	Jul	0	0	0	**0**
	Aug	0	0	0	**0**
	Sep	0	0	0	**0**
	Oct	0	0	28	**28**
	Nov	1,747	1,255	90	**3,093**
	Dec	21,817	4,799	0	**26,616**
2018	Jan	20,448	4,674	0	**25,122**
	Feb	14,952	4,386	0	**19,338**
	Mar	11,038	1,498	0	**12,536**
	Apr	3,207	557	0	**3,764**
	May	0	0	0	**0**
	Jun	0	0	0	**0**
	Jul	0	0	0	**0**
	Aug	0	0	64	**64**
	Sep	0	0	82	**82**
	Oct	0	0	118	**118**
	Nov	1,882	1,091	185	**3,158**
	Dec	22,038	4,601	62	**26,702**
2019	Jan	20,599	4,393	0	**24,992**
	Feb	15,087	4,109	0	**19,195**
	Mar	11,161	1,261	0	**12,422**
	Apr	3,306	332	20	**3,659**
	May	0	0	59	**59**
	Jun	0	0	74	**74**
	Jul	0	0	64	**64**
	Aug	0	0	156	**156**
	Sep	0	0	175	**175**
	Oct	0	0	214	**214**
	Nov	1,977	859	284	**3,121**
	Dec	22,194	4,321	155	**26,670**
TCAP Period:					
	Total EWD:	98,303	20,994	1,335	**120,632**
	Storage Inventory (Bcf)	9.5	2.0	0.1	**11.7**

The tables below show the Excess Winter Gas Demand totals that are used to allocate the total core storage inventory of 83 Bcf:

SoCalGas:

SoCalGas	Residential	Nonresidential Core G-10	G-AC	G-GE	G-NGV	Total SCG Core
"Excess Winter Demand" for Inventory Allocation in BCF	71.69	12.95	0.01	0.32	1.01	86.0

SDG&E:

SDG&E	Residential	Nonresidential Core GN-3	G-NGV	Total SDG&E Core		SCG & SDG&E Core Totals
"Excess Winter Demand" for Inventory Allocation in BCF	9.50	2.03	0.13	11.7		98

To allocate core withdrawal capacity, the respective Company's core peak day gas demand over the TCAP period are used; these values as proportions of SoCalGas' and SDG&E's respective core peak day load totals are shown below:

SoCalGas	Residential	Nonresidential Core G-10	G-AC	G-GE	G-NGV
(Scg Core PkDay % of Total)	79.38%	19.09%	0.004%	0.152%	1.3696%
SDG&E	**Residential**	**Nonresidential Core GN-3**	**G-NGV**		
(Sdge Core PkDay % of Total)	75.45%	23.21%	1.342%		

The allocation of total core withdrawal capacity between SoCalGas' and SDG&E's core is done based on the relative proportions of each Company's peak day load during the TCAP period to the sum of their peak day loads:

(Pk Day Load)	3-Yr Avg (MThm/d)		Pk Day Alloc Storage Wdr'l (MMcf/d)
SoCalGas	30,577.0	88.794%	1,976.0
SDG&E	3,859.0	11.206%	249.0
Total	34,436		2,225

The resulting allocations of core storage assets to the various core rate classes are shown in the tables below:

SCG and SDG&E Core Storage Allocations by Customer Class						
SoCalGas		**Nonresidential Core**				**Total**
	Residential	**G-10**	**G-AC**	**G-GE**	**G-NGV**	**SCG Core**
Inventory Allocation BCF	60.9	11.0	0.0	0.3	0.9	73
Injection MMcfd	284.9	51.5	0.1	1.3	4.0	342
Withdrawal MMcfd	1,568.6	377.3	0.1	3.0	27.1	1,976
SDG&E		**Nonresidential Core**		**Total**		**SCG & SDG&E**
	Residential	**GN-3**	**G-NGV**	**SDG&E Core**		**Core Totals**
Inventory Allocation BCF	8.1	1.7	0.1	10		**83**
Injection MMcfd	**37.7**	8.1	0.5	46		**388**
Withdrawal MMcfd	187.9	57.8	3.3	249		2,225

For example, the storage assets allocated to SoCalGas' residential market segment are calculated below:

<u>Inventory:</u>

60.9 Bcf = (71.69 / 98) x 83 Bcf

<u>Injection:</u>

284.6 MMcf/d = (60.9 Bcf) x (1,000 MMcf / Bcf) / 214 days, a result reasonably close to the value reported in the table above of 284.9 MMcf/d.

<u>Withdrawal:</u>

1,568.3 MMcf/d = (0.88794) x (2,225 MMcf/d) x (0.7938), which is reasonably close to the value reported in the table above of 1,586.6 MMcf/d.

2006 LUAF Study for SoCalGas
And
SDG&E

Southern California Gas Company

A Sempra Energy utility®

Year 2006 Lost and Unaccounted-For Gas at Southern California Gas Company and San Diego Gas & Electric Company

2006 Addendum to: "A Study of the 1991 Unaccounted-For Gas Volume at the Southern California Gas Company"

Prepared by: Southern California Gas Company
Gas Engineering-Measurement Regulation & Control

November 30th, 2007

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EXECUTIVE SUMMARY:

This document provides a summary of component and customer class allocations for Southern California Gas Company (SoCalGas) and San Diego Gas & Electric Company's (SDG&E) lost and unaccounted-for (LUAF) gas. The allocations are based on a review of reported year 2006 LUAF gas for the companies on areas of LUAF gas contribution as identified in a comprehensive 1991 LUAF gas study conducted by SoCalGas. SoCalGas' 2006 LUAF gas was 7,273,043 MMBtu, representing 0.73% of all system gas receipts while SDG&E's 2006 LUAF gas was 1,542,472 MMBtu, representing 1.27% of all system receipts.

Tables 1 and 2 on the following pages show year 2006 line-item core and non-core allocations of LUAF gas by component type for SoCalGas and SDG&E, respectively. The Tables show the following allocations:

LUAF Gas Allocations:

Company	**Core MMBtu**	**Non-Core MMbtu**	**Core**	**Non-Core**
SoCalGas:	5,170,794	2,102,249	71.1%	28.9%
SDG&E:	1,183,217	359,235	76.7%	23.3%

The analytical approach used to derive these allocations follows.

Table 1

SoCalGas 2006 LUAF Gas Component Allocation

Line Item	Department	1991 Subcomponents	1991 LAUF Volumes (MCF)	SoCalGas1991 % of LUAF	2006 LAUF Volumes (MCF)	SoCal Gas 2006 % of LUAF	2006 vs.1991 LAUF Volumes (MCF)	2006 % of LUAF Change	2006 LUAF MMBtus	SoCal % Non-core	SoCal 2006 Non-core LUAF MMBtus	SoCal 2006 Core LUAF MMBtus	SoCal Core %
A	Accounting	Cycle Billing Adjustments	201,666	1.86%	0	0.00%	-201,666	-1.86%	-		-	-	
B	Accounting	Company-Use Gas	61,928	0.57%	35,065	0.50%	-26,863	-0.07%	36,176	62.90%	22,755	13,421	37.10%
C	Accounting	Bypass	3,047	0.03%	0	0.00%	-3,047	-0.03%	-	0.00%	-	-	
D	Accounting	Slow Meters	246	0.00%	302	0.00%	56	0.00%	312	0.00%	-	312	100.00%
E	Accounting	DR Meters	5,008	0.05%	3,250	0.05%	-1,758	0.00%	3,353	0.00%	-	3,353	100.00%
F	Accounting	No-Close Policy	3,479	0.03%	477,006	6.77%	473,527	6.73%	492,115	0.00%	-	492,115	100.00%
G	Accounting	Other Estimated	2,323	0.02%	0	0.00%	-2,323	-0.02%	-	0.00%	-	-	
H	Accounting	Other Actual	12,460	0.11%	0	0.00%	-12,460	-0.11%	-	0.00%	-	-	
I	Measurement Regulation & Control	Fixed-Factor Temperature	-1,331,123	-12.27%	-1,539,192	-21.83%	-208,069	-9.56%	(1,587,947)	0.00%	-	(1,587,947)	100.00%
J	Measurement Regulation & Control	Fixed-Factor Pressure	271,007	2.50%	312,599	4.43%	41,592	1.94%	322,501	0.00%	-	322,501	100.00%
K	Measurement Regulation & Control	Elevation and Barometric Pressure	1,603,207	14.78%	1,205,718	17.10%	-397,489	2.33%	1,243,910	0.00%	-	1,243,910	100.00%
L	Measurement Regulation & Control	Fixed-Factor For Calculation of Z	-425,932	-3.93%	-44,947	-0.64%	380,985	3.29%	(46,371)	0.00%	-	(46,371)	100.00%
M	Measurement Regulation & Control	Positive Displacement Meter Accuracy	2,957,299	27.26%	2,244,479	31.84%	-712,820	4.58%	2,315,574	0.00%	-	2,315,574	100.00%
N	Measurement Regulation & Control	Orifice Meter Accuracy	5,849,534	53.91%	4,137,346	58.69%	-1,712,188	4.77%	4,268,399	69.88%	2,982,757	1,285,642	30.12%
O	Measurement Regulation & Control	Ultrasonic Meter Accuracy	0	0.00%	-205,780	-2.92%	-205,780	-2.92%	(212,298)	207.85%	(441,261)	228,963	-107.85%
P	Measurement Regulation & Control	Turbine Meter Accuracy	-912,157	-8.41%	-797,839	-11.32%	114,318	-2.91%	(823,111)	97.33%	(801,134)	(21,977)	2.67%
Q	Measurement Regulation & Control	Instrument Calibration Bias	-28,031	-0.26%	-261,961	-3.72%	-233,930	-3.46%	(270,259)	99.10%	(267,826)	(2,432)	0.90%
R	Measurement Regulation & Control	Ambient Temperature Effect on Instrumentation*	116,012	1.07%	0	0.00%	-116,012	-1.07%	-	0.00%	-	-	
S	Measurement Regulation & Control	Chart Integration Bias	-50,999	-0.47%	0	0.00%	50,999	0.47%	-	0.00%	-	-	
T	Distribution Pipeline	Distribution Leakage	804,662	7.42%	566,861	8.04%	-237,801	0.62%	584,817	23.52%	137,549	447,268	76.48%
U	Transmission Pipeline	Transmission Leakage	67,174	0.62%	29,755	0.42%	-37,419	-0.20%	30,698	62.90%	19,309	11,389	37.10%
V	Accounting	Theft	644,529	5.94%	397,288	5.64%	-247,241	-0.30%	409,872	32.27%	132,266	277,606	67.73%
W	NA	Non-Study Components	994,461	9.17%	489,788	6.95%	-504,673	-2.22%	505,303	62.90%	317,835	187,467	37.10%
	Total		**10,849,800**	**100.00%**	**7,049,738**	**100.00%**	**-3,800,062**	**-0.30%**	**7,273,043**	**28.90%**	**2,102,249**	**5,170,794**	**71.10%**

1991 Total Gas Delivered:	**1,052,063,306**
1991 LUAF % of Total Gas Delivered:	**1.03%**
1991Total LUAF:	**10,849,800**

2006 Total Gas Delivered MCF:	**963,340,871**
2006 LUAF % of Total Gas Delivered:	**0.73180%**
2006 Total LUAF MCF:	**7,049,738**
2006 Total MMBtus Delivered:	**993,855,331**
2006 Total MMBtu LUAF:	**7,273,043**
2006 System Average BTU Factor:	**1.0316757**

LUAF Factor Total	LUAF Factor NC	LUAF Factor Core
0.73%	0.21%	0.52%

Allocation	Allocation NC	Allocation Core
100%	28.90%	71.10%

The following is included in Instrument Calibration Bias in the 2007 LUAF Study:

*Ambient Temperature Effect on Instrumentation

Table 2

SDG&E 2006 LUAF Gas Component Allocation

Line Item	Department	1991 Subcomponents	SDG&E 2006 % of LUAF	2006 LAUF Volumes (MCF)	2006 LUAF MMBtus	SD % Non-core	SD 2006 Non-core LUAF MMBtus	SD 2006 Core LUAF MMBtus	SD % core
A	Accounting	Cycle Billing Adjustments	0.00%	0	0	0.00%	-	-	
B	Accounting	Company-Use Gas	0.20%	3,021	3,074	59.45%	1,827	1,246	40.55%
C	Accounting	Bypass	0.00%	0	0	0.00%	-	-	
D	Accounting	Slow Meters	0.00%	38	38	0.00%	-	38	100.00%
E	Accounting	DR Meters	0.03%	403	410	0.00%	-	410	100.00%
F	Accounting	No-Close Policy	3.92%	59,368	60,400	0.00%	-	60,400	100.00%
G	Accounting	Other Estimated	0.00%	0	0	0.00%	-	-	
H	Accounting	Other Actual	0.00%	0	0	0.00%	-	-	
I	Measurement Regulation & Control	Fixed-Factor Temperature	-11.62%	-176,217	-179,281	0.00%	-	(179,281)	100.00%
J	Measurement Regulation & Control	Fixed-Factor Pressure	3.30%	50,035	50,905	0.00%	-	50,905	100.00%
K	Measurement Regulation & Control	Elevation and Barometric Pressure	12.83%	194,497	197,879	0.00%	-	197,879	100.00%
L	Measurement Regulation & Control	Fixed-Factor For Calculation of Z	-1.07%	-16,164	-16,445	0.00%	-	(16,445)	100.00%
M	Measurement Regulation & Control	Positive Displacement Meter Accuracy	35.90%	544,219	553,681	0.07%	376	553,305	99.93%
N	Measurement Regulation & Control	Orifice Meter Accuracy	-1.72%	-26,052	-26,505	57.55%	(15,255)	(11,250)	42.45%
O	Measurement Regulation & Control	Ultrasonic Meter Accuracy	33.58%	509,059	517,910	44.83%	232,171	285,739	55.17%
P	Measurement Regulation & Control	Turbine Meter Accuracy	-4.83%	-73,178	-74,450	96.69%	(71,985)	(2,465)	3.31%
Q	Measurement Regulation & Control	Instrument Calibration Bias	-0.75%	-11,325	-11,522	89.04%	(10,260)	(1,262)	10.96%
R	Measurement Regulation & Control	Ambient Temperature Effect on Instrumentation	0.00%	0	0	0.00%	-	-	
S	Measurement Regulation & Control	Chart Integration Bias	0.00%	0	0	0.00%	-	-	
T	Distribution Pipeline	Distribution Leakage	6.55%	99,378	101,106	23.52%	23,780	77,326	76.48%
U	Transmission Pipeline	Transmission Leakage	0.19%	2,948	2,999	59.45%	1,783	1,216	40.55%
V	Accounting	Theft	3.57%	54,134	55,075	25.72%	14,168	40,908	74.28%
W	NA	Non-Study Components	19.92%	301,947	307,197	59.45%	182,629	124,569	40.55%
	Total		**100.00%**	**1,516,111**	**1,542,472**	**23.29%**	**359,235**	**1,183,237**	**76.71%**

2006 Total Gas Delivered MCF:	**119,689,634**
2006 LUAF % of Total Gas Delivered:	**1.2667%**
2006 Total LUAF MCF:	**1,516,111**
2006 Total MMBtus Delivered:	**121,770,685**
2006 Total MMBtu LUAF:	**1,542,472**
2006 System Average BTU Factor:	**1.017**

LUAF Factor Total	LUAF Factor NC	LUAF Factor Core
1.27%	0.30%	0.97%
Allocation	**Allocation NC**	**Allocation Core**
100%	23.29%	76.71%

ANALYTICAL APPROACH:

SoCalGas' Gas Engineering Department formulated year 2006 LUAF gas components for both SoCalGas and SDG&E by employing the methods and assessment mechanics from SoCalGas' 1991 study entitled: "A Study of the 1991 Unaccounted For Gas Volume At the Southern California Gas Company". This comprehensive 1991 Study, which provided the framework for SoCalGas' LUAF gas component and customer assignment, was conducted over a two-year period. The study incorporated detailed testing, sampling and inspection of many of SoCalGas' metering, billing and accounting systems in 1990 and 1991. Gas Engineering personnel reviewed the base calculations and assumptions contained in the 1991 Report and modified/updated relevant calculations with year 2006 data sets to arrive at 2006 component allocations. The results are summarized in Table 1 for SoCalGas and Table 2 for SDG&E. An overview of the approach used to develop these numbers is discussed in this report under the Results and LUAF Gas Component Assignment Overview section. The specific methods, factors and calculations used to arrive at the figures in these tables are described in greater detail in Appendices A through W. These identifying Appendix letters are mapped to the specific Line Item designations A through W in the left columns of Tables 1 and 2.

Key base-data changes from 1991 to 2006 which influenced results included the new type of meters used to serve large customers and to receive gas supplies into the system, the change in families of small meters used by SoCalGas, the location of customers and growth in the Inland areas of the service territory, and temperature differences between the analysis years.

There is no companion study of SDG&E's LUAF gas which matches the SoCalGas 1991 study in detail and scope. As such, SDG&E's LUAF gas allocations for year 2006 constitute a derivative of SoCalGas' study results, with allowances incorporated when known dissimilar utilities practices, employed technologies, or other differences, warrant acknowledgement.

The 1991 Study identified four major contributors to SoCalGas' LUAF gas. The four major contributors were:

- Accounting
- Measurement
- Leakage
- Theft

Within these four major contributory areas, 23 sub-components were identified. These sub-component LUAF gas contributors have been reviewed for changes from 1991 to 2006 in operational practices, technologies, weather and other considerations. Some sub-component derivations are still relevant today and required no alteration while others have been updated or eliminated completely. In many instances, updated calculations to reflect differences between 1991 and 2006 data were performed to arrive at the 2006 LUAF gas components for each company.

RESULTS AND LUAF GAS COMPONENT ASSIGNMENT OVERVIEW:

Tables 1 and 2 provide a summary of specific LUAF gas components and their apportionment to the core or non-core customer classes. Each line item (A through W) constitutes one of the 23 sub-components calculated in the 1991 report, which has been updated with 2006 data where applicable. A summary of each sub-component and a brief description of the rationale and methodology applied to each 1991 line item to arrive at each 2006 updated LUAF gas result and customer class allocation follows:

Accounting:

A) ***Cycle Billing Adjustments* –** This component has been removed from the LUAF gas calculation due to the fact that SoCalGas and SDG&E have controlled/adjusted for this effect by incorporating an unbilled revenue calculation several years ago.

B) ***Company - Use Gas* –** This is gas used by the utilities to support operations which are not metered directly or otherwise not included in operational engineering calculations. These are very nominal volumes involving gas used for operating valves, controllers, gas measuring instruments, equipment start-up and small gas purging operations.
Appendix B shows the line item contributors to this use category.

SoCalGas percent of LUAF:	0.50%,	MMBtus:	36,176
SDG&E percent of LUAF:	0.20%,	MMBtus:	1,827

Computed SoCalGas customer allocation is 62.9% to non-core and 37.1% to core. SDG&E's allocation is 59.5% to non-core and a 40.5% to core. This gas use is shared by customers based on the ratio of their aggregate class use to total system deliveries.

C) ***Bypass* –** This is gas which bypasses meters under normal operations (e.g., testing change-outs and other related operations) where the affected gas volumes necessarily cannot be metered. This gas is no longer unreported and unaccounted-for. Estimates of bypass gas volume are placed on work orders. The totals from these forms are included in Company-Use Fuel ledgers.

D) ***Slow Meters* –** The SoCalGas year 2006 volume is based on 180,000+ small meter in-testing results and detailed testing performed on small diaphragm meters as part of the 1991 LUAF study. This sub-component represents gas delivery which did not get billed as a result of: a) meters operating at times in slow flow ranges as a function of their design and/or as observed in empirical testing and b) meters which are removed from service, tested and confirmed as operating slow, but which do not reach the procedural threshold requiring a billing adjustment. It includes only slow meters removed from service. Known meter families which run slow but which remain in service are covered under Line item *"M" – Positive Displacement Meter Accuracy*. This statistically negligible Slow Meter component has shown virtually insignificant change since the 1991 Study. Slow meter-associated LUAF gas was calculated for SDG&E by applying SoCalGas' meter testing results to SDG&E's similar family in-service meter populations.

SoCalGas percent of LUAF:	<0.00%,	MMBtus:	312
SDG&E percent of LUAF:	<0.00%,	MMBtus:	38

Allocation for this slow meter volume is 100% to the core market for both utilities. Slow meter considerations affecting larger meter technologies serving non-core customers are covered under other specific metering categories in this report.

E) Did Not Register (DR) Meters – The SoCalGas 2006 volume is based on actual 2006 customer billing adjustments associated with small meters which failed and required replacement. This sub-component has shown insignificant change at SoCalGas since 1991. DR meter LUAF gas was calculated for SDG&E based on SoCalGas' proportion of LUAF gas for the same meter categories.

SoCalGas percent of LUAF:	0.05%,	MMBtus:	3,353
SDG&E percent of LUAF:	0.03%,	MMBtus:	410

Assignment is 100% to core customers for this component, as any required DR meter adjustments affecting non-core customers are performed directly for each non-core meter site.

F) Authorized No-Close Policy – The 2006 SoCalGas allocation is based on 2006 recorded data from SoCalGas' billing system and has shown significant change since the 1991 study due to residential customer growth and expansion of the no-close process. The policy was merely a pilot study in 1991. This 2006 component was calculated by taking the aggregate of initial meter reads when a new customer moves into a location and subtracting the final meter reads associated with the previous customer's usage. The results of these calculations are shown below.

SoCalGas percent of LUAF:	6.77%,	MMBtus:	492,115
SDG&E percent of LUAF:	3.92%,	MMBtus:	60,400

No close policy LUAF gas is assigned fully to core customers, as they are the customer group for which this practice is authorized.

G) ***Other Estimated* –** This is no longer a calculated LUAF gas sub-component. The 2006 allocation is zero for both companies.

H) ***Other Actual* –** This is no longer a LUAF gas sub-component due to changes in measuring, estimating and accounting practices. The 2006 allocation is zero for both companies.

Measurement:

I) ***Fixed-Factor Temperature* –** This component represents the over-registration of small gas meters without gas temperature correction. In 2006, the net effect was to lower overall LUAF gas. Customer growth in the Inland area and warmer temperatures in year 2006 were the major causes which changed this number by 10% from 1991 levels for SoCalGas. SDG&E's component was apportioned based on relative numbers of meters which are subject to this phenomenon in comparable temperature zones.

SoCalGas percent of LUAF:	-21.83%,	MMBtus:	-1,587,947
SDG&E percent of LUAF:	-11.62%,	MMBtus:	-179,281

This entire component is assigned to core customers. Non-Core customers' meters ordinarily have compensation for both flowing gas pressure and temperature.

J) ***Fixed-Factor Pressure –*** This component represents under-billing which occurs due to gas regulation pressure upstream of meters being higher than the as-billed pressure. Based on the results of regulator inspections in 2006, the average fixed factor pressure customer still experiences this slight under-registration.

SoCalGas percent of LUAF:	4.43%,	MMBtus:	322,501
SDG&E percent of LUAF:	3.30%,	MMBtus:	50,905

This component is assigned 100% to core customers as non-core customers have electronic devices which measure and compensate for meter pressure (see Line Item *"Q"* - *Instrument Calibration Bias* discussion below.)

K) ***Elevation and Barometric Pressure –*** Elevation-based LUAF gas results from the elevation where customers actually are served, in the aggregate, being slightly different than the mean altitude assumed in their billing "altitude zone"- used for billing standard pressure customers or "elevation zone"- used for above standard pressure customers. When the aggregate of customers within a zone are situated at an altitude below the mean elevation of that zone used for barometric pressure billing correction, customers on average are under-billed. When they reside above the elevation zone median, their delivered gas pressure is slightly less than assumed, and thus a slight over-registration occurs.

An analysis of each of SoCalGas elevation and altitude zone was performed in 1991. The results showed that customers were on-average situated slightly below their zone mean resulting in higher delivery pressure (and barometric pressure) than employed in billing calculations. SoCalGas 2006 data for this component was calculated by applying updated meter and load information for each of eight standard pressure Altitude Zones (1000' increments) where statistical determination of customer elevation was performed in 1991. This result was applied to standard pressure customer volumes to compute a 2006 result. A similar analysis was performed for above standard pressure customers by updating information for each of 16 "elevation zones" (400' increments). The contributions to LUAF gas for this phenomenon in 2006 were as follows:

SoCalGas percent of LUAF:	17.10%,	MMBtus:	1,243,910
SDG&E percent of LUAF:	12.83%,	MMBtus:	197,879

SDG&E LUAF contribution was computed by applying SoCalGas altitude zone elevation biases for comparable SDG&E geographic areas. This gas LUAF component is assigned 100% to the core market, as non-core accounts are assigned a barometric read which is site specific, or the pressure at the metering site is an absolute reading from an electronic transmitter registering in units of absolute pressure.

***L) Fixed-Factor For Calculation of Z* –** Bias associated with the fixed factor calculation of super-compressibility changed from 1991, as the temperature associated with the delivery of gas to this class of customers was slightly different. This calculated bias occurs because the assumed system temperature used for the small customer super-compressibility calculation is 60 degrees Fahrenheit while the actual average gas temperature is approximately 64 degrees Fahrenheit for affected meter sets. This resulted in some minor over-registration of gas flows. SDG&E's LUAF gas was calculated using the same method, using a gas temperature of 62.7 degrees F and applying the results to fixed temperature SDG&E customer volumes. The resulting LUAF gas reductions are as follows:

SoCalGas percent of LUAF:	-0.64%,	MMBtus:	-46,371
SDG&E percent of LUAF:	-1.07%,	MMBtus:	-16,445

This component is allocated 100% to core customers, as non-core customer's super-compressibility and volumes are computed using the measured flowing gas temperature at the meter site.

M) ***Positive Displacement Meter Accuracy*** **–** This LUAF gas component reflects the impact of small meter families which have been shown to run slow, but which remain in service as they are not outside of SoCalGas and SDG&E's, CPUC-approved, Meter Performance Control Program criteria for replacement. The LUAF contributions are based on the in-testing of 180,000 meters and applying the results to both SoCalGas and SDG&E in-service meter families in order to statistically compute the system-wide impact of slow meters. Testing of meter performance at different flow rates and matching of registration biases with customer use profiles was also used to determine this LUAF contribution. Since the 1991 study, many slow meter families have been taken out of service resulting in a reduction in LUAF gas for this sub-component.

SoCalGas percent of LUAF:	31.84%,	MMBtus:	2,315,574
SDG&E percent of LUAF:	35.90%,	MMBtus:	553,681

This component is assigned 100% to core customers, since those customers are affected exclusively by the Meter Performance Control Program.

N) ***Orifice Meter Accuracy*** **–** There has been a migration of some SoCalGas retail and receipt-point orifice meters to ultrasonic meters since 1991. This includes the meters at the primary interconnection between SoCalGas and SDG&E at Rainbow. The net effect is a reduction in SoCalGas LUAF gas as a result of fewer "slow" orifice meters at retail delivery locations. SDG&E has a lesser percentage of retail deliveries through orifice meters compared to SoCalGas. SDG&E's largest orifice meter impact is from its gas receipt point at San Onofre. Slight under-measurement of this meter results in a favorable LUAF gas component for SDG&E.

SoCalGas percent of LUAF:	58.69%,	MMBtus:	4,268,399
SDG&E percent of LUAF:	-1.72%,	MMBtus:	-26,505

This component is assigned to both core and non-core customers based on volume weighted orifice-meter supplies and retail delivery meters considerations. All customer class' supplies are received by orifice meters, but only non-core customers are served by this metering technology.

O) ***Ultrasonic Meter Accuracy* –** SoCalGas' finding is that ultrasonic meters can exhibit a positive calibration shift over time and also can exhibit a bias from calibration factor parameters when operating with a single meter factor (and operating at lower than average flow rates.) Maintenance work and repair can also have an upward bias of such metering when probes are replaced in the field due to failure. SoCalGas has used its field findings to project minor upward bias on some of its ultrasonic meters. The associated 2006 LUAF gas impact are:

SoCalGas percent of LUAF:	-2.92%,	MMBtus:	-212,298
SDG&E percent of LUAF:	33.58%,	MMBtus:	517,910

The allocation of this component to customers is a volume-weighted calculation which takes into consideration that both core and non-core customers receive their gas into SoCalGas and SDG&E's transmission lines via ultrasonic meters, while all direct retail deliveries to customers via such meters are for non-core service only. The SoCalGas LUAF gas allocation is a 441,261 MMbtu credit to the non-core market and a 228,963 MMBtu LUAF gas contribution to the core market. The SDG&E LUAF gas allocations are 232,171 MMbtu to the non-core market and a 285,739 MMBtu to core customers.

P) ***Turbine Meter Accuracy* –** This component is based on the results of lab calibration tests for meters removed from service and includes field calibration (Aux) factor consideration, which places the lab calibration bias number in the field devices to provide true zero meter error upon installation. Overall these results show a slight over-registration effect for turbine meters in 2006. SDG&E's turbine meter-associated LUAF gas was based on similar results and also compensated for the fact that SDG&E does not include a meter aux factor in its field configuration.

SoCalGas percent of LUAF:	-11.32%,	MMBtus: -823,111
SDG&E percent of LUAF:	-4.83%,	MMBtus: -74,450

This component is assigned 97% to non- core customers for both utilities, based on the volume weighting of customers served by turbine meters.

Q) ***Instrument Calibration Bias*** **–** This component is calculated from actual field audits performed in 2006 (using "as-found" data from electronic instruments providing pressure and temperature correction for large customers) and now includes the sub-component *Ambient Temperature Effect on Instrumentation*.

SoCalGas percent of LUAF:	-3.72%,	MMBtus:	-261,961
SDG&E percent of LUAF:	-0.75%,	MMBtus:	-11,522

This component is assigned 99% to SoCalGas' non-core customers, based on the error type associated with the specific equipment in-service at the different customer classes and volume weighting the allocated bias effect. The allocation to SDG&E's non-core customers is 89% based on symmetric criteria.

R) ***Ambient Temperature Effect on Instrumentation*** **–** Ambient temperature effect is now included in the above referenced subcomponent "*Instrument Calibration Bias*".

S) ***Chart Integration Bias*** **–** Charts are an outdated technology and are no longer used for custody transfer billing. The 2006 LUAF gas component contribution is zero for both utilities.

Leakage:

T) ***Distribution Leakage –*** Year 2006 leakage data for mains and services was derived from 2006 mileage, pipe type and updated leak per mile factors for the associated pipe. SDG&E's pipeline leakage rate were computed in the same manner as SoCalGas', with SDG&E's miles of pipe used instead of SoCalGas. Details are provided in Appendix T/U.

SoCalGas percent of LUAF:	8.04%,	MMBtus: 584,817
SDG&E percent of LUAF:	6.55%,	MMBtus: 101,106

The allocation to customer class for both companies was computed based on the relative volume of gas used by core and non-core customers served off of the distribution system. The allocation for distribution leakage is 76% core and 24% non-core for both utilities.

U) ***Transmission Leakage –*** SoCalGas 2006 LUAF gas attributable to this component was derived by adjusting transmission pipeline mileages between 1991 and 2006 and applying the 1991 per mile leak rate. Leakage for compressor stations was computed by using 1991 Mcf/hour leak factors for each compressor station with actual 2006 operational hours used as the multiplier. SDG&E's 2006 LUAF gas for this component was computed using SDG&E's pipeline mileage and comparable-type SoCalGas leak factors for pipeline contribution. Comparable SoCalGas compressor leakage rates and SDG&E's actual operating hours were used to compute SDG&E's compressor station contributions.

SoCalGas percent of LUAF:	0.42%,	MMBtus:	30,698
SDG&E percent of LUAF:	0.19%,	MMBtus:	2,999

Transmission pipelines and compressors serve all customers; as such gas LUAF gas component allocations are based on customer class percentage of total gas deliveries. The results are: SDG&E: non-core 59% and core 41%; SoCalGas: non-core 63% and core 37%.

Theft:

V) ***Theft*** **–** Two calculation methods were used in the 1991 study and the method with the larger amount of LUAF gas was chosen for the analysis in that era. After updating these calculations for customer growth and other factors in 2006, an average of the two calculation methods (entailing percentage of customers who steal gas and the average amount per episode) was used for this revision, resulting in a slight decrease in the percentage of this sub-component. Theft component LUAF contribution was calculated for SDG&E by applying SoCalGas' customer behavior findings/results to SDG&E customer meter counts.

SoCalGas percent of LUAF:	5.64%,	MMBtus:	409,872
SDG&E percent of LUAF:	3.57%,	MMBtus:	55,075

Theft-related LUAF gas allocation was allocated to core and non-core customers based on residential/non-residential end use designation use in the theft calculations. Residential theft was assigned to core while non-residential theft was assigned to non-core for both Companies. The results are: SoCalGas: non-core 32%, core 68%; and SDG&E: non-core 26%, core 74%.

Non-Study Components:

W) ***Non-Study Components*** **–** This category represents the remainder of LUAF gas for each utility which has not been specifically assigned to a known LUAF gas contribution area. It represents those contributions which might be assignable in any of the other areas, but for which more study would be required to provide such definitive allocations. These numbers also represent the practical limits of certainty for each of the utilities' LUAF gas analyses.

SoCalGas percent of LUAF:	6.95%,	MMBtus:	505,303
SDG&E percent of LUAF:	19.92%,	MMBtus:	307,197

Non-study components were assigned to customer class based on aggregate customer class energy use in 2006.

CONCLUSIONS:

SoCalGas' 2006 LUAF gas was 7,273,043 MMBtu, representing 0.73% of all system deliveries; while SDG&E's 2006 LUAF gas was 1,542,472 MMBtu, constituting 1.27% of all system deliveries. Assignment of these LUAF gas figures to customer class, based on the volume-weighted results of all sub-component allocations, is as follows:

Description	SoCalGas	SDG&E:
2006 LUAF MMBtu	7,273,043	1,542,472
Core Allocation MMBtu	5,170,794	1,183,237
Non-Core Allocation MMbtu	2,102,249	359,235
Core Allocation%	71.1%	76.7%
Non-Core Allocation%	28.9%	23.3%

APPENDIX A

Cycle Billing Adjustments

Cycle billing adjustment was historically used to refine the formal annual LUAF number for end of year and beginning of year meter reads. This component has been removed from the LUAF gas calculation due to the fact that SoCalGas and SDG&E controlled/adjusted for this effect by incorporating an unbilled revenue calculation into the reported LUAF numbers several years ago. It is integral to the reported number.

APPENDIX B

Company Use Gas

Company use gas LUAF contribution is associated with gas which is used in operations but not sufficiently large enough to report on special accounting forms. Volume II (Accounting-P.43) of the 1991 LUAF study discusses the SoCalGas Company Use gas LUAF contribution of 61,928 Mcf in that year and the method employed to arrive at this figure. The base methodology for calculating Company Use gas LUAF in 2006 remained unchanged for 2006, although several technology changes from 1991 to 2006 did impact this figure favorably. High-bleed gas quality measurement devices have been replaced by gas chromatographs. Turbine start figures have been reduced substantially as gas used for such purposes is now measured for most of the two companies' gas turbine-driven compressors. Tables B-1 and B-2 show the data sets and calculation results for this gas LUAF component in 2006 for SoCalGas (35,065 Mcf : 36,176 MMBtu) and SDGE (3,021 Mcf : 3,074 MMBtu), respectively.

Table B-1

SoCalGas

Item	Unit#	cf/day	Mcf/yr	MMbtu	Notes
pnuematic controls-trans			22,129	22,830	91 study numbers unaltered
pnuematic controls-dist			5,909	6,096	91 study numbers unaltered
gas sampling-GCs	113	4	168	174	updated GC sampler number, 0.17 cf/hr/gc
gas sampling YZ samp	104	0	5	5	updated YZ number, 91 per sampler rate
facility blow and gas purge			3,314	3,418	30% of 91 numbers due to form capture of significant blows
drip operations			1,240	1,279	91 unaltered
wet gas effect			2,300	2,373	91 unaltered
turbine starts			-	-	all metered except Kelso unaltered
Totals			**35,065**	**36,176**	

SoCalGas Allocation to non-core	**37.10%**		**13,009.1**	**13,421.2**
SoCalGas Allocation to core	**62.90%**		**22,055.9**	**22,754.6**

Table B-2

SDGE

Item	Unit#	cf/day	Mcf/yr	MMbtu	Notes
pnuematic controls-trans			1,353	1,376	91 scg*sdge trans mi/Socalgas trans mi
pnuematic controls-dist			1,036	1,054	91 study numbers*sdge dist mi/socalgas dist mi
gas sampling-GCs	2	4	3	3	updated CG sampler number, 0.17cf/hr/gc
gas sampling YZ samp	4	0	0	0	updated YZ number, 91 per sampler rate
facility blow and gas purge			412	420	2006 SCG Number*sendout ratio SDGE/SCG
drip operations			76	77	91 SCG total * ratio transmission line mileage
wet gas effect			141	143	91 SCG total * ratio transmission line mileage
turbine starts			-	-	Moreno turbines start fuel metered
Totals			**3,021**	**3,073**	

SDGE Allocation to Core	**40.55%**		**1,224.9**	**1,264.1**
SDGE Allocation to non-Core	**59.45%**		**1,795.8**	**1,853.3**

Allocation to customer class for each company is based on 2006 relative delivered energy to core and non-core customers.

APPENDIX C
Bypass Gas LUAF

Bypass gas contribution to gas LUAF, as reported in 1991, is now fully reported and accounted for in Company Use gas for 2006. As a result, it is no longer a LUAF component for SoCalGas. It is similarly not a LUAF component for SDG&E in 2006.

APPENDIX D

Slow Meter Gas LUAF

Slow Meter gas LUAF contribution is associated with gas meters which have been in-tested (after removal from a customers premise, approximately 180,000 per year) and found to be operating slow, but which are below the threshold for SoCalGas/SDGE to provide the customers billing adjustments.

Volume II (Accounting-P.69) of the 1991 LUAF study discusses the Slow Meter gas LUAF contribution of 246 Mcf in that year. Accounting processes for calculating Bypass gas LUAF in 2006 remained unchanged. The value is simply the summation of all identified slow meters which were not re-billed as-compiled in CIS report E12P02-3 LUAF. The 2006 value, shown below in Table D-1 is 302.3 Mcf. SDG&E slow meter data was calculated using SoCalGas LUAF and multiplying by the ratio of contributing meter types/sizes between the two companies. The SDGE contribution is 38 Mcf.

Table D-1

Slow Meter Allowance

302.3 MCF/Year for 2006

Source

System Report: E12P02-3 Allowances Report

Definition

Slow meter volumes not billed

Explanation

This report identified slow meter volumes marked as too small to rebill.

A residential meter that is less than 25% slow
or when the calculated unregistered
volume
is 25 ccf or less is not rebilled

A non-residential meter that is less than 2% slow
or when the calculated unregistered
volume
is 25 ccf or less is not rebilled

As-found slow meters which do not trigger billing adjustments are generally limited to small volume use meters and customers. Therefore this component is assigned 100% to core customers for both Companies.

APPENDIX E

DR Meter Gas LUAF

DR Meter gas LUAF contribution is associated with gas meters serving customers which do not register and are removed, but for which estimated volumes are not fully billed to customers due to billing procedural requirements - estimated quantity less than 25 ccf.

The 1991 LUAF study discusses the DR gas LUAF contribution of 5,008 Mcf in that year. Accounting processes for calculating DR Meter gas LUAF gas LUAF in 2006 remained unchanged at SoCalGas. The DR Meter 2006 gas LUAF component is the summation of all DR gas estimates as-compiled in CIS report E12P02-3 LUAF. Table E-1 below, and excerpt from this report, shows this value to be 3,250 Mcf (3,353 MMBtu).

E-1

Unbilled DR Meter Volumes		
	3250 MCF/Year for 2006	
Source		
	System Report: E12P02-3 Allowances Report DW Query of Meter Changes for reason DR	
Definition		
	Volumes not billed for meters that stopped registering usage	
Explanation		
	When the calculated unregistered volume is 25 ccf or less, it is not rebilled	
Calculation		
Total No. of DR Txns Billed	11739	CIS report e12P02-3
Average Billed Txn/Meter	2.75	Estimated
No. of Meters Billed	4269	(1) ÷ (2)
Total No of DR meters	6869	Per DW Query
No of DR Meters Not Billed	2600	(4) - (5)
Usage per meter not billed	12.5	Midpoint between 0-25 based on 25 ccf threshold for rebilling
Total Usage not billed	32500	(5) - (6)
Usage in MCF	3250	(7) ÷ 10

SDG&E DR meter data was calculated using SoCalGas LUAF and multiplying by the ratio of contributing meter types/sizes between the two companies. The 2006 SDGE gas LUAF contribution associated with DR meters was 403 Mcf (410 MMBtu).

DR Meter gas LUAF is allocated 100% to core customers, as non-core customers DR meters are identified and fully reconciled for billing purposes.

APPENDIX F
No-Close Policy gas LUAF

No Close gas LUAF contribution is associated with authorized procedures which allow both companies to leave gas service active when customers vacate a premise. The gas use (typically pilot lights) at a facility between the time a customer moves out and the subsequent occupant orders gas service is not billed to any customer. The result is a significant LUAF contribution attributable to this phenomenon. The total contribution for this Policy is calculated in SoCalGas' CIS report E12P02-5 LUAF to be 477,006 MCF (492,115 MMBtu). This policy was a partial year pilot program in 1991 and the LUAF contribution much lower in that year (3,479 Mcf).

Table F-1
Summary of CIS billing system No Close Meter Registration differentials.

LUAF Due to No Close Policy

477,005.7 MCF/Year for 2006

Source

System Report: E12P02-5 LUAF Report

Definition

Usage recorded by the meter at a vacant facility.

Explanation of Report Categories

Usage between the off date and hard meter close date is recorded as "Soft Close" LUAF

Usage resulting from a leak at the meter on a vacant facility is recorded as "Leakage on an Off Meter".

Usage between the off date for one customer and On date for another customer is recorded as "LUAF"

Usage between hard meter close date and new customer on date is recorded as "Unauthorized Usage no customer to bill"

SDG&E No Close Policy LUAF contribution data was calculated using SoCalGas LUAF volumes and multiplying by the ratio of contributing meter types/sizes between the two companies. The Soft close policy impacts are symmetric for the two companies. The SDGE contribution is 59,368 Mcf. Soft Close is allocated 100% to core customers as they are the class of customer for which this policy is authorized.

APPENDIX G

Other Estimated

This Component is no longer considered LUAF in 2006. Corrections made to customer bills are fully reconciled as company credit/debit on gas ledgers, regardless of time skew.

APPENDIX H

Other Actual Gas Usage

This Component is no longer characterized as gas LUAF; it is accounted for or otherwise estimated and represented as Company Use on gas ledgers.

APPENDIX I

Fixed-Factor Temperature Gas LUAF

Fixed Factor Temperature gas LUAF results when actual gas temperature at a customer meter is something other than 60 degrees F, the value upon which customers without temperature compensating meters are billed. In 2006 the average gas temperature at small customer meters was calculated on the SoCalGas to be 62.08 degrees, resulting in slight over-billing of small meter customers in the aggregate. The average at larger meters was 63.72. For SDG&E the temperatures for small meters averaged 61.5 degrees F, while larger fixed factor temperature meters averaged 62.79. Larger fixed factor meters, serving processes and production activity as opposed to domestic use, have less variation in delivered volumes between summer and winter than smaller meters. Their relative use does not drop off as much in summer, resulting in higher volume-weighted average gas temperatures.

Discussion:

The 2006 Fixed Factor Temperature LUAF contribution for SoCalGas employed the method presented in the following 1991 LUAF Measurement report Tables.

Fixed-Factor Temperature UAF at Small Meters	Table 3.1.1-2
Fixed-Factor Temperature UAF at Large Meters	Table 3.1.1-3

This method was updated with 2006 customer volume and zone gas temperature data. In the elements of Fixed-Factor Temperature at Small and Large Meters and Fixed-factor Pressure at Standard Delivery Pressure, it was determined that the methodology of 1991 was correct, but the conditions in 2006 had changed and warranted a verification that the Temperature and pressure findings were still applicable.

In regards to Fixed-factor temperature at Small and Large meters, there are now 3 Billing Zones instead of 6 Weather Zones as in 1991. The 2006 monthly volume for small and large meters for each Billing Zone and the average monthly ambient temperature for each Billing Zone were required to calculate the 2006 UAF for this element. The increase in 2006 vs. 1991 UAF (gain due to over-registration) for Fixed Factor temperature was due to an increase in the average gas temperature. The gas temperature increased from 60.6 in 1991 to 62.8 degrees F for small meters in 2006. Table I-1 below shows the 2006 volume weighted temperature calculation for each billing zone.

Table I-1:
Fixed Factor Temperature Zone data (small meters core size 1-3)

Months 2006 Size 1-3 Meters	Zone 1 Monthly Temp Basin	Zone 2 Monthly Temp Foothill/Central	Zone 3 Monthly Temp Mountain	Zone 1 Monthly Volume (MCF)	Zone 2 Monthly Volume (MCF)	Zone 3 Monthly Volume (MCF)
January	57.13	50.85	37.88	28,607,140	3,113,444	235,179
February	58.98	53.05	39.44	24,775,664	2,638,099	209,398
March	54.48	51.07	35.13	28,292,914	2,805,513	238,889
April	60.21	58.28	44.51	19,738,166	1,819,751	201,971
May	67.25	68.47	53.35	14,194,073	1,103,071	84,143
June	74.51	75.84	63.79	11,894,148	880,932	50,682
July	80.47	81.7	69.45	10,135,585	799,517	40,851
August	75.47	75.83	65.23	10,017,561	790,645	38,691
September	73.79	72.21	60.22	10,906,293	888,200	49,165
October	67.07	62.88	50.04	12,337,124	1,078,415	87,069
November	64.39	57.35	46.42	16,632,589	1,778,166	131,505
December	56.85	49.18	37.35	28,133,204	3,250,625	233,971
Total Mcf each Zone				**215,664,461**	**20,946,378**	**1,601,514**
Volume weighted average zone temp (degrees F)	**62.78**	**57.71**	**43.58**			
Total Volumes (Mcf) of all Zones:						**238,212,353**
# of Meters per Zone				4,932,677	450,557	25,411
weighted gas temperature	62.08					

Table I-2 shows the resulting 2006 reduction to LUAF based on this zone deviation in gas temperature from 60 degrees F. This value is -951,824 Mcf (LUAF reduction).

Table I-2

Size 1-3 Meters

Months 2006	Zone 1 Monthly UAF %	Zone 2 Monthly UAF %	Zone 3 Monthly UAF %	Zone 1 Monthly UAF Volume (MCF)	Zone 2 Monthly UAF Volume (MCF)	Zone 3 Monthly UAF Volume (MCF)
January	0.555%	1.792%	4.446%	158867	55802	10456
February	0.197%	1.356%	4.119%	48725	35760	8626
March	1.074%	1.748%	5.026%	303757	49053	12007
April	-0.040%	0.332%	3.072%	-7973	6043	6205
May	-1.376%	-1.604%	1.296%	-195299	-17690	1091
June	-2.716%	-2.958%	-0.724%	-323082	-26057	-367
July	-3.790%	-4.008%	-1.786%	-384114	-32047	-730
August	-2.891%	-2.956%	-0.996%	-289591	-23372	-386
September	-2.585%	-2.296%	-0.042%	-281929	-20390	-21
October	-1.342%	-0.551%	1.954%	-165591	-5944	1701
November	-0.838%	0.513%	2.683%	-139330	9114	3529
December	0.610%	2.126%	4.557%	171570	69120	10662
Summary	-0.512%	0.475%	3.295%	-1,103,989	99,391	52,774
Weighted LUAF contribution for all zones-small meters			**0.40**	**TOTAL Small Meter LUAF Zones 1-3 (Mcf**		**-951,824**

Table I-3 shows temperature data for large core meter (size 4 meters and larger). These meters have a different geographic distribution and customer use profile which results in a 2006 average gas temperature of 63.72 degrees F.

Table I-3:
Fixed Factor Temperature gas LUAF (Large meters size core 4+)

2006 UAF Summary Fixed-Factor Temperature UAF at Large Meters

Months 2006 Size 4&up Meters	Zone 1 Monthly Temp Basin	Zone 2 Monthly Temp Foothill/Central	Zone 3 Monthly Temp Mountain	Zone 1 Monthly Volume (MCF)	Zone 2 Monthly Volume (MCF)	Zone 3 Monthly Volume (MCF)
January	57.13	50.85	37.88	8,217,370	760,380	18,108
February	58.98	53.05	39.44	7,522,001	685,267	17,453
March	54.48	51.07	35.13	8,103,237	698,356	19,082
April	60.21	58.28	44.51	6,788,903	518,655	15,975
May	67.25	68.47	53.35	5,828,766	408,145	9,444
June	74.51	75.84	63.79	5,147,656	400,502	7,106
July	80.47	81.7	69.45	4,636,873	402,008	6,415
August	75.47	75.83	65.23	4,626,831	399,785	6,484
September	73.79	72.21	60.22	4,961,077	416,496	7,476
October	67.07	62.88	50.04	5,437,476	445,523	9,201
November	64.39	57.35	46.42	6,338,021	552,429	11,847
December	56.85	49.18	37.35	8,066,697	800,781	18,701
Large Meter Zone totals (Mcf)				**75,674,908**	**6,488,327**	**147,292**
Volume weighted average Zone temp (degrees F)	**62.78**	**57.71**	**43.58**			

The associated gas LUAF gain for large meters, as shown in calculation summary Table I-4, is -587,368 Mcf.

Table I-4

Months 2006 Size 4&up Meters	Zone 1 Monthly UAF %	Zone 2 Monthly UAF %	Zone 3 Monthly UAF %	Zone 1 Monthly UAF Volume (MCF)	Zone 2 Monthly UAF Volume (MCF)	Zone 3 Monthly UAF Volume (MCF)
January	0.555%	1.792%	4.446%	45634	13628	805
February	0.197%	1.356%	4.119%	14793	9289	719
March	1.074%	1.748%	5.026%	86998	12210	959
April	-0.040%	0.332%	3.072%	-2742	1722	491
May	-1.376%	-1.604%	1.296%	-80199	-6546	122
June	-2.716%	-2.958%	-0.724%	-139826	-11847	-51
July	-3.790%	-4.008%	-1.786%	-175726	-16114	-115
August	-2.891%	-2.956%	-0.996%	-133754	-11818	-65
September	-2.585%	-2.296%	-0.042%	-128244	-9561	-3
October	-1.342%	-0.551%	1.954%	-72983	-2455	180
November	-0.838%	0.513%	2.683%	-53093	2831	318
December	0.610%	2.126%	4.557%	49195	17028	852
	-0.780%	-0.025%	2.860%	-589,948	-1,632	4,212
Summary	UAF% Zone 1	UAF% Zone 2	UAF% Zone 3	Zone 1 UAF	Zone 2 UAF	Zone 3 UAF

2006 UAF Fixed T Large	-587,368	**1991 UAF Fixed T Large**	**-1,470,933**
2006 Vol by Zone MCF	**82,310,527**	1991 Vol by Zone MCF	83,268,184
2006 UAF % by Zone	**-0.71%**	1991 UAF % by Zone	-1.77%
2006 Avg. T Large	**63.72 F**	1991 Avg. T Large	69.2 F

Total 2006 SoCalGas Fixed Factor Temperature gas LUAF reduction for both small and large core meters combined was 1,539,192 Mcf.

SDG&E:

SDG&E gas LUAF contribution associated with Fixed Factor Temperature phenomena was calculated by applying SoCalGas Temperature zone data to SDG&E deliveries by-month to SDGE zone volumes. The computed average temperature for SDGE small meters was 61.5 degrees F, while the computed average for large meters was 62.79 degrees F. Table I-5 shows the results of the volume and zone temperature weighted calculations.

Table I-5
SDG&E 2006 LUAF Fixed Factor Temperature Analysis – Average Gas Temperature Results.

Year 2006 SDG&E Avg T (degrees F)	64.54
Est. SDGE 2006 T vol wt Small Meters (deg F)	61.5
Est. SDGE % UAF Small Meter (1.5/520)	**-0.29%**
Est. SDGE 2006 T vol wt Large	62.79
Est. SDGE % UAF Large Meter (2.79/520)	**-0.53%**

Table I-6 below shows the calculated gas LUAF associated with fixed factor temperature billing phenomena for both small and larger meters. The associated volume weighted gas LUAF reduction is shown to be -83,731 for small meters and -92,486 for large core meters for a total LUAF reduction of 176,217 Mcf.

Table I-6

Fixed T Small Meters	**2006 Volume MCF**	**Fixed T Small UAF% SDGE 2006**	**SDG&E 2006 UAF Volume Mcf**
Small Diaphragm	28,709,290	-0.29%	-83,257
Small Diaphragm TG	163,518	-0.29%	-474
(Use SCG Small Meter UAF% Zone 2)			
Total Fixed T Small	28,872,808	-0.29%	-83,731
Fixed T Large Meters			
Large Diaphragm	3,441,982	-0.53%	-18,243
Rotary w/o TC	6,769,135	-0.53%	-35,876
Large Diaphragm TG	378,924	-0.53%	-2,008
Rotary TG w/o TC	5,789,354	-0.53%	-30,684
Turbine TG - no TC	1,070,770	-0.53%	-5,675
(Use SCG Large Meter UAF% Zone 2)			
Total Fixed T Large	17,450,165	-0.53%	-92,486
SDG&E UAF Fixed T 2006	46,322,973	**-0.38%**	**-176,217**

The allocation of Fixed Factor Temperature gas LUAF reduction is 100% to core customers for both SoCalGas and SDG&E, as non-core customers are equipped with temperature compensating metering devices.

APPENDIX J

Fixed Factor Pressure gas LUAF

The method for calculating LUAF contribution for this component was to apply measured 2006 regulator field pressure tests results and observed biases to fix-factor metered volumes for both SDGE and SoCalGas. These volumes were obtained from the CIS and CISCO billing systems. When the actual pressure delivered to a gas meter is higher than that assumed in fixed factor billing calculations, the associated gas meter under-registers by a small amount. In 2006, the net effect was to under-register by approximately 0.1%. This was due to average regulator standard pressure accounts being served at 8.51 inches water column while billing pressure was 8.0 inches. The results constitute an update of Table 3.1.2-1 in Volume III (Accounting-P.26) of the 1991 LUAF study. Fixed Factor Pressure gas LUAF contribution in that year was 271,007.

Year 2006 findings for small meter sets were based on 631 sampled regulators from a special field study and normal QC receiving inspection test results. Observed meter pressured biases were applied to associated customer volumes.

Table J-1 below shows the net Fixed Pressure gas LUAF contribution for SoCalGas to be 312,599 Mcf in 2006.

Table J-1

2006 UAF Summary SoCalGas Fixed-Factor Pressure for Standard Pressure and Temporary Gauge Meter Sets

Category	Avg Delivery Pressure (in. w.c.)	2006 Del Vol Sample TG Sets	2006 UAF Vol Sample Sets	Delivery Pressure Correction Factor	2006 System Delivery Volume (MCF)	2006 UAF Volume (MCF)
Small Meters 8" w.c.	*8.51	n/a	n/a	1.0012	237,276,951	290,892
Large Meters 8" w.c.	**8.40	n/a	n/a	1.0010	48,073,468	46,224
Temporary Gauge Sets	n/a	7,583,868	-13,600	0.9982	13,671,928	-24,518
2006 Totals				0.10%	299,022,347	**312,599**

SDG&E:
SDE&E Fixed Factor Pressure gas LUAF volumes were computed using SoCalGas and SDG&E regulator sampling results and applying them to SDG&E volumes subject to this phenomenon. The result is shown below in Table J-2 to be 50,035 Mcf.

Table J-2
2006 UAF Summary SDG&E Fixed-Factor Pressure for Standard Pressure and Temporary Gauge Meter Sets

SDG&E Fixed Factor Pressure	
SDG&E Volume Fixed Factor Pressure	50,035,048
Estimated SDG&E UAF% Fixed Factor Pressure	0.10%
SDG&E UAF MCF Fixed Factor Pressure	**50,035**

The allocation of Fixed Factor Pressure gas LUAF is 100% to core customers for both SoCalGas and SDG&E, as non-core customers are equipped with pressure measuring/compensating metering devices.

APPENDIX K

Elevation and Barometric Pressure gas LUAF

Elevation-based LUAF gas results from the elevation where customers actually are served, in the aggregate, being slightly different than the altitude assumed in their billing "altitude zone". When the aggregate of customers within a zone (@1000 ft or 400 foot increments) are situated at an altitude below the mean elevation of that zone (used for barometric pressure billing correction) customers on average are under-billed. When they reside above the elevation zone median, their delivered gas pressure is slightly less gas than assumed and thus a slight over-registration occurs. An analysis of each of SoCalGas elevation zone was performed in 1991 and discussed in Volume III (Measurement-P. 32) of the 1991 LUAF study. The associated LUAF results were contained in Tables 3.1.3-3 and 3.1.3-4 of that report. These results showed that customers were, on-average, situated slightly below their elevation zone mean resulting in higher delivery pressure than assumed.

SoCalGas 2006 data for this component was calculated by applying updated meter and load information for each Altitude Zone where statistical determination of customer elevation was performed in 1991. SoCalGas performed this update for both customers served at standard pressure and those served at above standard pressure but without site-specific barometric correction. The results are shown in Tables K-1 and K-2 for standard pressure and above standard pressure customers, respectively. Standard pressure customers are segregated into eight 1000 foot Altitude zone while above standard pressure customers are segregated into 16 zones of 400 foot increments.

Table K-1 shows the computed gas LUAF contribution of standard pressure meters to be 1,251,906 Mcf. There was a decrease in 2006 vs. 1991 UAF for Fixed Factor Elevation and Barometric Pressure due to a decrease in the volume delivered through both Standard Pressure and Above Standard Pressure meters using a fixed barometric pressure. More customers have electronic pressure correctors installed in 2006 than in 1991 and they also have site-specific barometric pressure data programmed into their correction device.

Table K-1
2006 UAF Summary Fixed-Factor Altitude Zone for Standard Pressure Meters

Altitude Zone	Feet Above Sea Level	No. Meters Per Zone	Recorded Volume (MCF) Per Zone	Assumed Altitude Factor For Zone	Apply 1991 Avg % UAF Per Meter In Zone	Total 2006 UAF Volume (MCF) Per Zone
A	Below 1000	4,301,206	184,783,983	1.000	0.52%	960877
B	1000 – 1999	899,042	41,606,532	0.968	0.73%	303728
C	2000 – 2999	164,668	8,334,536	0.935	-0.23%	-19169
D	3000 – 3999	11,402	600,500	0.903	0.17%	1021
E	4000 – 4999	12,453	685,266	0.871	-0.65%	-4454
F	5000 – 5999	12,678	843,134	0.841	0.00%	0
G	6000 – 6999	6,191	386,451	0.812	2.44%	9429
H	7000 – 7999	1,005	36,549	0.782	1.30%	475
	2006 Totals	5,408,645	237,276,951		0.53%	**1,251,906**
	1991 Totals	4,765,459	320,392,311			**1,695,949**

Table K-2 shows the 2006 gas LUAF contribution of above standard pressure meters as calculated by integrating the zone bias information from 1991 with 2006 customer data for the same regions. The result is a gas LUAF reduction of 46,188 Mcf for this set of customers. (They reside, in aggregate, above the mean elevation used for billing within their associated zone, resulting in measurement over-registration.)

Table K-2
2006 Fixed-Factor Elevation Zone LUAF for Above Standard Pressure Meters

Elevation Zone	Feet Above Sea Level	Std Barometric Pressure (psia)	No. Meters Per Zone	2006 Recorded Volume Per Zone (MCF)	Apply 1991 Avg % UAF Per Meter In Zone	Estimated 2006 UAF Volume Per Zone (MCF)
1	-200 to 199	14.73	6118	56,017,324	-0.07%	-39,212
2	200 to 599	14.53	4263	35,142,218	0.00%	0
3	600 to 999	14.32	2580	19,647,953	0.01%	1,965
4	1000 to 1399	14.12	1199	16,352,454	-0.02%	-3,270
5	1400 to 1799	13.92	478	3,787,988	0.03%	1,136
6	1800 to 2199	13.72	41	259,599	0.11%	286
7	2200 to 2599	13.53	216	1,218,916	-0.12%	-1,463
8	2600 to 2999	13.33	158	6,529,214	0.08%	5,223
9	3000 to 3399	13.14	22	2,514,964	-0.36%	-9,054
10	3400 to 3799	12.96	5	262,429	-0.14%	-367
11	3800 to 4199	13	20	153,441	-0.06%	-92
12	4200 to 4599	12.59	3	5,678	-0.52%	-30
13	4600 to 4999	12.41	6	7,202	-0.51%	-37
14	5000 to 5399	12.23	14	433,055	-0.29%	-1,256
15	5400 to 5799	12.06	3	3,196	0.12%	4
16	5800 to 6199	11.89	8	14,256	-0.15%	-21
17	6200 to 6599	11.72	0	0	0.00%	0
18	6600 to 6999	11.55	0	0	0.00%	0
19	7000 to 7399	11.39	0	0	0.00%	0
		2006 Totals	15,134	142,349,887	-0.03%	**-46,188**
		1991 Totals	15,279	413,752,364	-0.02%	-92,742

The total SoCalGas gas LUAF contribution associated with both standard and above standard pressure meters is 1,205,718 Mcf (1,243,910 MMBtu). Customer class allocation is 100% to core customers, as non-core customers have site-specific barometric pressure correction factors or absolute pressure data integrated into their electronic measurement computation processes, and thus have no part in this LUAF component.

SDG&E:
SDG&E LUAF contribution due to Elevation and Barometric Pressure measurement phenomena for both standard and above standard meters is shown in Table K-3 below to be 194,497 Mcf. This figure was calculated by applying SoCalGas' Altitude A and Elevation Zone 1 biases to SDG&E volumes in comparable geographic regions.

Table K-3

SDG&E Fixed Altitude Zone-standard pressure	
SDG&E Volume Fixed Altitude Zone (MCF)	39,207,013
Est. SDG&E UAF% Fixed Altitude Zone A (Below 1000 ft)	0.52%
SDG&E UAF MCF Fixed Altitude Zone	203,876
SDGE Fixed Factor Elevation Zone Above Standard Pressure	
SDGE Fixed Factor Elevation Zone Volume (MCF)	13,398,598
Est. SDGE UAF% Fixed Elevation Zone 1 (SDGE assumes Zone 1)	-0.07%
SDGE UAF MCF Fixed Elevation Zone 1	-9,379
Total SDGE UAF MCF Fixed Factor Altitude & Elevation Zone	**194,497**

The SDG&E Fixed Factor Elevation gas LUAF contribution customer allocation is 100% to core customers.

APPENDIX L

Fixed Factor Calculation of Super Compressibility

The 1991 Fixed Factor Calculation of Super Compressibility gas LUAF % is shown in 1991 LUAF Measurement report Table 3.1.4-2. SoCalGas' 2006 update to this Table, shown in Table L-1, incorporates a measured 2006 average gas temperature of 63.72 degrees F and a much smaller volume of customer volumes subject to this volume due to changes in employed measurement technology. Another source of improvement is better data used for N_2 and CO_2 factors for Super compressibility calculation. Electronic Correctors assumed 0% CO_2 and N_2 in 1991, while values closer to actual gas content in are now incorporated into billing processes.

Year 2006 LUAF% for Super compressibility bias was calculated and applied to the 2006 Volumes for the following two categories of meter sets where Super Compressibility is still calculated using fixed values for Temperature and Gas Quality: Temporary Gauge and Electronic Corrector-served customers. The total gas LUAF contribution related to Super compressibility factor bias is shown in Table L-1 to be a LUAF reduction of 44,947 Mcf (46,371 MMBtu).

The large decrease in 2006 vs. 1991 gas LUAF over-registration bias (425,932 vs. 44,947 Mcf) for Fixed Factor Calculation of Super Compressibility was attributable to SoCalGas' use of actual temperature, pressure and gas quality when calculating corrected volume starting in 1999 for all non-core meters sets except those with Temporary Gauges and Electronic Correctors. Thus, the volumes subject to super-compressibility calculation bias has decreased substantially.

Table L-1
SoCalGas Fixed Super Compressibility gas LUAF contribution

Fixed Super Calc Meter Sets	2006 Billing Volume (MCF)	2006 Calc'd %UAF	2006 UAF Volume (Fixed Factor Super Calc)
Temporary Gauges See Note 1	13,671,928	-0.04%	-4,785
Electronic Correctors See Note 2	22,311,895	-0.18%	-40,161
2006 Total (Actual T 2006 = 63.7) (Billing T 2006 = 60 F)	35,983,823	-0.12%	**-44,947**
1991 Totals	159,387,774	-0.27%	**-425,932**

Note 1: Temporary Gauges Billing & Actual Assume SG=0.5918; N_2=1.592;CO_2=1.507
Note 2: Electronic Correctors Billing Assumes SG=0.6 and N_2=CO_2=0.0
Electronic Correctors Actual Assumes same values listed in Note 1.

SDG&E

SDG&E LUAF for this component was calculated by applying SoCalGas calculate bias to SDG&E volumes subject to the same measurement imperfections. The result, shown in Table L-2, is a gas LUAF reduction of -16,164 Mcf (16,445 MMBtu) for SDG&E in 2006.

Table L-2

SDG&E Fixed Factor Super Compressibility	
SDG&E Volume Fixed Factor Super Compressibility	13,469,812
Estimated SDG&E UAF% Fixed Factor Super	-0.12%
SDG&E UAF MCF Fixed Factor Super Compressibility	**-16,164**

The allocation of Fixed Factor Super compressibility gas LUAF is 100% to core customers for both SoCalGas and SDG&E, as non-core customers are equipped with gas quality and temperature devices used to calculate real-time compressibility factors.

APPENDIX M

2006 UAF Estimate in Reference to 1991 Assessment
PD Meter Accuracy

I. Introduction

PD Meter is the abbreviation for Positive Displacement Meter. A PD gas meter is a diaphragm-operated or rotary device that is designed to measure a specific volume of gas in one cycle. These finite volumes are counted and displayed on the meter's index dials or counters.

PD meters are classified by three major meter groups:
1. Small diaphragm meters (up to 500 CFH or Sizes 1, 2 and 3).
2. Large diaphragm meters (500 CFH or larger, Size 4 and larger).
3. Rotary meters.

The meter accuracy, either under or over volume registration, of all 5.4 million PD meters collectively contributed a significant amount of LUAF in 2006.

II. PD Meter Accuracy

The accuracy profile is a function of the flow rate. To assess the consumption behavior of small meter accounts, SoCalGas conducted an extensive study in 1991 to identify the gas consumption volume at various flow rates for Company six weather zones. The small meter accuracy curves were also developed for a few meter types by using eight flow rates. The LUAF was derived from the integration of these two sets of data. Another LUAF contributor – no registration at low flow, was also quantified for small diaphragm meters.

At the same time, the LUAF from the large PD and rotary meters was calculated from 1991 PMC results. Volume III (Accounting-P.59) of the 1991 LUAF study discusses the PD Meter gas LUAF contribution of 2,957,299 Mcf in that year.

III. 2006 Method for SoCalGas LUAF

The 1991 LUAF study was a major company wide effort in SoCalGas and took two years to complete. It laid out a format that was used for 2006 assessment. A benefit from adopting the 1991 format was that many studies completed for the 1991 LUAF assessment were still valid for 2006. The parameters developed and used in 1991 were used in 2006. Only certain major factors had to be updated with 2006 data. The following 1991 parameters were adopted for 2006:

1. The consumption volume % vs. flow rates was unchanged.
2. The accuracy curve for various flow rates was true because the PD meter technology had not changed since 1991.
3. The no registration at low flow was true because of the same reason as (2).

IV. 2006 Update for SoCalGas LUAF

Similar to the 1991 study, the LUAF contributed by PD meter accuracy was the sum of two parts:

1. Small meter low flow non-registration.
2. Meter accuracy calculated from the annual Meter Performance Control Program (MPCP) testing results.

To make the assessment comparable to the 1991 results, all PD meters, their annual volume delivery, and MPCP testing results were summarized by major PD meter types. Then, the same calculation routines used in 1991 were also applied to compute the associated 2006 LUAF volumes.

V. 2006 Results for SoCalGas

The 2006 LUAF contributed by PD meters is summarized in the following table.

Table M-1

Study Area	Core UAF (MCF)	Non-Core UAF (MCF)	All Accounts UAF (MCF)
Small Meter Accuracy	-202,179	-7	-202,187
Small Meter Low-Flow Non-Registration	2,596,677	4	2,596,681
Large Diaphragm Accuracy	921	1	922
Rotary meter Accuracy	-150,654	-283	-150,937
Total PD Meter UAF	**2,244,765**	**-286**	**2,244,479**

In 1991, the PD meter LUAF was 2,957,299 MCF. There was some reduction in 2006. It was due to the meter demographics changes that had occurred in the past 15 years. The following were observed in the data:

1. The tin meter population was reduced from 827,000 in 1991 to 132,000 in 2006. The tin meter was a positive LUAF contributor.
2. Aluminum meters had increased and become the dominant group in the past 15 years. The population had grown from 2.4 million in 1991 to 4.1 million in 2006. It was a negative LUAF contributor.
3. The large diaphragm meters were decreased and replaced by rotary meters in the last 15 years. The large diaphragm meters were positive LUAF contributors while rotaries were negative. However the LUAF of large PD meters was improved in 2006. It was due to two reasons:

(a) Better testing technologies and procedures were developed for rotary meters.
(b) Aluminum bodies replaced iron bodies for rotary meters. It improved the meter accuracy.

VI. 2006 LUAF Assessment for SDG&E

SDG&E has not assessed PD meter LUAF in the past. There is no format that can be adopted for 2006 update. To make a logical assessment, the SoCalGas framework was used for 2006. It is based on the following facts:

1. SDG&E uses the same meter technologies as SoCalGas.
2. Meters used by SDG&E have the same performance profile as SoCalGas'.
3. The consumption behavior of SDG&E's residential customers is the same as SoCalGas'.

Table M-2 below shows the results for SDG&E.

Table M-2

Study Area	Core UAF (MCF)	Non-Core UAF (MCF)	All Acounts UAF (MCF)
Small Meter Accuracy	53,388	0	53,388
Small Meter Low-Flow Non-Registration	371,438	0	371,438
Large Diaphragm Accuracy	19,883	0	19,883
Rotary meter Accuracy	99,140	370	99,510
Total PD Meter UAF	**543,849**	**370**	**544,219**

The allocation of PD Meter LUAF is virtually 100% to core customers for both SoCalGas and SDG&E based on the 2006 volumes passing though these meters to serve each customer type.

APPENDIX N

Orifice Meter Accuracy

Orifice meters are used for major customer deliveries, interstate supply, local gas production (supplies) and storage gas measurement. The 1991 LUAF study Measurement Volume discusses Orifice Meter Accuracy and its LUAF contribution of 5,849,534 Mcf in that year. The 1991 results are summarized in Table N-1 below.

Table N-1

Orifice Meter Category	1991 Volume	1991 UAF%	1991 UAF (Mcf)
Supplier	963,052,498	0.80%	7,704,420
Producer	95,527,528	0.30%	286,583
Delivery	364,526,676	-0.58%	-2,114,255
Storage Withdrawal	95,290,197	0.33%	314,458
Storage Injection	103,536,910	-0.33%	-341,672
1991 Totals	**1,621,933,809**	**0.36%**	**5,849,534**

In reviewing the 1991 UAF Study (Table 3.2.2-1 of the Measurement Report) it was determined that 1991 calculated gas LUAF contributions were no longer applicable and should be recalculated for Orifice Meter Accuracy. Year 2006 supplier and customer orifice meter volumes are 50% less than what they were in 1991. The reduced volume is now being measured by ultrasonic meters. In addition, 2 of the 5 sampled supplier orifice meter runs and 11 of the 15 sampled Customer orifice meter runs in the 1991 UAF Study have been removed from service. Moreover, SoCalGas testing on a removed 12" and 16" Customer Orifice Meter tube in 2006 confirmed that both meters runs under-measured by 0.8% and 0.3% respectively. 2006 Billing Volumes for Customer, Producer, Supplier and Storage Withdrawal and Injection Meters were obtained from MCS. The 2006 Orifice Meter test results were used to calculate an estimated average orifice meter error for the different categories of orifice meters. Table N-2 below shows the 2006 contribution to LUAF by meter use category.

Table N-2
2006 Meter Accuracy Contribution to Total Measurement UAF

Orifice Meter Category	2006 Volume	Meter Accuracy	UAF %	UAF Volume
Supplier	620,936,012	slow meter	0.62%	3,835,149
Producer	50,799,175	slow meter	-0.50%	-253,996
Delivery	115,607,670	slow meter	0.50%	578,038
Storage Withdrawal	90,112,226	slow meter	-0.50%	-450,561
Storage Injection	85,743,196	slow meter	0.50%	428,716
2006 Totals	963,198,279		0.43%	**4,137,346**

SDG&E:
SDG&E allocations are based on SoCalGas' test results and SDGE 2006 volumes by meter service. Table N-3 shows the summary of these calculations and the SDG&E gas LUAF contribution of -26,052 Mcf, a net reduction in LUAF for 2006.

Table N-3

SDG&E Orifice Meter Accuracy

SDG&E 2006 Orifice Meter Volume Supplier (UAF% = -0.5%)	5,453,992
SDG&E 2006 Orifice Meter Volume Customers (UAF% = +0.5%)	243,680
SDG&E 2006 UAF Volume (MCF) Suppliers	-27,270
SDG&E 2006 UAF Volume (MCF) Customers	1,218
SDG&E 2006 UAF Volume - Orifice Meter Accuracy	**-26,052**

The allocation of orifice meter gas LUAF to customer class was based on calculations which assigned supply volumes to core and non-core by aggregate use, while the Delivery/Customer volumes were assigned exclusively to non-core customers, the only customers served by orifice meters. The results are SoCalGas non-core - 69.9%, core 30.1%; SDG&E non-core - 57.6%, core 42.4%.

APPENDIX O

Ultrasonic Meter Accuracy

There were no Ultrasonic Meters installed in 1991. The computation of Ultrasonic meter gas LUAF contribution was completed using the gas LUAF% meter factors shown in Table O-1 below and applying these projected meter registration deviations to 2006 volumes for all company and supplier ultrasonic meters. The UAF% factors are based on test results and industry information on the types of meters used by SoCalGas and its suppliers. Table O-1 shows over-registration on both the supply and delivery side for SoCalGas, with the net effect a 205,780 Mcf reduction to LUAF on the SoCalGas system.

Table O-1

Ultrasonic Meter Category	2006 Volume	Meter Accuracy	UAF %	UAF Volume
Supplier (see below)	275,504,405	fast meter	0.22%	597,867
Delivery - Customer (see below)	225,360,905	fast meter	-0.36%	-803,861
Storage W/D Daniel Mtr PDR	3,270,934	fast meter	0.13%	4,252
Storage Injection Daniel Mtr PDR	3,106,221	fast meter	-0.13%	-4,038
2006 Totals	507,242,465		-0.04%	**-205,780**

SDG&E:
SDG&E Ultrasonic meter LUAF contribution is based on a SoCalGas test results, specific meter activity and SDGE 2006 volumes by meter service. Table O-2 shows the summary of these calculations and the SDG&E gas LUAF contribution of 509,059 Mcf in 2006.

Table O-2

SDG&E Ultrasonic Meter Data	
SDG&E 2006 Ultrasonic Meter Volume Supplier (Mcf)	113,952,358
SDG&E 2006 Ultrasonic Meter Volume Customer (Mcf)	30,351,489
SGG&E Ultrasonic Meter LUAF Contribution	
SDG&E 2006 UAF Volume (MCF) Suppliers (UAF% = +0.5%)	569,762
SDG&E 2006 UAF Volume (MCF) Customers (UAF% = -0.2%)	-60,703
SDG&E 2006 UAF Volume Contribution from Ultrasonic Meters-total	**509,059**

The 2006 allocation of ultrasonic meter gas LUAF to customer class is based on calculations which assigned supply volumes to core and non-core by aggregate use, while the Delivery/Customer volumes were assigned exclusively to non-core customers, the only customers served by ultrasonic meters. The results are SoCalGas - non-core - 441,216 MMBtu (credit) due to over registration, core - 228,963 MMBtu LUAF contribution. SDG&E non-core - 232,171 MMBtu, core 285,739, both LUAF contributions.

APPENDIX P

Turbine Meter Accuracy

Turbine meters are used by both companies to serve mainly non-core customers. Volume III (Accounting-P.99) of the 1991 LUAF study discusses Turbine Meter Accuracy and its LUAF contribution of -912,157 Mcf in that year. As in 1991, this gas LUAF component is based on the results of lab calibration tests for meters removed from service and includes field calibration (Aux factors) which now places the lab calibration bias number in the field devices to provide true zero meter registration upon installation. Table P-1 below shows the results of turbine meter tests in 2006 to average 0.39% over registration across the different types of meters. Overall these results show a slight increase from 1991.

Table P-1
2006 and 1991 LUAF factors for turbine meters from test data

SoCalGas Company	UAF Factor W/ Aux Factor	UAF Factor W/O Aux Factor	1991 Report	Diff
AAT-18	-0.15%	-0.10%	-0.10%	**0.05%**
AAT-30	-0.29%	-0.24%	-0.26%	**0.03%**
AAT-60	-0.11%	-0.36%	-0.44%	**-0.33%**
AAT-140	-0.69%	-0.27%	-0.45%	**0.24%**
Other Types	-0.39%	-0.40%	-0.41%	**-0.02%**
System UAF	**-0.39%**	**-0.40%**	**-0.34%**	**0.05%**

Table P-2 below shows the integration and application of individual turbine meter species' test results to the SoCalGas customer volumes associated with these meter types. The net result is a volume-weighted 0.28% over registration for all turbine meter volumes. This equates to 797,839 in over registration and associated reduction in LUAF.

Table P-2
2006 Gas LUAF for SoCalGas Turbine meters by type.

	2006 Sample Meters			Total 2006 System	
SoCalGas Sample Meter Volumes Meter Type	Recorded Volume (MSCF)	UAF Volume (MCF)	UAF Factor	Recorded Volume MSCF	UAF Volume (MSCF)
AAT-18	14,726,622	(22,515)	-0.15%	41,271,763	(63,100)
AAT-30	7,630,933	(21,877)	-0.29%	39,880,742	(114,335)
AAT-60	10,771,986	(11,639)	-0.11%	37,532,194	(40,554)
AAT-140	9,250,414	(63,970)	-0.69%	81,176,600	(561,367)
Other Types			-0.28%	6,600,752	(18,482)
Totals:	42,379,955	(120,002)		206,462,051	(797,839)
Average Sample UAF Factor =		-0.28%	Average System UAF Factor =		-0.39%
			1991 Average System UAF Factor =		-0.34%

SDG&E:
San Diego Gas & Electric's turbine meter associated LUAF was based on a similar methodology to SoCal Gas and also compensated for the fact that SDG&E does not include a meter aux factor in its field configuration. Table P-3 shows the result of 73,178 Mcf over-registration based on SDGE meter test results of 0.23% over-registration. This bias was applied to SDG&E 2006 turbine meter volumes.

Table P3

SDG&E Sample Meter Volumes	2006 Sample Meters Recorded Volume (MSCF)	2006 Sample Meters UAF Volume (MCF)	UAF Factor	Total 2006 System Recorded Volume MSCF	Total 2006 System UAF Volume (MSCF)
Totals:	42,403,990	(95,967)		32,334,490	(73,178)
Average Sample UAF Factor =		-0.23%	Average System UAF Factor =		-0.23%

The allocation of Turbine Meter gas LUAF is 97.33% to non-core for SoCalGas and 96.69% to non-core for SDG&E based on turbine meter volumes per core vs. non-core customers. Nearly all turbine meters serve non-core customers in both companies.

APPENDIX Q

Instrument Calibration Bias Gas LUAF Component

Electronic instruments are used on approximately 10,000 SoCalGas customer accounts to correct for temperature, pressure and/or gas quality. The calibration of these devices can shift between scheduled calibration periods. Instrument Calibration Bias gas LUAF contribution is calculated from actual field audits performed in 2006 (using “as-found” data) for customer, supplier and storage meters where electronic correction is performed, and now includes the sub-component Ambient Temperature Effect on Instrumentation.

Table Q-1 shows the result of SoCalGas’ calibration as-found results by major instrument type in 2006. This table also contains the volumes served by these instruments and the calculated contribution to LUAF in 2006. The SoCalGas total is -261,961 Mcf, a net LUAF reduction.

Table Q-1

Customer Other than orifice and ultrasonic:			error%
Temporary Gauges	15,486,336	-2,113	-0.01%
MINI-AT	82,152,739	99,424	0.12%
ECAT	42,501,793	-44,167	-0.10%
TOC	52,022,099	-9,403	-0.02%
OMNI	72,462,221	31,254	0.04%
Totalflow	58,766,964	-4,923	-0.01%
GM	2,700,154	-2,713	-0.10%
Subtotal	**326,092,307**	**67,359**	**0.03%**
Ultrasonic Meters			
Supplier	275,504,405	-118,828	-0.04%
Customer	225,360,904	97,200	0.04%
Subtotal	**500,865,309**	**-21,627**	**0.00%**
Orifice Meters			
Supplier	620,936,012	-335,325	-0.05%
Producer	50,799,175	-27,433	-0.05%
Customer	115,607,670	62,432	0.05%
Subtotal	**787,342,857**	**-300,326**	**-0.04%**
Ultrasonic Meters			
Injection	3,106,221	-1,340	-0.04%
Withdrawal/Injection	3,270,934	1,411	0.04%
Subtotal	**6,377,155**	**71**	**0.00%**

Orifice Meters				
Injection	85,743,196	-46,304		-0.05%
Withdrawal/Injection	90,112,226	38,866		0.05%
Subtotal	**175,855,422**	**-7,438**		**0.00%**
Total	**1,796,533,050**	**261,961**	**Wt Avg**	**0.015%**

The SoCalGas allocation is 99% to the non-core customer class based on weighted delivered volume considerations. Core allocation is 1%.

SDG&E:
SoCalGas' average recorded instrument error of 0.015% (over-registration) was applied to associated SDG&E customer and supply meters to compute the 2006 Instrument Bias gas LUAF component for SDG&E. There are many similar electronic instruments used between the companies. The results are shown in the Table Q-2 below to be an 11,325 Mcf reduction to gas LUAF. The allocation is 89% to the non-core customer class based on weighted volume considerations. Core allocation is 11%.

Table Q-2
SDGE instrument bias

SD Instrument Volumes

				Split	
Noncore		68,460,246	Noncore		89.04%
			Core		10.96%
Core	Rotary TG w/ TC	4,425,025	Total		
Core	Rotary w/Instrum	2,641,777			
Core	Rotary w/TC	286,606			
Core	Turbine	1,070,770			
			Groups with Instruments		76,884,424
Total		76,884,424	Core	Standard Groups	39,207,012
				Total MCF	116,091,437
Bias		-0.015%			
Error		(11,325)			
LUAF		**(11,325)**			

APPENDIX R
Ambient Temperature Effect on Instrumentation

Ambient Temperature Effect on Instrumentation – Ambient temperature effect is now included in the subcomponent "Instrument Calibration Bias" for both companies.

APPENDIX S
Chart Integration Bias

Measurement pen chart technology has been replaced by electronic measurement for both SoCalGas and SDG&E since 1991. There is no 2006 measurement component for either company.

APPENDIX T/U

Distribution and Transmission Leakage

This Appendix contains the results for both Distribution and Transmission gas LUAF leakage calculations for SoCalGas and SDG&E in 2006. This is leakage resulting from pipeline gas escape and gas blow-by events from gas compression operations which are otherwise neither metered nor form-reported for inclusion as "Company Use" in SDG&E's and SoCalGas' accounting systems.

Raw Data Sets for Distribution and Transmission and distribution pipeline leak contribution to gas LUAF are shown in Table T/U-1.

Table T/U-1

SoCalGas/SDG&E Base Leak data and volumetric LUAF contribution.

	DATA SETS			
Item	**Description**	**value**	**unit**	**DATA NOTES:**
A	SoCalGas Transmission Line Miles from 1991 LUAF report	4000	miles	report rounded to 4000
B	SoCalGas Transmission Line Miles from 2006 Annual Report to CPUC	3926	miles	
C	SoCalGas Distribution main miles 2006 Annual CPUC report	46711	miles	
D	SDGE Transmission Line Miles from 2006 Annual Report to CPUC	240	miles	
E	SDGE Distribution main miles 2006 Annual CPUC report	8189	miles	
F	1991 SoCalGas Tranmsmission pipeline leak volume	9135	Mcf	
G	2006 Transmission Compressor Station Leakage (Mejia)	20789	Mcf	2006 runtime with 1991 factors per unit
H	2006 SDGE Compressor Station Leakage (Mejia)	1129	Mcf	2006 runtime with SCG 1991 factors per comparable SCG unit in 1991
I	2006 Distribution Leak data - Gas Engineering (Schneider/Newton)	566861	Mcf	2006 newly developed data-Gas Engineering report

Updated 2006 calculations for leakage associate with compressor station operation for both SDG&E and SoCalGas are show in Table T/U-2. This Table shows the 2006 run hours for each station and the hourly leak factors used to calculate leakage for each company. The results show the SoCalGas gas LUAF contribution to be 20,789 Mcf from compressor station operation, while the SDG&E sub-component is 1129 Mcf.

Table T/U-2

Compressor Station 2006 Leak Contributions to LUAF in MCF- SoCalGas and SDG&E

	CFH/Unit	2006 hours	MCF Gas
Turbines			
Kelso	1,824	851	1552
Cactus City	1200	0	0
Desert Center	1500	0	0
Adelanto	2150	0	0
Wheeler Ridge	91.2	4569	417
	Turbines =		1969
Reciprocating Compressors			
South Needles	240.1	39482	9480
North Needles	380	5320	2022
Newberry	240.1	27164	6522
Blythe	38	16690	634
Ventura High-P	34	4789	163
Ventura Low-P	3	0	0
Sylmar	34	0	0
SoCalGas Total:		98865	**20789**
SDGE			
Moreno -recip	38	9410	358
Moreno-Turb	91.2	8393	765
Rainbow	38	149	5.662
SDGE Total		17952	**1129**

Table T/U-3 shows the 2006 compilation results for Transmission and Distribution leakage for both SDG&E and SoCalGas. The SoCalGas Distribution leak total (566,861 Mcf) is taken directly from a Gas Engineering report using updated 2006 pipeline leakage data. SDG&E distribution leakage was computed by scaling the SoCalGas result using relative distribution pipeline mileage between the two companies. The SDG&E 2006 result for distribution leakage gas LUAF contribution is 99,378 Mcf.

The total Transmission Leak gas LUAF component is the sum of compressor station leakage and computed transmission line leakage for each company. The totals are shown below under items 3 and 4 as 29,755 Mcf for SoCalGas and 2,948 Mcf for SDG&E.

Table T/U-3

Item	LUAF Component in 2006	Value	Unit	Notes on Calculation/Source
1	SoCalGas Distribution Leak Mcf	566,861	Mcf	Data from Gas Engineering 2006 Calculation
2	SDGE Distribution Leak Mcf	99,378	Mcf	Use SCG 2006 calc and apportion based on Distribution Main miles SDGE/SC
3	SoCalGas Transmission Leak Mcf	29,755	Mcf	Compressor Station Plus Pipeline Use 1991 factors with 2006 runtime
4	SDGE Transmission Leak Mcf	2,948	Mcf	Use SCG and ratio of SDGE/SCG transmission line mileage and new 2006 Compressor run time with 1991 factors

Allocation of system leak gas LUAF contribution to customer class is based on which pipelines are used to serve customers on a volume-weighted basis. Transmission leakage is a component fully shared by core and non-core customer classes based on the ratio of delivered energy to these customer classes (every customer essentially uses transmission lines.) The allocations for transmission leakage are SDG&E: core- 40.55%, non-core 59.55%; SoCalGas: core - 37.1%, non-core - 62.9%.

Distribution leak allocation is based on the proportion of customer volumes which are served via distribution lines. All core customers and a subset of non-core customers are served by distribution pipelines. The allocation for distribution leakage is 76.48% core and 23.52% non-core for both companies.

APPENDIX V

Theft

Two calculation methods were used in the 1991 study and the method with the larger amount of LUAF was chosen. After updating these calculations for customer growth and other factors, an average of the two calculation methods was used for this revision resulting in a slight decrease in the percentage of this sub-component. This component was estimated for SDG&E based on SoCalGas' proportion of LUAF for the same category using SDG&E volumes. Table V-1 below shows the SoCalGas result to be 397,288 Mcf while Table V-2 shows the SDGE component to be 54,134 Mcf.

Table V-1
SDG&E Theft Calculation Sheet

	Residential		Non-Residential	
	1991	**2006**	**1991**	**2006**
Customers	4,430,000	5,367,739	218,669	268,556
customers who steal	3,207	3,886	592	728
% customers who steal	0.072%	0.072%	0.271%	0.271%
Ave Gas Stolen/convicted cust	71.4	69.24	333.3	176.23
Total Stolen MCF	228,980	269,067	197,460	128,221
Percent of Total	54%	68%	46%	32%
2006 Total Stolen MCF	**397,288**			

Table V-2
SDG&E Theft Calculation Sheet

	Residential		Non-Residential	
	SoCal 1991	**SD 2006**	**SoCal 1991**	**SD 2006**
Customers	4,430,000	802,140	218,669	29,167
customers who steal	3,207	581	592	79
% customers who steal	0.072%	0.072%	0.271%	0.271%
Ave Gas Stolen/convicted cust	71.4	69.24	333.3	176.23
Total Stolen MCF	228,980	40,209	197,460	13,926
Percent of Total	54%	74%	46%	26%

Total Stolen MCF	**54,134**

Residential theft was assigned to core market while non-residential theft has been allocated to non-core customers for both companies. The results are: SoCalGas Core - 68%, non-core 32%; SDG&E core 74%, non-core 26%.

APPENDIX W

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