Workpapers of Ch 5 (Wei Bin Guo)

A.18-07-024 SoCalGas and SDG&E
2020 Triennial Cost Allocation Proceeding

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SoCalGas Consolidated Gas Demand

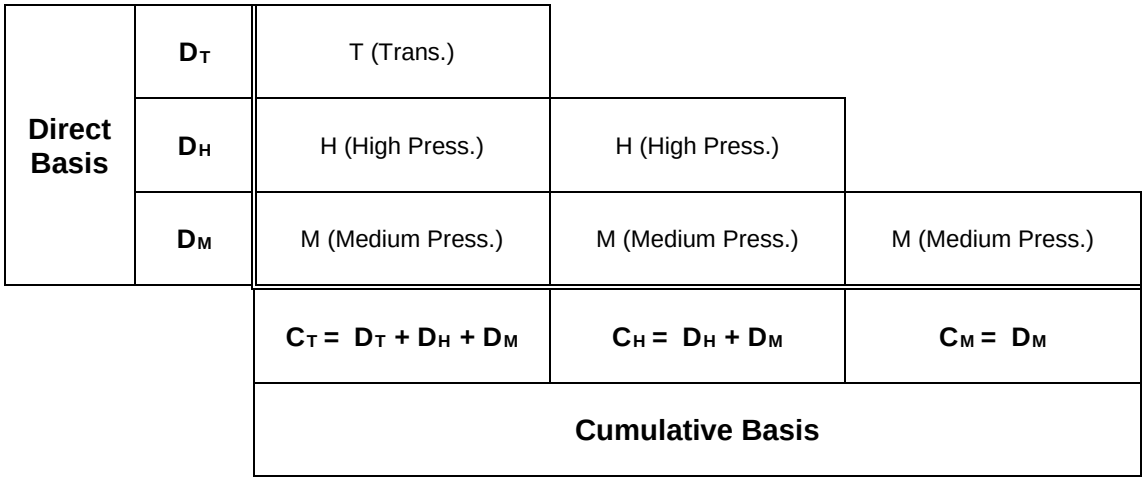
Marginal Demand Measures (MDM)

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



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 = 626,080 MTh, D_H = 615,166 MTh, and D_M = 304,569 MTh.

The corresponding *cumulative* totals are:

C_T = 1,545,814 MTh, C_H = 919,735 MTh, and C_M = 304,569 MTh,

using the formulas indicated in the Figure 1, above.

2020 TCAP: SoCalGas
Consolidated Gas Demand
Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.937%
MDM #Yrs Av (2- or 3-yr)
3

Btu Factor:	1.0343

Co-Use-Fuel	UAF
0.336%	0.926%
0.340%	0.937%

Forecast Summary	MDM	Residential	Nonresidential Core G-10	G-AC	G-GE	G-NGV	Total Core
<< TCAP Period >> January 2020 - December 2022							
DIRECT (%'s Load or Cust/Mtrs Sum to 100%)							
Transmission	%-Load:	0.005%	0.65%	0.00%	5.32%	19.21%	
Average Year Throughput (MTh)		117	6,487	0	1,186	34,342	42,134
Cold Year Throughput (1-in-35) (MTh)		129	6,762	0	1,186	34,342	42,420
Cold Year Peak Month (December) (MTh)		20	769	0	52	2,828	3,668
Peak Day (see note a/ below) (MTh)		1	38	-	2	91	132
%-Cust/Mtrs:		0.0004%	0.0338%	0.00%	2.24%	4.49%	
Number of Customers		25	69	-	16	17	127
High Pressure	%-Load:	0.40%	4.58%	44.31%	11.51%	39.31%	
Average Year Throughput (MTh)		9,291	45,498	184	2,566	70,282	127,822
Cold Year Throughput (1-in-35) (MTh)		10,233	47,421	184	2,566	70,282	130,688
Cold Year Peak Month (December) (MTh)		1,556	5,391	12	112	5,787	12,857
Peak Day (see note a/ below) (MTh)		96	264	0	4	187	550
%-Cust/Mtrs:		0.1225%	0.4819%	37.50%	17.93%	19.18%	
Number of Customers		7,000	981	2	128	73	8,183
Medium Pressure	%-Load:	99.60%	94.76%	55.69%	83.17%	41.47%	
Average Year Throughput (MTh)		2,336,945	940,720	232	18,549	74,144	3,370,590
Cold Year Throughput (1-in-35) (MTh)		2,574,091	980,491	232	18,549	74,144	3,647,507
Cold Year Peak Month (December) (MTh)		391,330	111,469	15	809	6,105	509,728
Peak Day (see note a/ below) (MTh)		24,072	5,457	0	26	197	29,752
%-Cust/Mtrs:		99.8771%	99.4842%	62.50%	79.83%	76.33%	
Number of Customers		5,707,506	202,465	3	568	289	5,910,830

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Btu Factor: 1.0343

Co-Use-Fuel	UAF
0.336%	0.926%
0.340%	0.937%

Forecast Summary	MDM	Residential	Nonresidential Core G-10	G-AC	G-GE	G-NGV	Total Core
<< TCAP Period >> January 2020 - December 2022							
CUMULATIVE (Calc'd from DIRECT %'s)							
Transmission %-Load:		100.00%	100.00%	100.00%	100.00%	100.00%	
Average Year Throughput (MTh)		2,346,353	992,706	416	22,302	178,769	**3,540,545**
Cold Year Throughput (1-in-35) (MTh)		2,584,453	1,034,674	416	22,302	178,769	**3,820,615**
Cold Year Peak Month (December) (MTh)		392,906	117,629	26	973	14,720	**526,253**
Peak Day (see note a/ below) (MTh)		24,168	5,759	1	31	475	**30,434**
%-Cust/Mtrs:		100.00%	100.00%	100.00%	100.00%	100.00%	
Number of Customers		5,714,531	203,514	4	712	378	**5,919,139**
High Pressure %-Load:		99.99%	99.35%	100.00%	94.68%	80.79%	
Average Year Throughput (MTh)		2,346,235	986,218	416	21,115	144,427	**3,498,412**
Cold Year Throughput (1-in-35) (MTh)		2,584,324	1,027,913	416	21,115	144,427	**3,778,195**
Cold Year Peak Month (December) (MTh)		392,886	116,860	26	921	11,892	**522,586**
Peak Day (see note a/ below) (MTh)		24,167	5,721	1	30	384	**30,302**
%-Cust/Mtrs:		100.00%	99.97%	100.00%	97.76%	95.51%	
Number of Customers		5,714,506	203,446	4	696	361	**5,919,013**
Medium Pressure %-Load:		99.60%	94.76%	55.69%	83.17%	41.47%	
Average Year Throughput (MTh)		2,336,945	940,720	232	18,549	74,144	**3,370,590**
Cold Year Throughput (1-in-35) (MTh)		2,574,091	980,491	232	18,549	74,144	**3,647,507**
Cold Year Peak Month (December) (MTh)		391,330	111,469	15	809	6,105	**509,728**
Peak Day (see note a/ below) (MTh)		24,072	5,457	0	26	197	**29,752**
%-Cust/Mtrs:		99.88%	99.48%	62.50%	79.83%	76.33%	
Number of Customers		5,707,506	202,465	3	568	289	**5,910,830**

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.**

2020 TCAP: SoCalGas
Consolidated Gas Demand
Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.937%
MDM #Yrs Av (2- or 3-yr)
3

Forecast Summary	MDM				N	O	P	Q	R	S	T	U	V	W
							Noncore - C&I	EG-Dist	EG-Trans	EG-Dist	EG-Trans	Noncore - Electric Generatiion		
					G-30 Dist	G-30 Trans	G-30	EG (<3MMThms)	EG (<3MMThms)	EG (>=3MMThms)	EG (>=3MMThms)	EG (<3MMThms)	(>=3MMThms)	EG (Total)
<< TCAP Period >> January 2020 - December 2022														
DIRECT (%'s Load or Cust/Mtrs Sum to 100%)														
Transmission		%-Load:												
		Average Year Throughput (MTh)			0	626,080	626,080	0	9,166	0	2,237,170	9,166	2,237,170	2,246,336
		Cold Year Throughput (1-in-35) (MTh)			0	626,181	626,181	0	9,166	0	2,237,170	9,166	2,237,170	2,246,336
		Cold Year Peak Month (December) (MTh)			0	60,847	60,847	0	291	0	188,755	291	188,755	189,046
		Peak Day (see note a/ below) (MTh)			0	2,005	2,005	0	9	0	7,454	9	7,454	7,463
		%-Cust/Mtrs:												
		Number of Customers			0	30	30	0	14	0	36	14	36	51
High Pressure		%-Load:												
		Average Year Throughput (MTh)			615,166	0	615,166	18,556	0	185,896	0	18,556	185,896	204,452
		Cold Year Throughput (1-in-35) (MTh)			616,507	0	616,507	18,556	0	185,896	0	18,556	185,896	204,452
		Cold Year Peak Month (December) (MTh)			52,062	0	52,062	1,526	0	15,479	0	1,526	15,479	17,005
		Peak Day (see note a/ below) (MTh)			1,737	0	1,737	49	0	500	0	49	500	549
		%-Cust/Mtrs:												
		Number of Customers			216	0	216	35	0	22	0	35	22	57
Medium Pressure		%-Load:												
		Average Year Throughput (MTh)			304,569	0	304,569	69,893	0	57,097	0	69,893	57,097	126,990
		Cold Year Throughput (1-in-35) (MTh)			307,209	0	307,209	69,893	0	57,097	0	69,893	57,097	126,990
		Cold Year Peak Month (December) (MTh)			27,338	0	27,338	5,989	0	4,876	0	5,989	4,876	10,865
		Peak Day (see note a/ below) (MTh)			996	0	996	197	0	157	0	197	157	354
		%-Cust/Mtrs:												
		Number of Customers			347	0	347	273	0	8	0	273	8	282

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0.937%
MDM #Yrs Av (2- or 3-yr)
3

Forecast Summary	MDM				Noncore - C&I	EG-Dist	EG-Trans	EG-Dist	EG-Trans	Noncore - Electric Generatiion		
		G-30 Dist	G-30 Trans		G-30	EG (<3MMThms)	EG (<3MMThms)	EG (>=3MMThms)	EG (>=3MMThms)	EG (<3MMThms)	(>=3MMThms)	EG (Total)
<< TCAP Period >> January 2020 - December 2022												
CUMULATIVE (Calc'd from DIRECT %'s)												
Transmission	%-Load:											
	Average Year Throughput (MTh)	919,735	626,080		1,545,814	88,449	9,166	242,993	2,237,170	97,615	2,480,164	2,577,778
	Cold Year Throughput (1-in-35) (MTh)	923,717	626,181		1,549,897	88,449	9,166	242,993	2,237,170	97,615	2,480,164	2,577,778
	Cold Year Peak Month (December) (MTh)	79,400	60,847		140,247	7,515	291	20,356	188,755	7,806	209,111	216,917
	Peak Day (see note a/ below) (MTh)	2,733	2,005		4,738	246	9	657	7,454	255	8,111	8,366
	%-Cust/Mtrs:											
	Number of Customers	563	30		593	308	14	30	36	323	67	389
High Pressure	%-Load:											
	Average Year Throughput (MTh)	919,735	0		919,735	88,449	0	242,993	0	88,449	242,993	331,442
	Cold Year Throughput (1-in-35) (MTh)	923,717	0		923,717	88,449	0	242,993	0	88,449	242,993	331,442
	Cold Year Peak Month (December) (MTh)	79,400	0		79,400	7,515	0	20,356	0	7,515	20,356	27,871
	Peak Day (see note a/ below) (MTh)	2,733	0		2,733	246	0	657	0	246	657	903
	%-Cust/Mtrs:											
	Number of Customers	563	0		563	308	0	30	0	308	30	338
Medium Pressure	%-Load:											
	Average Year Throughput (MTh)	304,569	0		304,569	69,893	0	57,097	0	69,893	57,097	126,990
	Cold Year Throughput (1-in-35) (MTh)	307,209	0		307,209	69,893	0	57,097	0	69,893	57,097	126,990
	Cold Year Peak Month (December) (MTh)	27,338	0		27,338	5,989	0	4,876	0	5,989	4,876	10,865
	Peak Day (see note a/ below) (MTh)	996	0		996	197	0	157	0	197	157	354
	%-Cust/Mtrs:											
	Number of Customers	347	0		347	273	0	8	0	273	8	282

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.

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Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.937%
MDM #Yrs Av (2- or 3-yr)
3

Forecast Summary	MDM	EOR Dist	EOR Trans	Noncore- EOR	Total Retail Noncore
<< TCAP Period >> January 2020 - December 2022					
DIRECT (%'s Load or Cust/Mtrs Sum to 100%)					
Transmission %-Load:					
Average Year Throughput (MTh)		0	57,184	57,184	**2,929,599**
Cold Year Throughput (1-in-35) (MTh)		0	57,184	57,184	**2,929,700**
Cold Year Peak Month (December) (MTh)		0	4,857	4,857	**254,750**
Peak Day (see note a/ below) (MTh)		0	157	157	**9,625**
%-Cust/Mtrs:					
Number of Customers		0	11	11	**91**
High Pressure %-Load:					
Average Year Throughput (MTh)		150,438	0	150,438	**970,056**
Cold Year Throughput (1-in-35) (MTh)		150,438	0	150,438	**971,397**
Cold Year Peak Month (December) (MTh)		12,777	0	12,777	**81,845**
Peak Day (see note a/ below) (MTh)		412	0	412	**2,698**
%-Cust/Mtrs:					
Number of Customers		20	0	20	**293**
Medium Pressure %-Load:					
Average Year Throughput (MTh)		1,320	0	1,320	**432,879**
Cold Year Throughput (1-in-35) (MTh)		1,320	0	1,320	**435,520**
Cold Year Peak Month (December) (MTh)		112	0	112	**38,315**
Peak Day (see note a/ below) (MTh)		4	0	4	**1,353**
%-Cust/Mtrs:					
Number of Customers		3	0	3	**632**

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0.937%
MDM #Yrs Av (2- or 3-yr)
3

Forecast Summary	MDM	EOR Dist	EOR Trans	Noncore- EOR EOR	Total Retail Noncore
<< TCAP Period >> January 2020 - December 2022					
CUMULATIVE (Calc'd from DIRECT %'s)					
Transmission	%-Load:				
Average Year Throughput (MTh)		151,758	57,184	208,941	**4,332,534**
Cold Year Throughput (1-in-35) (MTh)		151,758	57,184	208,941	**4,336,617**
Cold Year Peak Month (December) (MTh)		12,889	4,857	17,746	**374,910**
Peak Day (see note a/ below) (MTh)		416	157	572	**13,676**
	%-Cust/Mtrs:				
Number of Customers		23	11	34	**1,016**
High Pressure	%-Load:				
Average Year Throughput (MTh)		151,758	0	151,758	**1,402,935**
Cold Year Throughput (1-in-35) (MTh)		151,758	0	151,758	**1,406,917**
Cold Year Peak Month (December) (MTh)		12,889	0	12,889	**120,160**
Peak Day (see note a/ below) (MTh)		416	0	416	**4,051**
	%-Cust/Mtrs:				
Number of Customers		23	0	23	**925**
Medium Pressure	%-Load:				
Average Year Throughput (MTh)		1,320	0	1,320	**432,879**
Cold Year Throughput (1-in-35) (MTh)		1,320	0	1,320	**435,520**
Cold Year Peak Month (December) (MTh)		112	0	112	**38,315**
Peak Day (see note a/ below) (MTh)		4	0	4	**1,353**
	%-Cust/Mtrs:				
Number of Customers		3	0	3	**632**

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.

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0.937%
MDM #Yrs Av (2- or 3-yr)
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Forecast Summary **MDM**

			Wholesale Noncore								
<< TCAP Period >> January 2020 - December 2022		Long Beach	SDG&E	Southwest Gas	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)	79,646	1,118,614	66,431	96,890	**1,361,582**	116,299	**4,407,480**	**4,449,614**
	Cold Year Throughput (1-in-35) (MTh)	86,356	1,157,571	71,786	101,919	**1,417,632**	116,299	**4,463,632**	**4,506,051**
	Cold Year Peak Month (December) (MTh)	10,565	121,858	11,583	8,300	**152,307**	9,871	**416,928**	**420,596**
	Peak Day (see note a/ below) (MTh)	561	6,177	528	267	**7,533**	318	**17,476**	**17,608**
	%-Cust/Mtrs:	100.00%	100.00%	100.00%	100.00%		100.00%		
	Number of Customers	1	1	1	1	**4**	1	**96**	**223**
High Pressure	%-Load:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Average Year Throughput (MTh)	0	0	0	0	**0**	0	**970,056**	**1,097,877**
	Cold Year Throughput (1-in-35) (MTh)	0	0	0	0	**0**	0	**971,397**	**1,102,085**
	Cold Year Peak Month (December) (MTh)	0	0	0	0	**0**	0	**81,845**	**94,702**
	Peak Day (see note a/ below) (MTh)	-	-	-	-	**0**	-	**2,698**	**3,249**
	%-Cust/Mtrs:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Number of Customers	-	-	-	-	**0**	-	**293**	**8,476**
Medium Pressure	%-Load:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Average Year Throughput (MTh)	0	0	0	0	**0**	0	**432,879**	**3,803,469**
	Cold Year Throughput (1-in-35) (MTh)	0	0	0	0	**0**	0	**435,520**	**4,083,027**
	Cold Year Peak Month (December) (MTh)	0	0	0	0	**0**	0	**38,315**	**548,043**
	Peak Day (see note a/ below) (MTh)	-	-	-	-	**0**	-	**1,353**	**31,105**
	%-Cust/Mtrs:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Number of Customers	-	-	-	-	**0**	-	**632**	**5,911,462**

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MDM #Yrs Av (2- or 3-yr)
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Forecast Summary **MDM**

			Wholesale Noncore							
<< TCAP Period >> January 2020 - December 2022		Long Beach	SDG&E	Southwest Gas	Vernon	**Total Wholesale**	International NC Ecogas	**Total Noncore**	**Total System**
CUMULATIVE (Calc'd from DIRECT %'s)									
Transmission	%-Load:	100.00%	100.00%	100.00%	100.00%		100.00%		
	Average Year Throughput (MTh)	79,646	1,118,614	66,431	96,890	**1,361,582**	116,299	**5,810,415**	**9,350,960**
	Cold Year Throughput (1-in-35) (MTh)	86,356	1,157,571	71,786	101,919	**1,417,632**	116,299	**5,870,548**	**9,691,163**
	Cold Year Peak Month (December) (MTh)	10,565	121,858	11,583	8,300	**152,307**	9,871	**537,087**	**1,063,341**
	Peak Day (see note a/ below) (MTh)	561	6,177	528	267	**7,533**	318	**21,527**	**51,962**
	%-Cust/Mtrs:	100.00%	100.00%	100.00%	100.00%		100.00%		
	Number of Customers	1	1	1	1	**4**	1	**1,021**	**5,920,161**
High Pressure	%-Load:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Average Year Throughput (MTh)	0	0	0	0	**0**	0	**1,402,935**	**4,901,347**
	Cold Year Throughput (1-in-35) (MTh)	0	0	0	0	**0**	0	**1,406,917**	**5,185,112**
	Cold Year Peak Month (December) (MTh)	0	0	0	0	**0**	0	**120,160**	**642,745**
	Peak Day (see note a/ below) (MTh)	0	0	0	0	**0**	0	**4,051**	**34,354**
	%-Cust/Mtrs:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Number of Customers	0	0	0	0	**0**	0	**925**	**5,919,938**
Medium Pressure	%-Load:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Average Year Throughput (MTh)	0	0	0	0	**0**	0	**432,879**	**3,803,469**
	Cold Year Throughput (1-in-35) (MTh)	0	0	0	0	**0**	0	**435,520**	**4,083,027**
	Cold Year Peak Month (December) (MTh)	0	0	0	0	**0**	0	**38,315**	**548,043**
	Peak Day (see note a/ below) (MTh)	0	0	0	0	**0**	0	**1,353**	**31,105**
	%-Cust/Mtrs:	0.00%	0.00%	0.00%	0.00%		0.00%		
	Number of Customers	0	0	0	0	**0**	0	**632**	**5,911,462**

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.**

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**												
59	***ANNUAL FORECAST DATA***						Nonresidential Core					**Total**	
60						Residential	G-10		G-AC	G-GE	G-NGV	**Core**	
61	**Average Year Throughput (Mth)**												
62	2017					2,464,787	1,048,765		826	18,056	144,347	**3,676,781**	
63	2018					2,444,659	1,034,731		416	22,302	152,232	**3,654,339**	
64	2019					2,415,412	1,026,241		416	22,302	160,552	**3,624,922**	
65	2020					2,381,595	1,013,303		416	22,302	169,332	**3,586,948**	
66	2021					2,348,573	994,178		416	22,302	178,598	**3,544,067**	
67	2022					2,308,891	970,636		416	22,302	188,377	**3,490,622**	
68	2023					2,254,447	939,194		416	22,302	198,698	**3,415,057**	
69													
70													
71							Nonresidential Core					**Total**	
72						Residential	G-10		G-AC	G-GE	G-NGV	**Core**	
73	**Average Year Sales (Mth)**												
74	2017		365			2,436,015	901,636		826	15,146	80,181	**3,433,805**	
75	2018		365			2,416,122	889,383		416	18,707	84,603	**3,409,231**	
76	2019		365			2,387,216	882,159		416	18,707	89,273	**3,377,771**	
77	2020		366			2,353,794	871,079		416	18,707	94,206	**3,338,203**	
78	2021		365			2,321,157	854,655		416	18,707	99,417	**3,294,353**	
79	2022		365			2,281,939	834,458		416	18,707	104,922	**3,240,442**	
80	2023		365			2,228,130	807,451		416	18,707	110,739	**3,165,443**	
81													
82													
83							Nonresidential Core					**Total**	
84						Residential	G-10		G-AC	G-GE	G-NGV	**Core**	
85	**Cold Year Throughput (Mth)**												
86	2017					2,699,339	1,090,566		826	18,056	144,347	**3,953,134**	
87	2018					2,680,923	1,076,609		416	22,302	152,232	**3,932,482**	
88	2019					2,652,347	1,068,178		416	22,302	160,552	**3,903,795**	
89	2020					2,619,049	1,055,275		416	22,302	169,332	**3,866,374**	
90	2021					2,586,921	1,036,152		416	22,302	178,598	**3,824,389**	
91	2022					2,547,391	1,012,595		416	22,302	188,377	**3,771,081**	
92	2023					2,491,835	981,080		416	22,302	198,698	**3,694,330**	
93													
94													
95							Nonresidential Core					**Total**	
96	**Specified**	**Peak Day Thrughput (Mth/Day)**				Residential	G-10		G-AC	G-GE	G-NGV	**Core**	
97	2017					24,778	5,946		2	37	383	**31,146**	
98	2018					24,718	5,904		1	31	404	**31,059**	
99	2019					24,559	5,876		1	31	426	**30,894**	
100	2020					24,366	5,832		1	31	450	**30,679**	
101	2021					24,192	5,764		1	31	474	**30,463**	
102	2022					23,947	5,680		1	31	500	**30,160**	
103	2023					23,560	5,566		1	31	528	**29,686**	
104													
105													
106							Nonresidential Core					**Total**	
107						Residential	G-10		G-AC	G-GE	G-NGV	**Core**	
108	**Forecast Number of Customers**												
109	2017					5,537,971	203,975		8	714	318	**5,742,987**	
110	2018					5,568,693	203,686		4	712	333	**5,773,428**	
111	2019					5,614,540	203,683		4	712	348	**5,819,287**	
112	2020					5,663,352	203,651		4	712	363	**5,868,082**	
113	2021					5,714,082	203,522		4	712	378	**5,918,698**	
114	2022					5,766,159	203,370		4	712	393	**5,970,638**	
115	2023					5,818,967	203,240		4	712	404	**6,023,327**	

	A	B	C	D	E	N	O	P	Q	R	S	T
1	**2020 TCAP: 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	2017					937,619	661,562	**1,599,181**	94,451	16,571	260,376	2,210,087
63	2018					937,948	631,068	**1,569,016**	88,129	14,106	246,297	2,360,038
64	2019					931,996	628,887	**1,560,883**	86,823	11,597	244,351	2,277,370
65	2020					928,593	629,576	**1,558,169**	86,879	9,999	244,254	2,270,635
66	2021					920,029	623,983	**1,544,012**	89,331	9,338	243,450	2,223,593
67	2022					910,583	624,680	**1,535,263**	89,137	8,160	241,276	2,217,283
68	2023					895,780	694,735	**1,590,516**	86,226	6,373	235,275	2,216,820
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	2017		365			0	0	**0**	0	0	0	0
75	2018		365			0	0	**0**	0	0	0	0
76	2019		365			0	0	**0**	0	0	0	0
77	2020		366			0	0	**0**	0	0	0	0
78	2021		365			0	0	**0**	0	0	0	0
79	2022		365			0	0	**0**	0	0	0	0
80	2023		365			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	2017					941,601	661,663	**1,603,264**	94,451	16,571	260,376	2,210,087
87	2018					941,930	631,169	**1,573,099**	88,129	14,106	246,297	2,360,038
88	2019					935,978	628,988	**1,564,966**	86,823	11,597	244,351	2,277,370
89	2020					932,574	629,677	**1,562,252**	86,879	9,999	244,254	2,270,635
90	2021					924,011	624,084	**1,548,095**	89,331	9,338	243,450	2,223,593
91	2022					914,564	624,781	**1,539,345**	89,137	8,160	241,276	2,217,283
92	2023					899,762	694,836	**1,594,598**	86,226	6,373	235,275	2,216,820
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	2017					2,773	2,093	**4,866**	243	9	659	5,822
98	2018					2,783	2,032	**4,815**	250	12	631	6,717
99	2019					2,764	2,017	**4,780**	248	13	629	6,581
100	2020					2,755	2,017	**4,772**	247	9	674	7,413
101	2021					2,734	2,006	**4,739**	246	9	632	7,593
102	2022					2,710	1,993	**4,702**	244	9	666	7,355
103	2023					2,669	1,963	**4,632**	236	9	650	7,149
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	2017					552	29	**581**	296	15	30	41
110	2018					555	29	**584**	299	14	29	38
111	2019					559	29	**588**	303	14	30	37
112	2020					562	30	**591**	306	14	30	37
113	2021					564	30	**593**	309	14	30	36
114	2022					565	30	**595**	310	14	30	36
115	2023					566	30	**596**	311	14	30	36

2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

ANNUAL FORECAST DATA

		ratiion			Noncore - EOR			Total
		EG (<3MMThms)	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
Average Year Throughput (Mth)								
2017		**111,022**	**2,470,463**	**2,581,485**	151,758	57,184	**208,941**	**4,389,608**
2018		**102,234**	**2,606,335**	**2,708,570**	151,758	57,184	**208,941**	**4,486,527**
2019		**98,420**	**2,521,721**	**2,620,142**	151,758	57,184	**208,941**	**4,389,967**
2020		**96,879**	**2,514,889**	**2,611,767**	151,758	57,184	**208,941**	**4,378,877**
2021		**98,669**	**2,467,044**	**2,565,712**	151,758	57,184	**208,941**	**4,318,666**
2022		**97,296**	**2,458,558**	**2,555,855**	151,758	57,184	**208,941**	**4,300,059**
2023		**92,598**	**2,452,095**	**2,544,694**	151,758	57,184	**208,941**	**4,344,151**

		ratiion			Noncore - EOR			Total
		EG (<3MMThms)	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
Average Year Sales (Mth)								
2017	365	**0**	**0**	**0**	0	0	**0**	**0**
2018	365	**0**	**0**	**0**	0	0	**0**	**0**
2019	365	**0**	**0**	**0**	0	0	**0**	**0**
2020	366	**0**	**0**	**0**	0	0	**0**	**0**
2021	365	**0**	**0**	**0**	0	0	**0**	**0**
2022	365	**0**	**0**	**0**	0	0	**0**	**0**
2023	365	**0**	**0**	**0**	0	0	**0**	**0**

		ratiion			Noncore - EOR			Total
		EG (<3MMThms)	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
Cold Year Throughput (Mth)								
2017		**111,022**	**2,470,463**	**2,581,485**	151,758	57,184	**208,941**	**4,393,690**
2018		**102,234**	**2,606,335**	**2,708,570**	151,758	57,184	**208,941**	**4,490,610**
2019		**98,420**	**2,521,721**	**2,620,142**	151,758	57,184	**208,941**	**4,394,050**
2020		**96,879**	**2,514,889**	**2,611,767**	151,758	57,184	**208,941**	**4,382,960**
2021		**98,669**	**2,467,044**	**2,565,712**	151,758	57,184	**208,941**	**4,322,749**
2022		**97,296**	**2,458,558**	**2,555,855**	151,758	57,184	**208,941**	**4,304,141**
2023		**92,598**	**2,452,095**	**2,544,694**	151,758	57,184	**208,941**	**4,348,233**

		ratiion			Noncore - EOR			Total
		EG (<3MMThms)	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
Specified Peak Day Throughput (Mth/Day)								
2017		**253**	**6,480**	**6,733**	416	157	**572**	**12,172**
2018		**263**	**7,348**	**7,610**	416	157	**572**	**12,997**
2019		**260**	**7,210**	**7,470**	416	157	**572**	**12,823**
2020		**257**	**8,086**	**8,343**	416	157	**572**	**13,687**
2021		**256**	**8,225**	**8,480**	416	157	**572**	**13,792**
2022		**253**	**8,021**	**8,274**	416	157	**572**	**13,549**
2023		**245**	**7,799**	**8,044**	416	157	**572**	**13,249**

		ratiion			Noncore - EOR			Total
		EG (<3MMThms)	**EG (>=3MMThms)**	**EG (Total)**	EOR (Dist.)	EOR (Trans.)	**EOR (Total)**	**Retail Noncore**
Forecast Number of Customers								
2017		**311**	**71**	**382**	23	11	**34**	**997**
2018		**313**	**67**	**380**	23	11	**34**	**998**
2019		**317**	**67**	**383**	23	11	**34**	**1,005**
2020		**321**	**67**	**388**	23	11	**34**	**1,013**
2021		**323**	**66**	**389**	23	11	**34**	**1,016**
2022		**324**	**66**	**391**	23	11	**34**	**1,019**
2023		**326**	**67**	**392**	23	11	**34**	**1,022**

	A	B	C	D	E	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**														
59	***ANNUAL FORECAST DATA***					Wholesale Noncore				**Total**		International NC		**Total**	
60						Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**		Ecogas		**Noncore**	
61	**Average Year Throughput (Mth)**														
62	2017					92,440	**1,202,227**	57,735	89,151	**1,441,553**		102,207		**5,933,367**	
63	2018					79,305	**1,159,356**	64,718	90,444	**1,393,823**		108,071		**5,988,421**	
64	2019					78,994	**1,143,469**	65,277	97,400	**1,385,140**		115,069		**5,890,176**	
65	2020					79,572	**1,127,125**	65,949	96,618	**1,369,264**		115,961		**5,864,103**	
66	2021					79,641	**1,122,286**	66,393	97,213	**1,365,533**		116,178		**5,800,377**	
67	2022					79,724	**1,106,432**	66,951	96,839	**1,349,947**		116,759		**5,766,764**	
68	2023					80,110	**1,091,288**	67,509	93,134	**1,332,041**		117,343		**5,793,535**	
69															
70															
71						Wholesale Noncore				**Total**		International NC		**Total**	
72						Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**		Ecogas		**Noncore**	
73	**Average Year Sales (Mth)**														
74	2017	365				0	**0**	0	0	**0**		0		**0**	
75	2018	365				0	**0**	0	0	**0**		0		**0**	
76	2019	365				0	**0**	0	0	**0**		0		**0**	
77	2020	366				0	**0**	0	0	**0**		0		**0**	
78	2021	365				0	**0**	0	0	**0**		0		**0**	
79	2022	365				0	**0**	0	0	**0**		0		**0**	
80	2023	365				0	**0**	0	0	**0**		0		**0**	
81															
82															
83						Wholesale Noncore				**Total**		International NC		**Total**	
84						Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**		Ecogas		**Noncore**	
85	**Cold Year Throughput (Mth)**														
86	2017					92,440	**1,241,319**	57,735	89,151	**1,480,645**		102,207		**5,976,542**	
87	2018					85,957	**1,198,716**	69,936	90,444	**1,445,053**		108,071		**6,043,733**	
88	2019					85,655	**1,182,705**	70,540	101,983	**1,440,882**		115,069		**5,950,001**	
89	2020					86,264	**1,166,303**	71,259	101,974	**1,425,799**		115,961		**5,924,720**	
90	2021					86,351	**1,161,312**	71,748	102,212	**1,421,623**		116,178		**5,860,550**	
91	2022					86,452	**1,145,097**	72,352	101,573	**1,405,474**		116,759		**5,826,374**	
92	2023					86,864	**1,129,904**	72,956	96,402	**1,386,127**		117,343		**5,851,703**	
93															
94															
95						Wholesale Noncore				**Total**		International NC		**Total**	
96	**Specified Peak Day Thrughput (Mth/Day)**					Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**		Ecogas		**Noncore**	
97	2017					556	**6,025**	514	275	**7,370**		271		**19,813**	
98	2018					556	**6,413**	514	279	**7,763**		314		**21,074**	
99	2019					557	**6,578**	519	292	**7,946**		315		**21,084**	
100	2020					559	**6,299**	523	296	**7,677**		317		**21,681**	
101	2021					561	**6,114**	528	203	**7,406**		318		**21,516**	
102	2022					562	**6,119**	532	303	**7,516**		320		**21,385**	
103	2023					564	**5,818**	537	291	**7,210**		322		**20,780**	
104															
105															
106						Wholesale Noncore				**Total**		International NC		**Total**	
107						Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**		Ecogas		**Noncore**	
108	**Forecast Number of Customers**														
109	2017					1	**1**	1	1	**4**		1		**1,002**	
110	2018					1	**1**	1	1	**4**		1		**1,003**	
111	2019					1	**1**	1	1	**4**		1		**1,010**	
112	2020					1	**1**	1	1	**4**		1		**1,018**	
113	2021					1	**1**	1	1	**4**		1		**1,021**	
114	2022					1	**1**	1	1	**4**		1		**1,024**	
115	2023					1	**1**	1	1	**4**		1		**1,027**	

2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

ANNUAL FORECAST DATA

	Total System End-Use Dmd	System Total (Mdth/d)	Co-Use-Fuel	"Un-Acnt'd-For" (UAF)	Total System Throughput
Average Year Throughput (Mth)					
2017	**9,610,149**	**2,633**	**32,692**	**90,093**	**9,732,934**
2018	**9,642,759**	**2,642**	**32,803**	**90,399**	**9,765,962**
2019	**9,515,098**	**2,607**	**32,369**	**89,202**	**9,636,669**
2020	**9,451,050**	**2,582**	**32,151**	**88,602**	**9,571,803**
2021	**9,344,445**	**2,560**	**31,788**	**87,602**	**9,463,835**
2022	**9,257,386**	**2,536**	**31,492**	**86,786**	**9,375,664**
2023	**9,208,592**	**2,523**	**31,326**	**86,329**	**9,326,247**

		Total System End-Use Dmd	Check of System Total (Mdth/d)
Average Year Sales (Mth)			
2017	365	**3,433,805**	**941**
2018	365	**3,409,231**	**934**
2019	365	**3,377,771**	**925**
2020	366	**3,338,203**	**912**
2021	365	**3,294,353**	**903**
2022	365	**3,240,442**	**888**
2023	365	**3,165,443**	**867**

	Total System End-Use Dmd	Check of System Total (Mdth/d)	Co-Use-Fuel	"Un-Acnt'd-For" (UAF)	System Throughput
Cold Year Throughput (Mth)					
2017	**9,929,677**	**2,720**	**33,779**	**93,089**	**10,056,545**
2018	**9,976,215**	**2,733**	**33,937**	**93,525**	**10,103,678**
2019	**9,853,796**	**2,700**	**33,521**	**92,377**	**9,979,694**
2020	**9,791,094**	**2,675**	**33,308**	**91,790**	**9,916,191**
2021	**9,684,939**	**2,653**	**32,946**	**90,794**	**9,808,680**
2022	**9,597,456**	**2,629**	**32,649**	**89,974**	**9,720,079**
2023	**9,546,033**	**2,615**	**32,474**	**89,492**	**9,667,999**

	Total System End-Use Dmd
Specified Peak Day Thrughput (Mth/Day)	
2017	**50,959**
2018	**52,132**
2019	**51,978**
2020	**52,360**
2021	**51,979**
2022	**51,545**
2023	**50,466**

	Total System
Forecast Number of Customers	
2017	**5,743,988**
2018	**5,774,431**
2019	**5,820,298**
2020	**5,869,100**
2021	**5,919,719**
2022	**5,971,663**
2023	**6,024,354**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																			
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)**																			
62	2017	Jan				342,071	111,082		36	757	11,233	**465,178**		81,933	58,442	**140,375**	6,984	863	21,279	164,292
63		Feb				301,529	106,376		35	555	10,634	**419,129**		72,745	48,836	**121,582**	6,477	1,269	18,313	156,131
64		Mar				260,042	97,925		37	694	12,349	**371,046**		78,023	51,974	**129,997**	6,786	2,015	19,538	150,253
65		Apr				215,119	89,540		56	1,105	11,431	**317,251**		76,256	50,559	**126,816**	6,871	2,018	19,870	144,419
66		May				155,455	77,414		52	1,341	12,436	**246,697**		77,221	55,680	**132,901**	7,750	1,624	21,376	168,882
67		Jun				119,803	71,746		51	1,966	11,870	**205,437**		73,774	52,582	**126,355**	8,567	1,533	23,440	200,724
68		Jul				115,038	69,402		79	2,377	11,797	**198,693**		79,827	55,398	**135,225**	8,961	2,038	23,247	255,699
69		Aug				114,782	70,035		124	2,612	12,880	**200,433**		81,914	53,594	**135,508**	9,766	1,144	24,584	307,332
70		Sep				113,480	71,229		117	2,331	12,347	**199,504**		80,573	52,458	**133,030**	8,556	1,222	24,315	232,640
71		Oct				141,527	76,428		98	1,491	13,261	**232,804**		79,631	59,812	**139,443**	8,455	1,096	22,573	166,779
72		Nov				226,697	92,663		84	1,675	12,229	**333,348**		75,961	59,257	**135,218**	7,935	1,124	21,064	132,292
73		Dec				359,246	114,926		58	1,153	11,879	**487,262**		79,761	62,971	**142,732**	7,344	623	20,778	130,644
74																				
75	2018	Jan				339,277	109,745		21	800	11,845	**461,690**		80,518	51,966	**132,484**	7,155	321	20,339	133,730
76		Feb				299,066	105,057		30	950	11,214	**416,318**		72,654	46,071	**118,725**	6,239	352	18,001	113,193
77		Mar				257,918	96,664		23	1,199	13,023	**368,826**		78,819	51,388	**130,206**	6,709	505	19,295	132,201
78		Apr				213,362	88,354		21	1,614	12,055	**315,406**		77,133	50,238	**127,371**	6,889	424	19,826	162,196
79		May				154,185	76,328		39	2,012	13,115	**245,679**		77,160	52,980	**130,141**	7,288	612	20,614	166,103
80		Jun				118,825	70,701		18	2,559	12,518	**204,621**		73,965	50,694	**124,659**	7,455	1,785	20,643	184,197
81		Jul				114,099	68,385		41	3,029	12,442	**197,996**		80,072	53,447	**133,519**	8,287	2,556	21,975	280,140
82		Aug				113,844	69,004		53	2,863	13,584	**199,348**		82,404	52,147	**134,550**	8,281	3,278	22,359	313,537
83		Sep				112,553	70,178		53	2,585	13,022	**198,391**		80,744	50,173	**130,917**	7,719	2,502	21,266	287,762
84		Oct				140,371	75,327		49	2,090	13,986	**231,823**		78,573	54,486	**133,059**	7,425	908	20,932	221,712
85		Nov				224,846	91,439		43	1,627	12,897	**330,852**		75,832	56,414	**132,246**	7,278	556	20,414	202,555
86		Dec				356,312	113,549		26	973	12,530	**483,390**		80,073	61,066	**141,139**	7,405	306	20,633	162,712
87																				
88	2019	Jan				335,218	108,827		21	800	12,491	**457,358**		80,055	51,857	**131,913**	7,076	307	20,188	146,610
89		Feb				295,488	104,190		30	950	11,826	**412,485**		72,149	45,760	**117,910**	6,170	296	17,860	111,881
90		Mar				254,832	95,874		23	1,199	13,734	**365,661**		78,179	50,802	**128,981**	6,634	299	19,129	149,124
91		Apr				210,810	87,628		21	1,614	12,713	**312,786**		76,630	50,031	**126,662**	6,812	320	19,676	158,823
92		May				152,340	75,701		39	2,012	13,832	**243,924**		76,709	52,910	**129,619**	7,205	333	20,462	152,852
93		Jun				117,403	70,124		18	2,559	13,202	**203,306**		73,550	50,677	**124,227**	7,361	1,175	20,489	183,208
94		Jul				112,734	67,821		41	3,029	13,123	**196,748**		79,619	53,474	**133,093**	8,117	2,319	21,799	265,835
95		Aug				112,482	68,441		53	2,863	14,327	**198,166**		81,940	52,204	**134,144**	7,988	2,974	22,188	317,154
96		Sep				111,207	69,611		53	2,585	13,734	**197,190**		80,313	50,244	**130,557**	7,600	2,496	21,107	291,765
97		Oct				138,692	74,723		49	2,090	14,751	**230,304**		78,112	54,399	**132,511**	7,343	406	20,773	215,869
98		Nov				222,156	90,696		43	1,627	13,603	**328,125**		75,253	55,938	**131,191**	7,196	379	20,224	133,128
99		Dec				352,049	112,605		26	973	13,216	**478,870**		79,487	60,590	**140,077**	7,322	294	20,457	151,121
100																				
101	2020	Jan				330,525	107,448		21	800	13,172	**451,967**		79,751	51,843	**131,594**	7,102	301	20,186	171,059
102		Feb				291,351	102,879		30	950	12,472	**407,682**		72,601	47,658	**120,259**	6,201	311	18,055	112,223
103		Mar				251,265	94,670		23	1,199	14,484	**361,640**		77,871	50,770	**128,640**	6,656	281	19,128	112,855
104		Apr				207,858	86,523		21	1,614	13,408	**309,424**		76,265	49,870	**126,136**	6,838	300	19,665	134,644
105		May				150,208	74,744		39	2,012	14,588	**241,590**		76,332	52,724	**129,056**	7,225	324	20,453	124,373
106		Jun				115,759	69,238		18	2,559	13,923	**201,498**		73,161	50,430	**123,591**	7,407	910	20,478	156,294
107		Jul				111,155	66,960		41	3,029	13,841	**195,026**		79,206	53,276	**132,482**	8,038	2,022	21,735	263,685
108		Aug				110,908	67,576		53	2,863	15,111	**196,510**		81,537	52,073	**133,610**	7,933	2,797	22,090	311,019
109		Sep				109,650	68,736		53	2,585	14,486	**195,509**		79,937	50,125	**130,063**	7,513	1,823	21,026	284,416
110		Oct				136,750	73,788		49	2,090	15,558	**228,235**		77,766	54,299	**132,065**	7,380	342	20,765	236,528
111		Nov				219,046	89,559		43	1,627	14,348	**324,623**		74,954	55,898	**130,853**	7,233	294	20,219	173,933
112		Dec				347,120	111,183		26	973	13,941	**473,243**		79,210	60,609	**139,819**	7,352	294	20,454	189,604

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																			
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	2021	Jan				325,942	105,423		21	800	13,891	**446,078**		79,159	51,695	**130,854**	7,164	296	20,139	188,714
115		Feb				287,312	100,944		30	950	13,153	**402,389**		71,330	45,618	**116,948**	6,353	276	17,821	107,419
116		Mar				247,781	92,890		23	1,199	15,276	**357,168**		77,214	50,417	**127,631**	6,849	281	19,076	106,119
117		Apr				204,976	84,891		21	1,614	14,141	**305,643**		75,579	49,478	**125,056**	7,045	295	19,600	151,307
118		May				148,125	73,328		39	2,012	15,386	**238,890**		75,659	52,372	**128,031**	7,446	306	20,382	151,692
119		Jun				114,154	67,925		18	2,559	14,685	**199,342**		72,543	50,152	**122,695**	7,603	614	20,412	173,631
120		Jul				109,614	65,686		41	3,029	14,599	**192,968**		78,517	52,999	**131,516**	8,282	2,087	21,699	242,473
121		Aug				109,370	66,293		53	2,863	15,939	**194,518**		80,815	51,768	**132,583**	8,243	2,897	22,088	276,275
122		Sep				108,129	67,436		53	2,585	15,279	**193,482**		79,234	49,782	**129,016**	7,681	1,395	20,973	255,409
123		Oct				134,854	72,396		49	2,090	16,410	**225,799**		77,091	53,916	**131,007**	7,585	309	20,706	223,977
124		Nov				216,008	87,875		43	1,627	15,134	**320,688**		74,320	55,534	**129,855**	7,441	292	20,161	157,327
125		Dec				342,307	109,091		26	973	14,705	**467,103**		78,569	60,251	**138,820**	7,640	291	20,395	189,251
126																				
127	2022	Jan				320,435	102,921		21	800	14,650	**438,828**		78,401	51,332	**129,733**	7,284	294	19,971	176,194
128		Feb				282,457	98,557		30	950	13,871	**395,866**		70,635	45,277	**115,911**	6,320	267	17,673	131,131
129		Mar				243,594	90,696		23	1,199	16,112	**351,624**		76,456	50,037	**126,493**	6,841	279	18,889	138,203
130		Apr				201,513	82,881		21	1,614	14,914	**300,943**		74,805	49,082	**123,887**	7,038	293	19,396	144,791
131		May				145,622	71,588		39	2,012	16,229	**235,489**		74,866	51,925	**126,791**	7,366	302	20,184	157,345
132		Jun				112,225	66,314		18	2,559	15,488	**196,605**		71,779	49,719	**121,497**	7,517	613	20,217	172,102
133		Jul				107,762	64,122		41	3,029	15,399	**190,353**		77,661	52,531	**130,192**	8,215	1,613	21,516	238,401
134		Aug				107,522	64,720		53	2,863	16,812	**191,969**		79,925	51,295	**131,219**	8,268	2,495	21,892	261,153
135		Sep				106,302	65,840		53	2,585	16,116	**190,896**		78,388	49,329	**127,717**	7,695	1,131	20,809	242,842
136		Oct				132,575	70,688		49	2,090	17,310	**222,712**		76,280	53,437	**129,717**	7,580	296	20,525	211,265
137		Nov				212,359	85,801		43	1,627	15,964	**315,794**		73,572	59,100	**132,672**	7,459	289	19,985	156,448
138		Dec				336,524	106,508		26	973	15,513	**459,543**		77,817	61,615	**139,432**	7,553	288	20,219	187,410
139																				
140	2023	Jan				312,879	99,583		21	800	15,450	**428,735**		77,266	59,886	**137,152**	7,057	288	19,509	174,278
141		Feb				275,797	95,364		30	950	14,630	**386,770**		69,581	52,550	**122,130**	6,123	261	17,270	142,842
142		Mar				237,850	87,759		23	1,199	16,993	**343,824**		75,355	59,042	**134,397**	6,628	273	18,416	144,826
143		Apr				196,761	80,196		21	1,614	15,730	**294,323**		73,644	56,163	**129,807**	6,819	286	18,897	163,199
144		May				142,188	69,269		39	2,012	17,118	**230,626**		73,617	58,462	**132,079**	7,136	293	19,630	170,789
145		Jun				109,579	64,167		18	2,559	16,336	**192,659**		70,554	57,086	**127,640**	7,282	292	19,681	176,637
146		Jul				105,221	62,044		41	3,029	16,243	**186,578**		76,327	58,792	**135,119**	7,917	1,481	21,008	237,375
147		Aug				104,986	62,624		53	2,863	17,734	**188,260**		78,555	57,300	**135,855**	7,951	1,562	21,331	250,367
148		Sep				103,796	63,709		53	2,585	17,000	**187,142**		77,034	55,699	**132,733**	7,427	785	20,298	224,044
149		Oct				129,449	68,401		49	2,090	18,259	**218,248**		74,928	60,918	**135,846**	7,343	289	20,014	186,980
150		Nov				207,351	83,023		43	1,627	16,840	**308,884**		72,346	58,153	**130,498**	7,226	282	19,495	164,999
151		Dec				328,588	103,055		26	973	16,365	**449,007**		76,574	60,686	**137,260**	7,317	281	19,726	180,485

	A	B	C	D	E	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
1	**2020 TCAP: 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)**																			
62	2017	Jan				**7,847**	**185,571**	**193,418**		12,889	4,857	**17,746**		**351,539**		12,558	**127,098**	9,073	7,371	**156,100**
63		Feb				**7,746**	**174,444**	**182,190**		11,642	4,387	**16,028**		**319,800**		10,083	**109,921**	8,111	7,306	**135,421**
64		Mar				**8,801**	**169,790**	**178,591**		12,889	4,857	**17,746**		**326,334**		8,372	**98,532**	5,765	7,521	**120,190**
65		Apr				**8,889**	**164,289**	**173,178**		12,473	4,700	**17,173**		**317,167**		7,114	**88,687**	3,683	7,354	**106,838**
66		May				**9,374**	**190,258**	**199,632**		12,889	4,857	**17,746**		**350,279**		6,664	**83,741**	3,062	7,531	**100,998**
67		Jun				**10,100**	**224,165**	**234,265**		12,473	4,700	**17,173**		**377,794**		6,306	**90,350**	2,264	7,534	**106,454**
68		Jul				**10,999**	**278,946**	**289,945**		12,889	4,857	**17,746**		**442,916**		5,823	**96,108**	2,200	7,639	**111,771**
69		Aug				**10,910**	**331,916**	**342,827**		12,889	4,857	**17,746**		**496,080**		5,939	**104,841**	2,742	7,347	**120,869**
70		Sep				**9,777**	**256,956**	**266,733**		12,473	4,700	**17,173**		**416,936**		5,815	**93,848**	2,867	7,511	**110,042**
71		Oct				**9,552**	**189,351**	**198,903**		12,889	4,857	**17,746**		**356,091**		6,509	**101,509**	3,643	7,511	**119,173**
72		Nov				**9,059**	**153,356**	**162,415**		12,473	4,700	**17,173**		**314,806**		7,448	**96,067**	4,993	7,263	**115,771**
73		Dec				**7,967**	**151,421**	**159,388**		12,889	4,857	**17,746**		**319,866**		9,807	**111,525**	9,330	7,263	**137,925**
74																				
75	2018	Jan				**7,476**	**154,070**	**161,545**		12,889	4,857	**17,746**		**311,775**		8,423	**109,270**	**10,526**	7,023	**135,243**
76		Feb				**6,591**	**131,194**	**137,785**		11,642	4,387	**16,028**		**272,538**		8,364	**97,809**	**8,910**	6,474	**121,558**
77		Mar				**7,215**	**151,496**	**158,710**		12,889	4,857	**17,746**		**306,662**		8,368	**85,105**	**7,045**	7,103	**107,620**
78		Apr				**7,313**	**182,022**	**189,335**		12,473	4,700	**17,173**		**333,880**		7,121	**93,206**	**5,271**	7,022	**112,620**
79		May				**7,900**	**186,717**	**194,617**		12,889	4,857	**17,746**		**342,504**		5,850	**83,877**	**3,145**	7,275	**100,147**
80		Jun				**9,239**	**204,840**	**214,080**		12,473	4,700	**17,173**		**355,912**		4,968	**73,073**	**2,571**	7,436	**88,048**
81		Jul				**10,843**	**302,115**	**312,958**		12,889	4,857	**17,746**		**464,222**		4,855	**102,179**	**2,393**	8,413	**117,840**
82		Aug				**11,559**	**335,896**	**347,455**		12,889	4,857	**17,746**		**499,751**		4,838	**104,088**	**2,406**	8,188	**119,519**
83		Sep				**10,221**	**309,029**	**319,249**		12,473	4,700	**17,173**		**467,339**		4,975	**98,379**	**2,330**	8,170	**113,854**
84		Oct				**8,333**	**242,644**	**250,977**		12,889	4,857	**17,746**		**401,781**		5,149	**88,456**	**3,233**	8,226	**105,063**
85		Nov				**7,834**	**222,969**	**230,803**		12,473	4,700	**17,173**		**380,222**		7,143	**102,776**	**6,412**	7,843	**124,174**
86		Dec				**7,711**	**183,344**	**191,055**		12,889	4,857	**17,746**		**349,940**		9,251	**121,139**	**10,477**	7,271	**148,137**
87																				
88	2019	Jan				**7,383**	**166,798**	**174,181**		12,889	4,857	**17,746**		**323,839**		8,453	**114,921**	**10,620**	7,261	**141,255**
89		Feb				**6,466**	**129,741**	**136,207**		11,642	4,387	**16,028**		**270,145**		8,348	**96,024**	**8,989**	6,614	**119,976**
90		Mar				**6,934**	**168,253**	**175,186**		12,889	4,857	**17,746**		**321,913**		8,339	**96,826**	**7,106**	7,701	**119,973**
91		Apr				**7,132**	**178,498**	**185,630**		12,473	4,700	**17,173**		**329,466**		7,090	**94,364**	**5,317**	8,036	**114,807**
92		May				**7,538**	**173,314**	**180,852**		12,889	4,857	**17,746**		**328,217**		5,810	**83,849**	**3,171**	8,289	**101,118**
93		Jun				**8,536**	**203,697**	**212,233**		12,473	4,700	**17,173**		**353,633**		4,961	**74,853**	**2,592**	8,053	**90,458**
94		Jul				**10,436**	**287,633**	**298,069**		12,889	4,857	**17,746**		**448,908**		4,826	**88,293**	**2,412**	9,137	**104,668**
95		Aug				**10,962**	**339,342**	**350,304**		12,889	4,857	**17,746**		**502,194**		4,780	**104,773**	**2,425**	9,233	**121,210**
96		Sep				**10,095**	**312,873**	**322,968**		12,473	4,700	**17,173**		**470,698**		4,915	**99,799**	**2,348**	9,198	**116,260**
97		Oct				**7,749**	**236,641**	**244,390**		12,889	4,857	**17,746**		**394,647**		5,130	**87,607**	**3,260**	8,916	**104,912**
98		Nov				**7,575**	**153,353**	**160,928**		12,473	4,700	**17,173**		**309,292**		7,098	**85,843**	**6,468**	7,403	**106,811**
99		Dec				**7,616**	**171,577**	**179,193**		12,889	4,857	**17,746**		**337,016**		9,246	**116,318**	**10,569**	7,559	**143,691**
100																				
101	2020	Jan				**7,404**	**191,245**	**198,648**		12,889	4,857	**17,746**		**347,988**		8,457	**120,932**	**10,715**	7,972	**148,075**
102		Feb				**6,512**	**130,278**	**136,790**		11,642	4,387	**16,028**		**273,078**		8,504	**102,018**	**9,182**	6,886	**126,591**
103		Mar				**6,937**	**131,983**	**138,920**		12,889	4,857	**17,746**		**285,306**		8,376	**95,294**	**7,168**	7,354	**118,192**
104		Apr				**7,138**	**154,309**	**161,447**		12,473	4,700	**17,173**		**304,756**		7,141	**88,481**	**5,363**	7,883	**108,867**
105		May				**7,549**	**144,827**	**152,376**		12,889	4,857	**17,746**		**299,178**		5,843	**76,974**	**3,197**	7,657	**93,670**
106		Jun				**8,317**	**176,771**	**185,088**		12,473	4,700	**17,173**		**325,853**		4,971	**70,962**	**2,612**	7,762	**86,307**
107		Jul				**10,060**	**285,420**	**295,480**		12,889	4,857	**17,746**		**445,708**		4,873	**93,458**	**2,431**	8,794	**109,557**
108		Aug				**10,731**	**333,109**	**343,840**		12,889	4,857	**17,746**		**495,195**		4,828	**102,357**	**2,444**	9,173	**118,801**
109		Sep				**9,336**	**305,442**	**314,778**		12,473	4,700	**17,173**		**462,014**		4,965	**96,046**	**2,366**	9,058	**112,435**
110		Oct				**7,723**	**257,294**	**265,016**		12,889	4,857	**17,746**		**414,827**		5,164	**84,437**	**3,287**	8,693	**101,580**
111		Nov				**7,527**	**194,153**	**201,679**		12,473	4,700	**17,173**		**349,706**		7,156	**82,329**	**6,524**	7,587	**103,596**
112		Dec				**7,646**	**210,058**	**217,704**		12,889	4,857	**17,746**		**375,268**		9,295	**113,837**	**10,662**	7,799	**141,593**

	A	B	C	D	E	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
1	**2020 TCAP: 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	2021	Jan				**7,461**	**208,853**	**216,313**		12,889	4,857	**17,746**		**364,913**		8,506	**113,370**	**10,809**	7,839	**140,524**
115		Feb				**6,629**	**125,240**	**131,869**		11,642	4,387	**16,028**		**264,846**		8,374	**98,971**	**9,147**	6,838	**123,330**
116		Mar				**7,129**	**125,194**	**132,324**		12,889	4,857	**17,746**		**277,700**		8,421	**89,821**	**7,230**	7,446	**112,917**
117		Apr				**7,340**	**170,907**	**178,247**		12,473	4,700	**17,173**		**320,476**		7,160	**88,881**	**5,408**	7,753	**109,202**
118		May				**7,752**	**172,074**	**179,826**		12,889	4,857	**17,746**		**325,603**		5,875	**77,740**	**3,222**	7,659	**94,496**
119		Jun				**8,217**	**194,043**	**202,260**		12,473	4,700	**17,173**		**342,128**		4,995	**75,044**	**2,632**	7,891	**90,563**
120		Jul				**10,368**	**264,172**	**274,541**		12,889	4,857	**17,746**		**423,802**		4,866	**93,935**	**2,450**	9,041	**110,292**
121		Aug				**11,140**	**298,362**	**309,503**		12,889	4,857	**17,746**		**459,832**		4,831	**101,826**	**2,463**	9,271	**118,390**
122		Sep				**9,076**	**276,382**	**285,457**		12,473	4,700	**17,173**		**431,647**		4,967	**92,103**	**2,385**	9,121	**108,576**
123		Oct				**7,894**	**244,683**	**252,577**		12,889	4,857	**17,746**		**401,330**		5,170	**92,439**	**3,313**	8,828	**109,751**
124		Nov				**7,733**	**177,488**	**185,221**		12,473	4,700	**17,173**		**332,248**		7,159	**85,680**	**6,580**	7,620	**107,040**
125		Dec				**7,930**	**209,646**	**217,576**		12,889	4,857	**17,746**		**374,142**		9,317	**112,475**	**10,754**	7,906	**140,452**
126																				
127	2022	Jan				**7,578**	**196,165**	**203,743**		12,889	4,857	**17,746**		**351,222**		8,496	**111,916**	**10,903**	7,834	**139,149**
128		Feb				**6,586**	**148,803**	**155,390**		11,642	4,387	**16,028**		**287,330**		8,405	**96,153**	**9,225**	6,968	**120,751**
129		Mar				**7,120**	**157,092**	**164,211**		12,889	4,857	**17,746**		**308,450**		8,412	**90,638**	**7,291**	7,560	**113,901**
130		Apr				**7,331**	**164,186**	**171,517**		12,473	4,700	**17,173**		**312,577**		7,174	**89,547**	**5,454**	7,587	**109,762**
131		May				**7,668**	**177,529**	**185,197**		12,889	4,857	**17,746**		**329,734**		5,876	**76,347**	**3,248**	7,725	**93,196**
132		Jun				**8,130**	**192,319**	**200,449**		12,473	4,700	**17,173**		**339,119**		4,996	**74,468**	**2,653**	7,875	**89,992**
133		Jul				**9,828**	**259,917**	**269,745**		12,889	4,857	**17,746**		**417,683**		4,879	**88,142**	**2,469**	8,865	**104,354**
134		Aug				**10,763**	**283,045**	**293,808**		12,889	4,857	**17,746**		**442,773**		4,831	**97,335**	**2,482**	8,979	**113,627**
135		Sep				**8,826**	**263,651**	**272,477**		12,473	4,700	**17,173**		**417,367**		4,971	**87,520**	**2,403**	8,903	**103,797**
136		Oct				**7,877**	**231,790**	**239,667**		12,889	4,857	**17,746**		**387,130**		5,177	**89,268**	**3,340**	8,809	**106,593**
137		Nov				**7,748**	**176,433**	**184,181**		12,473	4,700	**17,173**		**334,026**		7,175	**90,237**	**6,636**	7,667	**111,715**
138		Dec				**7,841**	**207,629**	**215,470**		12,889	4,857	**17,746**		**372,648**		9,333	**114,863**	**10,847**	8,067	**143,110**
139																				
140	2023	Jan				**7,345**	**193,787**	**201,132**		12,889	4,857	**17,746**		**356,030**		8,541	**108,677**	**10,997**	7,569	**135,784**
141		Feb				**6,384**	**160,111**	**166,495**		11,642	4,387	**16,028**		**304,654**		8,434	**97,951**	**9,304**	6,959	**122,648**
142		Mar				**6,901**	**163,242**	**170,143**		12,889	4,857	**17,746**		**322,286**		8,468	**94,857**	**7,353**	7,560	**118,238**
143		Apr				**7,105**	**182,095**	**189,201**		12,473	4,700	**17,173**		**336,181**		7,200	**86,408**	**5,500**	7,286	**106,393**
144		May				**7,429**	**190,418**	**197,848**		12,889	4,857	**17,746**		**347,673**		5,902	**77,811**	**3,274**	7,621	**94,608**
145		Jun				**7,574**	**196,318**	**203,891**		12,473	4,700	**17,173**		**348,704**		5,017	**75,027**	**2,673**	7,723	**90,440**
146		Jul				**9,398**	**258,383**	**267,781**		12,889	4,857	**17,746**		**420,645**		4,901	**87,547**	**2,488**	8,670	**103,606**
147		Aug				**9,513**	**271,699**	**281,211**		12,889	4,857	**17,746**		**434,812**		4,863	**96,002**	**2,501**	8,490	**111,855**
148		Sep				**8,212**	**244,342**	**252,554**		12,473	4,700	**17,173**		**402,461**		4,998	**82,778**	**2,422**	8,317	**98,514**
149		Oct				**7,632**	**206,995**	**214,626**		12,889	4,857	**17,746**		**368,218**		5,198	**79,135**	**3,367**	7,792	**95,491**
150		Nov				**7,508**	**184,494**	**192,002**		12,473	4,700	**17,173**		**339,674**		7,210	**91,761**	**6,691**	7,503	**113,166**
151		Dec				**7,598**	**200,211**	**207,809**		12,889	4,857	**17,746**		**362,814**		9,378	**113,335**	**10,939**	7,644	**141,297**

	A	B	C	D	E	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																
59	***MONTHLY FORECAST DATA***						International NC		**Total**		**Total System End-Use Dmd**		**System Total**				**Total System Throughput**
60							Ecogas		**Noncore**				**(Mdth/d)**		**Co-Use-Fuel**	**"Un-Acnt'd-For" (UAF)**	
61	**Average Year Throughput (Mth)**																
62	2017	Jan					8,158		**515,797**		**980,975**		**3,164**		**3,337**	**9,196**	**993,508**
63		Feb					8,809		**464,030**		**883,159**		**3,154**		**3,004**	**8,279**	**894,443**
64		Mar					8,542		**455,067**		**826,113**		**2,665**		**2,810**	**7,745**	**836,668**
65		Apr					8,705		**432,710**		**749,961**		**2,500**		**2,551**	**7,031**	**759,543**
66		May					8,319		**459,596**		**706,293**		**2,278**		**2,403**	**6,621**	**715,317**
67		Jun					8,414		**492,661**		**698,098**		**2,327**		**2,375**	**6,545**	**707,018**
68		Jul					8,679		**563,365**		**762,058**		**2,458**		**2,592**	**7,144**	**771,795**
69		Aug					8,289		**625,238**		**825,671**		**2,663**		**2,809**	**7,741**	**836,220**
70		Sep					8,900		**535,879**		**735,382**		**2,451**		**2,502**	**6,894**	**744,778**
71		Oct					8,580		**483,844**		**716,648**		**2,312**		**2,438**	**6,718**	**725,805**
72		Nov					8,406		**438,984**		**772,332**		**2,574**		**2,627**	**7,240**	**782,200**
73		Dec					8,406		**466,197**		**953,459**		**3,076**		**3,244**	**8,938**	**965,641**
74																	
75	2018	Jan					8,844		**455,862**		**917,551**		**2,960**		**3,121**	**8,602**	**929,274**
76		Feb					8,276		**402,373**		**818,691**		**2,924**		**2,785**	**7,675**	**829,151**
77		Mar					8,932		**423,213**		**792,040**		**2,555**		**2,694**	**7,425**	**802,159**
78		Apr					8,501		**455,000**		**770,406**		**2,568**		**2,621**	**7,222**	**780,249**
79		May					8,931		**451,581**		**697,260**		**2,249**		**2,372**	**6,537**	**706,168**
80		Jun					8,643		**452,603**		**657,224**		**2,191**		**2,236**	**6,161**	**665,621**
81		Jul					8,931		**590,993**		**788,989**		**2,545**		**2,684**	**7,397**	**799,070**
82		Aug					8,931		**628,201**		**827,549**		**2,670**		**2,815**	**7,758**	**838,122**
83		Sep					9,357		**590,550**		**788,941**		**2,630**		**2,684**	**7,396**	**799,021**
84		Oct					9,645		**516,490**		**748,313**		**2,414**		**2,546**	**7,015**	**757,874**
85		Nov					9,357		**513,753**		**844,605**		**2,815**		**2,873**	**7,918**	**855,396**
86		Dec					9,724		**507,801**		**991,191**		**3,197**		**3,372**	**9,292**	**1,003,855**
87																	
88	2019	Jan					9,773		**474,867**		**932,225**		**3,007**		**3,171**	**8,739**	**944,135**
89		Feb					8,827		**398,948**		**811,433**		**2,898**		**2,760**	**7,607**	**821,800**
90		Mar					9,773		**451,658**		**817,320**		**2,637**		**2,780**	**7,662**	**827,762**
91		Apr					9,458		**453,730**		**766,515**		**2,555**		**2,608**	**7,186**	**776,309**
92		May					9,773		**439,108**		**683,032**		**2,203**		**2,324**	**6,403**	**691,759**
93		Jun					9,458		**453,549**		**656,855**		**2,190**		**2,235**	**6,158**	**665,247**
94		Jul					9,773		**563,349**		**760,097**		**2,452**		**2,586**	**7,126**	**769,808**
95		Aug					9,773		**633,177**		**831,343**		**2,682**		**2,828**	**7,794**	**841,965**
96		Sep					9,458		**596,416**		**793,606**		**2,645**		**2,700**	**7,440**	**803,745**
97		Oct					9,773		**509,332**		**739,637**		**2,386**		**2,516**	**6,934**	**749,087**
98		Nov					9,458		**425,561**		**753,686**		**2,512**		**2,564**	**7,066**	**763,316**
99		Dec					9,773		**490,480**		**969,350**		**3,127**		**3,298**	**9,087**	**981,735**
100																	
101	2020	Jan					9,822		**505,885**		**957,852**		**3,090**		**3,258**	**8,980**	**970,090**
102		Feb					9,188		**408,857**		**816,539**		**2,916**		**2,778**	**7,655**	**826,972**
103		Mar					9,822		**413,320**		**774,960**		**2,500**		**2,636**	**7,265**	**784,861**
104		Apr					9,505		**423,128**		**732,552**		**2,442**		**2,492**	**6,868**	**741,912**
105		May					9,822		**402,670**		**644,260**		**2,078**		**2,192**	**6,040**	**652,492**
106		Jun					9,505		**421,664**		**623,163**		**2,077**		**2,120**	**5,842**	**631,124**
107		Jul					9,822		**565,087**		**760,112**		**2,452**		**2,586**	**7,126**	**769,824**
108		Aug					9,822		**623,818**		**820,328**		**2,646**		**2,791**	**7,690**	**830,809**
109		Sep					9,505		**583,954**		**779,463**		**2,598**		**2,652**	**7,307**	**789,422**
110		Oct					9,822		**526,229**		**754,464**		**2,434**		**2,567**	**7,073**	**764,103**
111		Nov					9,505		**462,807**		**787,429**		**2,625**		**2,679**	**7,382**	**797,490**
112		Dec					9,822		**526,683**		**999,926**		**3,226**		**3,402**	**9,374**	**1,012,702**

	A	B	C	D	E	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																
59	***MONTHLY FORECAST DATA***						International NC		**Total**		**Total System End-Use Dmd**		**System Total**				**Total System Throughput**
60							Ecogas		**Noncore**				**(Mdth/d)**		**Co-Use-Fuel**	**"Un-Acnt'd-For" (UAF)**	
61	**Average Year Throughput (Mth)**																
113																	
114	2021	Jan					9,871		**515,308**		**961,386**		**3,101**		**3,270**	**9,013**	**973,669**
115		Feb					8,871		**397,047**		**799,436**		**2,855**		**2,720**	**7,495**	**809,650**
116		Mar					9,871		**400,488**		**757,657**		**2,444**		**2,577**	**7,103**	**767,337**
117		Apr					9,553		**439,231**		**744,874**		**2,483**		**2,534**	**6,983**	**754,391**
118		May					9,871		**429,970**		**668,860**		**2,158**		**2,275**	**6,270**	**677,406**
119		Jun					9,553		**442,243**		**641,585**		**2,139**		**2,183**	**6,015**	**649,782**
120		Jul					9,871		**543,965**		**736,934**		**2,377**		**2,507**	**6,909**	**746,349**
121		Aug					9,871		**588,093**		**782,611**		**2,525**		**2,662**	**7,337**	**792,610**
122		Sep					9,553		**549,776**		**743,257**		**2,478**		**2,528**	**6,968**	**752,754**
123		Oct					9,871		**520,951**		**746,750**		**2,409**		**2,540**	**7,001**	**756,291**
124		Nov					9,553		**448,841**		**769,528**		**2,565**		**2,618**	**7,214**	**779,360**
125		Dec					9,871		**524,464**		**991,567**		**3,199**		**3,373**	**9,296**	**1,004,236**
126																	
127	2022	Jan					9,920		**500,291**		**939,119**		**3,029**		**3,195**	**8,804**	**951,117**
128		Feb					8,916		**416,996**		**812,862**		**2,903**		**2,765**	**7,620**	**823,248**
129		Mar					9,920		**432,272**		**783,896**		**2,529**		**2,667**	**7,349**	**793,911**
130		Apr					9,600		**431,940**		**732,883**		**2,443**		**2,493**	**6,871**	**742,247**
131		May					9,920		**432,850**		**668,340**		**2,156**		**2,274**	**6,266**	**676,879**
132		Jun					9,600		**438,711**		**635,316**		**2,118**		**2,161**	**5,956**	**643,433**
133		Jul					9,920		**531,957**		**722,310**		**2,330**		**2,457**	**6,772**	**731,539**
134		Aug					9,920		**566,320**		**758,290**		**2,446**		**2,580**	**7,109**	**767,978**
135		Sep					9,600		**530,764**		**721,660**		**2,406**		**2,455**	**6,765**	**730,880**
136		Oct					9,920		**503,643**		**726,354**		**2,343**		**2,471**	**6,809**	**735,635**
137		Nov					9,600		**455,341**		**771,135**		**2,570**		**2,623**	**7,229**	**780,987**
138		Dec					9,920		**525,678**		**985,221**		**3,178**		**3,352**	**9,236**	**997,809**
139																	
140	2023	Jan					9,970		**501,783**		**930,518**		**3,002**		**3,165**	**8,723**	**942,407**
141		Feb					8,960		**436,263**		**823,033**		**2,939**		**2,800**	**7,716**	**833,549**
142		Mar					9,970		**450,493**		**794,318**		**2,562**		**2,702**	**7,447**	**804,466**
143		Apr					9,648		**452,222**		**746,545**		**2,488**		**2,540**	**6,999**	**756,083**
144		May					9,970		**452,251**		**682,877**		**2,203**		**2,323**	**6,402**	**691,601**
145		Jun					9,648		**448,793**		**641,452**		**2,138**		**2,182**	**6,013**	**649,648**
146		Jul					9,970		**534,221**		**720,799**		**2,325**		**2,452**	**6,757**	**730,009**
147		Aug					9,970		**556,637**		**744,897**		**2,403**		**2,534**	**6,983**	**754,415**
148		Sep					9,648		**510,624**		**697,766**		**2,326**		**2,374**	**6,541**	**706,681**
149		Oct					9,970		**473,678**		**691,926**		**2,232**		**2,354**	**6,487**	**700,767**
150		Nov					9,648		**462,488**		**771,372**		**2,571**		**2,624**	**7,231**	**781,228**
151		Dec					9,970		**514,081**		**963,088**		**3,107**		**3,276**	**9,029**	**975,393**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																	
154	***MONTHLY FORECAST DATA***						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)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)
156	**Average Year Sales (Mth)**																	
157	2017	Jan	31			338,078	95,152		36	635	6,415	**440,315**		0	0	**0**	0	0
158		Feb	28			298,009	91,262		35	465	6,075	**395,846**		0	0	**0**	0	0
159		Mar	31			257,006	84,129		37	582	7,026	**348,780**		0	0	**0**	0	0
160		Apr	30			212,608	76,956		56	927	6,494	**297,041**		0	0	**0**	0	0
161		May	31			153,640	66,632		52	1,124	7,115	**228,563**		0	0	**0**	0	0
162		Jun	30			118,404	61,838		51	1,650	6,809	**188,753**		0	0	**0**	0	0
163		Jul	31			113,695	59,792		79	1,994	6,797	**182,356**		0	0	**0**	0	0
164		Aug	31			113,442	60,378		124	2,191	6,962	**183,097**		0	0	**0**	0	0
165		Sep	30			112,155	61,446		117	1,955	6,647	**182,320**		0	0	**0**	0	0
166		Oct	31			139,875	65,910		98	1,250	7,074	**214,207**		0	0	**0**	0	0
167		Nov	30			224,051	79,678		84	1,405	6,538	**311,756**		0	0	**0**	0	0
168		Dec	31			355,052	98,463		58	967	6,231	**460,771**		0	0	**0**	0	0
169																		
170	2018	Jan	31			335,317	93,989		21	671	6,767	**436,766**		0	0	**0**	0	0
171		Feb	28			295,575	90,112		30	797	6,408	**392,923**		0	0	**0**	0	0
172		Mar	31			254,907	83,028		23	1,005	7,413	**346,377**		0	0	**0**	0	0
173		Apr	30			210,872	75,921		21	1,354	6,851	**295,019**		0	0	**0**	0	0
174		May	31			152,385	65,683		39	1,688	7,507	**227,302**		0	0	**0**	0	0
175		Jun	30			117,438	60,924		18	2,147	7,184	**187,710**		0	0	**0**	0	0
176		Jul	31			112,767	58,902		41	2,541	7,172	**181,423**		0	0	**0**	0	0
177		Aug	31			112,515	59,476		53	2,401	7,347	**181,793**		0	0	**0**	0	0
178		Sep	30			111,239	60,526		53	2,168	7,014	**181,000**		0	0	**0**	0	0
179		Oct	31			138,732	64,947		49	1,753	7,465	**212,946**		0	0	**0**	0	0
180		Nov	30			222,221	78,609		43	1,365	6,899	**309,137**		0	0	**0**	0	0
181		Dec	31			352,153	97,265		26	816	6,576	**456,836**		0	0	**0**	0	0
182																		
183	2019	Jan	31			331,305	93,209		21	671	7,139	**432,346**		0	0	**0**	0	0
184		Feb	28			292,039	89,376		30	797	6,761	**389,002**		0	0	**0**	0	0
185		Mar	31			251,858	82,356		23	1,005	7,821	**343,063**		0	0	**0**	0	0
186		Apr	30			208,349	75,303		21	1,354	7,229	**292,256**		0	0	**0**	0	0
187		May	31			150,562	65,149		39	1,688	7,921	**225,359**		0	0	**0**	0	0
188		Jun	30			116,033	60,432		18	2,147	7,580	**186,209**		0	0	**0**	0	0
189		Jul	31			111,418	58,422		41	2,541	7,568	**179,989**		0	0	**0**	0	0
190		Aug	31			111,169	58,996		53	2,401	7,753	**180,373**		0	0	**0**	0	0
191		Sep	30			109,908	60,043		53	2,168	7,402	**179,574**		0	0	**0**	0	0
192		Oct	31			137,073	64,431		49	1,753	7,878	**211,184**		0	0	**0**	0	0
193		Nov	30			219,563	77,977		43	1,365	7,281	**306,228**		0	0	**0**	0	0
194		Dec	31			347,940	96,464		26	816	6,941	**452,187**		0	0	**0**	0	0
195																		
196	2020	Jan	31			326,667	92,032		21	671	7,531	**426,923**		0	0	**0**	0	0
197		Feb	29			287,950	88,255		30	797	7,133	**384,165**		0	0	**0**	0	0
198		Mar	31			248,332	81,326		23	1,005	8,252	**338,938**		0	0	**0**	0	0
199		Apr	30			205,432	74,357		21	1,354	7,627	**288,792**		0	0	**0**	0	0
200		May	31			148,454	64,328		39	1,688	8,359	**222,867**		0	0	**0**	0	0
201		Jun	30			114,408	59,672		18	2,147	7,998	**184,242**		0	0	**0**	0	0
202		Jul	31			109,858	57,682		41	2,541	7,986	**178,108**		0	0	**0**	0	0
203		Aug	31			109,613	58,253		53	2,401	8,183	**178,503**		0	0	**0**	0	0
204		Sep	30			108,370	59,291		53	2,168	7,812	**177,694**		0	0	**0**	0	0
205		Oct	31			135,153	63,628		49	1,753	8,314	**208,898**		0	0	**0**	0	0
206		Nov	30			216,489	77,003		43	1,365	7,685	**302,584**		0	0	**0**	0	0
207		Dec	31			343,068	95,250		26	816	7,327	**446,488**		0	0	**0**	0	0

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																	
154	***MONTHLY FORECAST DATA***						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)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)
156	**Average Year Sales (Mth)**																	
208																		
209	2021	Jan	31			322,137	90,299		21	671	7,946	**421,075**		0	0	**0**	0	0
210		Feb	28			283,958	86,597		30	797	7,526	**378,907**		0	0	**0**	0	0
211		Mar	31			244,888	79,799		23	1,005	8,708	**334,423**		0	0	**0**	0	0
212		Apr	30			202,584	72,956		21	1,354	8,048	**284,963**		0	0	**0**	0	0
213		May	31			146,396	63,111		39	1,688	8,820	**220,054**		0	0	**0**	0	0
214		Jun	30			112,822	58,541		18	2,147	8,439	**181,967**		0	0	**0**	0	0
215		Jul	31			108,334	56,586		41	2,541	8,428	**175,930**		0	0	**0**	0	0
216		Aug	31			108,093	57,149		53	2,401	8,636	**176,332**		0	0	**0**	0	0
217		Sep	30			106,867	58,171		53	2,168	8,245	**175,503**		0	0	**0**	0	0
218		Oct	31			133,280	62,430		49	1,753	8,775	**206,287**		0	0	**0**	0	0
219		Nov	30			213,487	75,557		43	1,365	8,111	**298,563**		0	0	**0**	0	0
220		Dec	31			338,311	93,460		26	816	7,735	**440,348**		0	0	**0**	0	0
221																		
222	2022	Jan	31			316,695	88,160		21	671	8,383	**413,931**		0	0	**0**	0	0
223		Feb	28			279,160	84,554		30	797	7,941	**372,481**		0	0	**0**	0	0
224		Mar	31			240,751	77,919		23	1,005	9,189	**328,886**		0	0	**0**	0	0
225		Apr	30			199,161	71,232		21	1,354	8,493	**280,261**		0	0	**0**	0	0
226		May	31			143,922	61,616		39	1,688	9,308	**216,573**		0	0	**0**	0	0
227		Jun	30			110,915	57,155		18	2,147	8,906	**179,141**		0	0	**0**	0	0
228		Jul	31			106,504	55,241		41	2,541	8,894	**173,222**		0	0	**0**	0	0
229		Aug	31			106,267	55,795		53	2,401	9,115	**173,632**		0	0	**0**	0	0
230		Sep	30			105,061	56,797		53	2,168	8,702	**172,782**		0	0	**0**	0	0
231		Oct	31			131,028	60,961		49	1,753	9,262	**203,053**		0	0	**0**	0	0
232		Nov	30			209,880	73,777		43	1,365	8,562	**293,627**		0	0	**0**	0	0
233		Dec	31			332,595	91,250		26	816	8,166	**432,854**		0	0	**0**	0	0
234																		
235	2023	Jan	31			309,227	85,303		21	671	8,846	**404,068**		0	0	**0**	0	0
236		Feb	28			272,577	81,816		30	797	8,379	**363,599**		0	0	**0**	0	0
237		Mar	31			235,074	75,398		23	1,005	9,697	**321,196**		0	0	**0**	0	0
238		Apr	30			194,464	68,927		21	1,354	8,963	**273,729**		0	0	**0**	0	0
239		May	31			140,529	59,622		39	1,688	9,824	**211,701**		0	0	**0**	0	0
240		Jun	30			108,300	55,306		18	2,147	9,399	**175,170**		0	0	**0**	0	0
241		Jul	31			103,993	53,453		41	2,541	9,388	**169,415**		0	0	**0**	0	0
242		Aug	31			103,761	53,990		53	2,401	9,622	**169,827**		0	0	**0**	0	0
243		Sep	30			102,584	54,961		53	2,168	9,186	**168,951**		0	0	**0**	0	0
244		Oct	31			127,938	58,991		49	1,753	9,777	**198,508**		0	0	**0**	0	0
245		Nov	30			204,931	71,391		43	1,365	9,039	**286,768**		0	0	**0**	0	0
246		Dec	31			324,753	88,294		26	816	8,621	**422,511**		0	0	**0**	0	0

	A	B	C	D	E	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																
154	***MONTHLY FORECAST DATA***					Noncore - Electric Generatiion						Noncore - EOR				**Total**	
155						EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**		EOR (Dist.)	EOR (Trans.)	**EOR (Total)**		**Retail Noncore**	
156	**Average Year Sales (Mth)**																
157	2017	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	2018	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	2019	Jan	31			0	0	**0**	**0**	**0**		0	0	**0**		**0**	
184		Feb	28			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	2020	Jan	31			0	0	**0**	**0**	**0**		0	0	**0**		**0**	
197		Feb	29			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**	

	A	B	C	D	E	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																
154	***MONTHLY FORECAST DATA***					Noncore - Electric Generatiion						Noncore - EOR				**Total**	
155						EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**	**EG (>=3MMThms)**	**EG (Total)**		EOR (Dist.)	EOR (Trans.)	**EOR (Total)**		**Retail Noncore**	
156	**Average Year Sales (Mth)**																
208																	
209	2021	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	2022	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	2023	Jan	31			0	0	**0**	**0**	**0**		0	0	**0**		**0**	
236		Feb	28			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	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																	
154	***MONTHLY FORECAST DATA***					Wholesale Noncore				**Total**		International NC		**Total**		**Total System End-**		**System Total**
155						Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**		Ecogas		**Noncore**		**Use Dmd**		**(Mdth/d)**
156	**Average Year Sales (Mth)**																	
157	2017	Jan	31			0	**0**	0	0	**0**		0		**0**		**440,315**		**1,420**
158		Feb	28			0	**0**	0	0	**0**		0		**0**		**395,846**		**1,414**
159		Mar	31			0	**0**	0	0	**0**		0		**0**		**348,780**		**1,125**
160		Apr	30			0	**0**	0	0	**0**		0		**0**		**297,041**		**990**
161		May	31			0	**0**	0	0	**0**		0		**0**		**228,563**		**737**
162		Jun	30			0	**0**	0	0	**0**		0		**0**		**188,753**		**629**
163		Jul	31			0	**0**	0	0	**0**		0		**0**		**182,356**		**588**
164		Aug	31			0	**0**	0	0	**0**		0		**0**		**183,097**		**591**
165		Sep	30			0	**0**	0	0	**0**		0		**0**		**182,320**		**608**
166		Oct	31			0	**0**	0	0	**0**		0		**0**		**214,207**		**691**
167		Nov	30			0	**0**	0	0	**0**		0		**0**		**311,756**		**1,039**
168		Dec	31			0	**0**	0	0	**0**		0		**0**		**460,771**		**1,486**
169																		
170	2018	Jan	31			0	**0**	0	0	**0**		0		**0**		**436,766**		**1,409**
171		Feb	28			0	**0**	0	0	**0**		0		**0**		**392,923**		**1,403**
172		Mar	31			0	**0**	0	0	**0**		0		**0**		**346,377**		**1,117**
173		Apr	30			0	**0**	0	0	**0**		0		**0**		**295,019**		**983**
174		May	31			0	**0**	0	0	**0**		0		**0**		**227,302**		**733**
175		Jun	30			0	**0**	0	0	**0**		0		**0**		**187,710**		**626**
176		Jul	31			0	**0**	0	0	**0**		0		**0**		**181,423**		**585**
177		Aug	31			0	**0**	0	0	**0**		0		**0**		**181,793**		**586**
178		Sep	30			0	**0**	0	0	**0**		0		**0**		**181,000**		**603**
179		Oct	31			0	**0**	0	0	**0**		0		**0**		**212,946**		**687**
180		Nov	30			0	**0**	0	0	**0**		0		**0**		**309,137**		**1,030**
181		Dec	31			0	**0**	0	0	**0**		0		**0**		**456,836**		**1,474**
182																		
183	2019	Jan	31			0	**0**	0	0	**0**		0		**0**		**432,346**		**1,395**
184		Feb	28			0	**0**	0	0	**0**		0		**0**		**389,002**		**1,389**
185		Mar	31			0	**0**	0	0	**0**		0		**0**		**343,063**		**1,107**
186		Apr	30			0	**0**	0	0	**0**		0		**0**		**292,256**		**974**
187		May	31			0	**0**	0	0	**0**		0		**0**		**225,359**		**727**
188		Jun	30			0	**0**	0	0	**0**		0		**0**		**186,209**		**621**
189		Jul	31			0	**0**	0	0	**0**		0		**0**		**179,989**		**581**
190		Aug	31			0	**0**	0	0	**0**		0		**0**		**180,373**		**582**
191		Sep	30			0	**0**	0	0	**0**		0		**0**		**179,574**		**599**
192		Oct	31			0	**0**	0	0	**0**		0		**0**		**211,184**		**681**
193		Nov	30			0	**0**	0	0	**0**		0		**0**		**306,228**		**1,021**
194		Dec	31			0	**0**	0	0	**0**		0		**0**		**452,187**		**1,459**
195																		
196	2020	Jan	31			0	**0**	0	0	**0**		0		**0**		**426,923**		**1,377**
197		Feb	29			0	**0**	0	0	**0**		0		**0**		**384,165**		**1,325**
198		Mar	31			0	**0**	0	0	**0**		0		**0**		**338,938**		**1,093**
199		Apr	30			0	**0**	0	0	**0**		0		**0**		**288,792**		**963**
200		May	31			0	**0**	0	0	**0**		0		**0**		**222,867**		**719**
201		Jun	30			0	**0**	0	0	**0**		0		**0**		**184,242**		**614**
202		Jul	31			0	**0**	0	0	**0**		0		**0**		**178,108**		**575**
203		Aug	31			0	**0**	0	0	**0**		0		**0**		**178,503**		**576**
204		Sep	30			0	**0**	0	0	**0**		0		**0**		**177,694**		**592**
205		Oct	31			0	**0**	0	0	**0**		0		**0**		**208,898**		**674**
206		Nov	30			0	**0**	0	0	**0**		0		**0**		**302,584**		**1,009**
207		Dec	31			0	**0**	0	0	**0**		0		**0**		**446,488**		**1,440**

	A	B	C	D	E	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																	
154	***MONTHLY FORECAST DATA***					Wholesale Noncore				**Total**		International NC		**Total**		**Total System End-Use Dmd**		**System Total**
155						Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**		Ecogas		**Noncore**				**(Mdth/d)**
156	**Average Year Sales (Mth)**																	
208																		
209	2021	Jan	31			0	**0**	0	0	**0**		0		**0**		**421,075**		**1,358**
210		Feb	28			0	**0**	0	0	**0**		0		**0**		**378,907**		**1,353**
211		Mar	31			0	**0**	0	0	**0**		0		**0**		**334,423**		**1,079**
212		Apr	30			0	**0**	0	0	**0**		0		**0**		**284,963**		**950**
213		May	31			0	**0**	0	0	**0**		0		**0**		**220,054**		**710**
214		Jun	30			0	**0**	0	0	**0**		0		**0**		**181,967**		**607**
215		Jul	31			0	**0**	0	0	**0**		0		**0**		**175,930**		**568**
216		Aug	31			0	**0**	0	0	**0**		0		**0**		**176,332**		**569**
217		Sep	30			0	**0**	0	0	**0**		0		**0**		**175,503**		**585**
218		Oct	31			0	**0**	0	0	**0**		0		**0**		**206,287**		**665**
219		Nov	30			0	**0**	0	0	**0**		0		**0**		**298,563**		**995**
220		Dec	31			0	**0**	0	0	**0**		0		**0**		**440,348**		**1,420**
221																		
222	2022	Jan	31			0	**0**	0	0	**0**		0		**0**		**413,931**		**1,335**
223		Feb	28			0	**0**	0	0	**0**		0		**0**		**372,481**		**1,330**
224		Mar	31			0	**0**	0	0	**0**		0		**0**		**328,886**		**1,061**
225		Apr	30			0	**0**	0	0	**0**		0		**0**		**280,261**		**934**
226		May	31			0	**0**	0	0	**0**		0		**0**		**216,573**		**699**
227		Jun	30			0	**0**	0	0	**0**		0		**0**		**179,141**		**597**
228		Jul	31			0	**0**	0	0	**0**		0		**0**		**173,222**		**559**
229		Aug	31			0	**0**	0	0	**0**		0		**0**		**173,632**		**560**
230		Sep	30			0	**0**	0	0	**0**		0		**0**		**172,782**		**576**
231		Oct	31			0	**0**	0	0	**0**		0		**0**		**203,053**		**655**
232		Nov	30			0	**0**	0	0	**0**		0		**0**		**293,627**		**979**
233		Dec	31			0	**0**	0	0	**0**		0		**0**		**432,854**		**1,396**
234																		
235	2023	Jan	31			0	**0**	0	0	**0**		0		**0**		**404,068**		**1,303**
236		Feb	28			0	**0**	0	0	**0**		0		**0**		**363,599**		**1,299**
237		Mar	31			0	**0**	0	0	**0**		0		**0**		**321,196**		**1,036**
238		Apr	30			0	**0**	0	0	**0**		0		**0**		**273,729**		**912**
239		May	31			0	**0**	0	0	**0**		0		**0**		**211,701**		**683**
240		Jun	30			0	**0**	0	0	**0**		0		**0**		**175,170**		**584**
241		Jul	31			0	**0**	0	0	**0**		0		**0**		**169,415**		**547**
242		Aug	31			0	**0**	0	0	**0**		0		**0**		**169,827**		**548**
243		Sep	30			0	**0**	0	0	**0**		0		**0**		**168,951**		**563**
244		Oct	31			0	**0**	0	0	**0**		0		**0**		**198,508**		**640**
245		Nov	30			0	**0**	0	0	**0**		0		**0**		**286,768**		**956**
246		Dec	31			0	**0**	0	0	**0**		0		**0**		**422,511**		**1,363**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																	
249	***MONTHLY FORECAST DATA***						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	2017	Jan				389,629	119,017		36	757	11,233	**520,670**		82,741	58,463	**141,203**	6,984	863
253		Feb				342,181	113,456		35	555	10,634	**466,861**		73,436	48,854	**122,289**	6,477	1,269
254		Mar				290,560	103,421		37	694	12,349	**407,061**		78,542	51,987	**130,528**	6,786	2,015
255		Apr				237,063	93,424		56	1,105	11,431	**343,080**		76,629	50,569	**127,198**	6,871	2,018
256		May				164,246	79,006		52	1,341	12,436	**257,080**		77,370	55,684	**133,054**	7,750	1,624
257		Jun				121,947	72,264		51	1,966	11,870	**208,099**		73,810	52,583	**126,393**	8,567	1,533
258		Jul				115,434	69,469		79	2,377	11,797	**199,156**		79,834	55,398	**135,232**	8,961	2,038
259		Aug				115,125	70,229		124	2,612	12,880	**200,969**		81,919	53,594	**135,513**	9,766	1,144
260		Sep				114,310	71,665		117	2,331	12,347	**200,770**		80,586	52,458	**133,045**	8,556	1,222
261		Oct				147,425	77,859		98	1,491	13,261	**240,134**		79,731	59,815	**139,545**	8,455	1,096
262		Nov				251,047	97,154		84	1,675	12,229	**362,189**		76,375	59,267	**135,642**	7,935	1,124
263		Dec				410,371	123,604		58	1,153	11,879	**547,066**		80,629	62,993	**143,622**	7,344	623
264																		
265	2018	Jan				386,971	117,688		21	800	11,845	**517,326**		81,325	51,986	**133,312**	7,155	321
266		Feb				339,846	112,148		30	950	11,214	**464,189**		73,345	46,088	**119,433**	6,239	352
267		Mar				288,577	102,171		23	1,199	13,023	**404,993**		79,337	51,401	**130,737**	6,709	505
268		Apr				235,446	92,245		21	1,614	12,055	**341,381**		77,506	50,247	**127,753**	6,889	424
269		May				163,126	77,922		39	2,012	13,115	**256,214**		77,309	52,984	**130,293**	7,288	612
270		Jun				121,115	71,221		18	2,559	12,518	**207,431**		74,001	50,695	**124,696**	7,455	1,785
271		Jul				114,647	68,451		41	3,029	12,442	**198,610**		80,079	53,447	**133,526**	8,287	2,556
272		Aug				114,339	69,200		53	2,863	13,584	**200,039**		82,409	52,147	**134,556**	8,281	3,278
273		Sep				113,531	70,618		53	2,585	13,022	**199,809**		80,758	50,173	**130,931**	7,719	2,502
274		Oct				146,420	76,766		49	2,090	13,986	**239,311**		78,673	54,488	**133,161**	7,425	908
275		Nov				249,334	95,940		43	1,627	12,897	**359,842**		76,246	56,424	**132,670**	7,278	556
276		Dec				407,572	122,238		26	973	12,530	**543,339**		80,941	61,088	**142,029**	7,405	306
277																		
278	2019	Jan				382,846	116,776		21	800	12,491	**512,934**		80,863	51,878	**132,741**	7,076	307
279		Feb				336,224	111,289		30	950	11,826	**460,320**		72,840	45,778	**118,617**	6,170	296
280		Mar				285,501	101,389		23	1,199	13,734	**401,846**		78,697	50,815	**129,512**	6,634	299
281		Apr				232,936	91,525		21	1,614	12,713	**338,809**		77,003	50,041	**127,044**	6,812	320
282		May				161,387	77,298		39	2,012	13,832	**254,568**		76,858	52,914	**129,772**	7,205	333
283		Jun				119,824	70,646		18	2,559	13,202	**206,249**		73,586	50,678	**124,264**	7,361	1,175
284		Jul				113,425	67,888		41	3,029	13,123	**197,505**		79,625	53,474	**133,100**	8,117	2,319
285		Aug				113,120	68,638		53	2,863	14,327	**199,002**		81,945	52,204	**134,150**	7,988	2,974
286		Sep				112,320	70,055		53	2,585	13,734	**198,747**		80,327	50,245	**130,571**	7,600	2,496
287		Oct				144,859	76,167		49	2,090	14,751	**237,916**		78,212	54,401	**132,613**	7,343	406
288		Nov				246,676	95,205		43	1,627	13,603	**357,155**		75,666	55,948	**131,615**	7,196	379
289		Dec				403,227	121,302		26	973	13,216	**538,745**		80,356	60,612	**140,968**	7,322	294
290																		
291	2020	Jan				378,040	115,401		21	800	13,172	**507,434**		80,559	51,863	**132,422**	7,102	301
292		Feb				332,003	109,983		30	950	12,472	**455,437**		73,292	47,675	**120,967**	6,201	311
293		Mar				281,917	100,190		23	1,199	14,484	**397,813**		78,389	50,783	**129,172**	6,656	281
294		Apr				230,012	90,423		21	1,614	13,408	**335,478**		76,638	49,880	**126,518**	6,838	300
295		May				159,361	76,342		39	2,012	14,588	**252,342**		76,481	52,728	**129,209**	7,225	324
296		Jun				118,320	69,762		18	2,559	13,923	**204,582**		73,197	50,431	**123,628**	7,407	910
297		Jul				112,001	67,026		41	3,029	13,841	**195,938**		79,213	53,276	**132,489**	8,038	2,022
298		Aug				111,700	67,774		53	2,863	15,111	**197,501**		81,543	52,073	**133,615**	7,933	2,797
299		Sep				110,910	69,182		53	2,585	14,486	**197,216**		79,951	50,126	**130,077**	7,513	1,823
300		Oct				143,040	75,235		49	2,090	15,558	**235,973**		77,866	54,301	**132,168**	7,380	342
301		Nov				243,579	94,073		43	1,627	14,348	**353,670**		75,368	55,909	**131,277**	7,233	294
302		Dec				398,165	119,885		26	973	13,941	**532,990**		80,078	60,631	**140,709**	7,352	294

2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)

MONTHLY FORECAST DATA

		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)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)
Cold Year Throughput (Mth)											
2021 Jan	373,402	113,375	21	800	13,891	**501,491**	79,966	51,715	**131,682**	7,164	296
Feb	327,930	108,049	30	950	13,153	**450,112**	72,020	45,636	**117,656**	6,353	276
Mar	278,459	98,411	23	1,199	15,276	**393,367**	77,732	50,430	**128,162**	6,849	281
Apr	227,190	88,791	21	1,614	14,141	**331,757**	75,951	49,487	**125,438**	7,045	295
May	157,406	74,926	39	2,012	15,386	**249,770**	75,808	52,376	**128,184**	7,446	306
Jun	116,868	68,449	18	2,559	14,685	**202,579**	72,579	50,153	**122,732**	7,603	614
Jul	110,627	65,752	41	3,029	14,599	**194,048**	78,523	52,999	**131,523**	8,282	2,087
Aug	110,330	66,492	53	2,863	15,939	**195,676**	80,821	51,768	**132,589**	8,243	2,897
Sep	109,550	67,881	53	2,585	15,279	**195,348**	79,248	49,783	**129,030**	7,681	1,395
Oct	141,286	73,844	49	2,090	16,410	**233,679**	77,191	53,919	**131,109**	7,585	309
Nov	240,591	92,389	43	1,627	15,134	**349,784**	74,734	55,545	**130,278**	7,441	292
Dec	393,281	117,794	26	973	14,705	**526,779**	79,437	60,273	**139,710**	7,640	291
2022 Jan	367,696	110,872	21	800	14,650	**494,040**	79,209	51,353	**130,562**	7,284	294
Feb	322,919	105,660	30	950	13,871	**443,430**	71,325	45,294	**116,619**	6,320	267
Mar	274,204	96,215	23	1,199	16,112	**387,752**	76,974	50,050	**127,025**	6,841	279
Apr	223,719	86,780	21	1,614	14,914	**327,048**	75,177	49,092	**124,269**	7,038	293
May	155,001	73,186	39	2,012	16,229	**246,466**	75,015	51,929	**126,944**	7,366	302
Jun	115,083	66,837	18	2,559	15,488	**199,985**	71,815	49,720	**121,534**	7,517	613
Jul	108,936	64,189	41	3,029	15,399	**191,594**	77,667	52,531	**130,199**	8,215	1,613
Aug	108,644	64,918	53	2,863	16,812	**193,290**	79,930	51,295	**131,225**	8,268	2,495
Sep	107,876	66,285	53	2,585	16,116	**192,914**	78,402	49,329	**127,731**	7,695	1,131
Oct	139,127	72,134	49	2,090	17,310	**230,710**	76,380	53,439	**129,819**	7,580	296
Nov	236,915	90,313	43	1,627	15,964	**344,862**	73,985	59,111	**133,096**	7,459	289
Dec	387,271	115,208	26	973	15,513	**518,991**	78,685	61,637	**140,322**	7,553	288
2023 Jan	359,677	107,527	21	800	15,450	**483,476**	78,074	59,907	**137,980**	7,057	288
Feb	315,877	102,456	30	950	14,630	**433,942**	70,271	52,567	**122,838**	6,123	261
Mar	268,224	93,267	23	1,199	16,993	**379,706**	75,873	59,055	**134,928**	6,628	273
Apr	218,840	84,088	21	1,614	15,730	**320,293**	74,017	56,172	**130,189**	6,819	286
May	151,620	70,863	39	2,012	17,118	**241,653**	73,766	58,466	**132,232**	7,136	293
Jun	112,573	64,687	18	2,559	16,336	**196,173**	70,590	57,086	**127,677**	7,282	292
Jul	106,561	62,111	41	3,029	16,243	**187,984**	76,333	58,792	**135,125**	7,917	1,481
Aug	106,275	62,820	53	2,863	17,734	**189,744**	78,560	57,300	**135,861**	7,951	1,562
Sep	105,523	64,150	53	2,585	17,000	**189,310**	77,048	55,700	**132,748**	7,427	785
Oct	136,092	69,841	49	2,090	18,259	**226,331**	75,028	60,920	**135,948**	7,343	289
Nov	231,748	87,525	43	1,627	16,840	**337,783**	72,759	58,163	**130,922**	7,226	282
Dec	378,825	111,745	26	973	16,365	**507,934**	77,442	60,708	**138,150**	7,317	281

		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)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)
Peak Day Throughput (Mth/Day)											
2017	24,778	5,946	2	37	383	**31,146**	2,773	2,093	**4,866**	243	9
2018	24,718	5,904	1	31	404	**31,059**	2,783	2,032	**4,815**	**250**	**12**
2019	24,559	5,876	1	31	426	**30,894**	2,764	2,017	**4,780**	**248**	**13**
2020	24,366	5,832	1	31	450	**30,679**	2,755	2,017	**4,772**	**247**	**9**
2021	24,192	5,764	1	31	474	**30,463**	2,734	2,006	**4,739**	**246**	**9**
2022	23,947	5,680	1	31	500	**30,160**	2,710	1,993	**4,702**	**244**	**9**
2023	23,560	5,566	1	31	528	**29,686**	2,669	1,963	**4,632**	**236**	**9**

	A	B	C	D	E	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																
249	***MONTHLY FORECAST DATA***					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	2017	Jan				21,279	164,292	**7,847**	**185,571**	**193,418**		12,889	4,857	**17,746**		**352,367**	
253		Feb				18,313	156,131	**7,746**	**174,444**	**182,190**		11,642	4,387	**16,028**		**320,508**	
254		Mar				19,538	150,253	**8,801**	**169,790**	**178,591**		12,889	4,857	**17,746**		**326,865**	
255		Apr				19,870	144,419	**8,889**	**164,289**	**173,178**		12,473	4,700	**17,173**		**317,549**	
256		May				21,376	168,882	**9,374**	**190,258**	**199,632**		12,889	4,857	**17,746**		**350,432**	
257		Jun				23,440	200,724	**10,100**	**224,165**	**234,265**		12,473	4,700	**17,173**		**377,831**	
258		Jul				23,247	255,699	**10,999**	**278,946**	**289,945**		12,889	4,857	**17,746**		**442,922**	
259		Aug				24,584	307,332	**10,910**	**331,916**	**342,827**		12,889	4,857	**17,746**		**496,086**	
260		Sep				24,315	232,640	**9,777**	**256,956**	**266,733**		12,473	4,700	**17,173**		**416,951**	
261		Oct				22,573	166,779	**9,552**	**189,351**	**198,903**		12,889	4,857	**17,746**		**356,194**	
262		Nov				21,064	132,292	**9,059**	**153,356**	**162,415**		12,473	4,700	**17,173**		**315,230**	
263		Dec				20,778	130,644	**7,967**	**151,421**	**159,388**		12,889	4,857	**17,746**		**320,756**	
264																	
265	2018	Jan				20,339	133,730	**7,476**	**154,070**	**161,545**		12,889	4,857	**17,746**		**312,603**	
266		Feb				18,001	113,193	**6,591**	**131,194**	**137,785**		11,642	4,387	**16,028**		**273,246**	
267		Mar				19,295	132,201	**7,215**	**151,496**	**158,710**		12,889	4,857	**17,746**		**307,194**	
268		Apr				19,826	162,196	**7,313**	**182,022**	**189,335**		12,473	4,700	**17,173**		**334,262**	
269		May				20,614	166,103	**7,900**	**186,717**	**194,617**		12,889	4,857	**17,746**		**342,656**	
270		Jun				20,643	184,197	**9,239**	**204,840**	**214,080**		12,473	4,700	**17,173**		**355,949**	
271		Jul				21,975	280,140	**10,843**	**302,115**	**312,958**		12,889	4,857	**17,746**		**464,229**	
272		Aug				22,359	313,537	**11,559**	**335,896**	**347,455**		12,889	4,857	**17,746**		**499,757**	
273		Sep				21,266	287,762	**10,221**	**309,029**	**319,249**		12,473	4,700	**17,173**		**467,354**	
274		Oct				20,932	221,712	**8,333**	**242,644**	**250,977**		12,889	4,857	**17,746**		**401,884**	
275		Nov				20,414	202,555	**7,834**	**222,969**	**230,803**		12,473	4,700	**17,173**		**380,646**	
276		Dec				20,633	162,712	**7,711**	**183,344**	**191,055**		12,889	4,857	**17,746**		**350,831**	
277																	
278	2019	Jan				20,188	146,610	**7,383**	**166,798**	**174,181**		12,889	4,857	**17,746**		**324,667**	
279		Feb				17,860	111,881	**6,466**	**129,741**	**136,207**		11,642	4,387	**16,028**		**270,852**	
280		Mar				19,129	149,124	**6,934**	**168,253**	**175,186**		12,889	4,857	**17,746**		**322,444**	
281		Apr				19,676	158,823	**7,132**	**178,498**	**185,630**		12,473	4,700	**17,173**		**329,848**	
282		May				20,462	152,852	**7,538**	**173,314**	**180,852**		12,889	4,857	**17,746**		**328,370**	
283		Jun				20,489	183,208	**8,536**	**203,697**	**212,233**		12,473	4,700	**17,173**		**353,670**	
284		Jul				21,799	265,835	**10,436**	**287,633**	**298,069**		12,889	4,857	**17,746**		**448,915**	
285		Aug				22,188	317,154	**10,962**	**339,342**	**350,304**		12,889	4,857	**17,746**		**502,200**	
286		Sep				21,107	291,765	**10,095**	**312,873**	**322,968**		12,473	4,700	**17,173**		**470,712**	
287		Oct				20,773	215,869	**7,749**	**236,641**	**244,390**		12,889	4,857	**17,746**		**394,749**	
288		Nov				20,224	133,128	**7,575**	**153,353**	**160,928**		12,473	4,700	**17,173**		**309,716**	
289		Dec				20,457	151,121	**7,616**	**171,577**	**179,193**		12,889	4,857	**17,746**		**337,906**	
290																	
291	2020	Jan				20,186	171,059	**7,404**	**191,245**	**198,648**		12,889	4,857	**17,746**		**348,816**	
292		Feb				18,055	112,223	**6,512**	**130,278**	**136,790**		11,642	4,387	**16,028**		**273,786**	
293		Mar				19,128	112,855	**6,937**	**131,983**	**138,920**		12,889	4,857	**17,746**		**285,838**	
294		Apr				19,665	134,644	**7,138**	**154,309**	**161,447**		12,473	4,700	**17,173**		**305,138**	
295		May				20,453	124,373	**7,549**	**144,827**	**152,376**		12,889	4,857	**17,746**		**299,331**	
296		Jun				20,478	156,294	**8,317**	**176,771**	**185,088**		12,473	4,700	**17,173**		**325,890**	
297		Jul				21,735	263,685	**10,060**	**285,420**	**295,480**		12,889	4,857	**17,746**		**445,715**	
298		Aug				22,090	311,019	**10,731**	**333,109**	**343,840**		12,889	4,857	**17,746**		**495,201**	
299		Sep				21,026	284,416	**9,336**	**305,442**	**314,778**		12,473	4,700	**17,173**		**462,028**	
300		Oct				20,765	236,528	**7,723**	**257,294**	**265,016**		12,889	4,857	**17,746**		**414,930**	
301		Nov				20,219	173,933	**7,527**	**194,153**	**201,679**		12,473	4,700	**17,173**		**350,129**	
302		Dec				20,454	189,604	**7,646**	**210,058**	**217,704**		12,889	4,857	**17,746**		**376,159**	

	A	B	C	D	E	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																
249	***MONTHLY FORECAST DATA***					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	2021	Jan				20,139	188,714	**7,461**	**208,853**	**216,313**		12,889	4,857	**17,746**		**365,741**	
305		Feb				17,821	107,419	**6,629**	**125,240**	**131,869**		11,642	4,387	**16,028**		**265,554**	
306		Mar				19,076	106,119	**7,129**	**125,194**	**132,324**		12,889	4,857	**17,746**		**278,232**	
307		Apr				19,600	151,307	**7,340**	**170,907**	**178,247**		12,473	4,700	**17,173**		**320,858**	
308		May				20,382	151,692	**7,752**	**172,074**	**179,826**		12,889	4,857	**17,746**		**325,756**	
309		Jun				20,412	173,631	**8,217**	**194,043**	**202,260**		12,473	4,700	**17,173**		**342,165**	
310		Jul				21,699	242,473	**10,368**	**264,172**	**274,541**		12,889	4,857	**17,746**		**423,809**	
311		Aug				22,088	276,275	**11,140**	**298,362**	**309,503**		12,889	4,857	**17,746**		**459,837**	
312		Sep				20,973	255,409	**9,076**	**276,382**	**285,457**		12,473	4,700	**17,173**		**431,661**	
313		Oct				20,706	223,977	**7,894**	**244,683**	**252,577**		12,889	4,857	**17,746**		**401,432**	
314		Nov				20,161	157,327	**7,733**	**177,488**	**185,221**		12,473	4,700	**17,173**		**332,672**	
315		Dec				20,395	189,251	**7,930**	**209,646**	**217,576**		12,889	4,857	**17,746**		**375,032**	
316																	
317	2022	Jan				19,971	176,194	**7,578**	**196,165**	**203,743**		12,889	4,857	**17,746**		**352,050**	
318		Feb				17,673	131,131	**6,586**	**148,803**	**155,390**		11,642	4,387	**16,028**		**288,038**	
319		Mar				18,889	138,203	**7,120**	**157,092**	**164,211**		12,889	4,857	**17,746**		**308,982**	
320		Apr				19,396	144,791	**7,331**	**164,186**	**171,517**		12,473	4,700	**17,173**		**312,959**	
321		May				20,184	157,345	**7,668**	**177,529**	**185,197**		12,889	4,857	**17,746**		**329,887**	
322		Jun				20,217	172,102	**8,130**	**192,319**	**200,449**		12,473	4,700	**17,173**		**339,156**	
323		Jul				21,516	238,401	**9,828**	**259,917**	**269,745**		12,889	4,857	**17,746**		**417,689**	
324		Aug				21,892	261,153	**10,763**	**283,045**	**293,808**		12,889	4,857	**17,746**		**442,779**	
325		Sep				20,809	242,842	**8,826**	**263,651**	**272,477**		12,473	4,700	**17,173**		**417,381**	
326		Oct				20,525	211,265	**7,877**	**231,790**	**239,667**		12,889	4,857	**17,746**		**387,232**	
327		Nov				19,985	156,448	**7,748**	**176,433**	**184,181**		12,473	4,700	**17,173**		**334,450**	
328		Dec				20,219	187,410	**7,841**	**207,629**	**215,470**		12,889	4,857	**17,746**		**373,538**	
329																	
330	2023	Jan				19,509	174,278	**7,345**	**193,787**	**201,132**		12,889	4,857	**17,746**		**356,858**	
331		Feb				17,270	142,842	**6,384**	**160,111**	**166,495**		11,642	4,387	**16,028**		**305,362**	
332		Mar				18,416	144,826	**6,901**	**163,242**	**170,143**		12,889	4,857	**17,746**		**322,817**	
333		Apr				18,897	163,199	**7,105**	**182,095**	**189,201**		12,473	4,700	**17,173**		**336,563**	
334		May				19,630	170,789	**7,429**	**190,418**	**197,848**		12,889	4,857	**17,746**		**347,825**	
335		Jun				19,681	176,637	**7,574**	**196,318**	**203,891**		12,473	4,700	**17,173**		**348,741**	
336		Jul				21,008	237,375	**9,398**	**258,383**	**267,781**		12,889	4,857	**17,746**		**420,652**	
337		Aug				21,331	250,367	**9,513**	**271,699**	**281,211**		12,889	4,857	**17,746**		**434,818**	
338		Sep				20,298	224,044	**8,212**	**244,342**	**252,554**		12,473	4,700	**17,173**		**402,475**	
339		Oct				20,014	186,980	**7,632**	**206,995**	**214,626**		12,889	4,857	**17,746**		**368,320**	
340		Nov				19,495	164,999	**7,508**	**184,494**	**192,002**		12,473	4,700	**17,173**		**340,098**	
341		Dec				19,726	180,485	**7,598**	**200,211**	**207,809**		12,889	4,857	**17,746**		**363,705**	
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	2017					659	5,822	**253**	**6,480**	**6,733**		416	157	**572**		**12,172**	
347	2018					**631**	**6,717**	**263**	**7,348**	**7,610**		416	157	**572**		**12,997**	
348	2019					**629**	**6,581**	**260**	**7,210**	**7,470**		416	157	**572**		**12,823**	
349	2020					**674**	**7,413**	**257**	**8,086**	**8,343**		416	157	**572**		**13,687**	
350	2021					**632**	**7,593**	**256**	**8,225**	**8,480**		416	157	**572**		**13,792**	
351	2022					**666**	**7,355**	**253**	**8,021**	**8,274**		416	157	**572**		**13,549**	
352	2023					**650**	**7,149**	**245**	**7,799**	**8,044**		416	157	**572**		**13,249**	

	A	B	C	D	E	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**														
249	***MONTHLY FORECAST DATA***					Wholesale Noncore				**Total**		International NC		**Total**	
250						Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**		Ecogas		**Noncore**	
251	**Cold Year Throughput (Mth)**														
252	2017	Jan				12,558	**134,988**	9,073	7,371	**163,990**		8,158		**524,515**	
253		Feb				10,083	**116,730**	8,111	7,306	**142,229**		8,809		**471,546**	
254		Mar				8,372	**104,068**	5,765	7,521	**125,727**		8,542		**461,135**	
255		Apr				7,114	**92,616**	3,683	7,354	**110,767**		8,705		**437,021**	
256		May				6,664	**85,439**	3,062	7,531	**102,696**		8,319		**461,447**	
257		Jun				6,306	**90,773**	2,264	7,534	**106,877**		8,414		**493,122**	
258		Jul				5,823	**96,147**	2,200	7,639	**111,810**		8,679		**563,411**	
259		Aug				5,939	**104,845**	2,742	7,347	**120,873**		8,289		**625,248**	
260		Sep				5,815	**93,891**	2,867	7,511	**110,085**		8,900		**535,935**	
261		Oct				6,509	**102,257**	3,643	7,511	**119,921**		8,580		**484,695**	
262		Nov				7,448	**99,843**	4,993	7,263	**119,546**		8,406		**443,183**	
263		Dec				9,807	**119,723**	9,330	7,263	**146,123**		8,406		**475,286**	
264															
265	2018	Jan				9,515	**117,205**	**12,205**	7,023	**145,949**		8,844		**467,395**	
266		Feb				9,412	**104,658**	**9,497**	6,474	**130,041**		8,276		**411,564**	
267		Mar				9,284	**90,676**	**7,722**	7,103	**114,785**		8,932		**430,910**	
268		Apr				7,740	**97,161**	**5,676**	7,022	**117,600**		8,501		**460,362**	
269		May				6,142	**85,590**	**3,308**	7,275	**102,314**		8,931		**453,902**	
270		Jun				5,131	**73,505**	**2,625**	7,436	**88,697**		8,643		**453,289**	
271		Jul				4,994	**102,224**	**2,393**	8,413	**118,025**		8,931		**591,185**	
272		Aug				4,976	**104,097**	**2,406**	8,188	**119,668**		8,931		**628,355**	
273		Sep				5,119	**98,427**	**2,367**	8,170	**114,084**		9,357		**590,794**	
274		Oct				5,362	**89,213**	**3,402**	8,226	**106,203**		9,645		**517,732**	
275		Nov				7,792	**106,576**	**7,051**	7,843	**129,262**		9,357		**519,264**	
276		Dec				10,489	**129,383**	**11,285**	7,271	**158,427**		9,724		**518,982**	
277															
278	2019	Jan				9,548	**122,823**	**12,315**	7,898	**152,585**		9,773		**487,025**	
279		Feb				9,399	**102,845**	**9,581**	7,046	**128,872**		8,827		**408,551**	
280		Mar				9,257	**102,377**	**7,789**	8,237	**127,660**		9,773		**459,877**	
281		Apr				7,710	**98,307**	**5,725**	8,368	**120,110**		9,458		**459,416**	
282		May				6,100	**85,559**	**3,335**	8,700	**103,696**		9,773		**441,838**	
283		Jun				5,124	**75,287**	**2,646**	8,510	**91,567**		9,458		**454,695**	
284		Jul				4,965	**88,343**	**2,412**	9,520	**105,239**		9,773		**563,927**	
285		Aug				4,917	**104,787**	**2,425**	9,524	**121,653**		9,773		**633,626**	
286		Sep				5,058	**99,852**	**2,385**	9,441	**116,736**		9,458		**596,906**	
287		Oct				5,343	**88,366**	**3,430**	9,237	**106,375**		9,773		**510,897**	
288		Nov				7,747	**89,630**	**7,112**	7,589	**112,078**		9,458		**431,252**	
289		Dec				10,487	**124,529**	**11,384**	7,912	**154,312**		9,773		**501,991**	
290															
291	2020	Jan				9,555	**128,814**	**12,425**	8,479	**159,274**		9,822		**517,912**	
292		Feb				9,562	**108,823**	**9,779**	7,425	**135,589**		9,188		**418,563**	
293		Mar				9,297	**100,832**	**7,857**	8,020	**126,006**		9,822		**421,666**	
294		Apr				7,764	**92,417**	**5,774**	8,293	**114,248**		9,505		**428,891**	
295		May				6,136	**78,684**	**3,363**	8,380	**96,563**		9,822		**405,716**	
296		Jun				5,134	**71,401**	**2,667**	8,209	**87,411**		9,505		**422,806**	
297		Jul				5,013	**93,514**	**2,431**	9,273	**110,231**		9,822		**565,768**	
298		Aug				4,966	**102,377**	**2,444**	9,479	**119,266**		9,822		**624,288**	
299		Sep				5,109	**96,104**	**2,404**	9,396	**113,013**		9,505		**584,545**	
300		Oct				5,378	**85,199**	**3,458**	9,019	**103,054**		9,822		**527,806**	
301		Nov				7,808	**86,110**	**7,174**	7,800	**108,892**		9,505		**468,527**	
302		Dec				10,541	**122,027**	**11,484**	8,201	**152,253**		9,822		**538,234**	

	A	B	C	D	E	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**														
249	***MONTHLY FORECAST DATA***					Wholesale Noncore				**Total**		International NC		**Total**	
250						Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**		Ecogas		**Noncore**	
251	**Cold Year Throughput (Mth)**														
303															
304	2021	Jan				9,609	**121,212**	**12,535**	8,460	**151,815**		9,871		**527,427**	
305		Feb				9,431	**105,741**	**9,749**	7,493	**132,415**		8,871		**406,840**	
306		Mar				9,346	**95,333**	**7,924**	7,664	**120,267**		9,871		**408,370**	
307		Apr				7,785	**92,800**	**5,823**	8,177	**114,585**		9,553		**444,996**	
308		May				6,169	**79,447**	**3,390**	8,415	**97,421**		9,871		**433,048**	
309		Jun				5,160	**75,487**	**2,688**	8,371	**91,705**		9,553		**443,423**	
310		Jul				5,006	**93,998**	**2,450**	9,478	**110,932**		9,871		**544,612**	
311		Aug				4,969	**101,854**	**2,463**	9,515	**118,801**		9,871		**588,509**	
312		Sep				5,111	**92,169**	**2,422**	9,428	**109,130**		9,553		**550,344**	
313		Oct				5,384	**93,204**	**3,486**	9,117	**111,192**		9,871		**522,495**	
314		Nov				7,814	**89,445**	**7,235**	7,835	**112,328**		9,553		**454,553**	
315		Dec				10,567	**120,622**	**11,583**	8,259	**151,032**		9,871		**535,935**	
316															
317	2022	Jan				9,602	**119,675**	**12,645**	8,479	**150,401**		9,920		**512,371**	
318		Feb				9,466	**102,852**	**9,832**	7,361	**129,511**		8,916		**426,464**	
319		Mar				9,339	**96,094**	**7,992**	7,765	**121,190**		9,920		**440,092**	
320		Apr				7,801	**93,427**	**5,872**	8,165	**115,267**		9,600		**437,826**	
321		May				6,170	**78,042**	**3,417**	8,301	**95,930**		9,920		**435,738**	
322		Jun				5,161	**74,913**	**2,708**	8,368	**91,150**		9,600		**439,907**	
323		Jul				5,019	**88,211**	**2,469**	9,255	**104,954**		9,920		**532,563**	
324		Aug				4,969	**97,369**	**2,482**	9,360	**114,180**		9,920		**566,879**	
325		Sep				5,115	**87,591**	**2,441**	9,185	**104,332**		9,600		**531,314**	
326		Oct				5,391	**90,031**	**3,515**	8,995	**107,932**		9,920		**505,084**	
327		Nov				7,831	**93,966**	**7,296**	7,898	**116,991**		9,600		**461,042**	
328		Dec				10,587	**122,925**	**11,683**	8,440	**153,635**		9,920		**537,094**	
329															
330	2023	Jan				9,651	**116,416**	**12,755**	7,947	**146,769**		9,970		**513,596**	
331		Feb				9,498	**104,633**	**9,916**	7,296	**131,344**		8,960		**445,667**	
332		Mar				9,399	**100,301**	**8,059**	7,749	**125,508**		9,970		**458,294**	
333		Apr				7,830	**90,281**	**5,922**	7,642	**111,674**		9,648		**457,885**	
334		May				6,198	**79,508**	**3,444**	7,687	**96,836**		9,970		**454,632**	
335		Jun				5,182	**75,478**	**2,729**	7,863	**91,252**		9,648		**449,642**	
336		Jul				5,042	**87,624**	**2,488**	8,989	**104,142**		9,970		**534,764**	
337		Aug				5,002	**96,044**	**2,501**	8,776	**112,323**		9,970		**557,110**	
338		Sep				5,143	**82,857**	**2,460**	8,511	**98,971**		9,648		**511,094**	
339		Oct				5,413	**79,903**	**3,543**	8,288	**97,147**		9,970		**475,437**	
340		Nov				7,869	**95,483**	**7,358**	7,810	**118,520**		9,648		**468,266**	
341		Dec				10,637	**121,375**	**11,783**	7,845	**151,640**		9,970		**525,315**	
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	2017					556	**6,025**	514	275	**7,370**		271		**19,813**	
347	2018					**556**	**6,413**	**514**	**279**	**7,763**		314		**21,074**	
348	2019					**557**	**6,578**	**519**	**292**	**7,946**		315		**21,084**	
349	2020					**559**	**6,299**	**523**	**296**	**7,677**		317		**21,681**	
350	2021					**561**	**6,114**	**528**	**203**	**7,406**		318		**21,516**	
351	2022					**562**	**6,119**	**532**	**303**	**7,516**		320		**21,385**	
352	2023					**564**	**5,818**	**537**	**291**	**7,210**		322		**20,780**	

	A	B	C	D	E	AO	AP	AQ	AR	AS	AT	AU
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**											
249	***MONTHLY FORECAST DATA***					**Total System End-Use Dmd**		**System Total (Mdth/d)**		**Co-Use-Fuel**	**"Un-Acnt'd-For" (UAF)**	**Total System Throughput**
250												
251	**Cold Year Throughput (Mth)**											
252		2017	Jan			**1,045,185**		**3,372**		**3,556**	**9,798**	**1,058,539**
253			Feb			**938,407**		**3,351**		**3,192**	**8,797**	**950,397**
254			Mar			**868,196**		**2,801**		**2,953**	**8,139**	**879,288**
255			Apr			**780,101**		**2,600**		**2,654**	**7,313**	**790,068**
256			May			**718,527**		**2,318**		**2,444**	**6,736**	**727,708**
257			Jun			**701,220**		**2,337**		**2,385**	**6,574**	**710,180**
258			Jul			**762,566**		**2,460**		**2,594**	**7,149**	**772,309**
259			Aug			**826,217**		**2,665**		**2,811**	**7,746**	**836,773**
260			Sep			**736,706**		**2,456**		**2,506**	**6,906**	**746,118**
261			Oct			**724,829**		**2,338**		**2,466**	**6,795**	**734,089**
262			Nov			**805,371**		**2,685**		**2,740**	**7,550**	**815,661**
263			Dec			**1,022,352**		**3,298**		**3,478**	**9,584**	**1,035,414**
264												
265		2018	Jan			**984,721**		**3,177**		**3,350**	**9,232**	**997,303**
266			Feb			**875,752**		**3,128**		**2,979**	**8,210**	**886,942**
267			Mar			**835,903**		**2,696**		**2,844**	**7,836**	**846,583**
268			Apr			**801,743**		**2,672**		**2,727**	**7,516**	**811,987**
269			May			**710,116**		**2,291**		**2,416**	**6,657**	**719,189**
270			Jun			**660,720**		**2,202**		**2,248**	**6,194**	**669,162**
271			Jul			**789,795**		**2,548**		**2,687**	**7,404**	**799,886**
272			Aug			**828,394**		**2,672**		**2,818**	**7,766**	**838,978**
273			Sep			**790,603**		**2,635**		**2,689**	**7,412**	**800,704**
274			Oct			**757,042**		**2,442**		**2,575**	**7,097**	**766,715**
275			Nov			**879,106**		**2,930**		**2,991**	**8,241**	**890,338**
276			Dec			**1,062,321**		**3,427**		**3,614**	**9,959**	**1,075,893**
277												
278		2019	Jan			**999,959**		**3,226**		**3,402**	**9,374**	**1,012,735**
279			Feb			**868,871**		**3,103**		**2,956**	**8,146**	**879,972**
280			Mar			**861,723**		**2,780**		**2,931**	**8,078**	**872,733**
281			Apr			**798,224**		**2,661**		**2,715**	**7,483**	**808,423**
282			May			**696,406**		**2,246**		**2,369**	**6,529**	**705,304**
283			Jun			**660,944**		**2,203**		**2,248**	**6,196**	**669,389**
284			Jul			**761,432**		**2,456**		**2,590**	**7,138**	**771,160**
285			Aug			**832,627**		**2,686**		**2,832**	**7,806**	**843,266**
286			Sep			**795,653**		**2,652**		**2,707**	**7,459**	**805,819**
287			Oct			**748,813**		**2,416**		**2,547**	**7,020**	**758,381**
288			Nov			**788,407**		**2,628**		**2,682**	**7,391**	**798,480**
289			Dec			**1,040,736**		**3,357**		**3,540**	**9,757**	**1,054,033**
290												
291		2020	Jan			**1,025,346**		**3,308**		**3,488**	**9,612**	**1,038,447**
292			Feb			**874,000**		**3,014**		**2,973**	**8,194**	**885,167**
293			Mar			**819,478**		**2,643**		**2,788**	**7,682**	**829,949**
294			Apr			**764,369**		**2,548**		**2,600**	**7,166**	**774,135**
295			May			**658,058**		**2,123**		**2,239**	**6,169**	**666,466**
296			Jun			**627,388**		**2,091**		**2,134**	**5,882**	**635,404**
297			Jul			**761,706**		**2,457**		**2,591**	**7,141**	**771,438**
298			Aug			**821,789**		**2,651**		**2,796**	**7,704**	**832,289**
299			Sep			**781,761**		**2,606**		**2,659**	**7,329**	**791,749**
300			Oct			**763,778**		**2,464**		**2,598**	**7,160**	**773,537**
301			Nov			**822,197**		**2,741**		**2,797**	**7,708**	**832,702**
302			Dec			**1,071,224**		**3,456**		**3,644**	**10,043**	**1,084,911**

	A	B	C	D	E	AO	AP	AQ	AR	AS	AT	AU
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**											
249	***MONTHLY FORECAST DATA***					**Total System End-Use Dmd**		**System Total (Mdth/d)**		**Co-Use-Fuel**	**"Un-Acnt'd-For" (UAF)**	**Total System Throughput**
250												
251	**Cold Year Throughput (Mth)**											
303												
304	2021	Jan				**1,028,918**		**3,319**		**3,500**	**9,646**	**1,042,064**
305		Feb				**856,951**		**3,061**		**2,915**	**8,034**	**867,900**
306		Mar				**801,736**		**2,586**		**2,727**	**7,516**	**811,980**
307		Apr				**776,753**		**2,589**		**2,642**	**7,282**	**786,678**
308		May				**682,817**		**2,203**		**2,323**	**6,401**	**691,541**
309		Jun				**646,002**		**2,153**		**2,198**	**6,056**	**654,256**
310		Jul				**738,659**		**2,383**		**2,513**	**6,925**	**748,097**
311		Aug				**784,185**		**2,530**		**2,668**	**7,352**	**794,204**
312		Sep				**745,691**		**2,486**		**2,537**	**6,991**	**755,219**
313		Oct				**756,174**		**2,439**		**2,572**	**7,089**	**765,835**
314		Nov				**804,338**		**2,681**		**2,736**	**7,541**	**814,614**
315		Dec				**1,062,714**		**3,428**		**3,615**	**9,963**	**1,076,292**
316												
317	2022	Jan				**1,006,411**		**3,246**		**3,424**	**9,435**	**1,019,270**
318		Feb				**869,894**		**3,107**		**2,959**	**8,155**	**881,009**
319		Mar				**827,843**		**2,670**		**2,816**	**7,761**	**838,420**
320		Apr				**764,874**		**2,550**		**2,602**	**7,171**	**774,647**
321		May				**682,204**		**2,201**		**2,321**	**6,396**	**690,920**
322		Jun				**639,892**		**2,133**		**2,177**	**5,999**	**648,068**
323		Jul				**724,157**		**2,336**		**2,463**	**6,789**	**733,409**
324		Aug				**760,169**		**2,452**		**2,586**	**7,126**	**769,882**
325		Sep				**724,228**		**2,414**		**2,464**	**6,790**	**733,481**
326		Oct				**735,794**		**2,374**		**2,503**	**6,898**	**745,195**
327		Nov				**805,904**		**2,686**		**2,742**	**7,555**	**816,200**
328		Dec				**1,056,085**		**3,407**		**3,593**	**9,901**	**1,069,578**
329												
330	2023	Jan				**997,072**		**3,216**		**3,392**	**9,347**	**1,009,812**
331		Feb				**879,608**		**3,141**		**2,992**	**8,246**	**890,847**
332		Mar				**838,000**		**2,703**		**2,851**	**7,856**	**848,707**
333		Apr				**778,179**		**2,594**		**2,647**	**7,295**	**788,121**
334		May				**696,284**		**2,246**		**2,369**	**6,528**	**705,181**
335		Jun				**645,815**		**2,153**		**2,197**	**6,054**	**654,067**
336		Jul				**722,748**		**2,331**		**2,459**	**6,776**	**731,983**
337		Aug				**746,855**		**2,409**		**2,541**	**7,002**	**756,397**
338		Sep				**700,405**		**2,335**		**2,383**	**6,566**	**709,353**
339		Oct				**701,768**		**2,264**		**2,387**	**6,579**	**710,734**
340		Nov				**806,049**		**2,687**		**2,742**	**7,557**	**816,348**
341		Dec				**1,033,249**		**3,333**		**3,515**	**9,687**	**1,046,450**
342												
343												
344						**Total System End-Use Dmd**							
345	**Peak Day Throughput (Mth/Day)**											
346	2017					**50,959**						
347	2018					**52,132**						
348	2019					**51,978**						
349	2020					**52,360**						
350	2021					**51,979**						
351	2022					**51,545**						
352	2023					**50,466**						

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**															
355	***MONTHLY FORECAST DATA***						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**															
358	2017	Jan				5,522,440	204,392		8	718	318	**5,727,876**		552	29	**581**
359		Feb				5,530,663	205,014		8	716	318	**5,736,719**		552	29	**581**
360		Mar				5,534,228	205,004		8	715	318	**5,740,273**		552	29	**581**
361		Apr				5,536,041	204,611		8	713	318	**5,741,691**		552	29	**581**
362		May				5,539,034	204,407		8	714	318	**5,744,481**		552	29	**581**
363		Jun				5,538,477	204,008		8	714	318	**5,743,525**		552	29	**581**
364		Jul				5,535,634	203,687		9	714	318	**5,740,362**		552	29	**581**
365		Aug				5,536,751	203,364		8	713	318	**5,741,154**		552	29	**581**
366		Sep				5,539,377	203,192		9	715	318	**5,743,611**		552	29	**581**
367		Oct				5,542,483	203,100		9	713	318	**5,746,623**		552	29	**581**
368		Nov				5,547,880	203,213		8	713	318	**5,752,132**		552	29	**581**
369		Dec				5,552,647	203,708		8	711	318	**5,757,392**		552	29	**581**
370																
371	2018	Jan				5,553,076	204,102		4	711	333	**5,758,226**		555	29	**584**
372		Feb				5,561,344	204,723		4	712	333	**5,767,117**		555	29	**584**
373		Mar				5,564,929	204,713		4	711	333	**5,770,691**		555	29	**584**
374		Apr				5,566,752	204,321		4	712	333	**5,772,122**		555	29	**584**
375		May				5,569,762	204,117		4	713	333	**5,774,930**		555	29	**584**
376		Jun				5,569,202	203,719		4	711	333	**5,773,969**		555	29	**584**
377		Jul				5,566,343	203,398		4	713	333	**5,770,792**		555	29	**584**
378		Aug				5,567,466	203,076		4	711	333	**5,771,590**		555	29	**584**
379		Sep				5,570,107	202,904		4	712	333	**5,774,060**		555	29	**584**
380		Oct				5,573,230	202,812		4	713	333	**5,777,092**		555	29	**584**
381		Nov				5,578,657	202,925		4	712	333	**5,782,631**		555	29	**584**
382		Dec				5,583,450	203,419		4	711	333	**5,787,918**		555	29	**584**
383																
384	2019	Jan				5,598,794	204,100		4	711	348	**5,803,957**		559	29	**588**
385		Feb				5,607,131	204,721		4	712	348	**5,812,916**		559	29	**588**
386		Mar				5,610,745	204,711		4	711	348	**5,816,519**		559	29	**588**
387		Apr				5,612,583	204,319		4	712	348	**5,817,965**		559	29	**588**
388		May				5,615,617	204,115		4	713	348	**5,820,798**		559	29	**588**
389		Jun				5,615,053	203,716		4	711	348	**5,819,832**		559	29	**588**
390		Jul				5,612,170	203,396		4	713	348	**5,816,632**		559	29	**588**
391		Aug				5,613,303	203,073		4	711	348	**5,817,440**		559	29	**588**
392		Sep				5,615,965	202,902		4	712	348	**5,819,931**		559	29	**588**
393		Oct				5,619,114	202,810		4	713	348	**5,822,989**		559	29	**588**
394		Nov				5,624,586	202,923		4	712	348	**5,828,572**		559	29	**588**
395		Dec				5,629,419	203,417		4	711	348	**5,833,899**		559	29	**588**
396																
397	2020	Jan				5,647,469	204,067		4	711	363	**5,852,615**		562	30	**591**
398		Feb				5,655,879	204,688		4	712	363	**5,861,646**		562	30	**591**
399		Mar				5,659,524	204,678		4	711	363	**5,865,281**		562	30	**591**
400		Apr				5,661,378	204,286		4	712	363	**5,866,743**		562	30	**591**
401		May				5,664,439	204,082		4	713	363	**5,869,602**		562	30	**591**
402		Jun				5,663,869	203,684		4	711	363	**5,868,631**		562	30	**591**
403		Jul				5,660,962	203,363		4	713	363	**5,865,406**		562	30	**591**
404		Aug				5,662,104	203,041		4	711	363	**5,866,224**		562	30	**591**
405		Sep				5,664,790	202,869		4	712	363	**5,868,738**		562	30	**591**
406		Oct				5,667,966	202,777		4	713	363	**5,871,823**		562	30	**591**
407		Nov				5,673,485	202,890		4	712	363	**5,877,454**		562	30	**591**
408		Dec				5,678,360	203,384		4	711	363	**5,882,823**		562	30	**591**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**															
355	***MONTHLY FORECAST DATA***						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	2021	Jan				5,698,057	203,938		4	711	378	**5,903,088**		564	30	**593**
411		Feb				5,706,542	204,559		4	712	378	**5,912,194**		564	30	**593**
412		Mar				5,710,220	204,549		4	711	378	**5,915,862**		564	30	**593**
413		Apr				5,712,091	204,157		4	712	378	**5,917,341**		564	30	**593**
414		May				5,715,179	203,953		4	713	378	**5,920,227**		564	30	**593**
415		Jun				5,714,604	203,555		4	711	378	**5,919,252**		564	30	**593**
416		Jul				5,711,671	203,235		4	713	378	**5,916,001**		564	30	**593**
417		Aug				5,712,823	202,912		4	711	378	**5,916,829**		564	30	**593**
418		Sep				5,715,533	202,741		4	712	378	**5,919,367**		564	30	**593**
419		Oct				5,718,737	202,649		4	713	378	**5,922,481**		564	30	**593**
420		Nov				5,724,306	202,762		4	712	378	**5,928,162**		564	30	**593**
421		Dec				5,729,225	203,256		4	711	378	**5,933,573**		564	30	**593**
422																
423	2022	Jan				5,749,988	203,786		4	711	393	**5,954,882**		565	30	**595**
424		Feb				5,758,549	204,406		4	712	393	**5,964,065**		565	30	**595**
425		Mar				5,762,261	204,396		4	711	393	**5,967,766**		565	30	**595**
426		Apr				5,764,149	204,004		4	712	393	**5,969,262**		565	30	**595**
427		May				5,767,265	203,801		4	713	393	**5,972,177**		565	30	**595**
428		Jun				5,766,685	203,403		4	711	393	**5,971,197**		565	30	**595**
429		Jul				5,763,725	203,083		4	713	393	**5,967,919**		565	30	**595**
430		Aug				5,764,888	202,761		4	711	393	**5,968,758**		565	30	**595**
431		Sep				5,767,623	202,590		4	712	393	**5,971,321**		565	30	**595**
432		Oct				5,770,857	202,498		4	713	393	**5,974,465**		565	30	**595**
433		Nov				5,776,476	202,611		4	712	393	**5,980,196**		565	30	**595**
434		Dec				5,781,439	203,104		4	711	393	**5,985,652**		565	30	**595**
435																
436	2023	Jan				5,802,648	203,656		4	711	404	**6,007,423**		566	30	**596**
437		Feb				5,811,288	204,276		4	712	404	**6,016,684**		566	30	**596**
438		Mar				5,815,034	204,266		4	711	404	**6,020,419**		566	30	**596**
439		Apr				5,816,939	203,874		4	712	404	**6,021,933**		566	30	**596**
440		May				5,820,084	203,671		4	713	404	**6,024,876**		566	30	**596**
441		Jun				5,819,498	203,273		4	711	404	**6,023,891**		566	30	**596**
442		Jul				5,816,511	202,953		4	713	404	**6,020,586**		566	30	**596**
443		Aug				5,817,685	202,632		4	711	404	**6,021,436**		566	30	**596**
444		Sep				5,820,444	202,460		4	712	404	**6,024,024**		566	30	**596**
445		Oct				5,823,708	202,368		4	713	404	**6,027,197**		566	30	**596**
446		Nov				5,829,379	202,481		4	712	404	**6,032,980**		566	30	**596**
447		Dec				5,834,387	202,974		4	711	404	**6,038,481**		566	30	**596**

	A	B	C	D	E	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																	
355	***MONTHLY FORECAST DATA***					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**																	
358	2017	Jan				296	15	30	41	**311**	**71**	**382**		23	11	**34**		**997**
359		Feb				296	15	30	41	**311**	**71**	**382**		23	11	**34**		**997**
360		Mar				296	15	30	41	**311**	**71**	**382**		23	11	**34**		**997**
361		Apr				296	15	30	41	**311**	**71**	**382**		23	11	**34**		**997**
362		May				296	15	30	41	**311**	**71**	**382**		23	11	**34**		**997**
363		Jun				296	15	30	41	**311**	**71**	**382**		23	11	**34**		**997**
364		Jul				296	15	30	41	**311**	**71**	**382**		23	11	**34**		**997**
365		Aug				296	15	30	41	**311**	**71**	**382**		23	11	**34**		**997**
366		Sep				296	15	30	41	**311**	**71**	**382**		23	11	**34**		**997**
367		Oct				296	15	30	41	**311**	**71**	**382**		23	11	**34**		**997**
368		Nov				296	15	30	40	**311**	**70**	**381**		23	11	**34**		**996**
369		Dec				296	15	30	40	**311**	**70**	**381**		23	11	**34**		**996**
370																		
371	2018	Jan				299	14	30	40	**313**	**70**	**383**		23	11	**34**		**1,002**
372		Feb				299	14	30	38	**313**	**68**	**381**		23	11	**34**		**1,000**
373		Mar				299	14	29	38	**313**	**67**	**380**		23	11	**34**		**999**
374		Apr				299	14	29	38	**313**	**67**	**380**		23	11	**34**		**999**
375		May				299	14	29	38	**313**	**67**	**380**		23	11	**34**		**999**
376		Jun				299	14	29	38	**313**	**67**	**380**		23	11	**34**		**999**
377		Jul				299	14	29	38	**313**	**67**	**380**		23	11	**34**		**999**
378		Aug				299	14	29	38	**313**	**67**	**380**		23	11	**34**		**999**
379		Sep				299	14	29	38	**313**	**67**	**380**		23	11	**34**		**999**
380		Oct				298	14	29	37	**312**	**66**	**378**		23	11	**34**		**997**
381		Nov				298	14	29	37	**312**	**66**	**378**		23	11	**34**		**997**
382		Dec				298	14	29	37	**312**	**66**	**378**		23	11	**34**		**997**
383																		
384	2019	Jan				303	14	30	37	**317**	**67**	**383**		23	11	**34**		**1,005**
385		Feb				303	14	30	37	**317**	**67**	**383**		23	11	**34**		**1,005**
386		Mar				303	14	30	37	**317**	**67**	**383**		23	11	**34**		**1,005**
387		Apr				303	14	30	37	**317**	**67**	**383**		23	11	**34**		**1,005**
388		May				303	14	30	37	**317**	**67**	**383**		23	11	**34**		**1,005**
389		Jun				303	14	30	37	**317**	**67**	**383**		23	11	**34**		**1,005**
390		Jul				303	14	30	37	**317**	**67**	**383**		23	11	**34**		**1,005**
391		Aug				303	14	30	37	**317**	**67**	**383**		23	11	**34**		**1,005**
392		Sep				303	14	30	37	**317**	**67**	**383**		23	11	**34**		**1,005**
393		Oct				303	14	30	37	**317**	**67**	**383**		23	11	**34**		**1,005**
394		Nov				303	14	30	37	**317**	**67**	**383**		23	11	**34**		**1,005**
395		Dec				303	14	30	37	**317**	**67**	**383**		23	11	**34**		**1,005**
396																		
397	2020	Jan				306	14	30	37	**321**	**67**	**388**		23	11	**34**		**1,013**
398		Feb				306	14	30	37	**321**	**67**	**388**		23	11	**34**		**1,013**
399		Mar				306	14	30	37	**321**	**67**	**388**		23	11	**34**		**1,013**
400		Apr				306	14	30	37	**321**	**67**	**388**		23	11	**34**		**1,013**
401		May				306	14	30	37	**321**	**67**	**388**		23	11	**34**		**1,013**
402		Jun				306	14	30	37	**321**	**67**	**388**		23	11	**34**		**1,013**
403		Jul				306	14	30	37	**321**	**67**	**388**		23	11	**34**		**1,013**
404		Aug				306	14	30	37	**321**	**67**	**388**		23	11	**34**		**1,013**
405		Sep				306	14	30	37	**321**	**67**	**388**		23	11	**34**		**1,013**
406		Oct				306	14	30	37	**321**	**67**	**388**		23	11	**34**		**1,013**
407		Nov				306	14	30	37	**321**	**67**	**388**		23	11	**34**		**1,013**
408		Dec				306	14	30	37	**321**	**67**	**388**		23	11	**34**		**1,013**

	A	B	C	D	E	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																	
355	***MONTHLY FORECAST DATA***					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	2021	Jan				309	14	30	36	**323**	**66**	**389**		23	11	**34**		**1,016**
411		Feb				309	14	30	36	**323**	**66**	**389**		23	11	**34**		**1,016**
412		Mar				309	14	30	36	**323**	**66**	**389**		23	11	**34**		**1,016**
413		Apr				309	14	30	36	**323**	**66**	**389**		23	11	**34**		**1,016**
414		May				309	14	30	36	**323**	**66**	**389**		23	11	**34**		**1,016**
415		Jun				309	14	30	36	**323**	**66**	**389**		23	11	**34**		**1,016**
416		Jul				309	14	30	36	**323**	**66**	**389**		23	11	**34**		**1,016**
417		Aug				309	14	30	36	**323**	**66**	**389**		23	11	**34**		**1,016**
418		Sep				309	14	30	36	**323**	**66**	**389**		23	11	**34**		**1,016**
419		Oct				309	14	30	36	**323**	**66**	**389**		23	11	**34**		**1,016**
420		Nov				309	14	30	36	**323**	**66**	**389**		23	11	**34**		**1,016**
421		Dec				309	14	30	36	**323**	**66**	**389**		23	11	**34**		**1,016**
422																		
423	2022	Jan				310	14	30	36	**324**	**66**	**391**		23	11	**34**		**1,019**
424		Feb				310	14	30	36	**324**	**66**	**391**		23	11	**34**		**1,019**
425		Mar				310	14	30	36	**324**	**66**	**391**		23	11	**34**		**1,019**
426		Apr				310	14	30	36	**324**	**66**	**391**		23	11	**34**		**1,019**
427		May				310	14	30	36	**324**	**66**	**391**		23	11	**34**		**1,019**
428		Jun				310	14	30	36	**324**	**66**	**391**		23	11	**34**		**1,019**
429		Jul				310	14	30	36	**324**	**66**	**391**		23	11	**34**		**1,019**
430		Aug				310	14	30	36	**324**	**66**	**391**		23	11	**34**		**1,019**
431		Sep				310	14	30	36	**324**	**66**	**391**		23	11	**34**		**1,019**
432		Oct				310	14	30	36	**324**	**66**	**391**		23	11	**34**		**1,019**
433		Nov				310	14	30	36	**324**	**66**	**391**		23	11	**34**		**1,019**
434		Dec				310	14	30	36	**324**	**66**	**391**		23	11	**34**		**1,019**
435																		
436	2023	Jan				311	14	30	36	**326**	**67**	**392**		23	11	**34**		**1,022**
437		Feb				311	14	30	36	**326**	**67**	**392**		23	11	**34**		**1,022**
438		Mar				311	14	30	36	**326**	**67**	**392**		23	11	**34**		**1,022**
439		Apr				311	14	30	36	**326**	**67**	**392**		23	11	**34**		**1,022**
440		May				311	14	30	36	**326**	**67**	**392**		23	11	**34**		**1,022**
441		Jun				311	14	30	36	**326**	**67**	**392**		23	11	**34**		**1,022**
442		Jul				311	14	30	36	**326**	**67**	**392**		23	11	**34**		**1,022**
443		Aug				311	14	30	36	**326**	**67**	**392**		23	11	**34**		**1,022**
444		Sep				311	14	30	36	**326**	**67**	**392**		23	11	**34**		**1,022**
445		Oct				311	14	30	36	**326**	**67**	**392**		23	11	**34**		**1,022**
446		Nov				311	14	30	36	**326**	**67**	**392**		23	11	**34**		**1,022**
447		Dec				311	14	30	36	**326**	**67**	**392**		23	11	**34**		**1,022**

	A	B	C	D	E	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																
355	***MONTHLY FORECAST DATA***						Wholesale Noncore				**Total**		International NC		**Total**		**Total**
356							Long Beach	SDG&E	Southwest Gas	Vernon	**Wholesale**		Ecogas		**Noncore**		**System**
357	**Forecast Number of Customers**																
358	2017	Jan					1	1	1	1	**4**		1		**1,002**		**5,728,878**
359		Feb					1	1	1	1	**4**		1		**1,002**		**5,737,721**
360		Mar					1	1	1	1	**4**		1		**1,002**		**5,741,275**
361		Apr					1	1	1	1	**4**		1		**1,002**		**5,742,693**
362		May					1	1	1	1	**4**		1		**1,002**		**5,745,483**
363		Jun					1	1	1	1	**4**		1		**1,002**		**5,744,527**
364		Jul					1	1	1	1	**4**		1		**1,002**		**5,741,364**
365		Aug					1	1	1	1	**4**		1		**1,002**		**5,742,156**
366		Sep					1	1	1	1	**4**		1		**1,002**		**5,744,613**
367		Oct					1	1	1	1	**4**		1		**1,002**		**5,747,625**
368		Nov					1	1	1	1	**4**		1		**1,001**		**5,753,133**
369		Dec					1	1	1	1	**4**		1		**1,001**		**5,758,393**
370																	
371	2018	Jan					1	1	1	1	**4**		1		**1,007**		**5,759,233**
372		Feb					1	1	1	1	**4**		1		**1,005**		**5,768,121**
373		Mar					1	1	1	1	**4**		1		**1,004**		**5,771,695**
374		Apr					1	1	1	1	**4**		1		**1,004**		**5,773,126**
375		May					1	1	1	1	**4**		1		**1,004**		**5,775,933**
376		Jun					1	1	1	1	**4**		1		**1,004**		**5,774,972**
377		Jul					1	1	1	1	**4**		1		**1,004**		**5,771,795**
378		Aug					1	1	1	1	**4**		1		**1,004**		**5,772,594**
379		Sep					1	1	1	1	**4**		1		**1,004**		**5,775,063**
380		Oct					1	1	1	1	**4**		1		**1,002**		**5,778,094**
381		Nov					1	1	1	1	**4**		1		**1,002**		**5,783,633**
382		Dec					1	1	1	1	**4**		1		**1,002**		**5,788,919**
383																	
384	2019	Jan					1	1	1	1	**4**		1		**1,010**		**5,804,967**
385		Feb					1	1	1	1	**4**		1		**1,010**		**5,813,926**
386		Mar					1	1	1	1	**4**		1		**1,010**		**5,817,530**
387		Apr					1	1	1	1	**4**		1		**1,010**		**5,818,976**
388		May					1	1	1	1	**4**		1		**1,010**		**5,821,808**
389		Jun					1	1	1	1	**4**		1		**1,010**		**5,820,843**
390		Jul					1	1	1	1	**4**		1		**1,010**		**5,817,642**
391		Aug					1	1	1	1	**4**		1		**1,010**		**5,818,450**
392		Sep					1	1	1	1	**4**		1		**1,010**		**5,820,941**
393		Oct					1	1	1	1	**4**		1		**1,010**		**5,823,999**
394		Nov					1	1	1	1	**4**		1		**1,010**		**5,829,583**
395		Dec					1	1	1	1	**4**		1		**1,010**		**5,834,909**
396																	
397	2020	Jan					1	1	1	1	**4**		1		**1,018**		**5,853,633**
398		Feb					1	1	1	1	**4**		1		**1,018**		**5,862,664**
399		Mar					1	1	1	1	**4**		1		**1,018**		**5,866,299**
400		Apr					1	1	1	1	**4**		1		**1,018**		**5,867,761**
401		May					1	1	1	1	**4**		1		**1,018**		**5,870,620**
402		Jun					1	1	1	1	**4**		1		**1,018**		**5,869,649**
403		Jul					1	1	1	1	**4**		1		**1,018**		**5,866,424**
404		Aug					1	1	1	1	**4**		1		**1,018**		**5,867,242**
405		Sep					1	1	1	1	**4**		1		**1,018**		**5,869,756**
406		Oct					1	1	1	1	**4**		1		**1,018**		**5,872,842**
407		Nov					1	1	1	1	**4**		1		**1,018**		**5,878,473**
408		Dec					1	1	1	1	**4**		1		**1,018**		**5,883,841**

	A	B	C	D	E	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO
1	**2020 TCAP: SoCalGas Consolidated Gas Demand Forecast Summary (Mtherms)**																
355	***MONTHLY FORECAST DATA***						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	2021	Jan					1	1	1	1	**4**		1		**1,021**		**5,904,109**
411		Feb					1	1	1	1	**4**		1		**1,021**		**5,913,216**
412		Mar					1	1	1	1	**4**		1		**1,021**		**5,916,883**
413		Apr					1	1	1	1	**4**		1		**1,021**		**5,918,362**
414		May					1	1	1	1	**4**		1		**1,021**		**5,921,248**
415		Jun					1	1	1	1	**4**		1		**1,021**		**5,920,273**
416		Jul					1	1	1	1	**4**		1		**1,021**		**5,917,022**
417		Aug					1	1	1	1	**4**		1		**1,021**		**5,917,850**
418		Sep					1	1	1	1	**4**		1		**1,021**		**5,920,389**
419		Oct					1	1	1	1	**4**		1		**1,021**		**5,923,503**
420		Nov					1	1	1	1	**4**		1		**1,021**		**5,929,183**
421		Dec					1	1	1	1	**4**		1		**1,021**		**5,934,595**
422																	
423	2022	Jan					1	1	1	1	**4**		1		**1,024**		**5,955,906**
424		Feb					1	1	1	1	**4**		1		**1,024**		**5,965,089**
425		Mar					1	1	1	1	**4**		1		**1,024**		**5,968,790**
426		Apr					1	1	1	1	**4**		1		**1,024**		**5,970,287**
427		May					1	1	1	1	**4**		1		**1,024**		**5,973,201**
428		Jun					1	1	1	1	**4**		1		**1,024**		**5,972,221**
429		Jul					1	1	1	1	**4**		1		**1,024**		**5,968,943**
430		Aug					1	1	1	1	**4**		1		**1,024**		**5,969,782**
431		Sep					1	1	1	1	**4**		1		**1,024**		**5,972,346**
432		Oct					1	1	1	1	**4**		1		**1,024**		**5,975,489**
433		Nov					1	1	1	1	**4**		1		**1,024**		**5,981,220**
434		Dec					1	1	1	1	**4**		1		**1,024**		**5,986,676**
435																	
436	2023	Jan					1	1	1	1	**4**		1		**1,027**		**6,008,450**
437		Feb					1	1	1	1	**4**		1		**1,027**		**6,017,711**
438		Mar					1	1	1	1	**4**		1		**1,027**		**6,021,446**
439		Apr					1	1	1	1	**4**		1		**1,027**		**6,022,960**
440		May					1	1	1	1	**4**		1		**1,027**		**6,025,903**
441		Jun					1	1	1	1	**4**		1		**1,027**		**6,024,918**
442		Jul					1	1	1	1	**4**		1		**1,027**		**6,021,613**
443		Aug					1	1	1	1	**4**		1		**1,027**		**6,022,463**
444		Sep					1	1	1	1	**4**		1		**1,027**		**6,025,051**
445		Oct					1	1	1	1	**4**		1		**1,027**		**6,028,224**
446		Nov					1	1	1	1	**4**		1		**1,027**		**6,034,007**
447		Dec					1	1	1	1	**4**		1		**1,027**		**6,039,508**

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.

Figure 1

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 = 17,569 MTh, D_H = 7,497 MTh, and D_M = 21,879 MTh.

The corresponding *cumulative* totals are:

C_T = 46,945 MTh, C_H = 29,376 MTh, and C_M = 21,879 MTh,

using the formulas indicated in the Figure 1, above.

2020 TCAP: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.569%
MDM #Hrs Av (2* of 3 yr)
3

Btu Factor: 1.0397

Co-Use-Fuel	UAF
0.267%	0.565%
0.269%	0.569%

Forecast Summary	MDM	Residential	Nonresidential Core GN-3	Nonresidential Core G-NGV	Total Core	C&I (Dist.)	C&I (Trans.)	Noncore - C&I C&I
<< TCAP Period >> January 2020 - December 2022								
DIRECT (%'s Load or Cust/Mtrs Sum to 100%)								
Transmission %-Load:		0.00%	0.00%	0.00%				
Average Year Throughput (MTh)		0	0	0	0	0	17,569	17,569
Cold Year Throughput (1-in-35) (MTh)		0	0	0	0	0	17,569	17,569
Cold Year Peak Month (December) (MTh)		0	0	0	0	0	1,477	1,477
Peak Day (see note a/ below) (MTh)		-	-	-	0	0	48	48
%-Cust/Mtrs:		0.0000%	0.0000%	0.0000%				
Number of Customers		-	-	-	0	0	9	9
High Pressure %-Load:		0.02%	1.60%	36.78%				
Average Year Throughput (MTh)		67	3,116	8,874	12,057	7,497	0	7,497
Cold Year Throughput (1-in-35) (MTh)		74	3,251	8,874	12,199	7,497	0	7,497
Cold Year Peak Month (December) (MTh)		11	373	721	1,105	630	0	630
Peak Day (see note a/ below) (MTh)		1	18	23	42	20	0	20
%-Cust/Mtrs:		0.0002%	0.0166%	14.5455%				
Number of Customers		2	5	4	11	9	0	9
Medium Pressure %-Load:		99.98%	98.40%	63.22%				
Average Year Throughput (MTh)		313,167	191,661	15,255	520,083	21,879	0	21,879
Cold Year Throughput (1-in-35) (MTh)		343,334	199,985	15,255	558,574	21,879	0	21,879
Cold Year Peak Month (December) (MTh)		50,177	22,957	1,239	74,374	1,839	0	1,839
Peak Day (see note a/ below) (MTh)		2,943	1,098	40	4,081	59	0	59
%-Cust/Mtrs:		99.9998%	99.9834%	85.4545%				
Number of Customers		874,065	30,932	24	905,021	35	0	35
CUMULATIVE (Calc'd from DIRECT %'s)								
Transmission %-Load:		100.0000%	100.0000%	100.0000%				
Average Year Throughput (MTh)		313,234	194,777	24,129	532,140	29,376	17,569	46,945
Cold Year Throughput (1-in-35) (MTh)		343,408	203,236	24,129	570,773	29,376	17,569	46,945
Cold Year Peak Month (December) (MTh)		50,188	23,331	1,960	75,479	2,470	1,477	3,947
Peak Day (see note a/ below) (MTh)		2,944	1,115	63	4,123	80	48	127
%-Cust/Mtrs:		100.0000%	100.0000%	100.0000%				
Number of Customers		874,067	30,937	28	905,032	44	9	53
High Pressure %-Load:		100.0000%	100.0000%	100.0000%				
Average Year Throughput (MTh)		313,234	194,777	24,129	532,140	29,376	0	29,376
Cold Year Throughput (1-in-35) (MTh)		343,408	203,236	24,129	570,773	29,376	0	29,376
Cold Year Peak Month (December) (MTh)		50,188	23,331	1,960	75,479	2,470	0	2,470
Peak Day (see note a/ below) (MTh)		2,944	1,115	63	4,123	80	0	80
%-Cust/Mtrs:		100.0000%	100.0000%	100.0000%				
Number of Customers		874,067	30,937	28	905,032	44	0	44
Medium Pressure %-Load:		99.9785%	98.4003%	63.2223%				
Average Year Throughput (MTh)		313,167	191,661	15,255	520,083	21,879	0	21,879
Cold Year Throughput (1-in-35) (MTh)		343,334	199,985	15,255	558,574	21,879	0	21,879
Cold Year Peak Month (December) (MTh)		50,177	22,957	1,239	74,374	1,839	0	1,839
Peak Day (see note a/ below) (MTh)		2,943	1,098	40	4,081	59	0	59
%-Cust/Mtrs:		99.9998%	99.9834%	85.4545%				
Number of Customers		874,065	30,932	24	905,021	35	0	35

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.

2020 TCAP: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

Unaccounted Fcst (%*AYTP)
0.569%
MDM #Yrs Av (2- or 3-yr)
3

Forecast Summary	MDM						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
<< TCAP Period >> January 2020 - December 2022										
DIRECT (%'s Load or Cust/Mtrs Sum to 100%)										
Transmission	%-Load:									
Average Year Throughput (MTh)		0	5,074	0	456,289	5,074	456,289	461,363	**478,932**	**478,932**
Cold Year Throughput (1-in-35) (MTh)		0	5,074	0	456,289	5,074	456,289	461,363	**478,932**	**478,932**
Cold Year Peak Month (December) (MTh)		0	191	0	35,479	191	35,479	35,670	**37,147**	**37,147**
Peak Day (see note a/ below) (MTh)		0	6	0	1,684	6	1,684	1,690	**1,738**	**1,738**
	%-Cust/Mtrs:									
Number of Customers		0	3	0	12	3	12	15	**24**	**24**
High Pressure	%-Load:									
Average Year Throughput (MTh)		3,531	0	36,209	0	3,531	36,209	39,740	**47,237**	**59,294**
Cold Year Throughput (1-in-35) (MTh)		3,531	0	36,209	0	3,531	36,209	39,740	**47,237**	**59,436**
Cold Year Peak Month (December) (MTh)		287	0	3,027	0	287	3,027	3,314	**3,944**	**5,049**
Peak Day (see note a/ below) (MTh)		9	0	98	0	9	98	107	**127**	**169**
	%-Cust/Mtrs:									
Number of Customers		5	0	4	0	5	4	9	**18**	**29**
Medium Pressure	%-Load:									
Average Year Throughput (MTh)		21,131	0	7,997	0	21,131	7,997	29,127	**51,006**	**571,089**
Cold Year Throughput (1-in-35) (MTh)		21,131	0	7,997	0	21,131	7,997	29,127	**51,006**	**609,580**
Cold Year Peak Month (December) (MTh)		1,767	0	669	0	1,767	669	2,435	**4,275**	**78,649**
Peak Day (see note a/ below) (MTh)		57	0	22	0	57	22	79	**138**	**4,219**
	%-Cust/Mtrs:									
Number of Customers		64	0	2	0	64	2	66	**101**	**905,122**
CUMULATIVE (Calc'd from DIRECT %'s)										
Transmission	%-Load:									
Average Year Throughput (MTh)		24,662	5,074	44,206	456,289	29,736	500,494	530,230	**577,175**	**1,109,315**
Cold Year Throughput (1-in-35) (MTh)		24,662	5,074	44,206	456,289	29,736	500,494	530,230	**577,175**	**1,147,948**
Cold Year Peak Month (December) (MTh)		2,053	191	3,696	35,479	2,244	39,175	41,419	**45,366**	**120,845**
Peak Day (see note a/ below) (MTh)		66	6	119	1,684	72	1,803	1,876	**2,003**	**6,126**
	%-Cust/Mtrs:									
Number of Customers		69	3	6	12	72	18	90	**143**	**905,175**
High Pressure	%-Load:									
Average Year Throughput (MTh)		24,662	0	44,206	0	24,662	44,206	68,867	**98,243**	**630,384**
Cold Year Throughput (1-in-35) (MTh)		24,662	0	44,206	0	24,662	44,206	68,867	**98,243**	**669,016**
Cold Year Peak Month (December) (MTh)		2,053	0	3,696	0	2,053	3,696	5,749	**8,219**	**83,698**
Peak Day (see note a/ below) (MTh)		66	0	119	0	66	119	185	**265**	**4,388**
	%-Cust/Mtrs:									
Number of Customers		69	0	6	0	69	6	75	**119**	**905,151**
Medium Pressure	%-Load:									
Average Year Throughput (MTh)		21,131	0	7,997	0	21,131	7,997	29,127	**51,006**	**571,089**
Cold Year Throughput (1-in-35) (MTh)		21,131	0	7,997	0	21,131	7,997	29,127	**51,006**	**609,580**
Cold Year Peak Month (December) (MTh)		1,767	0	669	0	1,767	669	2,435	**4,275**	**78,649**
Peak Day (see note a/ below) (MTh)		57	0	22	0	57	22	79	**138**	**4,219**
	%-Cust/Mtrs:									
Number of Customers		64	0	2	0	64	2	66	**101**	**905,122**

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.

2020 TCAP: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

ANNUAL FORECAST DATA

			Nonresidential Core			Noncore - C&I			Noncore - Electric Generatiion				
		Residential	GN-3	G-NGV	**Total 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)													
2017		320,521	189,995	18,241	**528,757**	27,353	16,359	**43,713**	26,258	8,259	72,043	513,203	**34,517**
2018		321,732	195,519	19,553	**536,804**	28,700	17,165	**45,865**	24,295	10,379	46,123	486,252	**34,674**
2019		319,285	195,894	20,961	**536,140**	29,076	17,389	**46,465**	24,546	7,056	43,830	475,925	**31,602**
2020		317,206	195,951	22,471	**535,627**	29,334	17,544	**46,878**	24,660	5,615	44,159	460,815	**30,275**
2021		313,940	195,005	24,090	**533,034**	29,390	17,577	**46,968**	24,677	4,925	44,234	459,118	**29,602**
2022		308,558	193,377	25,826	**527,760**	29,403	17,585	**46,988**	24,648	4,683	44,223	448,933	**29,331**
2023		306,222	191,481	27,687	**525,390**	29,365	17,562	**46,927**	24,645	3,733	44,224	437,298	**28,377**

			Nonresidential Core			Noncore - C&I			Noncore - Electric Generatiion				
		Residential	GN-3	G-NGV	**Total 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)													
2017	365	318,215	150,999	5,581	**474,795**	0	0	**0**	0	0	0	0	**0**
2018	365	319,417	155,389	5,992	**480,799**	0	0	**0**	0	0	0	0	**0**
2019	365	316,989	155,687	6,434	**479,109**	0	0	**0**	0	0	0	0	**0**
2020	366	314,924	155,732	6,908	**477,564**	0	0	**0**	0	0	0	0	**0**
2021	365	311,682	154,980	7,419	**474,080**	0	0	**0**	0	0	0	0	**0**
2022	365	306,338	153,687	7,967	**467,992**	0	0	**0**	0	0	0	0	**0**
2023	365	304,019	152,180	8,557	**464,755**	0	0	**0**	0	0	0	0	**0**

		Nonresidential Core			Noncore - C&I			Noncore - Electric Generatiion				
	Residential	GN-3	G-NGV	**Total 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)												
2017	350,847	198,436	18,241	**567,524**	27,353	16,359	**43,713**	26,258	8,259	72,043	513,203	**34,517**
2018	352,303	203,980	19,553	**575,837**	28,700	17,165	**45,865**	24,295	10,379	46,123	486,252	**34,674**
2019	349,731	204,357	20,961	**575,050**	29,076	17,389	**46,465**	24,546	7,056	43,830	475,925	**31,602**
2020	347,594	204,414	22,471	**574,479**	29,334	17,544	**46,878**	24,660	5,615	44,159	460,815	**30,275**
2021	344,182	203,464	24,090	**571,736**	29,390	17,577	**46,968**	24,677	4,925	44,234	459,118	**29,602**
2022	338,449	201,829	25,826	**566,103**	29,403	17,585	**46,988**	24,648	4,683	44,223	448,933	**29,331**
2023	336,073	199,924	27,687	**563,685**	29,365	17,562	**46,927**	24,645	3,733	44,224	437,298	**28,377**

		Nonresidential Core			Noncore - C&I			Noncore - Electric Generatiion				
Specified Peak Day Thrughput (Mth/Day)	Residential	GN-3	G-NGV	**Total Core**	C&I (Dist.)	C&I (Trans.)	**C&I (Total)**	EG-Dist. (<3MMThms)	EG-Trans. (<3MMThms)	EG-Dist. (>=3MMThms)	EG-Trans. (>=3MMThms)	**EG (<3MMThms)**
2017	2,993	1,098	47.8	**4,139**	77	46	**124**	105	18	211	1,379	**123**
2018	3,009	1,118	51.2	**4,178**	78	47	**125**	65	6	118	1,868	**71**
2019	2,990	1,120	54.9	**4,164**	79	47	**126**	66	6	119	2,042	**72**
2020	2,975	1,120	58.9	**4,154**	80	48	**127**	66	6	119	1,774	**72**
2021	2,951	1,116	63.1	**4,130**	80	48	**127**	66	6	119	1,614	**72**
2022	2,906	1,110	67.7	**4,084**	80	48	**127**	66	6	119	1,665	**72**
2023	2,891	1,103	72.6	**4,066**	80	48	**127**	66	6	119	1,384	**72**

		Nonresidential Core			Noncore - C&I			Noncore - Electric Generatiion				
	Residential	GN-3	G-NGV	**Total 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												
2017	850,136	30,083	26	**880,244**	44	9	**53**	70	5	7	14	**75**
2018	855,820	30,527	26	**886,374**	44	9	**53**	69	3	6	12	**72**
2019	861,541	30,712	27	**892,279**	44	9	**53**	69	3	6	12	**72**
2020	867,507	30,844	27	**898,378**	44	9	**53**	69	3	6	12	**72**
2021	874,002	30,940	28	**904,970**	44	9	**53**	69	3	6	12	**72**
2022	880,694	31,027	28	**911,748**	44	9	**53**	69	3	6	12	**72**
2023	887,384	31,121	29	**918,534**	44	9	**53**	69	3	6	12	**72**

2020 TCAP: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

ANNUAL FORECAST DATA

	EG (>=3MMThms)	EG (Total)	Noncore Total	System-Wide Total End-Use Dmd	System Total (Mdth/d)	Co-Use-Fuel	"Un-Acnt'd-For" (UAF)	Total System Throughput
Average Year Throughput (Mth)								
2017	**585,246**	**619,764**	**663,476**	**1,192,233**	**327**	**3,207**	**6,787**	**1,202,227**
2018	**532,375**	**567,049**	**612,914**	**1,149,718**	**315**	**3,093**	**6,545**	**1,159,356**
2019	**519,755**	**551,358**	**597,823**	**1,133,964**	**311**	**3,051**	**6,455**	**1,143,469**
2020	**504,975**	**535,250**	**582,128**	**1,117,755**	**305**	**3,007**	**6,363**	**1,127,125**
2021	**503,352**	**532,955**	**579,922**	**1,112,956**	**305**	**2,994**	**6,335**	**1,122,286**
2022	**493,156**	**522,487**	**569,474**	**1,097,235**	**301**	**2,952**	**6,246**	**1,106,432**
2023	**481,522**	**509,900**	**556,827**	**1,082,217**	**296**	**2,911**	**6,160**	**1,091,288**

		EG (>=3MMThms)	EG (Total)	Noncore Total	System-Wide Total End-Use Dmd	Check of System Total (Mdth/d)
Average Year Sales (Mth)						
2017	365	**0**	**0**	**0**	**474,795**	**130**
2018	365	**0**	**0**	**0**	**480,799**	**132**
2019	365	**0**	**0**	**0**	**479,109**	**131**
2020	366	**0**	**0**	**0**	**477,564**	**130**
2021	365	**0**	**0**	**0**	**474,080**	**130**
2022	365	**0**	**0**	**0**	**467,992**	**128**
2023	365	**0**	**0**	**0**	**464,755**	**127**

	EG (>=3MMThms)	EG (Total)	Noncore Total	System-Wide Total End-Use Dmd	Check of System Total (Mdth/d)	Co-Use-Fuel	"Un-Acnt'd-For" (UAF)	System Throughput
Cold Year Throughput (Mth)								
2017	**585,246**	**619,764**	**663,476**	**1,231,000**	**337**	**3,312**	**7,007**	**1,241,319**
2018	**532,375**	**567,049**	**612,914**	**1,188,751**	**326**	**3,198**	**6,767**	**1,198,716**
2019	**519,755**	**551,358**	**597,823**	**1,172,873**	**321**	**3,155**	**6,677**	**1,182,705**
2020	**504,975**	**535,250**	**582,128**	**1,156,607**	**316**	**3,112**	**6,584**	**1,166,303**
2021	**503,352**	**532,955**	**579,922**	**1,151,658**	**316**	**3,098**	**6,556**	**1,161,312**
2022	**493,156**	**522,487**	**569,474**	**1,135,578**	**311**	**3,055**	**6,464**	**1,145,097**
2023	**481,522**	**509,900**	**556,827**	**1,120,511**	**307**	**3,014**	**6,378**	**1,129,904**

	EG (>=3MMThms)	EG (Total)	Noncore Total	System-Wide Total End-Use Dmd
Specified Peak Day Thrughput (Mth/Day)				
2017	**1,589**	**1,712**	**1,836**	**5,975**
2018	**1,985**	**2,057**	**2,182**	**6,360**
2019	**2,161**	**2,233**	**2,359**	**6,524**
2020	**1,893**	**1,965**	**2,093**	**6,247**
2021	**1,733**	**1,806**	**1,933**	**6,063**
2022	**1,784**	**1,857**	**1,984**	**6,068**
2023	**1,503**	**1,576**	**1,703**	**5,769**

	EG (>=3MMThms)	EG (Total)	Noncore Total	System-Wide Total
Forecast Number of Customers				
2017	**21**	**96**	**149**	**880,393**
2018	**19**	**91**	**144**	**886,517**
2019	**18**	**90**	**143**	**892,422**
2020	**18**	**90**	**143**	**898,521**
2021	**18**	**90**	**143**	**905,113**
2022	**18**	**90**	**143**	**911,891**
2023	**18**	**90**	**143**	**918,677**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	**2020 TCAP: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)**																	
59	***MONTHLY FORECAST DATA***						Nonresidential Core			**Total**		Noncore - C&I					Noncore - Electric Gene	
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	2017	Jan				43,734	20,765		1,398	**65,897**		2,527	1,759	**4,286**	1,753	1,090	6,332	46,684
63		Feb				38,730	19,711		1,422	**59,863**		2,132	1,552	**3,684**	1,791	1,310	5,973	36,388
64		Mar				35,097	18,376		1,648	**55,121**		2,578	1,371	**3,949**	2,124	280	6,012	30,226
65		Apr				28,785	16,666		1,533	**46,985**		2,196	1,735	**3,931**	2,232	367	5,733	28,702
66		May				21,306	14,169		1,560	**37,035**		2,212	1,334	**3,546**	2,238	383	6,109	33,734
67		Jun				16,186	12,823		1,553	**30,563**		2,197	1,501	**3,698**	2,441	768	5,755	46,375
68		Jul				15,356	12,356		1,549	**29,260**		2,295	1,374	**3,669**	2,091	544	5,683	54,062
69		Aug				15,276	12,265		1,606	**29,148**		2,138	1,450	**3,588**	2,556	842	6,281	61,555
70		Sep				14,902	12,317		1,370	**28,590**		1,965	891	**2,856**	2,231	703	6,181	52,507
71		Oct				17,935	13,093		1,625	**32,653**		2,332	1,019	**3,351**	2,187	831	6,537	55,107
72		Nov				28,337	16,386		1,495	**46,218**		2,277	1,043	**3,321**	2,351	741	5,750	36,889
73		Dec				44,877	21,067		1,482	**67,425**		2,503	1,331	**3,834**	2,264	400	5,699	30,975
74																		
75	2018	Jan				43,899	21,369		1,498	**66,766**		2,355	1,409	**3,764**	1,974	191	5,987	29,681
76		Feb				38,877	20,284		1,524	**60,685**		2,364	1,414	**3,779**	1,978	304	4,023	26,227
77		Mar				35,230	18,911		1,767	**55,907**		2,370	1,418	**3,788**	1,978	279	3,560	18,885
78		Apr				28,894	17,151		1,644	**47,688**		2,378	1,422	**3,800**	1,994	325	3,580	35,043
79		May				21,387	14,581		1,672	**37,639**		2,387	1,428	**3,815**	1,999	638	3,589	35,499
80		Jun				16,247	13,196		1,665	**31,108**		2,399	1,435	**3,833**	2,031	866	3,605	31,021
81		Jul				15,414	12,715		1,660	**29,789**		2,394	1,432	**3,827**	2,093	1,443	3,631	60,547
82		Aug				15,334	12,622		1,722	**29,678**		2,402	1,436	**3,838**	2,101	1,642	3,629	62,335
83		Sep				14,959	12,676		1,469	**29,103**		2,396	1,433	**3,829**	2,082	1,576	3,621	57,349
84		Oct				18,003	13,473		1,742	**33,218**		2,408	1,440	**3,848**	2,024	1,518	3,624	43,488
85		Nov				28,444	16,863		1,603	**46,909**		2,420	1,447	**3,868**	2,017	1,404	3,631	44,093
86		Dec				45,046	21,679		1,588	**68,313**		2,425	1,450	**3,876**	2,024	191	3,644	42,083
87																		
88	2019	Jan				43,565	21,409		1,606	**66,580**		2,389	1,429	**3,818**	2,017	187	3,631	37,731
89		Feb				38,581	20,323		1,634	**60,538**		2,398	1,434	**3,833**	2,017	197	3,631	25,010
90		Mar				34,962	18,947		1,894	**55,803**		2,404	1,438	**3,842**	2,015	187	3,627	30,547
91		Apr				28,674	17,184		1,762	**47,620**		2,413	1,443	**3,856**	2,024	231	3,643	36,206
92		May				21,224	14,609		1,792	**37,625**		2,421	1,448	**3,868**	2,026	285	3,646	35,702
93		Jun				16,124	13,222		1,784	**31,130**		2,431	1,454	**3,885**	2,039	630	3,655	32,892
94		Jul				15,296	12,740		1,780	**29,816**		2,424	1,450	**3,873**	2,110	1,316	3,671	46,774
95		Aug				15,217	12,646		1,846	**29,710**		2,431	1,454	**3,885**	2,091	1,508	3,667	63,042
96		Sep				14,845	12,700		1,575	**29,119**		2,425	1,451	**3,876**	2,096	1,600	3,658	58,621
97		Oct				17,866	13,499		1,868	**33,232**		2,438	1,458	**3,896**	2,034	486	3,661	43,569
98		Nov				28,228	16,895		1,718	**46,840**		2,449	1,465	**3,914**	2,036	237	3,665	28,437
99		Dec				44,704	21,720		1,703	**68,126**		2,453	1,467	**3,921**	2,042	193	3,675	37,395
100																		
101	2020	Jan				43,281	21,416		1,721	**66,418**		2,413	1,443	**3,856**	2,035	189	3,662	43,767
102		Feb				38,330	20,329		1,752	**60,411**		2,422	1,449	**3,871**	2,034	208	3,661	30,985
103		Mar				34,734	18,952		2,031	**55,718**		2,428	1,452	**3,881**	2,032	189	3,657	29,026
104		Apr				28,487	17,189		1,888	**47,565**		2,438	1,458	**3,897**	2,040	193	3,672	30,379
105		May				21,086	14,613		1,921	**37,620**		2,445	1,463	**3,908**	2,042	239	3,675	28,851
106		Jun				16,019	13,226		1,913	**31,157**		2,455	1,468	**3,922**	2,053	540	3,684	29,016
107		Jul				15,197	12,743		1,908	**29,848**		2,446	1,463	**3,910**	2,105	936	3,701	52,183
108		Aug				15,118	12,650		1,979	**29,747**		2,452	1,466	**3,918**	2,092	1,322	3,695	60,731
109		Sep				14,748	12,704		1,688	**29,140**		2,445	1,462	**3,907**	2,078	1,182	3,684	55,256
110		Oct				17,749	13,503		2,002	**33,254**		2,456	1,469	**3,924**	2,048	236	3,686	40,586
111		Nov				28,044	16,900		1,842	**46,785**		2,466	1,475	**3,940**	2,049	190	3,688	24,992
112		Dec				44,412	21,727		1,825	**67,964**		2,468	1,476	**3,944**	2,053	191	3,696	35,042

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	**2020 TCAP: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)**																	
59	***MONTHLY FORECAST DATA***						Nonresidential Core			**Total**		Noncore - C&I						Noncore - Electric Gene
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)
113																		
114	2021	Jan				42,836	21,312		1,845	**65,993**		2,424	1,449	**3,873**	2,042	190	3,676	36,652
115		Feb				37,935	20,231		1,879	**60,044**		2,431	1,454	**3,886**	2,041	194	3,673	28,310
116		Mar				34,376	18,861		2,178	**55,415**		2,436	1,457	**3,893**	2,038	189	3,668	23,872
117		Apr				28,194	17,105		2,024	**47,324**		2,443	1,461	**3,904**	2,046	190	3,682	30,997
118		May				20,869	14,542		2,059	**37,470**		2,449	1,465	**3,914**	2,046	190	3,683	29,790
119		Jun				15,854	13,162		2,051	**31,066**		2,458	1,470	**3,928**	2,050	322	3,690	33,363
120		Jul				15,040	12,682		2,045	**29,767**		2,449	1,465	**3,914**	2,104	998	3,703	52,667
121		Aug				14,963	12,589		2,122	**29,673**		2,455	1,468	**3,923**	2,092	1,205	3,698	60,389
122		Sep				14,596	12,642		1,810	**29,049**		2,448	1,464	**3,911**	2,066	874	3,686	51,752
123		Oct				17,567	13,438		2,146	**33,151**		2,458	1,470	**3,929**	2,049	190	3,688	48,665
124		Nov				27,755	16,818		1,974	**46,548**		2,468	1,476	**3,944**	2,050	190	3,690	28,546
125		Dec				43,955	21,622		1,957	**67,534**		2,471	1,478	**3,948**	2,054	191	3,698	34,114
126																		
127	2022	Jan				42,101	21,135		1,978	**65,214**		2,426	1,451	**3,877**	2,043	190	3,677	35,985
128		Feb				37,285	20,062		2,014	**59,361**		2,433	1,455	**3,889**	2,041	190	3,674	26,199
129		Mar				33,787	18,703		2,335	**54,826**		2,438	1,458	**3,895**	2,038	189	3,668	25,269
130		Apr				27,711	16,962		2,170	**46,843**		2,444	1,462	**3,905**	2,045	190	3,681	32,138
131		May				20,511	14,421		2,207	**37,139**		2,450	1,466	**3,916**	2,046	190	3,682	28,739
132		Jun				15,582	13,051		2,198	**30,832**		2,459	1,471	**3,930**	2,050	363	3,689	32,986
133		Jul				14,782	12,576		2,192	**29,550**		2,450	1,466	**3,916**	2,090	828	3,703	47,321
134		Aug				14,706	12,484		2,274	**29,464**		2,456	1,469	**3,924**	2,084	1,276	3,697	56,081
135		Sep				14,346	12,537		1,940	**28,823**		2,448	1,464	**3,912**	2,063	695	3,685	47,613
136		Oct				17,266	13,326		2,301	**32,892**		2,459	1,471	**3,930**	2,048	190	3,686	45,779
137		Nov				27,279	16,678		2,117	**46,074**		2,469	1,476	**3,945**	2,049	190	3,687	33,542
138		Dec				43,202	21,442		2,098	**66,742**		2,471	1,478	**3,948**	2,052	191	3,694	37,281
139																		
140	2023	Jan				41,783	20,929		2,120	**64,831**		2,425	1,450	**3,875**	2,044	190	3,680	33,153
141		Feb				37,003	19,865		2,160	**59,028**		2,432	1,454	**3,886**	2,042	190	3,676	28,315
142		Mar				33,531	18,520		2,504	**54,555**		2,436	1,457	**3,892**	2,038	189	3,669	29,724
143		Apr				27,501	16,796		2,326	**46,623**		2,441	1,460	**3,901**	2,046	190	3,682	29,247
144		May				20,356	14,279		2,366	**37,001**		2,448	1,464	**3,912**	2,046	190	3,683	30,333
145		Jun				15,464	12,923		2,357	**30,744**		2,456	1,469	**3,925**	2,050	216	3,689	33,780
146		Jul				14,670	12,452		2,350	**29,473**		2,447	1,463	**3,910**	2,081	701	3,702	46,954
147		Aug				14,595	12,361		2,438	**29,394**		2,452	1,466	**3,918**	2,087	810	3,696	55,300
148		Sep				14,238	12,414		2,081	**28,732**		2,444	1,462	**3,906**	2,064	486	3,684	43,219
149		Oct				17,135	13,195		2,467	**32,797**		2,455	1,468	**3,923**	2,047	190	3,684	35,836
150		Nov				27,073	16,514		2,269	**45,856**		2,464	1,474	**3,938**	2,048	190	3,686	35,279
151		Dec				42,874	21,233		2,249	**66,357**		2,466	1,475	**3,941**	2,052	191	3,694	36,158

	A	B	C	D	E	S	T	U	V	W	X	Y	Z	AA	AB	AC
1	**2020 TCAP: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)**															
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	2017	Jan				**2,844**	**53,015**	**55,859**	**60,145**	**126,041**		**407**		**339**	**717**	**127,098**
63		Feb				**3,100**	**42,360**	**45,460**	**49,144**	**109,008**		**389**		**293**	**621**	**109,921**
64		Mar				**2,405**	**36,238**	**38,643**	**42,591**	**97,712**		**315**		**263**	**556**	**98,532**
65		Apr				**2,599**	**34,435**	**37,034**	**40,965**	**87,950**		**293**		**237**	**501**	**88,687**
66		May				**2,621**	**39,843**	**42,464**	**46,010**	**83,045**		**268**		**223**	**473**	**83,741**
67		Jun				**3,208**	**52,130**	**55,338**	**59,036**	**89,599**		**299**		**241**	**510**	**90,350**
68		Jul				**2,635**	**59,745**	**62,380**	**66,049**	**95,309**		**307**		**256**	**543**	**96,108**
69		Aug				**3,398**	**67,835**	**71,233**	**74,821**	**103,969**		**335**		**280**	**592**	**104,841**
70		Sep				**2,934**	**58,688**	**61,621**	**64,478**	**93,068**		**310**		**250**	**530**	**93,848**
71		Oct				**3,018**	**61,644**	**64,662**	**68,013**	**100,665**		**325**		**271**	**573**	**101,509**
72		Nov				**3,092**	**42,638**	**45,730**	**49,051**	**95,269**		**318**		**256**	**542**	**96,067**
73		Dec				**2,664**	**36,674**	**39,338**	**43,173**	**110,598**		**357**		**298**	**630**	**111,525**
74																
75	2018	Jan				**2,165**	**35,668**	**37,832**	**41,596**	**108,362**		**350**		**292**	**617**	**109,270**
76		Feb				**2,282**	**30,251**	**32,533**	**36,311**	**96,996**		**346**		**261**	**552**	**97,809**
77		Mar				**2,257**	**22,445**	**24,702**	**28,490**	**84,397**		**272**		**227**	**480**	**85,105**
78		Apr				**2,319**	**38,623**	**40,942**	**44,742**	**92,431**		**308**		**249**	**526**	**93,206**
79		May				**2,637**	**39,089**	**41,726**	**45,541**	**83,180**		**268**		**224**	**473**	**83,877**
80		Jun				**2,898**	**34,626**	**37,524**	**41,357**	**72,465**		**242**		**195**	**413**	**73,073**
81		Jul				**3,536**	**64,178**	**67,714**	**71,540**	**101,329**		**327**		**273**	**577**	**102,179**
82		Aug				**3,743**	**65,964**	**69,707**	**73,545**	**103,223**		**333**		**278**	**588**	**104,088**
83		Sep				**3,659**	**60,970**	**64,628**	**68,458**	**97,561**		**325**		**262**	**555**	**98,379**
84		Oct				**3,542**	**47,112**	**50,654**	**54,503**	**87,721**		**283**		**236**	**499**	**88,456**
85		Nov				**3,421**	**47,724**	**51,145**	**55,013**	**101,922**		**340**		**274**	**580**	**102,776**
86		Dec				**2,216**	**45,727**	**47,943**	**51,818**	**120,132**		**388**		**323**	**684**	**121,139**
87																
88	2019	Jan				**2,205**	**41,362**	**43,567**	**47,385**	**113,965**		**368**		**307**	**649**	**114,921**
89		Feb				**2,214**	**28,641**	**30,855**	**34,688**	**95,226**		**340**		**256**	**542**	**96,024**
90		Mar				**2,202**	**34,174**	**36,376**	**40,218**	**96,021**		**310**		**258**	**547**	**96,826**
91		Apr				**2,255**	**39,849**	**42,105**	**45,960**	**93,580**		**312**		**252**	**533**	**94,364**
92		May				**2,311**	**39,349**	**41,659**	**45,527**	**83,152**		**268**		**224**	**473**	**83,849**
93		Jun				**2,668**	**36,548**	**39,216**	**43,101**	**74,231**		**247**		**200**	**423**	**74,853**
94		Jul				**3,426**	**50,444**	**53,870**	**57,743**	**87,559**		**282**		**236**	**498**	**88,293**
95		Aug				**3,598**	**66,709**	**70,307**	**74,192**	**103,902**		**335**		**280**	**591**	**104,773**
96		Sep				**3,695**	**62,279**	**65,974**	**69,850**	**98,969**		**330**		**266**	**563**	**99,799**
97		Oct				**2,520**	**47,230**	**49,751**	**53,646**	**86,879**		**280**		**234**	**495**	**87,607**
98		Nov				**2,273**	**32,102**	**34,375**	**38,289**	**85,129**		**284**		**229**	**485**	**85,843**
99		Dec				**2,235**	**41,069**	**43,304**	**47,224**	**115,351**		**372**		**310**	**657**	**116,318**
100																
101	2020	Jan				**2,224**	**47,429**	**49,653**	**53,508**	**119,927**		**387**		**323**	**683**	**120,932**
102		Feb				**2,242**	**34,646**	**36,889**	**40,760**	**101,170**		**349**		**272**	**576**	**102,018**
103		Mar				**2,220**	**32,683**	**34,903**	**38,784**	**94,502**		**305**		**254**	**538**	**95,294**
104		Apr				**2,233**	**34,052**	**36,284**	**40,181**	**87,746**		**292**		**236**	**499**	**88,481**
105		May				**2,281**	**32,526**	**34,806**	**38,714**	**76,334**		**246**		**205**	**435**	**76,974**
106		Jun				**2,592**	**32,700**	**35,292**	**39,215**	**70,372**		**235**		**189**	**401**	**70,962**
107		Jul				**3,041**	**55,883**	**58,924**	**62,833**	**92,681**		**299**		**249**	**528**	**93,458**
108		Aug				**3,414**	**64,426**	**67,840**	**71,759**	**101,506**		**327**		**273**	**578**	**102,357**
109		Sep				**3,261**	**58,940**	**62,200**	**66,107**	**95,247**		**317**		**256**	**542**	**96,046**
110		Oct				**2,284**	**44,272**	**46,556**	**50,480**	**83,735**		**270**		**225**	**477**	**84,437**
111		Nov				**2,239**	**28,680**	**30,920**	**34,860**	**81,645**		**272**		**220**	**465**	**82,329**
112		Dec				**2,244**	**38,738**	**40,982**	**44,926**	**112,891**		**364**		**304**	**643**	**113,837**

	A	B	C	D	E	S	T	U	V	W	X	Y	Z	AA	AB	AC
1	**2020 TCAP: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)**															
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	2021	Jan				**2,232**	**40,329**	**42,561**	**46,434**	**112,427**		**363**		**302**	**640**	**113,370**
115		Feb				**2,235**	**31,983**	**34,218**	**38,104**	**98,149**		**351**		**264**	**559**	**98,971**
116		Mar				**2,227**	**27,539**	**29,766**	**33,659**	**89,074**		**287**		**240**	**507**	**89,821**
117		Apr				**2,236**	**34,679**	**36,915**	**40,818**	**88,142**		**294**		**237**	**502**	**88,881**
118		May				**2,236**	**33,473**	**35,709**	**39,623**	**77,093**		**249**		**207**	**439**	**77,740**
119		Jun				**2,372**	**37,053**	**39,426**	**43,354**	**74,420**		**248**		**200**	**424**	**75,044**
120		Jul				**3,102**	**56,371**	**59,473**	**63,387**	**93,154**		**300**		**251**	**530**	**93,935**
121		Aug				**3,297**	**64,087**	**67,384**	**71,307**	**100,980**		**326**		**272**	**575**	**101,826**
122		Sep				**2,940**	**55,438**	**58,378**	**62,289**	**91,338**		**304**		**246**	**520**	**92,103**
123		Oct				**2,239**	**52,352**	**54,591**	**58,520**	**91,671**		**296**		**247**	**522**	**92,439**
124		Nov				**2,240**	**32,236**	**34,476**	**38,421**	**84,968**		**283**		**229**	**484**	**85,680**
125		Dec				**2,245**	**37,812**	**40,057**	**44,006**	**111,540**		**360**		**300**	**635**	**112,475**
126																
127	2022	Jan				**2,233**	**39,662**	**41,894**	**45,771**	**110,985**		**358**		**299**	**632**	**111,916**
128		Feb				**2,231**	**29,873**	**32,103**	**35,992**	**95,353**		**341**		**257**	**543**	**96,153**
129		Mar				**2,227**	**28,936**	**31,163**	**35,059**	**89,884**		**290**		**242**	**512**	**90,638**
130		Apr				**2,235**	**35,819**	**38,054**	**41,959**	**88,803**		**296**		**239**	**506**	**89,547**
131		May				**2,236**	**32,421**	**34,657**	**38,573**	**75,712**		**244**		**204**	**431**	**76,347**
132		Jun				**2,412**	**36,675**	**39,087**	**43,017**	**73,849**		**246**		**199**	**420**	**74,468**
133		Jul				**2,918**	**51,024**	**53,943**	**57,859**	**87,409**		**282**		**235**	**498**	**88,142**
134		Aug				**3,360**	**59,777**	**63,138**	**67,062**	**96,526**		**311**		**260**	**549**	**97,335**
135		Sep				**2,758**	**51,298**	**54,056**	**57,969**	**86,792**		**289**		**233**	**494**	**87,520**
136		Oct				**2,238**	**49,465**	**51,704**	**55,633**	**88,526**		**286**		**238**	**504**	**89,268**
137		Nov				**2,239**	**37,230**	**39,469**	**43,414**	**89,487**		**298**		**241**	**509**	**90,237**
138		Dec				**2,243**	**40,975**	**43,219**	**47,167**	**113,908**		**367**		**306**	**648**	**114,863**
139																
140	2023	Jan				**2,234**	**36,833**	**39,067**	**42,942**	**107,773**		**348**		**290**	**613**	**108,677**
141		Feb				**2,232**	**31,991**	**34,223**	**38,109**	**97,137**		**347**		**261**	**553**	**97,951**
142		Mar				**2,228**	**33,393**	**35,621**	**39,513**	**94,068**		**303**		**253**	**535**	**94,857**
143		Apr				**2,236**	**32,930**	**35,165**	**39,067**	**85,689**		**286**		**231**	**488**	**86,408**
144		May				**2,236**	**34,015**	**36,251**	**40,163**	**77,164**		**249**		**208**	**439**	**77,811**
145		Jun				**2,266**	**37,469**	**39,735**	**43,659**	**74,403**		**248**		**200**	**424**	**75,027**
146		Jul				**2,781**	**50,655**	**53,437**	**57,347**	**86,819**		**280**		**234**	**494**	**87,547**
147		Aug				**2,896**	**58,995**	**61,892**	**65,810**	**95,204**		**307**		**256**	**542**	**96,002**
148		Sep				**2,550**	**46,903**	**49,453**	**53,359**	**82,090**		**274**		**221**	**467**	**82,778**
149		Oct				**2,237**	**39,520**	**41,757**	**45,680**	**78,477**		**253**		**211**	**447**	**79,135**
150		Nov				**2,238**	**38,966**	**41,204**	**45,142**	**90,998**		**303**		**245**	**518**	**91,761**
151		Dec				**2,243**	**39,852**	**42,095**	**46,036**	**112,393**		**363**		**302**	**640**	**113,335**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**2020 TCAP: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)**													
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	2017	Jan	31			43,419	16,503		425	**60,347**		0	0	**0**
158		Feb	28			38,452	15,665		427	**54,544**		0	0	**0**
159		Mar	31			34,844	14,605		469	**49,918**		0	0	**0**
160		Apr	30			28,578	13,245		457	**42,280**		0	0	**0**
161		May	31			21,153	11,261		461	**32,875**		0	0	**0**
162		Jun	30			16,070	10,191		463	**26,725**		0	0	**0**
163		Jul	31			15,245	9,820		469	**25,534**		0	0	**0**
164		Aug	31			15,166	9,748		482	**25,396**		0	0	**0**
165		Sep	30			14,795	9,789		482	**25,067**		0	0	**0**
166		Oct	31			17,806	10,405		499	**28,710**		0	0	**0**
167		Nov	30			28,133	13,023		476	**41,632**		0	0	**0**
168		Dec	31			44,554	16,743		471	**61,767**		0	0	**0**
169														
170	2018	Jan	31			43,583	16,983		456	**61,022**		0	0	**0**
171		Feb	28			38,597	16,121		458	**55,176**		0	0	**0**
172		Mar	31			34,976	15,029		504	**50,510**		0	0	**0**
173		Apr	30			28,686	13,631		490	**42,807**		0	0	**0**
174		May	31			21,233	11,588		495	**33,316**		0	0	**0**
175		Jun	30			16,130	10,488		497	**27,116**		0	0	**0**
176		Jul	31			15,303	10,106		503	**25,911**		0	0	**0**
177		Aug	31			15,224	10,031		517	**25,772**		0	0	**0**
178		Sep	30			14,851	10,074		518	**25,443**		0	0	**0**
179		Oct	31			17,873	10,708		535	**29,116**		0	0	**0**
180		Nov	30			28,239	13,402		511	**42,152**		0	0	**0**
181		Dec	31			44,722	17,230		505	**62,457**		0	0	**0**
182														
183	2019	Jan	31			43,252	17,015		490	**60,757**		0	0	**0**
184		Feb	28			38,304	16,152		493	**54,948**		0	0	**0**
185		Mar	31			34,710	15,058		542	**50,310**		0	0	**0**
186		Apr	30			28,468	13,657		526	**42,651**		0	0	**0**
187		May	31			21,071	11,610		531	**33,213**		0	0	**0**
188		Jun	30			16,008	10,508		534	**27,050**		0	0	**0**
189		Jul	31			15,186	10,125		540	**25,851**		0	0	**0**
190		Aug	31			15,108	10,051		556	**25,714**		0	0	**0**
191		Sep	30			14,738	10,093		556	**25,387**		0	0	**0**
192		Oct	31			17,737	10,728		575	**29,041**		0	0	**0**
193		Nov	30			28,025	13,427		549	**42,001**		0	0	**0**
194		Dec	31			44,382	17,262		543	**62,187**		0	0	**0**
195														
196	2020	Jan	31			42,970	17,020		526	**60,516**		0	0	**0**
197		Feb	29			38,054	16,156		529	**54,740**		0	0	**0**
198		Mar	31			34,484	15,063		582	**50,129**		0	0	**0**
199		Apr	30			28,283	13,661		565	**42,508**		0	0	**0**
200		May	31			20,934	11,614		571	**33,118**		0	0	**0**
201		Jun	30			15,904	10,511		573	**26,988**		0	0	**0**
202		Jul	31			15,087	10,128		580	**25,795**		0	0	**0**
203		Aug	31			15,009	10,053		597	**25,660**		0	0	**0**
204		Sep	30			14,642	10,096		597	**25,335**		0	0	**0**
205		Oct	31			17,622	10,732		617	**28,971**		0	0	**0**
206		Nov	30			27,842	13,431		589	**41,862**		0	0	**0**
207		Dec	31			44,093	17,267		583	**61,943**		0	0	**0**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**2020 TCAP: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)**													
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)**													
208														
209	2021	Jan	31			42,528	16,938		564	**60,030**		0	0	**0**
210		Feb	28			37,662	16,078		568	**54,309**		0	0	**0**
211		Mar	31			34,129	14,990		626	**49,744**		0	0	**0**
212		Apr	30			27,991	13,595		607	**42,193**		0	0	**0**
213		May	31			20,718	11,558		613	**32,889**		0	0	**0**
214		Jun	30			15,740	10,460		616	**26,816**		0	0	**0**
215		Jul	31			14,932	10,079		623	**25,634**		0	0	**0**
216		Aug	31			14,855	10,005		641	**25,501**		0	0	**0**
217		Sep	30			14,491	10,047		640	**25,179**		0	0	**0**
218		Oct	31			17,440	10,680		663	**28,783**		0	0	**0**
219		Nov	30			27,555	13,366		633	**41,554**		0	0	**0**
220		Dec	31			43,639	17,184		626	**61,449**		0	0	**0**
221														
222	2022	Jan	31			41,799	16,797		606	**59,202**		0	0	**0**
223		Feb	28			37,017	15,944		611	**53,572**		0	0	**0**
224		Mar	31			33,544	14,865		672	**49,081**		0	0	**0**
225		Apr	30			27,512	13,481		651	**41,644**		0	0	**0**
226		May	31			20,363	11,461		658	**32,482**		0	0	**0**
227		Jun	30			15,470	10,373		661	**26,504**		0	0	**0**
228		Jul	31			14,676	9,995		669	**25,339**		0	0	**0**
229		Aug	31			14,600	9,921		688	**25,210**		0	0	**0**
230		Sep	30			14,243	9,964		688	**24,894**		0	0	**0**
231		Oct	31			17,141	10,591		712	**28,444**		0	0	**0**
232		Nov	30			27,083	13,255		680	**41,017**		0	0	**0**
233		Dec	31			42,891	17,041		672	**60,604**		0	0	**0**
234														
235	2023	Jan	31			41,482	16,633		650	**58,765**		0	0	**0**
236		Feb	28			36,736	15,788		656	**53,181**		0	0	**0**
237		Mar	31			33,290	14,719		723	**48,731**		0	0	**0**
238		Apr	30			27,303	13,348		699	**41,351**		0	0	**0**
239		May	31			20,209	11,348		706	**32,264**		0	0	**0**
240		Jun	30			15,353	10,271		710	**26,334**		0	0	**0**
241		Jul	31			14,565	9,896		718	**25,179**		0	0	**0**
242		Aug	31			14,490	9,824		739	**25,053**		0	0	**0**
243		Sep	30			14,135	9,866		739	**24,739**		0	0	**0**
244		Oct	31			17,012	10,487		765	**28,263**		0	0	**0**
245		Nov	30			26,878	13,125		730	**40,732**		0	0	**0**
246		Dec	31			42,566	16,875		722	**60,163**		0	0	**0**

	A	B	C	D	E	O	P	Q	R	S	T	U	V	W	X	Y
1	**2020 TCAP: 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)**															
157	2017	Jan	31			0	0	0	0	**0**	**0**	**0**	**0**	**60,347**		**195**
158		Feb	28			0	0	0	0	**0**	**0**	**0**	**0**	**54,544**		**195**
159		Mar	31			0	0	0	0	**0**	**0**	**0**	**0**	**49,918**		**161**
160		Apr	30			0	0	0	0	**0**	**0**	**0**	**0**	**42,280**		**141**
161		May	31			0	0	0	0	**0**	**0**	**0**	**0**	**32,875**		**106**
162		Jun	30			0	0	0	0	**0**	**0**	**0**	**0**	**26,725**		**89**
163		Jul	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,534**		**82**
164		Aug	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,396**		**82**
165		Sep	30			0	0	0	0	**0**	**0**	**0**	**0**	**25,067**		**84**
166		Oct	31			0	0	0	0	**0**	**0**	**0**	**0**	**28,710**		**93**
167		Nov	30			0	0	0	0	**0**	**0**	**0**	**0**	**41,632**		**139**
168		Dec	31			0	0	0	0	**0**	**0**	**0**	**0**	**61,767**		**199**
169																
170	2018	Jan	31			0	0	0	0	**0**	**0**	**0**	**0**	**61,022**		**197**
171		Feb	28			0	0	0	0	**0**	**0**	**0**	**0**	**55,176**		**197**
172		Mar	31			0	0	0	0	**0**	**0**	**0**	**0**	**50,510**		**163**
173		Apr	30			0	0	0	0	**0**	**0**	**0**	**0**	**42,807**		**143**
174		May	31			0	0	0	0	**0**	**0**	**0**	**0**	**33,316**		**107**
175		Jun	30			0	0	0	0	**0**	**0**	**0**	**0**	**27,116**		**90**
176		Jul	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,911**		**84**
177		Aug	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,772**		**83**
178		Sep	30			0	0	0	0	**0**	**0**	**0**	**0**	**25,443**		**85**
179		Oct	31			0	0	0	0	**0**	**0**	**0**	**0**	**29,116**		**94**
180		Nov	30			0	0	0	0	**0**	**0**	**0**	**0**	**42,152**		**141**
181		Dec	31			0	0	0	0	**0**	**0**	**0**	**0**	**62,457**		**201**
182																
183	2019	Jan	31			0	0	0	0	**0**	**0**	**0**	**0**	**60,757**		**196**
184		Feb	28			0	0	0	0	**0**	**0**	**0**	**0**	**54,948**		**196**
185		Mar	31			0	0	0	0	**0**	**0**	**0**	**0**	**50,310**		**162**
186		Apr	30			0	0	0	0	**0**	**0**	**0**	**0**	**42,651**		**142**
187		May	31			0	0	0	0	**0**	**0**	**0**	**0**	**33,213**		**107**
188		Jun	30			0	0	0	0	**0**	**0**	**0**	**0**	**27,050**		**90**
189		Jul	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,851**		**83**
190		Aug	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,714**		**83**
191		Sep	30			0	0	0	0	**0**	**0**	**0**	**0**	**25,387**		**85**
192		Oct	31			0	0	0	0	**0**	**0**	**0**	**0**	**29,041**		**94**
193		Nov	30			0	0	0	0	**0**	**0**	**0**	**0**	**42,001**		**140**
194		Dec	31			0	0	0	0	**0**	**0**	**0**	**0**	**62,187**		**201**
195																
196	2020	Jan	31			0	0	0	0	**0**	**0**	**0**	**0**	**60,516**		**195**
197		Feb	29			0	0	0	0	**0**	**0**	**0**	**0**	**54,740**		**189**
198		Mar	31			0	0	0	0	**0**	**0**	**0**	**0**	**50,129**		**162**
199		Apr	30			0	0	0	0	**0**	**0**	**0**	**0**	**42,508**		**142**
200		May	31			0	0	0	0	**0**	**0**	**0**	**0**	**33,118**		**107**
201		Jun	30			0	0	0	0	**0**	**0**	**0**	**0**	**26,988**		**90**
202		Jul	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,795**		**83**
203		Aug	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,660**		**83**
204		Sep	30			0	0	0	0	**0**	**0**	**0**	**0**	**25,335**		**84**
205		Oct	31			0	0	0	0	**0**	**0**	**0**	**0**	**28,971**		**93**
206		Nov	30			0	0	0	0	**0**	**0**	**0**	**0**	**41,862**		**140**
207		Dec	31			0	0	0	0	**0**	**0**	**0**	**0**	**61,943**		**200**

	A	B	C	D	E	O	P	Q	R	S	T	U	V	W	X	Y
1	**2020 TCAP: 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	2021	Jan	31			0	0	0	0	**0**	**0**	**0**	**0**	**60,030**		**194**
210		Feb	28			0	0	0	0	**0**	**0**	**0**	**0**	**54,309**		**194**
211		Mar	31			0	0	0	0	**0**	**0**	**0**	**0**	**49,744**		**160**
212		Apr	30			0	0	0	0	**0**	**0**	**0**	**0**	**42,193**		**141**
213		May	31			0	0	0	0	**0**	**0**	**0**	**0**	**32,889**		**106**
214		Jun	30			0	0	0	0	**0**	**0**	**0**	**0**	**26,816**		**89**
215		Jul	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,634**		**83**
216		Aug	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,501**		**82**
217		Sep	30			0	0	0	0	**0**	**0**	**0**	**0**	**25,179**		**84**
218		Oct	31			0	0	0	0	**0**	**0**	**0**	**0**	**28,783**		**93**
219		Nov	30			0	0	0	0	**0**	**0**	**0**	**0**	**41,554**		**139**
220		Dec	31			0	0	0	0	**0**	**0**	**0**	**0**	**61,449**		**198**
221																
222	2022	Jan	31			0	0	0	0	**0**	**0**	**0**	**0**	**59,202**		**191**
223		Feb	28			0	0	0	0	**0**	**0**	**0**	**0**	**53,572**		**191**
224		Mar	31			0	0	0	0	**0**	**0**	**0**	**0**	**49,081**		**158**
225		Apr	30			0	0	0	0	**0**	**0**	**0**	**0**	**41,644**		**139**
226		May	31			0	0	0	0	**0**	**0**	**0**	**0**	**32,482**		**105**
227		Jun	30			0	0	0	0	**0**	**0**	**0**	**0**	**26,504**		**88**
228		Jul	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,339**		**82**
229		Aug	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,210**		**81**
230		Sep	30			0	0	0	0	**0**	**0**	**0**	**0**	**24,894**		**83**
231		Oct	31			0	0	0	0	**0**	**0**	**0**	**0**	**28,444**		**92**
232		Nov	30			0	0	0	0	**0**	**0**	**0**	**0**	**41,017**		**137**
233		Dec	31			0	0	0	0	**0**	**0**	**0**	**0**	**60,604**		**195**
234																
235	2023	Jan	31			0	0	0	0	**0**	**0**	**0**	**0**	**58,765**		**190**
236		Feb	28			0	0	0	0	**0**	**0**	**0**	**0**	**53,181**		**190**
237		Mar	31			0	0	0	0	**0**	**0**	**0**	**0**	**48,731**		**157**
238		Apr	30			0	0	0	0	**0**	**0**	**0**	**0**	**41,351**		**138**
239		May	31			0	0	0	0	**0**	**0**	**0**	**0**	**32,264**		**104**
240		Jun	30			0	0	0	0	**0**	**0**	**0**	**0**	**26,334**		**88**
241		Jul	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,179**		**81**
242		Aug	31			0	0	0	0	**0**	**0**	**0**	**0**	**25,053**		**81**
243		Sep	30			0	0	0	0	**0**	**0**	**0**	**0**	**24,739**		**82**
244		Oct	31			0	0	0	0	**0**	**0**	**0**	**0**	**28,263**		**91**
245		Nov	30			0	0	0	0	**0**	**0**	**0**	**0**	**40,732**		**136**
246		Dec	31			0	0	0	0	**0**	**0**	**0**	**0**	**60,163**		**194**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	**2020 TCAP: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)**																	
249	***MONTHLY FORECAST DATA***						Nonresidential Core			**Total**		Noncore - C&I					Noncore - Electric Gene	
250						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)
251	**Cold Year Throughput (Mth)**																	
252	2017	Jan				49,886	22,437		1,398	**73,721**		2,527	1,759	**4,286**	1,753	1,090	6,332	46,684
253		Feb				44,014	21,179		1,422	**66,615**		2,132	1,552	**3,684**	1,791	1,310	5,973	36,388
254		Mar				39,383	19,581		1,648	**60,612**		2,578	1,371	**3,949**	2,124	280	6,012	30,226
255		Apr				31,814	17,534		1,533	**50,881**		2,196	1,735	**3,931**	2,232	367	5,733	28,702
256		May				22,613	14,546		1,560	**38,719**		2,212	1,334	**3,546**	2,238	383	6,109	33,734
257		Jun				16,493	12,937		1,553	**30,982**		2,197	1,501	**3,698**	2,441	768	5,755	46,375
258		Jul				15,376	12,374		1,549	**29,299**		2,295	1,374	**3,669**	2,091	544	5,683	54,062
259		Aug				15,280	12,265		1,606	**29,152**		2,138	1,450	**3,588**	2,556	842	6,281	61,555
260		Sep				14,932	12,330		1,370	**28,632**		1,965	891	**2,856**	2,231	703	6,181	52,507
261		Oct				18,513	13,256		1,625	**33,394**		2,332	1,019	**3,351**	2,187	831	6,537	55,107
262		Nov				31,269	17,198		1,495	**49,962**		2,277	1,043	**3,321**	2,351	741	5,750	36,889
263		Dec				51,275	22,798		1,482	**75,555**		2,503	1,331	**3,834**	2,264	400	5,699	30,975
264																		
265	2018	Jan				50,093	23,043		1,498	**74,634**		2,355	1,409	**3,764**	1,974	191	5,987	29,681
266		Feb				44,197	21,755		1,524	**67,476**		2,364	1,414	**3,779**	1,978	304	4,023	26,227
267		Mar				39,546	20,119		1,767	**61,432**		2,370	1,418	**3,788**	1,978	279	3,560	18,885
268		Apr				31,946	18,021		1,644	**51,611**		2,378	1,422	**3,800**	1,994	325	3,580	35,043
269		May				22,706	14,960		1,672	**39,338**		2,387	1,428	**3,815**	1,999	638	3,589	35,499
270		Jun				16,561	13,311		1,665	**31,537**		2,399	1,435	**3,833**	2,031	866	3,605	31,021
271		Jul				15,440	12,733		1,660	**29,834**		2,394	1,432	**3,827**	2,093	1,443	3,631	60,547
272		Aug				15,343	12,622		1,722	**29,687**		2,402	1,436	**3,838**	2,101	1,642	3,629	62,335
273		Sep				14,994	12,689		1,469	**29,151**		2,396	1,433	**3,829**	2,082	1,576	3,621	57,349
274		Oct				18,590	13,637		1,742	**33,969**		2,408	1,440	**3,848**	2,024	1,518	3,624	43,488
275		Nov				31,398	17,676		1,603	**50,677**		2,420	1,447	**3,868**	2,017	1,404	3,631	44,093
276		Dec				51,488	23,413		1,588	**76,490**		2,425	1,450	**3,876**	2,024	191	3,644	42,083
277																		
278	2019	Jan				49,727	23,084		1,606	**74,417**		2,389	1,429	**3,818**	2,017	187	3,631	37,731
279		Feb				43,874	21,795		1,634	**67,303**		2,398	1,434	**3,833**	2,017	197	3,631	25,010
280		Mar				39,258	20,155		1,894	**61,308**		2,404	1,438	**3,842**	2,015	187	3,627	30,547
281		Apr				31,713	18,055		1,762	**51,529**		2,413	1,443	**3,856**	2,024	231	3,643	36,206
282		May				22,541	14,988		1,792	**39,321**		2,421	1,448	**3,868**	2,026	285	3,646	35,702
283		Jun				16,440	13,336		1,784	**31,561**		2,431	1,454	**3,885**	2,039	630	3,655	32,892
284		Jul				15,327	12,758		1,780	**29,865**		2,424	1,450	**3,873**	2,110	1,316	3,671	46,774
285		Aug				15,231	12,646		1,846	**29,724**		2,431	1,454	**3,885**	2,091	1,508	3,667	63,042
286		Sep				14,884	12,713		1,575	**29,172**		2,425	1,451	**3,876**	2,096	1,600	3,658	58,621
287		Oct				18,454	13,663		1,868	**33,985**		2,438	1,458	**3,896**	2,034	486	3,661	43,569
288		Nov				31,169	17,709		1,718	**50,596**		2,449	1,465	**3,914**	2,036	237	3,665	28,437
289		Dec				51,112	23,455		1,703	**76,270**		2,453	1,467	**3,921**	2,042	193	3,675	37,395
290																		
291	2020	Jan				49,423	23,091		1,721	**74,235**		2,413	1,443	**3,856**	2,035	189	3,662	43,767
292		Feb				43,606	21,801		1,752	**67,159**		2,422	1,449	**3,871**	2,034	208	3,661	30,985
293		Mar				39,018	20,161		2,031	**61,210**		2,428	1,452	**3,881**	2,032	189	3,657	29,026
294		Apr				31,519	18,060		1,888	**51,467**		2,438	1,458	**3,897**	2,040	193	3,672	30,379
295		May				22,403	14,992		1,921	**39,316**		2,445	1,463	**3,908**	2,042	239	3,675	28,851
296		Jun				16,340	13,340		1,913	**31,593**		2,455	1,468	**3,922**	2,053	540	3,684	29,016
297		Jul				15,234	12,762		1,908	**29,903**		2,446	1,463	**3,910**	2,105	936	3,701	52,183
298		Aug				15,138	12,650		1,979	**29,767**		2,452	1,466	**3,918**	2,092	1,322	3,695	60,731
299		Sep				14,793	12,717		1,688	**29,198**		2,445	1,462	**3,907**	2,078	1,182	3,684	55,256
300		Oct				18,341	13,667		2,002	**34,011**		2,456	1,469	**3,924**	2,048	236	3,686	40,586
301		Nov				30,979	17,714		1,842	**50,534**		2,466	1,475	**3,940**	2,049	190	3,688	24,992
302		Dec				50,800	23,461		1,825	**76,086**		2,468	1,476	**3,944**	2,053	191	3,696	35,042

2020 TCAP: 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)											
2021 Jan	48,938	22,987	1,845	**73,770**	2,424	1,449	**3,873**	2,042	190	3,676	36,652
Feb	43,178	21,702	1,879	**66,758**	2,431	1,454	**3,886**	2,041	194	3,673	28,310
Mar	38,635	20,069	2,178	**60,882**	2,436	1,457	**3,893**	2,038	189	3,668	23,872
Apr	31,210	17,976	2,024	**51,210**	2,443	1,461	**3,904**	2,046	190	3,682	30,997
May	22,183	14,921	2,059	**39,163**	2,449	1,465	**3,914**	2,046	190	3,683	29,790
Jun	16,180	13,276	2,051	**31,506**	2,458	1,470	**3,928**	2,050	322	3,690	33,363
Jul	15,084	12,700	2,045	**29,829**	2,449	1,465	**3,914**	2,104	998	3,703	52,667
Aug	14,990	12,589	2,122	**29,700**	2,455	1,468	**3,923**	2,092	1,205	3,698	60,389
Sep	14,648	12,655	1,810	**29,113**	2,448	1,464	**3,911**	2,066	874	3,686	51,752
Oct	18,161	13,602	2,146	**33,909**	2,458	1,470	**3,929**	2,049	190	3,688	48,665
Nov	30,675	17,632	1,974	**50,281**	2,468	1,476	**3,944**	2,050	190	3,690	28,546
Dec	50,301	23,356	1,957	**75,614**	2,471	1,478	**3,948**	2,054	191	3,698	34,114
2022 Jan	48,123	22,809	1,978	**72,909**	2,426	1,451	**3,877**	2,043	190	3,677	35,985
Feb	42,459	21,532	2,014	**66,005**	2,433	1,455	**3,889**	2,041	190	3,674	26,199
Mar	37,991	19,910	2,335	**60,237**	2,438	1,458	**3,895**	2,038	189	3,668	25,269
Apr	30,690	17,832	2,170	**50,691**	2,444	1,462	**3,905**	2,045	190	3,681	32,138
May	21,813	14,799	2,207	**38,820**	2,450	1,466	**3,916**	2,046	190	3,682	28,739
Jun	15,910	13,165	2,198	**31,273**	2,459	1,471	**3,930**	2,050	363	3,689	32,986
Jul	14,833	12,594	2,192	**29,619**	2,450	1,466	**3,916**	2,090	828	3,703	47,321
Aug	14,740	12,484	2,274	**29,498**	2,456	1,469	**3,924**	2,084	1,276	3,697	56,081
Sep	14,404	12,550	1,940	**28,894**	2,448	1,464	**3,912**	2,063	695	3,685	47,613
Oct	17,859	13,489	2,301	**33,649**	2,459	1,471	**3,930**	2,048	190	3,686	45,779
Nov	30,164	17,491	2,117	**49,771**	2,469	1,476	**3,945**	2,049	190	3,687	33,542
Dec	49,463	23,175	2,098	**74,736**	2,471	1,478	**3,948**	2,052	191	3,694	37,281
2023 Jan	47,785	22,601	2,120	**72,506**	2,425	1,450	**3,875**	2,044	190	3,680	33,153
Feb	42,161	21,334	2,160	**65,654**	2,432	1,454	**3,886**	2,042	190	3,676	28,315
Mar	37,725	19,725	2,504	**59,954**	2,436	1,457	**3,892**	2,038	189	3,669	29,724
Apr	30,474	17,664	2,326	**50,464**	2,441	1,460	**3,901**	2,046	190	3,682	29,247
May	21,660	14,657	2,366	**38,684**	2,448	1,464	**3,912**	2,046	190	3,683	30,333
Jun	15,798	13,036	2,357	**31,191**	2,456	1,469	**3,925**	2,050	216	3,689	33,780
Jul	14,729	12,470	2,350	**29,549**	2,447	1,463	**3,910**	2,081	701	3,702	46,954
Aug	14,636	12,361	2,438	**29,436**	2,452	1,466	**3,918**	2,087	810	3,696	55,300
Sep	14,303	12,427	2,081	**28,810**	2,444	1,462	**3,906**	2,064	486	3,684	43,219
Oct	17,733	13,358	2,467	**33,559**	2,455	1,468	**3,923**	2,047	190	3,684	35,836
Nov	29,952	17,327	2,269	**49,548**	2,464	1,474	**3,938**	2,048	190	3,686	35,279
Dec	49,116	22,965	2,249	**74,330**	2,466	1,475	**3,941**	2,052	191	3,694	36,158

	Nonresidential Core			Total	Noncore - C&I			Noncore - Electric Gene			
Peak Day Throughput (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)
2017	2,993	1,098	47.8	**4,139**	77	46	**124**	105	18	211	1,379
2018	3,009	1,118	51.2	**4,178**	78	47	**125**	**65**	**6**	**118**	**1,868**
2019	2,990	1,120	54.9	**4,164**	79	47	**126**	**66**	**6**	**119**	**2,042**
2020	2,975	1,120	58.9	**4,154**	80	48	**127**	**66**	**6**	**119**	**1,774**
2021	2,951	1,116	63.1	**4,130**	80	48	**127**	**66**	**6**	**119**	**1,614**
2022	2,906	1,110	67.7	**4,084**	80	48	**127**	**66**	**6**	**119**	**1,665**
2023	2,891	1,103	72.6	**4,066**	80	48	**127**	**66**	**6**	**119**	**1,384**

	A	B	C	D	E	S	T	U	V	W	X	Y	Z	AA	AB	AC
1	**2020 TCAP: 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)**															
252	2017	Jan				**2,844**	**53,015**	**55,859**	**60,145**	**133,865**		**432**		**360**	**762**	**134,988**
253		Feb				**3,100**	**42,360**	**45,460**	**49,144**	**115,759**		**413**		**311**	**659**	**116,730**
254		Mar				**2,405**	**36,238**	**38,643**	**42,591**	**103,203**		**333**		**278**	**587**	**104,068**
255		Apr				**2,599**	**34,435**	**37,034**	**40,965**	**91,846**		**306**		**247**	**523**	**92,616**
256		May				**2,621**	**39,843**	**42,464**	**46,010**	**84,729**		**273**		**228**	**482**	**85,439**
257		Jun				**3,208**	**52,130**	**55,338**	**59,036**	**90,019**		**300**		**242**	**512**	**90,773**
258		Jul				**2,635**	**59,745**	**62,380**	**66,049**	**95,348**		**308**		**257**	**543**	**96,147**
259		Aug				**3,398**	**67,835**	**71,233**	**74,821**	**103,973**		**335**		**280**	**592**	**104,845**
260		Sep				**2,934**	**58,688**	**61,621**	**64,478**	**93,110**		**310**		**250**	**530**	**93,891**
261		Oct				**3,018**	**61,644**	**64,662**	**68,013**	**101,407**		**327**		**273**	**577**	**102,257**
262		Nov				**3,092**	**42,638**	**45,730**	**49,051**	**99,013**		**330**		**266**	**564**	**99,843**
263		Dec				**2,664**	**36,674**	**39,338**	**43,173**	**118,728**		**383**		**319**	**676**	**119,723**
264																
265	2018	Jan				**2,165**	**35,668**	**37,832**	**41,596**	**116,231**		**375**		**313**	**662**	**117,205**
266		Feb				**2,282**	**30,251**	**32,533**	**36,311**	**103,788**		**371**		**279**	**591**	**104,658**
267		Mar				**2,257**	**22,445**	**24,702**	**28,490**	**89,922**		**290**		**242**	**512**	**90,676**
268		Apr				**2,319**	**38,623**	**40,942**	**44,742**	**96,353**		**321**		**259**	**548**	**97,161**
269		May				**2,637**	**39,089**	**41,726**	**45,541**	**84,879**		**274**		**228**	**483**	**85,590**
270		Jun				**2,898**	**34,626**	**37,524**	**41,357**	**72,894**		**243**		**196**	**415**	**73,505**
271		Jul				**3,536**	**64,178**	**67,714**	**71,540**	**101,374**		**327**		**273**	**577**	**102,224**
272		Aug				**3,743**	**65,964**	**69,707**	**73,545**	**103,232**		**333**		**278**	**588**	**104,097**
273		Sep				**3,659**	**60,970**	**64,628**	**68,458**	**97,609**		**325**		**263**	**556**	**98,427**
274		Oct				**3,542**	**47,112**	**50,654**	**54,503**	**88,472**		**285**		**238**	**504**	**89,213**
275		Nov				**3,421**	**47,724**	**51,145**	**55,013**	**105,690**		**352**		**284**	**602**	**106,576**
276		Dec				**2,216**	**45,727**	**47,943**	**51,818**	**128,308**		**414**		**345**	**730**	**129,383**
277																
278	2019	Jan				**2,205**	**41,362**	**43,567**	**47,385**	**121,802**		**393**		**328**	**693**	**122,823**
279		Feb				**2,214**	**28,641**	**30,855**	**34,688**	**101,991**		**364**		**274**	**581**	**102,845**
280		Mar				**2,202**	**34,174**	**36,376**	**40,218**	**101,526**		**328**		**273**	**578**	**102,377**
281		Apr				**2,255**	**39,849**	**42,105**	**45,960**	**97,489**		**325**		**262**	**555**	**98,307**
282		May				**2,311**	**39,349**	**41,659**	**45,527**	**84,848**		**274**		**228**	**483**	**85,559**
283		Jun				**2,668**	**36,548**	**39,216**	**43,101**	**74,662**		**249**		**201**	**425**	**75,287**
284		Jul				**3,426**	**50,444**	**53,870**	**57,743**	**87,608**		**283**		**236**	**499**	**88,343**
285		Aug				**3,598**	**66,709**	**70,307**	**74,192**	**103,916**		**335**		**280**	**592**	**104,787**
286		Sep				**3,695**	**62,279**	**65,974**	**69,850**	**99,022**		**330**		**266**	**564**	**99,852**
287		Oct				**2,520**	**47,230**	**49,751**	**53,646**	**87,631**		**283**		**236**	**499**	**88,366**
288		Nov				**2,273**	**32,102**	**34,375**	**38,289**	**88,885**		**296**		**239**	**506**	**89,630**
289		Dec				**2,235**	**41,069**	**43,304**	**47,224**	**123,494**		**398**		**332**	**703**	**124,529**
290																
291	2020	Jan				**2,224**	**47,429**	**49,653**	**53,508**	**127,744**		**412**		**344**	**727**	**128,814**
292		Feb				**2,242**	**34,646**	**36,889**	**40,760**	**107,918**		**372**		**290**	**614**	**108,823**
293		Mar				**2,220**	**32,683**	**34,903**	**38,784**	**99,994**		**323**		**269**	**569**	**100,832**
294		Apr				**2,233**	**34,052**	**36,284**	**40,181**	**91,648**		**305**		**247**	**522**	**92,417**
295		May				**2,281**	**32,526**	**34,806**	**38,714**	**78,030**		**252**		**210**	**444**	**78,684**
296		Jun				**2,592**	**32,700**	**35,292**	**39,215**	**70,808**		**236**		**190**	**403**	**71,401**
297		Jul				**3,041**	**55,883**	**58,924**	**62,833**	**92,737**		**299**		**249**	**528**	**93,514**
298		Aug				**3,414**	**64,426**	**67,840**	**71,759**	**101,526**		**328**		**273**	**578**	**102,377**
299		Sep				**3,261**	**58,940**	**62,200**	**66,107**	**95,305**		**318**		**256**	**543**	**96,104**
300		Oct				**2,284**	**44,272**	**46,556**	**50,480**	**84,491**		**273**		**227**	**481**	**85,199**
301		Nov				**2,239**	**28,680**	**30,920**	**34,860**	**85,394**		**285**		**230**	**486**	**86,110**
302		Dec				**2,244**	**38,738**	**40,982**	**44,926**	**121,013**		**390**		**326**	**689**	**122,027**

2020 TCAP: SDG&E Consolidated Gas Demand Forecast Summary (Mtherms)

MONTHLY FORECAST DATA

		ratiion			Noncore	System-Wide	System Total			
		EG (<3MMThms)	EG (>=3MMThms)	EG (Total)	Total	Total End-Use Dmd	(Mdth/d)	Co-Use-Fuel	"Un-Acnt'd-For" (UAF)	Total System Throughput
Cold Year Throughput (Mth)										
2021	Jan	2,232	40,329	42,561	46,434	120,204	388	323	684	121,212
	Feb	2,235	31,983	34,218	38,104	104,862	375	282	597	105,741
	Mar	2,227	27,539	29,766	33,659	94,540	305	254	538	95,333
	Apr	2,236	34,679	36,915	40,818	92,028	307	248	524	92,800
	May	2,236	33,473	35,709	39,623	78,787	254	212	448	79,447
	Jun	2,372	37,053	39,426	43,354	74,860	250	201	426	75,487
	Jul	3,102	56,371	59,473	63,387	93,217	301	251	531	93,998
	Aug	3,297	64,087	67,384	71,307	101,007	326	272	575	101,854
	Sep	2,940	55,438	58,378	62,289	91,402	305	246	520	92,169
	Oct	2,239	52,352	54,591	58,520	92,430	298	249	526	93,204
	Nov	2,240	32,236	34,476	38,421	88,701	296	239	505	89,445
	Dec	2,245	37,812	40,057	44,006	119,620	386	322	681	120,622
2022	Jan	2,233	39,662	41,894	45,771	118,680	383	319	676	119,675
	Feb	2,231	29,873	32,103	35,992	101,997	364	274	581	102,852
	Mar	2,227	28,936	31,163	35,059	95,295	307	256	542	96,094
	Apr	2,235	35,819	38,054	41,959	92,651	309	249	527	93,427
	May	2,236	32,421	34,657	38,573	77,393	250	208	441	78,042
	Jun	2,412	36,675	39,087	43,017	74,291	248	200	423	74,913
	Jul	2,918	51,024	53,943	57,859	87,477	282	235	498	88,211
	Aug	3,360	59,777	63,138	67,062	96,560	311	260	550	97,369
	Sep	2,758	51,298	54,056	57,969	86,863	290	234	494	87,591
	Oct	2,238	49,465	51,704	55,633	89,283	288	240	508	90,031
	Nov	2,239	37,230	39,469	43,414	93,185	311	251	530	93,966
	Dec	2,243	40,975	43,219	47,167	121,903	393	328	694	122,925
2023	Jan	2,234	36,833	39,067	42,942	115,448	372	311	657	116,416
	Feb	2,232	31,991	34,223	38,109	103,763	371	279	591	104,633
	Mar	2,228	33,393	35,621	39,513	99,467	321	268	566	100,301
	Apr	2,236	32,930	35,165	39,067	89,531	298	241	510	90,281
	May	2,236	34,015	36,251	40,163	78,847	254	212	449	79,508
	Jun	2,266	37,469	39,735	43,659	74,851	250	201	426	75,478
	Jul	2,781	50,655	53,437	57,347	86,896	280	234	495	87,624
	Aug	2,896	58,995	61,892	65,810	95,246	307	256	542	96,044
	Sep	2,550	46,903	49,453	53,359	82,169	274	221	468	82,857
	Oct	2,237	39,520	41,757	45,680	79,239	256	213	451	79,903
	Nov	2,238	38,966	41,204	45,142	94,690	316	255	539	95,483
	Dec	2,243	39,852	42,095	46,036	120,366	388	324	685	121,375

	ratiion			Noncore	System-Wide
Peak Day Throughput (Mth/Day)	EG (<3MMThms)	EG (>=3MMThms)	EG (Total)	Total	Total End-Use Dmd
2017	123	1,589	1,712	1,836	5,975
2018	71	1,985	2,057	2,182	6,360
2019	72	2,161	2,233	2,359	6,524
2020	72	1,893	1,965	2,093	6,247
2021	72	1,733	1,806	1,933	6,063
2022	72	1,784	1,857	1,984	6,068
2023	72	1,503	1,576	1,703	5,769

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**2020 TCAP: 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**													
358	2017	Jan				848,012	30,063		26	**878,101**		44	9	**53**
359		Feb				848,382	30,064		26	**878,472**		44	9	**53**
360		Mar				848,901	30,068		26	**878,995**		44	9	**53**
361		Apr				849,060	30,069		26	**879,155**		44	9	**53**
362		May				849,336	30,065		26	**879,427**		44	9	**53**
363		Jun				849,779	30,084		26	**879,889**		44	9	**53**
364		Jul				849,726	30,072		26	**879,824**		44	9	**53**
365		Aug				850,482	30,084		26	**880,592**		44	9	**53**
366		Sep				850,958	30,070		26	**881,054**		44	9	**53**
367		Oct				851,612	30,095		26	**881,733**		44	9	**53**
368		Nov				852,492	30,118		26	**882,636**		44	9	**53**
369		Dec				852,889	30,138		26	**883,053**		44	9	**53**
370														
371	2018	Jan				853,682	30,508		26	**884,216**		44	9	**53**
372		Feb				854,055	30,509		26	**884,590**		44	9	**53**
373		Mar				854,577	30,513		26	**885,116**		44	9	**53**
374		Apr				854,737	30,514		26	**885,277**		44	9	**53**
375		May				855,015	30,510		26	**885,551**		44	9	**53**
376		Jun				855,461	30,529		26	**886,016**		44	9	**53**
377		Jul				855,408	30,517		26	**885,951**		44	9	**53**
378		Aug				856,169	30,529		26	**886,724**		44	9	**53**
379		Sep				856,648	30,515		26	**887,189**		44	9	**53**
380		Oct				857,307	30,540		26	**887,873**		44	9	**53**
381		Nov				858,192	30,563		26	**888,782**		44	9	**53**
382		Dec				858,592	30,584		26	**889,202**		44	9	**53**
383														
384	2019	Jan				859,388	30,692		27	**890,107**		44	9	**53**
385		Feb				859,763	30,693		27	**890,483**		44	9	**53**
386		Mar				860,289	30,697		27	**891,013**		44	9	**53**
387		Apr				860,450	30,698		27	**891,175**		44	9	**53**
388		May				860,730	30,694		27	**891,451**		44	9	**53**
389		Jun				861,179	30,713		27	**891,919**		44	9	**53**
390		Jul				861,125	30,701		27	**891,853**		44	9	**53**
391		Aug				861,891	30,713		27	**892,632**		44	9	**53**
392		Sep				862,374	30,699		27	**893,100**		44	9	**53**
393		Oct				863,037	30,725		27	**893,788**		44	9	**53**
394		Nov				863,928	30,748		27	**894,704**		44	9	**53**
395		Dec				864,331	30,769		27	**895,126**		44	9	**53**
396														
397	2020	Jan				865,340	30,824		27	**896,191**		44	9	**53**
398		Feb				865,717	30,825		27	**896,569**		44	9	**53**
399		Mar				866,247	30,829		27	**897,103**		44	9	**53**
400		Apr				866,409	30,830		27	**897,266**		44	9	**53**
401		May				866,691	30,826		27	**897,544**		44	9	**53**
402		Jun				867,143	30,845		27	**898,015**		44	9	**53**
403		Jul				867,089	30,833		27	**897,949**		44	9	**53**
404		Aug				867,860	30,845		27	**898,733**		44	9	**53**
405		Sep				868,346	30,831		27	**899,204**		44	9	**53**
406		Oct				869,013	30,857		27	**899,897**		44	9	**53**
407		Nov				869,911	30,880		27	**900,819**		44	9	**53**
408		Dec				870,317	30,901		27	**901,244**		44	9	**53**

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**2020 TCAP: 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	2021	Jan				871,818	30,920		28	**902,766**		44	9	**53**
411		Feb				872,199	30,921		28	**903,148**		44	9	**53**
412		Mar				872,732	30,925		28	**903,685**		44	9	**53**
413		Apr				872,896	30,926		28	**903,850**		44	9	**53**
414		May				873,179	30,922		28	**904,129**		44	9	**53**
415		Jun				873,635	30,942		28	**904,604**		44	9	**53**
416		Jul				873,580	30,929		28	**904,538**		44	9	**53**
417		Aug				874,358	30,942		28	**905,327**		44	9	**53**
418		Sep				874,847	30,927		28	**905,802**		44	9	**53**
419		Oct				875,519	30,953		28	**906,500**		44	9	**53**
420		Nov				876,424	30,977		28	**907,429**		44	9	**53**
421		Dec				876,832	30,997		28	**907,857**		44	9	**53**
422														
423	2022	Jan				878,493	31,007		28	**909,528**		44	9	**53**
424		Feb				878,877	31,008		28	**909,913**		44	9	**53**
425		Mar				879,414	31,012		28	**910,454**		44	9	**53**
426		Apr				879,579	31,013		28	**910,620**		44	9	**53**
427		May				879,865	31,009		28	**910,902**		44	9	**53**
428		Jun				880,324	31,028		28	**911,380**		44	9	**53**
429		Jul				880,269	31,016		28	**911,313**		44	9	**53**
430		Aug				881,052	31,028		28	**912,109**		44	9	**53**
431		Sep				881,545	31,014		28	**912,587**		44	9	**53**
432		Oct				882,223	31,040		28	**913,291**		44	9	**53**
433		Nov				883,135	31,063		28	**914,226**		44	9	**53**
434		Dec				883,546	31,084		28	**914,658**		44	9	**53**
435														
436	2023	Jan				885,167	31,101		29	**916,297**		44	9	**53**
437		Feb				885,553	31,102		29	**916,684**		44	9	**53**
438		Mar				886,095	31,106		29	**917,230**		44	9	**53**
439		Apr				886,261	31,107		29	**917,397**		44	9	**53**
440		May				886,549	31,103		29	**917,681**		44	9	**53**
441		Jun				887,012	31,123		29	**918,163**		44	9	**53**
442		Jul				886,956	31,110		29	**918,096**		44	9	**53**
443		Aug				887,745	31,123		29	**918,897**		44	9	**53**
444		Sep				888,242	31,108		29	**919,380**		44	9	**53**
445		Oct				888,925	31,134		29	**920,088**		44	9	**53**
446		Nov				889,843	31,158		29	**921,030**		44	9	**53**
447		Dec				890,258	31,179		29	**921,466**		44	9	**53**

	A	B	C	D	E	O	P	Q	R	S	T	U	V	W
1	**2020 TCAP: 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**													
358		2017	Jan			70	5	7	14	**75**	**21**	**96**	**149**	**878,250**
359			Feb			70	5	7	14	**75**	**21**	**96**	**149**	**878,621**
360			Mar			70	5	7	14	**75**	**21**	**96**	**149**	**879,144**
361			Apr			70	5	7	14	**75**	**21**	**96**	**149**	**879,304**
362			May			70	5	7	14	**75**	**21**	**96**	**149**	**879,576**
363			Jun			70	5	7	14	**75**	**21**	**96**	**149**	**880,038**
364			Jul			70	5	7	14	**75**	**21**	**96**	**149**	**879,973**
365			Aug			70	5	7	14	**75**	**21**	**96**	**149**	**880,741**
366			Sep			70	5	7	14	**75**	**21**	**96**	**149**	**881,203**
367			Oct			70	5	7	14	**75**	**21**	**96**	**149**	**881,882**
368			Nov			70	5	7	14	**75**	**21**	**96**	**149**	**882,785**
369			Dec			70	4	7	14	**74**	**21**	**95**	**148**	**883,201**
370														
371		2018	Jan			69	3	7	14	**72**	**21**	**93**	**146**	**884,362**
372			Feb			69	3	7	14	**72**	**21**	**93**	**146**	**884,736**
373			Mar			69	3	6	12	**72**	**18**	**90**	**143**	**885,259**
374			Apr			69	3	6	12	**72**	**18**	**90**	**143**	**885,420**
375			May			69	3	6	12	**72**	**18**	**90**	**143**	**885,694**
376			Jun			69	3	6	12	**72**	**18**	**90**	**143**	**886,159**
377			Jul			69	3	6	12	**72**	**18**	**90**	**143**	**886,094**
378			Aug			69	3	6	12	**72**	**18**	**90**	**143**	**886,867**
379			Sep			69	3	6	12	**72**	**18**	**90**	**143**	**887,332**
380			Oct			69	3	6	12	**72**	**18**	**90**	**143**	**888,016**
381			Nov			69	3	6	12	**72**	**18**	**90**	**143**	**888,925**
382			Dec			69	3	6	12	**72**	**18**	**90**	**143**	**889,345**
383														
384		2019	Jan			69	3	6	12	**72**	**18**	**90**	**143**	**890,250**
385			Feb			69	3	6	12	**72**	**18**	**90**	**143**	**890,626**
386			Mar			69	3	6	12	**72**	**18**	**90**	**143**	**891,156**
387			Apr			69	3	6	12	**72**	**18**	**90**	**143**	**891,318**
388			May			69	3	6	12	**72**	**18**	**90**	**143**	**891,594**
389			Jun			69	3	6	12	**72**	**18**	**90**	**143**	**892,062**
390			Jul			69	3	6	12	**72**	**18**	**90**	**143**	**891,996**
391			Aug			69	3	6	12	**72**	**18**	**90**	**143**	**892,775**
392			Sep			69	3	6	12	**72**	**18**	**90**	**143**	**893,243**
393			Oct			69	3	6	12	**72**	**18**	**90**	**143**	**893,931**
394			Nov			69	3	6	12	**72**	**18**	**90**	**143**	**894,847**
395			Dec			69	3	6	12	**72**	**18**	**90**	**143**	**895,269**
396														
397		2020	Jan			69	3	6	12	**72**	**18**	**90**	**143**	**896,334**
398			Feb			69	3	6	12	**72**	**18**	**90**	**143**	**896,712**
399			Mar			69	3	6	12	**72**	**18**	**90**	**143**	**897,246**
400			Apr			69	3	6	12	**72**	**18**	**90**	**143**	**897,409**
401			May			69	3	6	12	**72**	**18**	**90**	**143**	**897,687**
402			Jun			69	3	6	12	**72**	**18**	**90**	**143**	**898,158**
403			Jul			69	3	6	12	**72**	**18**	**90**	**143**	**898,092**
404			Aug			69	3	6	12	**72**	**18**	**90**	**143**	**898,876**
405			Sep			69	3	6	12	**72**	**18**	**90**	**143**	**899,347**
406			Oct			69	3	6	12	**72**	**18**	**90**	**143**	**900,040**
407			Nov			69	3	6	12	**72**	**18**	**90**	**143**	**900,962**
408			Dec			69	3	6	12	**72**	**18**	**90**	**143**	**901,387**

	A	B	C	D	E	O	P	Q	R	S	T	U	V	W
1	**2020 TCAP: 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	2021	Jan				69	3	6	12	**72**	**18**	**90**	**143**	**902,909**
411		Feb				69	3	6	12	**72**	**18**	**90**	**143**	**903,291**
412		Mar				69	3	6	12	**72**	**18**	**90**	**143**	**903,828**
413		Apr				69	3	6	12	**72**	**18**	**90**	**143**	**903,993**
414		May				69	3	6	12	**72**	**18**	**90**	**143**	**904,272**
415		Jun				69	3	6	12	**72**	**18**	**90**	**143**	**904,747**
416		Jul				69	3	6	12	**72**	**18**	**90**	**143**	**904,681**
417		Aug				69	3	6	12	**72**	**18**	**90**	**143**	**905,470**
418		Sep				69	3	6	12	**72**	**18**	**90**	**143**	**905,945**
419		Oct				69	3	6	12	**72**	**18**	**90**	**143**	**906,643**
420		Nov				69	3	6	12	**72**	**18**	**90**	**143**	**907,572**
421		Dec				69	3	6	12	**72**	**18**	**90**	**143**	**908,000**
422														
423	2022	Jan				69	3	6	12	**72**	**18**	**90**	**143**	**909,671**
424		Feb				69	3	6	12	**72**	**18**	**90**	**143**	**910,056**
425		Mar				69	3	6	12	**72**	**18**	**90**	**143**	**910,597**
426		Apr				69	3	6	12	**72**	**18**	**90**	**143**	**910,763**
427		May				69	3	6	12	**72**	**18**	**90**	**143**	**911,045**
428		Jun				69	3	6	12	**72**	**18**	**90**	**143**	**911,523**
429		Jul				69	3	6	12	**72**	**18**	**90**	**143**	**911,456**
430		Aug				69	3	6	12	**72**	**18**	**90**	**143**	**912,252**
431		Sep				69	3	6	12	**72**	**18**	**90**	**143**	**912,730**
432		Oct				69	3	6	12	**72**	**18**	**90**	**143**	**913,434**
433		Nov				69	3	6	12	**72**	**18**	**90**	**143**	**914,369**
434		Dec				69	3	6	12	**72**	**18**	**90**	**143**	**914,801**
435														
436	2023	Jan				69	3	6	12	**72**	**18**	**90**	**143**	**916,440**
437		Feb				69	3	6	12	**72**	**18**	**90**	**143**	**916,827**
438		Mar				69	3	6	12	**72**	**18**	**90**	**143**	**917,373**
439		Apr				69	3	6	12	**72**	**18**	**90**	**143**	**917,540**
440		May				69	3	6	12	**72**	**18**	**90**	**143**	**917,824**
441		Jun				69	3	6	12	**72**	**18**	**90**	**143**	**918,306**
442		Jul				69	3	6	12	**72**	**18**	**90**	**143**	**918,239**
443		Aug				69	3	6	12	**72**	**18**	**90**	**143**	**919,040**
444		Sep				69	3	6	12	**72**	**18**	**90**	**143**	**919,523**
445		Oct				69	3	6	12	**72**	**18**	**90**	**143**	**920,231**
446		Nov				69	3	6	12	**72**	**18**	**90**	**143**	**921,173**
447		Dec				69	3	6	12	**72**	**18**	**90**	**143**	**921,609**

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 2020 TCAP.

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 noncore commercial and industrial markets were obtained from SoCalGas' billing records for 2017. 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 2017. 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 February 2018 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 2018 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 by the CPUC, 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 2017) for net movement of customers from core (G-10) to noncore (G-30) service, we

expect an average of 8,080,278 Therms of accumulated load from net customer migration from core to noncore through 2023. 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-users. 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 "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; Gas UECs; Electric UECs; Average Equipment Age (installation years); and a set of Base Year data.

EUForecaster Energy Price Data for Noncore Commercial & Industrial Models

Noncore C and I Retail Natural Gas Prices (Nominal $/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
2017	100.00	100.00	0.4454	0.4131	0.4212	0.3965
2018	102.78	102.78	0.4028	0.3704	0.3785	0.3537
2019	104.50	104.50	0.4481	0.4161	0.4240	0.3995
2020	107.29	107.29	0.4678	0.4360	0.4438	0.4195
2021	110.05	110.05	0.4949	0.4638	0.4714	0.4477
2022	112.70	112.70	0.5342	0.5025	0.5102	0.4860
2023	115.27	115.27	0.6113	0.5785	0.5864	0.5613

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

Year	C Non Core Average Price	C Non Core Marginal Price	I Non Core Average Price	I Non Core Marginal Price
2017	11.71	8.26	11.71	8.26
2018	12.28	8.66	12.28	8.66
2019	12.76	8.99	12.76	8.99
2020	13.15	9.27	13.15	9.27
2021	13.53	9.54	13.53	9.54
2022	13.87	9.78	13.87	9.78
2023	13.90	9.80	13.90	9.80

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

Year	C Non Core Average Price	C Non Core Marginal Price	I Non Core Average Price	I Non Core Marginal Price
2017	1.3310	1.3310	1.3310	1.3310
2018	1.2732	1.2732	1.2732	1.2732
2019	1.3091	1.3091	1.3091	1.3091
2020	1.4349	1.4349	1.4349	1.4349
2021	1.5197	1.5197	1.5197	1.5197
2022	1.6099	1.6099	1.6099	1.6099
2023	1.6889	1.6889	1.6889	1.6889

Noncore C and I Rate Components

Annual G30 Noncore C&I Gas Rates						Nominal Dollars					Constant 2017 Dollars			
Year	Com Trsp Average ¢/Therm	Com Trsp Marginal ¢/Therm	Ind Trsp Average ¢/Therm	Ind Trsp Marginal ¢/Therm	CBSP + BTS ¢/Therm	Com B/T Average $/Dth	Com B/T Marginal $/Dth	Ind B/T Average $/Dth	Ind B/T Marginal $/Dth	CPI (Yr-2017 = 1.0000)	Com B/T Average 2017-$ /Dth	Com B/T Marginal 2017-$ /Dth	Ind B/T Average 2017-$ /Dth	Ind B/T Marginal 2017-$ /Dth
2017	12.820	9.588	10.396	7.922	31.724	4.454	4.131	4.212	3.965	1.0000	4.454	4.131	4.212	3.965
2018	13.167	9.932	10.736	8.260	27.109	4.028	3.704	3.785	3.537	1.0278	3.919	3.604	3.682	3.441
2019	18.067	14.865	15.657	13.207	26.747	4.481	4.161	4.240	3.995	1.0450	4.288	3.982	4.058	3.823
2020	19.002	15.823	16.608	14.178	27.774	4.678	4.360	4.438	4.195	1.0729	4.360	4.063	4.137	3.910
2021	20.540	17.434	18.197	15.825	28.946	4.949	4.638	4.714	4.477	1.1005	4.497	4.214	4.284	4.068
2022	22.784	19.614	20.389	17.966	30.633	5.342	5.025	5.102	4.860	1.1270	4.740	4.459	4.527	4.312
2023	25.249	21.970	22.767	20.255	35.877	6.113	5.785	5.864	5.613	1.1527	5.303	5.018	5.088	4.870

2017 G30 C&I Weight of Usage by Tier

	Service	Tier	Both	Com	Ind
Average	D	1	D1	27.63%	15.31%
Average	D	2	D2	40.20%	29.02%
Average	D	3	D3	15.69%	16.99%
Average	D	4	D4	16.48%	38.68%
Average	T	1	T1	99.38%	38.59%
Average	T	2	T2	0.62%	61.41%
Marginal	D	1	D1	3.66%	1.13%
Marginal	D	2	D2	37.91%	18.30%
Marginal	D	3	D3	24.03%	19.24%
Marginal	D	4	D4	34.40%	61.33%
Marginal	T	1	T1	87.98%	11.23%
Marginal	T	2	T2	12.02%	88.77%

2017 Volume (Therms)			Percent
Com&Ind	D&T	689,965,846	100.00%
Com&Ind	D	663,648,654	96.19%
Com&Ind	T	26,317,192	3.81%
Com	D&T	177,378,956	25.71%
Ind	D&T	512,586,890	74.29%
Com	D	172,994,054	97.53%
Com	T	4,384,902	2.47%
Ind	D	490,654,600	95.72%
Ind	T	21,932,290	4.28%

Obs	seg	service	_TYPE_	("Cust Cnt") _FREQ_	G-30 C&I (Non-Refinery) Therms	Prop/Pct.	Annual Therms/"Cust"
1			0	563	689,965,846	100.0%	1,225,517
2		D	1	542	663,648,654	96.2%	1,224,444
3		T	1	21	26,317,192	3.8%	1,253,200
4	COM		2	227	177,378,956	25.7%	781,405
5	IND		2	336	512,586,890	74.3%	1,525,556
6	COM	D	3	216	172,994,054	97.5%	800,898
7	COM	T	3	11	4,384,902	2.5%	398,627
8	IND	D	3	326	490,654,600	95.72%	1,505,075
9	IND	T	3	10	21,932,290	4.28%	2,193,229

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)	GHG Credit (¢/Thm)	CPI	Price Deflator	CBSP $/Dth	BTS $/Dth
2017	3.04	$350	15.18	9.48	5.83	3.23	$0	2.02	2.02	0.61	1.10	1.10	0.000	1.000	100.00	2.852	0.32
2018	2.83	$350	15.74	10.04	6.39	3.78	$0	2.34	2.34	0.61	1.39	1.39	0.000	1.028	102.78	2.447	0.26
2019	2.88	$350	20.53	14.90	11.29	8.71	$0	6.99	6.99	0.67	5.95	5.95	-4.340	1.045	104.50	2.285	0.39
2020	2.96	$350	21.34	15.76	12.18	9.63	$0	7.74	7.74	0.66	6.67	6.67	-4.913	1.073	107.29	2.362	0.42
2021	3.04	$350	22.66	17.22	13.75	11.26	$0	9.03	9.03	0.66	7.96	7.96	-6.067	1.101	110.05	2.438	0.46
2022	3.11	$350	24.97	19.40	15.84	13.29	$0	10.97	10.97	0.66	9.90	9.90	-7.961	1.127	112.70	2.529	0.53
2023	3.18	$350	27.60	21.80	18.09	15.44	$0	13.06	13.06	0.68	11.95	11.95	-9.913	1.153	115.27	3.040	0.55

Example Calculation for 2021 Noncore Industrial

Example of Calculations: 2021 Noncore Industrial *Average* Gas Price:

Transportation Charge (¢/Thm): (including GHG)	18.197	=	**+ (95.72% Ind Dist of total Ind) * { [(100 ¢/$ *12 Mo/Yr)*($350.00 /mo/mtr)/(1,505,075 Thm/Mtr Ind Dist)]** **+ (15.31%*22.66 ¢/Thm + 29.02%* 17.22 ¢/Thm + 16.99%* 13.75 ¢/Thm + 38.68%* 11.26 ¢/Thm) }** **+ (4.28% Ind Trans of total Ind) * { [(100 ¢/$ *12 Mo/Yr)*($0.00 /mo/mtr)/(2,193,229 Thm/Mtr Ind Trans)]** **+ (38.59%* 9.03 ¢/Thm+61.41%* 9.03¢/Thm) }** **+ PPP Surcharge (¢/Thm): 3.04¢/Thm, in 2021**
Gas Commodity Price (¢/Thm):	28.946	=	**("CBSP" + BTS, market price of gas at the SoCalGas City Gate)**
Customer's "Burner-Tip" Price:	**47.144**	=	**(18.197 + 28.946) ¢/Thm (Final Average price in 'GasPrices' worksheet)**

Example of Calculations: 2021 Noncore Industrial *Marginal* Gas Price:

Transportation Charge (¢/Thm): (including GHG)	15.825	=	**+ (95.72% Ind Dist of total Ind) * {(1.13%* 22.66 ¢/Thm + 18.30%* 17.22 ¢/Thm + 19.24%* 13.75 ¢/Thm + 61.33%* 11.26 ¢/Thm) }** **+ (4.28% Ind Trans of total Ind) * { (11.23%* 9.03¢/Thm+88.77%* 9.03¢/Thm) }** **+ PPP Surcharge (¢/Thm): 3.04¢/Thm, in 2021**
Gas Commodity Price (¢/Thm):	28.946	=	**("CBSP" + BTS, market price of gas at the SoCalGas City Gate)**
Customer's "Burner-Tip" Price:	**44.772**	=	**(15.825 + 28.946) ¢/Thm (Final Marginal price in 'GasPrices' worksheet)**

EUForecaster Noncore Commercial Data

Noncore Commercial: Annual Employment (millions) by Business Types

YEAR	Office	Restaurant	Retail	Laundry	Warehouse	School	College	Health	Lodging	Misc	Governmen	TCU	Constructic	Agriculture	EMPLTOT
2017	1.64358	0.77950	1.01145	0.10199	0.49848	0.66067	0.22022	1.22209	0.14051	0.25465	0.64193	0.58362	0.41964	0.23952	8.41785
2018	1.67084	0.78230	1.01504	0.10321	0.50520	0.66154	0.22051	1.25299	0.14444	0.25771	0.64303	0.59835	0.43955	0.24309	8.53781
2019	1.73745	0.78405	1.01731	0.10218	0.51449	0.66708	0.22236	1.27671	0.14573	0.25513	0.64720	0.60504	0.45870	0.24590	8.67934
2020	1.78567	0.78549	1.01918	0.10113	0.52000	0.67334	0.22445	1.29252	0.14643	0.25250	0.65762	0.60699	0.48963	0.24790	8.80284
2021	1.80549	0.78220	1.01489	0.10032	0.52262	0.67997	0.22666	1.30747	0.14689	0.25049	0.65821	0.60846	0.51619	0.24879	8.86865
2022	1.83080	0.77426	1.00460	0.09966	0.52508	0.68647	0.22882	1.32299	0.14728	0.24884	0.66343	0.60641	0.53369	0.24931	8.92165
2023	1.85858	0.76617	0.99410	0.09911	0.52785	0.69305	0.23102	1.33895	0.14766	0.24746	0.66830	0.60188	0.54321	0.24975	8.96708

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

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	

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	215527	89483	10914	3628	2768	11289	2422	3694	10743	3070	214896	568434
Restaurant	20204	39107	65272	26852	51566	57054	13893	805	360	0	12822	287936
Retail	109615	66579	24242	4037	27002	46547	28785	6387	12274	981	151890	478338
Laundry	2220	35301	289	45	72	419	2	67	354616	0	330200	723233
Warehouse	421907	122568	17437	4860	42025	48321	61778	48008	140305	41679	1357589	2306477
School	0	0	0	0	0	0	0	0	0	0	0	0
College	460720	227569	22231	6558	11401	27366	6325	28797	6984	9787	313343	1121082
Health	261635	163941	26275	5089	7138	20206	11429	4735	35991	2684	276629	815753
Lodging	83751	171064	23611	5763	7379	28753	14152	1384	44566	29	193345	573797
Misc	0	0	0	0	0	0	0	0	0	0	0	0
Government	278103	161677	14209	7002	4156	11696	6344	7424	3750	41075	108977	644415
TCU	107309	38578	3398	844	1602	2976	2032	5242	331	168365	177994	508670
Construction	188461	58899	4729	28	703	2627	1611	5588	35236	121	278028	576031
Agriculture	188038	45558	7738	1291	16092	35784	32533	441	47423	310932	627828	1313660

Noncore Commercial: EUForecaster Historical Base Year Data

Segment	2017 Therm Sales	2017 Meter Count	2017 Meter Count, Existing/Old customers	2017 Meter Count New Customers	Avg Use Per Meter Existing Customers	Avg Use Per Meter New Customers	Price Elasticity	Employment Elasticities	MAS SQFT ADJ
Office + Restaurant + Retail + Laundry	11,783,503	18	18	0	654,639	0	-0.046000	0.474000	6,881,366
Warehouse + School + College	27,163,218	20	20	0	1,358,161	0	-0.046000	0.474000	10,064,926
Health	68,523,222	84	84	0	815,753	0	-0.046000	0.474000	1,707,720
Lodging + Misc	9,754,545	17	17	0	573,797	0	-0.046000	0.474000	14,736,871
Government	21,265,681	33	33	0	644,415	0	-0.046000	0.474000	3,533,422
TCU	16,786,112	33	33	0	508,670	0	-0.046000	0.474000	2,992,940
Construction + Agriculture	27,425,271	22	22	0	1,246,603	0	-0.046000	0.474000	2,571,346
Total	182,701,551	227							

Adjustment for Normal Year Year

Normal Year HDD	1,320	HDD
Actual 2017 HDD	963	HDD
HDD Difference	357	HDD
Load per HDD	14,901	Therm/HDD
Temperature Adj.	5,322,595	Therms

	Actual 2017	Ratio
Office + Restaurant + Retail + Laundry	11,440,217	6.45%
Warehouse + School + College	26,371,879	14.87%
Health	66,526,953	37.51%
Lodging + Misc	9,470,368	5.34%
Government	20,646,154	11.64%
TCU	16,297,087	9.19%
Construction + Agriculture	26,626,298	15.01%
Total	177,378,956	100.00%

EUForecaster Noncore Industrial Data

Noncore Industrial: Annual Employment (thousands) by Business Types

YEAR	Mining	Food	Textile	Wood_Paper	Chemical	Petroleum	Stone	Prim_Metal	Fab_Metal	Transport	Misc	EMPLTOT
2017	16.16348	129.06360	9.08084	30.67712	50.74915	8.01651	18.15697	11.09867	86.10730	75.99111	299.98373	735.09
2018	16.61525	130.66481	8.88556	31.01606	51.01045	7.99204	18.68871	11.21166	87.58227	76.13221	302.13723	741.94
2019	17.20602	132.71472	8.68342	31.58215	51.19664	7.96183	19.10647	11.28720	89.22850	75.44467	305.29770	749.71
2020	17.42385	134.60928	8.44485	32.17077	51.04258	7.92384	19.30948	11.28594	90.73881	74.65627	305.93007	753.54
2021	17.61213	135.99306	8.20023	32.70950	50.68284	7.80182	19.48590	11.07309	91.29486	73.90304	305.21324	753.97
2022	17.93442	137.44529	7.95285	33.15900	50.14178	7.62268	19.61029	10.83725	92.08721	72.52488	304.29957	753.62
2023	18.07082	138.79788	7.70432	33.70599	49.48541	7.43143	19.59295	10.62601	92.92007	70.12565	303.12865	751.59

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	59513	235592	3062	1824	158145	414455	0	17188	8262	898041
Food	879689	238082	9519	12401	327015	80205	905	2641	62989	1613447
Textile	564531	77690	4661	14827	258172	81797	0	8551	34832	1045060
Wood_Paper	279791	702610	119	490	104469	60037	0	0	43693	1191209
Chemical	605370	189460	4252	2956	0	29298	9736	0	353290	1194362
Petroleum	47163	0	21168	1632	178682	568639	0	0	58860	876144
Stone	129086	0	20010	3622	81280	3364992	0	0	162297	3761287
Prim_Metal	59614	213955	6718	772	70615	2638562	241	0	254715	3245192
Fab_Metal	137972	14493	18766	1948	3050	823490	62	1147	163187	1164114
Transport	86333	129456	26293	2753	1535	723067	203	0	126792	1096433
Misc	278315	92239	11292	11810	20687	191765	4	0	177488	783600

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 Gas Shares 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	0.75	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
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

Noncore Industrial: EUForecaster Gas UECs 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	15197607	60162069	12984	7981	31551928	34672498	0	3748606	15676
Food	2019797	546644	19869	18855	6599447	493600	8815	289660	48356
Textile	3108844	427834	11556	37402	6188629	2557853	0	1977498	37055
Wood_Paper	38981557	97890377	324	1108	3790529	2348782	0	0	45230
Chemical	3457019	1081930	5644	4049	0	460401	72363	0	209860
Petroleum	1031793	0	107646	8566	10689246	34233510	0	0	133945
Stone	13851560	0	35651	6660	6814194	118290626	0	0	129396
Prim_Metal	338405	1214539	4432	505	438453	20608729	969	0	75202
Fab_Metal	1904588	200068	30108	3097	46052	15640956	609	95727	117161
Transport	813269	1219491	57573	6221	39541	18743866	2495	0	124241
Misc	2821763	935185	26612	28723	573541	5350309	51	0	187184

Noncore Industrial: EUForecaster Electric UECs 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

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	1979	1976	1971	1989	1973	1972	.	1985	1972
Food	1981	1979	1978	1980	1984	1978	1999	1989	1976
Textile	1977	1975	.	1980	1988	1975	1990	.	1971
Wood_Paper	1980	1975	1975	1975	1981	1977	.	1968	1981
Chemical	1985	1976	1978	1985	1986	1979	1996	.	1983
Petroleum	1970	.	1980	1982	1968	1988	.	.	1968
Stone	1976	.	1984	1982	1978	1976	.	.	1967
Prim_Metal	1990	1975	1974	1983	1989	1982	1975	.	1979
Fab_Metal	1974	1972	1976	1981	1976	1980	1998	.	1978
Transport	1977	1989	1970	1976	.	1981	1976	.	1982
Misc	1980	1978	1978	1982	1984	1980	.	.	1984

* Year Equipment Installed

Noncore Industrial: EUForecaster Historical Base Year Data

Segment	2017 Therm Sales	2017 Meter Count	2017 Meter Count, Existing/Old customers	2017 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	17,062,782	19	19	0	898041	.	-0.071000	0.474000	13.2900	177.2025	8539
Food	187,190,407	97	97	0	1613447	.	-0.071000	0.474000	12.7700	116.3474	2356
Textile	22,991,330	22	22	0	1045060	.	-0.071000	0.474000	13.0200	271.4589	11002
Wood_Paper	33,353,843	28	28	0	1191209	.	-0.071000	0.474000	8.3700	11.8754	3237
Chemical	32,247,769	27	27	0	1194362	.	-0.071000	0.474000	17.2700	728.2737	17662
Petroleum	28,912,761	33	33	0	876144	.	-0.071000	0.474000	3.7300	0.3081	47145
Stone	45,135,449	12	12	0	3761287	.	-0.071000	0.474000	6.2300	40.1230	42397
Prim_Metal	64,903,844	20	20	0	3245192	.	-0.071000	0.474000	20.0200	184.5367	15764
Fab_Metal	47,728,669	41	41	0	1164114	.	-0.071000	0.474000	9.0100	16.8171	21333
Transport	14,253,629	13	13	0	1096433	.	-0.071000	0.474000	7.9900	966.3551	6969
Misc	18,806,407	24	24	0	783600	.	-0.071000	0.474000	9.4800	226.5333	17929
Total	512,586,890	336									

No temperature adjustment since the Hdd coefficient is "small" and statistically not significant

FORECAST RESULTS

A. Noncore Commercial

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

Sector	NonCore Commercial
Fuel Type	Natural Gas

	Therms/Yr	Noncore Com/ NonRefinery	Accum. Migr. to COV (subtraction)	Accum. EE/DSM Pgm Savings (subtraction)	Annual Migration from g10 Com to g30 Com (addittion)	Avg-Yr Final Forecast
Year (Base = 2017)	Forecast for Scenario 10	MDth/Yr	MDth/Yr	MDth/Yr	MDth/Yr	MDth/Yr
2017	182,701,551	18,270.2	0.0	0.0	0.0	18,270.2
2018	185,030,615	18,503.1	0.0	57.9	290.9	18,736.1
2019	185,149,918	18,515.0	0.0	113.2	290.9	18,692.7
2020	185,628,244	18,562.8	0.0	175.4	290.9	18,678.3
2021	185,706,002	18,570.6	0.0	244.6	290.9	18,616.9
2022	185,599,173	18,559.9	0.0	312.6	290.9	18,538.2
2023	184,811,880	18,481.2	0.0	385.2	290.9	18,386.9

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

Month #	Month	Predicted G30-Com at Avg year Hdd (MThm)	Weather Adj. Share of Ann. Total
1	Jan-16	1,890	10.19%
2	Feb-16	1,699	9.16%
3	Mar-16	1,726	9.31%
4	Apr-16	1,568	8.46%
5	May-16	1,425	7.68%
6	Jun-16	1,267	6.83%
7	Jul-16	1,218	6.57%
8	Aug-16	1,302	7.02%
9	Sep-16	1,521	8.20%
10	Oct-16	1,439	7.76%
11	Nov-16	1,571	8.47%
12	Dec-16	1,920	10.36%
		18,545	**100.00%**

The value for August 2020 would be:

= (18,562.8 - 0.0 - 175.4 + 290.9) X 7.02%
= (18,678.3) X 7.02%
= 1,311.2 Mdth

A final adjustment to the noncore commercial load forecast was done to account for "Rule-38" gas load. "Rule-38" amount is projected forward using 2017 Rule-38 existing G-30 commercial customers' load.

Using the August 2020 data example, the resulting G-30 commercial forecast of demand would be:

= (1,311.2) – (1)
= 1,310.2 MDth

B. Noncore Industrial (Non-Refinery)

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

Sector	NonCore Industrial
Fuel Type	Natural Gas

	Therms/Yr	Noncore Ind/ NonRefinery	Accum. Migr. to COV (subtraction)	Accum. EE/DSM Pgm Savings (subtraction)	Annual Migration from g10 Ind to g30 Ind (addittion)	Avg-Yr Final Forecast
Year (Base = 2017)	Forecast for Scenario 10	MDth/Yr	MDth/Yr	MDth/Yr	MDth/Yr	MDth/Yr
2017	512,586,890	51,258.7	0.0	0.0	0.0	51,258.7
2018	519,453,898	51,945.4	43.4	364.2	517.1	52,054.9
2019	518,374,899	51,837.5	86.8	712.3	517.1	51,555.6
2020	518,974,346	51,897.4	130.2	1,103.9	517.1	51,180.5
2021	517,478,827	51,747.9	173.6	1,538.9	517.1	50,552.5
2022	515,009,908	51,501.0	217.0	1,966.8	517.1	49,834.4
2023	509,372,611	50,937.3	217.0	2,423.6	517.1	48,813.8

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

Month #	Month	"Fitted Monthly" Load (per Simple Regression Model) (Mdth)	Monthly Proportions of Annual Total Load (%-of-Annual)
1	Jan-16	4,219	8.05%
2	Feb-16	3,877	7.40%
3	Mar-16	4,201	8.02%
4	Apr-16	4,332	8.27%
5	May-16	4,377	8.35%
6	Jun-16	4,240	8.09%
7	Jul-16	4,863	9.28%
8	Aug-16	5,088	9.71%
9	Sep-16	4,733	9.03%
10	Oct-16	4,409	8.42%
11	Nov-16	4,036	7.70%
12	Dec-16	4,019	7.67%
		52,394	**100.00%**

The value for August 2020 would be:

= (51,897.4 - 130.2 - 1,103.9 + 517.1) X 9.712%
= (51,180.5) X 9.712%
= 4,970.5 Mdth

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 (Refinery Cogen section) below. In this part of the noncore C&I only the refinery load billed at G-30 rates is discussed.

Continuing with the August 2020 month as an example and using the data from the following two tables, the G-30 industrial refinery demand was projected to be:

= (7,757.1) – (100.7)
= 7,656.4 MDth

The reduction of 100.7 MDth is the accumulated EE/DSM program impact for refineries.

The tables below show the refinery Industrial G30 monthly gas demand forecast and monthly energy efficiency savings from 2017 through 2023.

Industrial Refinery G-30 Gas Demand (1/2)

Month	Cal. Days per Month	Ref G30, Base Econ. Fcst (Mdth)	Accum. EE Savings for Refinery G30 (Mdth)	Final Refinery G30 (Mdth)
Jan-17	31	8,773.4	0.0	8,773.4
Feb-17	28	7,272.9	0.0	7,272.9
Mar-17	31	7,991.0	0.0	7,991.0
Apr-17	30	7,454.6	0.0	7,454.6
May-17	31	8,147.1	0.0	8,147.1
Jun-17	30	7,919.1	0.0	7,919.1
Jul-17	31	8,165.7	0.0	8,165.7
Aug-17	31	7,867.2	0.0	7,867.2
Sep-17	30	7,824.4	0.0	7,824.4
Oct-17	31	8,867.0	0.0	8,867.0
Nov-17	30	8,342.0	0.0	8,342.0
Dec-17	31	8,562.4	0.0	8,562.4
Jan-18	31	7,906.0	-33.3	7,872.7
Feb-18	28	6,915.7	-30.1	6,885.6
Mar-18	31	7,938.0	-33.3	7,904.7
Apr-18	30	7,437.2	-32.2	7,405.0
May-18	31	7,802.0	-33.3	7,768.7
Jun-18	30	7,685.5	-32.2	7,653.3
Jul-18	31	7,924.0	-33.3	7,890.7
Aug-18	31	7,694.8	-33.3	7,661.5
Sep-18	30	7,535.2	-32.2	7,502.9
Oct-18	31	8,158.8	-33.3	8,125.5
Nov-18	30	7,976.2	-32.2	7,944.0
Dec-18	31	8,327.2	-33.3	8,293.8
Jan-19	31	7,925.3	-65.1	7,860.2
Feb-19	28	6,903.9	-58.8	6,845.0
Mar-19	31	7,891.4	-65.1	7,826.2
Apr-19	30	7,442.0	-63.0	7,379.0
May-19	31	7,826.8	-65.1	7,761.6
Jun-19	30	7,716.4	-63.0	7,653.4
Jul-19	31	7,962.4	-65.1	7,897.2
Aug-19	31	7,737.6	-65.1	7,672.4
Sep-19	30	7,578.7	-63.0	7,515.6
Oct-19	31	8,181.2	-65.1	8,116.1
Nov-19	30	7,943.7	-63.0	7,880.6
Dec-19	31	8,295.6	-65.1	8,230.4
Jan-20	31	7,960.7	-100.7	7,860.0
Feb-20	29	7,203.3	-94.2	7,109.1
Mar-20	31	7,924.3	-100.7	7,823.6
Apr-20	30	7,456.0	-97.4	7,358.6
May-20	31	7,838.5	-100.7	7,737.8
Jun-20	30	7,718.6	-97.4	7,621.1

Industrial Refinery G-30 Gas Demand (2/2)

Month	Cal. Days per Month	Ref G30, Base Econ. Fcst (Mdth)	Accum. EE Savings for Refinery G30 (Mdth)	Final Refinery G30 (Mdth)
Jul-20	31	7,972.6	-100.7	7,871.9
Aug-20	31	7,757.1	-100.7	7,656.4
Sep-20	30	7,598.7	-97.4	7,501.2
Oct-20	31	8,204.8	-100.7	8,104.2
Nov-20	30	7,974.4	-97.4	7,876.9
Dec-20	31	8,335.6	-100.7	8,234.9
Jan-21	31	7,983.5	-140.8	7,842.8
Feb-21	28	6,957.2	-127.1	6,830.1
Mar-21	31	7,918.8	-140.8	7,778.1
Apr-21	30	7,443.7	-136.2	7,307.5
May-21	31	7,833.1	-140.8	7,692.3
Jun-21	30	7,722.0	-136.2	7,585.8
Jul-21	31	7,978.0	-140.8	7,837.3
Aug-21	31	7,758.8	-140.8	7,618.1
Sep-21	30	7,593.5	-136.2	7,457.3
Oct-21	31	8,195.3	-140.8	8,054.5
Nov-21	30	7,965.8	-136.2	7,829.6
Dec-21	31	8,329.2	-140.8	8,188.5
Jan-22	31	7,976.2	-179.9	7,796.3
Feb-22	28	6,948.7	-162.5	6,786.2
Mar-22	31	7,909.1	-179.9	7,729.2
Apr-22	30	7,430.7	-174.1	7,256.6
May-22	31	7,814.2	-179.9	7,634.4
Jun-22	30	7,703.6	-174.1	7,529.5
Jul-22	31	7,956.6	-179.9	7,776.7
Aug-22	31	7,736.8	-179.9	7,556.9
Sep-22	30	7,572.8	-174.1	7,398.7
Oct-22	31	8,171.9	-179.9	7,992.1
Nov-22	30	7,947.9	-174.1	7,773.8
Dec-22	31	8,316.0	-179.9	8,136.1
Jan-23	31	7,946.4	-221.7	7,724.7
Feb-23	28	6,915.6	-200.2	6,715.4
Mar-23	31	7,885.8	-221.7	7,664.1
Apr-23	30	7,388.8	-214.5	7,174.3
May-23	31	7,740.8	-221.7	7,519.1
Jun-23	30	7,623.6	-214.5	7,409.1
Jul-23	31	7,878.9	-221.7	7,657.2
Aug-23	31	7,663.9	-221.7	7,442.2
Sep-23	30	7,486.5	-214.5	7,272.0
Oct-23	31	8,063.5	-221.7	7,841.8
Nov-23	30	7,862.4	-214.5	7,647.9
Dec-23	31	8,234.4	-221.7	8,012.8

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 segments but who have gas consumption not used to generate electricity. This gas consumption is charged under G30 rates rather than the electric generation rate that applies for most of their consumption.

The following table shows the monthly load for year 2017. These values were used as the profile for these customers for each year of 2018 through 2023.

Month	Mdth
Jan-17	186.4
Feb-17	201.2
Mar-17	150.5
Apr-17	215.6
May-17	197.8
Jun-17	149.1
Jul-17	116.7
Aug-17	111.9
Sep-17	83.8
Oct-17	208.3
Nov-17	83.7
Dec-17	65.3

For example, the projected G-30 "out-of-model" gas demand for August 2020 would simply be: 111.9 MDth.

E. Combined G-30 Industrial Gas Demand Forecast

A final adjustment to the noncore industrial G30 load forecast was done to account for "Rule-38" gas load. "Rule-38" amount is projected forward using 2017 Rule-38 existing G-30 industrial customers' load.

Using the August 2020 data example, the resulting total G30 industrial forecast of demand would be:

= Noncore Industrial (Non-Refinery) + Noncore Industrial (Refinery)
+ Out-of-Model – Rule 38
= (4,970.5) + (7,656.4) + (111.9)– (688.0)
= 12,050.8 MDth

F. Combined G-30 Gas Demand Forecast

The resulting gas demand for SoCalGas' G30 C&I load is the sum of Commercial and Industrial forecasts discussed previously. Using the August 2020 example, we have:

= Noncore Commercial G30 + Noncore Industrial G30
= (1,310.2) + (12,050.8)
= 13,361.0 MDth

This value checks with the value (133,610 MTh) shown in the SoCalGas consolidated gas demand forecast work papers for August 2020.

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 2017 monthly proportions of each rate class.

For the non-cogeneration load component, there is an "out-of-model" adjustment to reflect expected implementation of mandated Energy Efficiency for this customer segment.

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) 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) = 5.682067 + (-0.086939) x LN(G/P)

where

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

The parameters of this equation were estimated from monthly data for Feb-1997 through Dec-2017.

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 2020 is as follows:

LN[Ref_MDth/d] = 5.682067 + (-0.086939) x
LN[((3.8224+3.8074/2)/((8.8253+9.4240)/2)]
LN[Ref_MDth/d] = 5.757883

Ref_MDth = (31 days) x (EXP[5.757883])
= (31 days) x (316.6772 MDth/d)
= (9,817.0 MDth)

This total refinery gas demand was "split" between G-30 and G-50 load using the 2017 monthly proportions that the G-30 load represented relative to the total refinery load. The table below provides these proportions.

Month	2017 G-30 % of total Refinery
Jan	80.46%
Feb	78.56%
Mar	80.92%
Apr	78.53%
May	79.52%
Jun	81.09%
Jul	81.37%
Aug	79.02%
Sep	79.16%
Oct	81.64%
Nov	81.85%
Dec	83.06%

Based on the August 2020 example above, the total refinery gas demand is split into G-30 and G-50 values:

Ref_G-30 = (7,757.1 MDth) = (9,817.0 MDth) x (79.017%), and
Ref_G-50 = (2,059.9 MDth) = (9,817.0 MDth) x (20.983%)

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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 (1/2)

Month	Day per month	Refinery G30	Refinery G50	**Total Refinery**	Total Refinery Mdth/Day	ln (MdthD)	ln(G/P): Moving 2-Mo Avg	Burner tip Gas Price (G) $/dth	Propane (P) $/dth
Jan-17	31	8,773.4	2,130.7	**10,904.1**	351.7	5.8629	-0.67235	4.1314	8.6277
Feb-17	28	7,272.9	1,985.2	**9,258.1**	330.6	5.8010	-0.81580	3.5199	8.6715
Mar-17	31	7,991.0	1,884.2	**9,875.2**	318.6	5.7638	-0.83622	3.4216	7.3467
Apr-17	30	7,454.6	2,037.9	**9,492.6**	316.4	5.7571	-0.71644	3.5955	7.0182
May-17	31	8,147.1	2,097.7	**10,244.8**	330.5	5.8005	-0.65587	3.6325	6.9088
Jun-17	30	7,919.1	1,847.0	**9,766.1**	325.5	5.7855	-0.61705	3.5509	6.4051
Jul-17	31	8,165.7	1,869.7	**10,035.4**	323.7	5.7799	-0.62745	3.5757	6.9416
Aug-17	31	7,867.2	2,089.2	**9,956.4**	321.2	5.7720	-0.73081	3.6787	8.1241
Sep-17	30	7,824.4	2,059.5	**9,883.9**	329.5	5.7975	-0.88463	3.5811	9.4599
Oct-17	31	8,867.0	1,993.7	**10,860.7**	350.3	5.8589	-1.02138	3.5393	10.3139
Nov-17	30	8,342.0	1,849.6	**10,191.6**	339.7	5.8281	-1.08239	3.6530	10.9161
Dec-17	31	8,562.4	1,745.8	**10,308.3**	332.5	5.8067	-1.06882	3.8219	10.8504
Jan-18	31	7,906.0	1,920.1	**9,826.0**	317.0	5.7588	-0.88263	3.8805	7.7683
Feb-18	28	6,915.7	1,887.7	**8,803.4**	314.4	5.7507	-0.78931	3.2151	7.8555
Mar-18	31	7,938.0	1,871.7	**9,809.7**	316.4	5.7571	-0.86351	3.1631	7.2703
Apr-18	30	7,437.2	2,033.2	**9,470.4**	315.7	5.7547	-0.83573	2.9549	6.8409
May-18	31	7,802.0	2,008.8	**9,810.9**	316.5	5.7573	-0.86486	2.9193	7.1085
Jun-18	30	7,685.5	1,792.5	**9,478.0**	315.9	5.7555	-0.84495	3.0276	6.7350
Jul-18	31	7,924.0	1,814.3	**9,738.3**	314.1	5.7498	-0.77950	3.2302	6.9093
Aug-18	31	7,694.8	2,043.4	**9,738.2**	314.1	5.7498	-0.77936	3.3511	7.4384
Sep-18	30	7,535.2	1,983.3	**9,518.5**	317.3	5.7598	-0.89403	3.1486	8.4530
Oct-18	31	8,158.8	1,834.4	**9,993.2**	322.4	5.7757	-1.07666	3.0191	9.6482
Nov-18	30	7,976.2	1,768.5	**9,744.7**	324.8	5.7833	-1.16422	3.0726	9.8660
Dec-18	31	8,327.2	1,697.9	**10,025.0**	323.4	5.7789	-1.11325	3.6320	10.5445
Jan-19	31	7,925.3	1,924.8	**9,850.1**	317.7	5.7612	-0.91076	4.2120	8.9575
Feb-19	28	6,903.9	1,884.4	**8,788.3**	313.9	5.7490	-0.76959	4.1278	9.0471
Mar-19	31	7,891.4	1,860.7	**9,752.1**	314.6	5.7512	-0.79574	3.7658	8.4458
Apr-19	30	7,442.0	2,034.5	**9,476.5**	315.9	5.7554	-0.84320	3.3132	8.0044
May-19	31	7,826.8	2,015.2	**9,842.0**	317.5	5.7604	-0.90126	3.2990	8.2795
Jun-19	30	7,716.4	1,799.7	**9,516.1**	317.2	5.7595	-0.89113	3.3359	7.8956
Jul-19	31	7,962.4	1,823.1	**9,785.5**	315.7	5.7547	-0.83511	3.5925	8.0748
Aug-19	31	7,737.6	2,054.7	**9,792.3**	315.9	5.7554	-0.84307	3.5921	8.6185
Sep-19	30	7,578.7	1,994.8	**9,573.4**	319.1	5.7655	-0.96024	3.4054	9.6612
Oct-19	31	8,181.2	1,839.5	**10,020.7**	323.2	5.7784	-1.10825	3.3790	10.8894
Nov-19	30	7,943.7	1,761.3	**9,705.0**	323.5	5.7792	-1.11720	3.8201	11.1133
Dec-19	31	8,295.6	1,691.4	**9,987.0**	322.2	5.7751	-1.06958	4.0463	11.8106
Jan-20	31	7,960.7	1,933.4	**9,894.0**	319.2	5.7657	-0.96198	4.2108	9.7973
Feb-20	29	7,203.3	1,966.2	**9,169.4**	316.2	5.7563	-0.85426	4.1706	9.8959
Mar-20	31	7,924.3	1,868.4	**9,792.7**	315.9	5.7554	-0.84360	4.0583	9.2338
Apr-20	30	7,456.0	2,038.3	**9,494.4**	316.5	5.7573	-0.86485	3.5141	8.7478
May-20	31	7,838.5	2,018.2	**9,856.7**	318.0	5.7619	-0.91847	3.5898	9.0507
Jun-20	30	7,718.6	1,800.2	**9,518.8**	317.3	5.7598	-0.89437	3.6384	8.6281

Base Forecast of Refinery Gas Demand (2/2)

Month	Day per month	Refinery G30	Refinery G50	**Total Refinery**	Total Refinery Mdth/Day	ln (MdthD)	ln(G/P): Moving 2-Mo Avg	Burner tip Gas Price (G) $/dth	Propane (P) $/dth
Jul-20	31	7,972.6	1,825.5	**9,798.1**	316.1	5.7560	-0.84987	3.8224	8.8253
Aug-20	31	7,757.1	2,059.9	**9,817.0**	316.7	5.7579	-0.87206	3.8074	9.4240
Sep-20	30	7,598.7	2,000.0	**9,598.7**	320.0	5.7682	-0.99058	3.6184	10.5721
Oct-20	31	8,204.8	1,844.8	**10,049.6**	324.2	5.7813	-1.14143	3.5662	11.9245
Nov-20	30	7,974.4	1,768.1	**9,742.5**	324.7	5.7831	-1.16155	3.9758	12.1711
Dec-20	31	8,335.6	1,699.6	**10,035.1**	323.7	5.7799	-1.12485	4.1774	12.9388
Jan-21	31	7,983.5	1,938.9	**9,922.4**	320.1	5.7686	-0.99491	4.4560	10.4102
Feb-21	28	6,957.2	1,899.0	**8,856.2**	316.3	5.7567	-0.85809	4.4152	10.5140
Mar-21	31	7,918.8	1,867.2	**9,786.0**	315.7	5.7547	-0.83570	4.3999	9.8176
Apr-21	30	7,443.7	2,035.0	**9,478.7**	316.0	5.7556	-0.84587	3.8078	9.3064
May-21	31	7,833.1	2,016.8	**9,849.9**	317.7	5.7612	-0.91053	3.8085	9.6250
Jun-21	30	7,722.0	1,801.0	**9,523.0**	317.4	5.7603	-0.89946	3.8413	9.1805
Jul-21	31	7,978.0	1,826.7	**9,804.7**	316.3	5.7566	-0.85765	4.0346	9.3879
Aug-21	31	7,758.8	2,060.4	**9,819.2**	316.7	5.7581	-0.87466	4.0575	10.0176
Sep-21	30	7,593.5	1,998.7	**9,592.2**	319.7	5.7675	-0.98279	3.8929	11.2252
Oct-21	31	8,195.3	1,842.6	**10,037.9**	323.8	5.7801	-1.12803	3.8340	12.6476
Nov-21	30	7,965.8	1,766.2	**9,732.0**	324.4	5.7820	-1.14920	4.2639	12.9068
Dec-21	31	8,329.2	1,698.3	**10,027.5**	323.5	5.7791	-1.11611	4.4559	13.7143
Jan-22	31	7,976.2	1,937.1	**9,913.3**	319.8	5.7677	-0.98440	4.8116	11.0875
Feb-22	28	6,948.7	1,896.7	**8,845.4**	315.9	5.7554	-0.84406	4.7695	11.1961
Mar-22	31	7,909.1	1,864.9	**9,774.0**	315.3	5.7535	-0.82153	4.7571	10.4671
Apr-22	30	7,430.7	2,031.4	**9,462.1**	315.4	5.7539	-0.82570	4.1762	9.9319
May-22	31	7,814.2	2,012.0	**9,826.2**	317.0	5.7588	-0.88287	4.1773	10.2654
Jun-22	30	7,703.6	1,796.7	**9,500.3**	316.7	5.7579	-0.87202	4.2122	9.8000
Jul-22	31	7,956.6	1,821.8	**9,778.4**	315.4	5.7539	-0.82672	4.4575	10.0172
Aug-22	31	7,736.8	2,054.5	**9,791.4**	315.9	5.7553	-0.84201	4.4582	10.6765
Sep-22	30	7,572.8	1,993.2	**9,566.0**	318.9	5.7648	-0.95132	4.2772	11.9407
Oct-22	31	8,171.9	1,837.4	**10,009.3**	322.9	5.7773	-1.09522	4.2084	13.4298
Nov-22	30	7,947.9	1,762.2	**9,710.1**	323.7	5.7797	-1.12327	4.6150	13.7012
Dec-22	31	8,316.0	1,695.6	**10,011.5**	323.0	5.7775	-1.09778	4.8088	14.5466
Jan-23	31	7,946.4	1,929.9	**9,876.2**	318.6	5.7639	-0.94127	5.4191	11.6698
Feb-23	28	6,915.6	1,887.7	**8,803.3**	314.4	5.7507	-0.78914	5.2339	11.7829
Mar-23	31	7,885.8	1,859.4	**9,745.2**	314.4	5.7505	-0.78759	5.1417	11.0237
Apr-23	30	7,388.8	2,019.9	**9,408.8**	313.6	5.7482	-0.76066	4.9019	10.4664
May-23	31	7,740.8	1,993.1	**9,733.8**	314.0	5.7494	-0.77418	4.9100	10.8137
Jun-23	30	7,623.6	1,778.0	**9,401.7**	313.4	5.7474	-0.75200	5.0572	10.3291
Jul-23	31	7,878.9	1,804.0	**9,682.8**	312.3	5.7441	-0.71380	5.1715	10.5553
Aug-23	31	7,663.9	2,035.2	**9,699.0**	312.9	5.7458	-0.73303	5.3009	11.2418
Sep-23	30	7,486.5	1,970.5	**9,457.1**	315.2	5.7533	-0.81956	5.1860	12.5582
Oct-23	31	8,063.5	1,813.0	**9,876.5**	318.6	5.7639	-0.94158	5.2145	14.1089
Nov-23	30	7,862.4	1,743.3	**9,605.7**	320.2	5.7689	-0.99893	5.2814	14.3916
Dec-23	31	8,234.4	1,679.0	**9,913.4**	319.8	5.7677	-0.98446	5.8021	15.2720

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 workpapers 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 98.90% of the base refinery cogeneration to tier 2. The cogeneration gas demand to tier 1 is 1.10% of the base refinery cogeneration demand. These ratios are calculated based on 2017 historical data.

Using August 2020 as an example:

Tier 1: = (2,059.9 MDth) x (1.10%)
= 22.7 MDth

Tier 2: = (2,059.9 MDth) x (98.90%)
= 2,037.2 MDth

Refinery Cogeneration Gas Demand by EG Rate Tier (1/2)

Month	Total (Refinery CoGeneration) (Mdth)	Refinery CoGen (Tier 1) (Mdth)	Refinery CoGen (Tier 2) (Mdth)
Jan-17	2,130.7	23.5	2,107.3
Feb-17	1,985.2	21.9	1,963.3
Mar-17	1,884.2	20.7	1,863.4
Apr-17	2,037.9	22.4	2,015.5
May-17	2,097.7	23.1	2,074.6
Jun-17	1,847.0	20.3	1,826.6
Jul-17	1,869.7	20.6	1,849.1
Aug-17	2,089.2	23.0	2,066.2
Sep-17	2,059.5	22.7	2,036.8
Oct-17	1,993.7	21.9	1,971.7
Nov-17	1,849.6	20.4	1,829.2
Dec-17	1,745.8	19.2	1,726.6
Jan-18	1,920.1	21.1	1,898.9
Feb-18	1,887.7	20.8	1,866.9
Mar-18	1,871.7	20.6	1,851.1
Apr-18	2,033.2	22.4	2,010.8
May-18	2,008.8	22.1	1,986.7
Jun-18	1,792.5	19.7	1,772.7
Jul-18	1,814.3	20.0	1,794.4
Aug-18	2,043.4	22.5	2,020.9
Sep-18	1,983.3	21.8	1,961.5
Oct-18	1,834.4	20.2	1,814.2
Nov-18	1,768.5	19.5	1,749.0
Dec-18	1,697.9	18.7	1,679.2
Jan-19	1,924.8	21.2	1,903.6
Feb-19	1,884.4	20.7	1,863.7
Mar-19	1,860.7	20.5	1,840.2
Apr-19	2,034.5	22.4	2,012.1
May-19	2,015.2	22.2	1,993.0
Jun-19	1,799.7	19.8	1,779.9
Jul-19	1,823.1	20.1	1,803.0
Aug-19	2,054.7	22.6	2,032.1
Sep-19	1,994.8	22.0	1,972.8
Oct-19	1,839.5	20.3	1,819.2
Nov-19	1,761.3	19.4	1,741.9
Dec-19	1,691.4	18.6	1,672.8
Jan-20	1,933.4	21.3	1,912.1
Feb-20	1,966.2	21.6	1,944.5
Mar-20	1,868.4	20.6	1,847.9
Apr-20	2,038.3	22.4	2,015.9
May-20	2,018.2	22.2	1,996.0
Jun-20	1,800.2	19.8	1,780.4

Refinery Cogeneration Gas Demand by EG Rate Tier (2/2)

Month	Total (Refinery CoGeneration) (Mdth)	Refinery CoGen (Tier 1) (Mdth)	Refinery CoGen (Tier 2) (Mdth)
Jul-20	1,825.5	20.1	1,805.4
Aug-20	2,059.9	22.7	2,037.2
Sep-20	2,000.0	22.0	1,978.0
Oct-20	1,844.8	20.3	1,824.5
Nov-20	1,768.1	19.5	1,748.6
Dec-20	1,699.6	18.7	1,680.9
Jan-21	1,938.9	21.3	1,917.5
Feb-21	1,899.0	20.9	1,878.1
Mar-21	1,867.2	20.6	1,846.6
Apr-21	2,035.0	22.4	2,012.6
May-21	2,016.8	22.2	1,994.6
Jun-21	1,801.0	19.8	1,781.2
Jul-21	1,826.7	20.1	1,806.6
Aug-21	2,060.4	22.7	2,037.7
Sep-21	1,998.7	22.0	1,976.7
Oct-21	1,842.6	20.3	1,822.3
Nov-21	1,766.2	19.4	1,746.7
Dec-21	1,698.3	18.7	1,679.6
Jan-22	1,937.1	21.3	1,915.8
Feb-22	1,896.7	20.9	1,875.8
Mar-22	1,864.9	20.5	1,844.3
Apr-22	2,031.4	22.4	2,009.0
May-22	2,012.0	22.1	1,989.8
Jun-22	1,796.7	19.8	1,776.9
Jul-22	1,821.8	20.1	1,801.7
Aug-22	2,054.5	22.6	2,031.9
Sep-22	1,993.2	21.9	1,971.3
Oct-22	1,837.4	20.2	1,817.1
Nov-22	1,762.2	19.4	1,742.8
Dec-22	1,695.6	18.7	1,676.9
Jan-23	1,929.9	21.2	1,908.6
Feb-23	1,887.7	20.8	1,866.9
Mar-23	1,859.4	20.5	1,838.9
Apr-23	2,019.9	22.2	1,997.7
May-23	1,993.1	21.9	1,971.1
Jun-23	1,778.0	19.6	1,758.5
Jul-23	1,804.0	19.9	1,784.1
Aug-23	2,035.2	22.4	2,012.8
Sep-23	1,970.5	21.7	1,948.8
Oct-23	1,813.0	20.0	1,793.0
Nov-23	1,743.3	19.2	1,724.1
Dec-23	1,679.0	18.5	1,660.5

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 $\leq$ 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) = 8.11941+ LN(#Cust) x (0.32373)
+ LN(G/E) x (-0.24418), where

#Cust = Number of active meters/customers. This is forecasted using the base year customer count projected forward by total C&I employment tread
G = SCG's "EG tier1" Burner-Tip Price cnv. to ¢/Kwh at 10,000 Btu/Kwh, 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 calculation of small cogeneration gas demand for 2020 is as follows:

LN[SmCoGen_MDth/yr] = 8.11941 + LN(325.75) x (0.32373)
+ LN[(4.6392 ¢/Kwh)/(13.1472 ¢/Kwh)] x (-0.24418)

LN[SmCoGen_MDth/yr] = 10.24691

(EXP[10.24691]) = 28,195.3 MDth/yr

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

Base Annual Forecast of Small Cogeneration Gas Demand

Year	Annual Load (Mdth)	Cust cnt	LN(Ann. Mdth/Yr)	LN(Cust cnt)	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 10,000 Btu/Kwh	Total C&I Empl (x 1000)
2017	27,561.0	312	10.224	5.743	-0.996	0.37	11.71	4.33	9,153
2018	28,541.9	316	10.259	5.757	-1.131	0.32	12.28	3.96	9,280
2019	28,228.9	321	10.248	5.773	-1.064	0.34	12.76	4.40	9,429
2020	28,195.3	326	10.247	5.786	-1.042	0.35	13.15	4.64	9,556
2021	28,083.9	328	10.243	5.793	-1.016	0.36	13.53	4.90	9,623
2022	27,756.1	330	10.231	5.799	-0.961	0.38	13.87	5.31	9,675
2023	26,873.5	331	10.199	5.803	-0.823	0.44	13.90	6.11	9,719

FORECAST OF ANNUAL DEMAND FROM NONCORE SGIP

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

Year	G50 SGIP (Mdth)
2017	0.0
2018	5.6
2019	11.2
2020	16.8
2021	22.4
2022	28.0
2023	33.6

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.

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	Econometric Model Fcst (Mdth)	SGIP (G50) Fcst (Mdth)	Final Sm. CoGen (Mdth)
2017	27,561.0	0.0	27,561.0
2018	28,541.9	5.6	28,547.5
2019	28,228.9	11.2	28,240.1
2020	28,195.3	16.8	28,212.1
2021	28,083.9	22.4	28,106.3
2022	27,756.1	28.0	27,784.1
2023	26,873.5	33.6	26,907.1

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 #	Month	Smoothed Monthly Load as % of Annual (2015-2017)
1	Jan	8.217%
2	Feb	7.116%
3	Mar	7.715%
4	Apr	7.930%
5	May	8.307%
6	Jun	8.493%
7	Jul	9.048%
8	Aug	9.060%
9	Sep	8.583%
10	Oct	8.563%
11	Nov	8.429%
12	Dec	8.541%
	Total	**100.000%**

FORECAST RESULTS

Based on the year 2020 example above, the August 2018 small cogeneration (G-50) gas demand is calculated as:

SmCoGen_G-50 = (28,195.3 + 16.8 MDth/yr) x (9.060%)
= (2,556.1 MDth)

Small cogeneration (G-50) gas demand is billed according to the two-tiered EG rate structure. The projected gas demand by tier assigns 67.742% of the total cogeneration demand to tier 2; the remaining 32.258% is assigned to tier 1. These ratios are calculated based on 2017 historical data.

Using August 2020 as an example:

Tier 2: (1,731.6 MDth) = (2,556.1 MDth) x (67.742%)

Tier 1: (824.6 MDth) = (2,556.1 MDth) x (32.258%)

The tables below show the small cogeneration monthly gas demand forecast from 2017 through 2023 by total and by EG rate tiers.

Small Cogeneration Gas Demand (1/2)

Year	Month	Total Small CoGen (Mdth)	Small CoGen - Tier 1 (Mdth)	Small CoGen - Tier 2 (Mdth)
2017	Jan	2,264.7	730.6	1,534.2
2017	Feb	1,961.1	632.6	1,328.5
2017	Mar	2,126.3	685.9	1,440.4
2017	Apr	2,185.5	705.0	1,480.5
2017	May	2,289.4	738.5	1,550.9
2017	Jun	2,340.7	755.1	1,585.6
2017	Jul	2,493.7	804.4	1,689.3
2017	Aug	2,497.1	805.5	1,691.6
2017	Sep	2,365.4	763.0	1,602.4
2017	Oct	2,360.0	761.3	1,598.7
2017	Nov	2,323.0	749.4	1,573.7
2017	Dec	2,353.9	759.3	1,594.6
2018	Jan	2,345.8	756.7	1,589.1
2018	Feb	2,031.3	655.3	1,376.1
2018	Mar	2,202.4	710.5	1,492.0
2018	Apr	2,263.7	730.2	1,533.5
2018	May	2,371.3	764.9	1,606.4
2018	Jun	2,424.5	782.1	1,642.4
2018	Jul	2,583.0	833.2	1,749.8
2018	Aug	2,586.5	834.4	1,752.2
2018	Sep	2,450.1	790.4	1,659.8
2018	Oct	2,444.5	788.5	1,655.9
2018	Nov	2,406.2	776.2	1,630.0
2018	Dec	2,438.2	786.5	1,651.6
2019	Jan	2,320.5	748.6	1,572.0
2019	Feb	2,009.5	648.2	1,361.2
2019	Mar	2,178.7	702.8	1,475.9
2019	Apr	2,239.4	722.4	1,517.0
2019	May	2,345.8	756.7	1,589.1
2019	Jun	2,398.4	773.7	1,624.7
2019	Jul	2,555.2	824.3	1,730.9
2019	Aug	2,558.7	825.4	1,733.3
2019	Sep	2,423.7	781.8	1,641.9
2019	Oct	2,418.1	780.0	1,638.1
2019	Nov	2,380.3	767.8	1,612.4
2019	Dec	2,411.9	778.0	1,633.9
2020	Jan	2,318.2	747.8	1,570.4
2020	Feb	2,007.5	647.6	1,359.9
2020	Mar	2,176.5	702.1	1,474.4
2020	Apr	2,237.1	721.7	1,515.5
2020	May	2,343.5	756.0	1,587.5
2020	Jun	2,396.0	772.9	1,623.1

Small Cogeneration Gas Demand (2/2)

Year	Month	Total Small CoGen (Mdth)	Small CoGen - Tier 1 (Mdth)	Small CoGen - Tier 2 (Mdth)
2020	Jul	2,552.6	823.4	1,729.2
2020	Aug	2,556.1	824.6	1,731.6
2020	Sep	2,421.3	781.1	1,640.3
2020	Oct	2,415.7	779.3	1,636.5
2020	Nov	2,377.9	767.1	1,610.8
2020	Dec	2,409.5	777.3	1,632.2
2021	Jan	2,309.6	745.0	1,564.5
2021	Feb	1,999.9	645.1	1,354.8
2021	Mar	2,168.4	699.5	1,468.9
2021	Apr	2,228.8	719.0	1,509.8
2021	May	2,334.7	753.1	1,581.6
2021	Jun	2,387.0	770.0	1,617.0
2021	Jul	2,543.1	820.3	1,722.7
2021	Aug	2,546.5	821.5	1,725.1
2021	Sep	2,412.2	778.1	1,634.1
2021	Oct	2,406.7	776.3	1,630.3
2021	Nov	2,369.0	764.2	1,604.8
2021	Dec	2,400.5	774.3	1,626.1
2022	Jan	2,283.1	736.5	1,546.6
2022	Feb	1,977.0	637.7	1,339.3
2022	Mar	2,143.5	691.5	1,452.1
2022	Apr	2,203.2	710.7	1,492.5
2022	May	2,307.9	744.5	1,563.4
2022	Jun	2,359.6	761.2	1,598.5
2022	Jul	2,513.9	810.9	1,703.0
2022	Aug	2,517.3	812.0	1,705.3
2022	Sep	2,384.6	769.2	1,615.4
2022	Oct	2,379.1	767.4	1,611.6
2022	Nov	2,341.8	755.4	1,586.4
2022	Dec	2,372.9	765.5	1,607.5
2023	Jan	2,211.0	713.2	1,497.8
2023	Feb	1,914.6	617.6	1,297.0
2023	Mar	2,075.9	669.6	1,406.2
2023	Apr	2,133.7	688.3	1,445.4
2023	May	2,235.1	721.0	1,514.1
2023	Jun	2,285.2	737.2	1,548.0
2023	Jul	2,434.6	785.3	1,649.2
2023	Aug	2,437.9	786.4	1,651.5
2023	Sep	2,309.3	744.9	1,564.4
2023	Oct	2,304.0	743.2	1,560.8
2023	Nov	2,267.9	731.6	1,536.3
2023	Dec	2,298.0	741.3	1,556.7

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 power market simulation model he uses. Forecast details are discussed by Mr. Huang in his prepared testimony and his workpapers.

The tables provided below summarize the gas demand forecasts from 2017 to 2023 provided by Mr. Huang for the large cogeneration and UEG/EWG segments. The tables are separated by EG rate tier.

Large Cogeneration, UEG/EWG Gas Demand (1/2)

Year	Month	Total Lg CoGen / UEG / EWG (Mdth)	Lg CoGen / UEG / EWG - Tier 1 (Mdth)	Lg CoGen / UEG / EWG - Tier 2 (Mdth)
2017	Jan	15,217.8	72.7	15,145.1
2017	Feb	14,507.6	154.0	14,353.6
2017	Mar	13,996.2	214.6	13,781.6
2017	Apr	13,345.4	203.3	13,142.1
2017	May	15,777.2	212.3	15,564.8
2017	Jun	19,457.4	271.1	19,186.3
2017	Jul	24,867.8	317.1	24,550.8
2017	Aug	29,934.2	313.4	29,620.7
2017	Sep	22,482.5	235.9	22,246.6
2017	Oct	15,695.1	217.5	15,477.6
2017	Nov	12,107.3	174.6	11,932.7
2017	Dec	11,874.5	53.5	11,820.9
2018	Jan	12,150.6	2.2	12,148.4
2018	Feb	10,085.7	8.2	10,077.5
2018	Mar	11,935.1	22.2	11,912.9
2018	Apr	14,879.8	12.6	14,867.2
2018	May	15,274.0	31.0	15,243.0
2018	Jun	17,401.3	150.2	17,251.1
2018	Jul	27,127.2	265.2	26,861.9
2018	Aug	30,344.0	340.5	30,003.4
2018	Sep	27,716.4	244.6	27,471.8
2018	Oct	20,967.8	60.7	20,907.1
2018	Nov	18,944.0	26.1	18,917.9
2018	Dec	15,004.9	1.3	15,003.6
2019	Jan	13,434.7	1.0	13,433.7
2019	Feb	9,953.0	2.7	9,950.2
2019	Mar	13,617.4	1.8	13,615.6
2019	Apr	14,532.4	2.4	14,530.0
2019	May	13,916.7	2.9	13,913.7
2019	Jun	17,235.5	88.3	17,147.3
2019	Jul	25,657.4	233.4	25,423.9
2019	Aug	30,645.4	289.7	30,355.7
2019	Sep	28,103.2	240.4	27,862.8
2019	Oct	20,330.4	10.6	20,319.7
2019	Nov	11,989.6	8.7	11,981.0
2019	Dec	13,851.4	0.3	13,851.1
2020	Jan	15,871.9	0.5	15,871.4
2020	Feb	9,928.3	3.8	9,924.5
2020	Mar	9,982.4	0.0	9,982.4
2020	Apr	12,109.1	0.4	12,108.8
2020	May	11,065.6	2.0	11,063.6
2020	Jun	14,518.6	62.8	14,455.8

Large Cogeneration, UEG/EWG Gas Demand (2/2)

Year	Month	Total Lg CoGen / UEG / EWG (Mdth)	Lg CoGen / UEG / EWG - Tier 1 (Mdth)	Lg CoGen / UEG / EWG - Tier 2 (Mdth)
2020	Jul	25,395.2	193.2	25,202.0
2020	Aug	29,992.3	263.4	29,728.9
2020	Sep	27,276.9	160.8	27,116.1
2020	Oct	22,385.6	4.3	22,381.3
2020	Nov	16,056.0	0.2	16,055.8
2020	Dec	17,693.0	0.3	17,692.7
2021	Jan	17,632.6	0.0	17,632.6
2021	Feb	9,492.9	0.7	9,492.2
2021	Mar	9,310.3	0.0	9,310.3
2021	Apr	13,777.6	0.0	13,777.6
2021	May	13,796.0	0.3	13,795.6
2021	Jun	16,220.1	31.9	16,188.2
2021	Jul	23,285.5	203.1	23,082.5
2021	Aug	26,540.6	280.3	26,260.3
2021	Sep	24,333.5	115.9	24,217.6
2021	Oct	21,129.5	1.0	21,128.5
2021	Nov	14,397.3	0.0	14,397.3
2021	Dec	17,658.8	0.0	17,658.8
2022	Jan	16,383.5	0.0	16,383.5
2022	Feb	11,866.4	0.0	11,866.4
2022	Mar	12,519.2	0.0	12,519.2
2022	Apr	13,126.3	0.0	13,126.3
2022	May	14,364.3	0.2	14,364.1
2022	Jun	16,070.7	32.0	16,038.7
2022	Jul	22,833.3	151.8	22,681.5
2022	Aug	24,995.8	241.7	24,754.1
2022	Sep	23,060.1	91.5	22,968.6
2022	Oct	19,863.1	0.0	19,863.1
2022	Nov	14,314.1	0.0	14,314.1
2022	Dec	17,478.5	0.0	17,478.5
2023	Jan	15,972.3	0.0	15,972.3
2023	Feb	12,847.3	0.0	12,847.3
2023	Mar	13,079.1	0.0	13,079.1
2023	Apr	14,766.5	0.0	14,766.5
2023	May	15,556.7	0.0	15,556.7
2023	Jun	16,325.9	0.6	16,325.3
2023	Jul	22,539.5	134.6	22,404.9
2023	Aug	23,648.1	142.5	23,505.6
2023	Sep	20,975.6	54.6	20,921.0
2023	Oct	17,345.7	0.0	17,345.7
2023	Nov	15,189.0	0.0	15,189.0
2023	Dec	16,803.9	0.0	16,803.9

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. "Rule-38" amount is projected forward using 2017 Rule-38 existing G-50 customers' load. "Rule-38" demands are subtracted from the tier totals of gas demand forecasts for Small Cogeneration, Refinery Cogeneration, and combined Large Cogeneration and UEG/EWG gas demand.

Using the August 2020 data as an example, the resulting EG-tier1 and EG-tier 2 forecasts of gas demand would be:

Tier 1:

EG-Tier1_MDth = (824.6 MDth for SmCoGen)
+ (22.7 MDth for RefCoGen)
+ (263.4 MDth for LgCoGen/UEG/EWG)
- (37.5 MDth for Rule-38 Elligible G-50 load)
EG-Tier1_MDth = (1,073.1 MDth).

Tier 2:

EG-Tier2_MDth = (1,731.6 MDth for SmCoGen)
+ (2,037.2 MDth for RefCoGen)
+ (29,728.9 MDth for LgCoGen/UEG/EWG)
- (186.9 MDth for Rule-38 Elligible G-50 load)
EG-Tier2_MDth = (33,310.9 MDth).

Note that the calculations above may reflect small rounding errors.

These results (noting that 1 MDth = 10 MTherms) for tier1 and tier2 gas demand are shown in the SoCalGas consolidated gas demand forecast work papers for August 2020.

ENHANCED OIL RECOVERY

GAS DEMAND FORECAST

Enhanced Oil Recovery Forecasting Methodology

The Enhanced Oil Recovery (EOR) demand forecast is prepared based on historical throughput and general market conditions. For the 2020 to 2022 TCAP period, we expect EOR customers' demand to be stable. Combined EOR cogeneration and steaming usage are forecasted to average 20,894 MDth per year in TCAP period. This is the same as the 2017 recorded EOR gas demand.

The table below shows EOR monthly gas demand forecast from 2017 through 2023.

EOR Gas Demand

Year	Month	Mdth	Customer #
2017	Jan	1,774.6	34
2017	Feb	1,602.8	34
2017	Mar	1,774.6	34
2017	Apr	1,717.3	34
2017	May	1,774.6	34
2017	Jun	1,717.3	34
2017	Jul	1,774.6	34
2017	Aug	1,774.6	34
2017	Sep	1,717.3	34
2017	Oct	1,774.6	34
2017	Nov	1,717.3	34
2017	Dec	1,774.6	34
2018	Jan	1,774.6	34
2018	Feb	1,602.8	34
2018	Mar	1,774.6	34
2018	Apr	1,717.3	34
2018	May	1,774.6	34
2018	Jun	1,717.3	34
2018	Jul	1,774.6	34
2018	Aug	1,774.6	34
2018	Sep	1,717.3	34
2018	Oct	1,774.6	34
2018	Nov	1,717.3	34
2018	Dec	1,774.6	34
2019	Jan	1,774.6	34
2019	Feb	1,602.8	34
2019	Mar	1,774.6	34
2019	Apr	1,717.3	34
2019	May	1,774.6	34
2019	Jun	1,717.3	34
2019	Jul	1,774.6	34
2019	Aug	1,774.6	34
2019	Sep	1,717.3	34
2019	Oct	1,774.6	34
2019	Nov	1,717.3	34
2019	Dec	1,774.6	34
2020	Jan	1,774.6	34
2020	Feb	1,602.8	34
2020	Mar	1,774.6	34
2020	Apr	1,717.3	34
2020	May	1,774.6	34
2020	Jun	1,717.3	34

Year	Month	Mdth	Customer #
2020	Jul	1,774.6	34
2020	Aug	1,774.6	34
2020	Sep	1,717.3	34
2020	Oct	1,774.6	34
2020	Nov	1,717.3	34
2020	Dec	1,774.6	34
2021	Jan	1,774.6	34
2021	Feb	1,602.8	34
2021	Mar	1,774.6	34
2021	Apr	1,717.3	34
2021	May	1,774.6	34
2021	Jun	1,717.3	34
2021	Jul	1,774.6	34
2021	Aug	1,774.6	34
2021	Sep	1,717.3	34
2021	Oct	1,774.6	34
2021	Nov	1,717.3	34
2021	Dec	1,774.6	34
2022	Jan	1,774.6	34
2022	Feb	1,602.8	34
2022	Mar	1,774.6	34
2022	Apr	1,717.3	34
2022	May	1,774.6	34
2022	Jun	1,717.3	34
2022	Jul	1,774.6	34
2022	Aug	1,774.6	34
2022	Sep	1,717.3	34
2022	Oct	1,774.6	34
2022	Nov	1,717.3	34
2022	Dec	1,774.6	34
2023	Jan	1,774.6	34
2023	Feb	1,602.8	34
2023	Mar	1,774.6	34
2023	Apr	1,717.3	34
2023	May	1,774.6	34
2023	Jun	1,717.3	34
2023	Jul	1,774.6	34
2023	Aug	1,774.6	34
2023	Sep	1,717.3	34
2023	Oct	1,774.6	34
2023	Nov	1,717.3	34
2023	Dec	1,774.6	34

SDG&E Noncore Retail Gas Demand

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

Noncore Commercial, Industrial and Small 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 energy efficiency and carbon-fee adjustments (MDth)

Small Cogeneration (MDTH_CGNNC_SD)

```
Cochrane-Orcutt
MONTHLY data for  142 periods from  MAR 2006 to  DEC 2017

 mdth_cgnnc_sd

   =    5.80515 * eisd/1000
       (23.6174)

 Sum Sq     259011   Std Err   43.1669   LHS Mean  578.023
 R Sq       0.6694   R Bar Sq   0.6646   F  2,139  140.698
 D.W.( 1)   2.0031   D.W.(12)   1.3422

 AR_0 =  + 0.56810 * AR_1 + 0.28252 * AR_2
          (6.95659)        (3.39097)
********************************************************************************
```

Commercial (MDTH_COMNC_SD)

```
Cochrane-Orcutt
MONTHLY data for  143 periods from  FEB 2006 to  DEC 2017

 mdth_comnc_sd

   =    0.15537 * ecsd/1000 + 102.539 * dum2006janmay
       (18.4437)             (3.49410)

 Sum Sq    93807.0   Std Err   25.8829   LHS Mean  201.079   Res Mean   0.3517
 R Sq       0.7489   R Bar Sq   0.7453   F  3,140  139.174   %RMSE     12.5427
 D.W.( 1)   2.3625   D.W.(12)   1.2504

 AR_0 =  + 0.79066 * AR_1
          (16.9128)
********************************************************************************
```

Industrial (MDTH_INDNC_SD)

```
Cochrane-Orcutt
MONTHLY data for  142 periods from  MAR 2006 to  DEC 2017

 mdth_indnc_sd

   =    1.64779 * eisd/1000 - 40.8185 * dum2013sepoct
       (16.4993)             (4.17061)

      + 87.1921 * dum2015mar
       (5.73848)

 Sum Sq    43007.4   Std Err   17.7177   LHS Mean  166.152
 R Sq       0.7057   R Bar Sq   0.6971   F  5,137  65.6874
 D.W.( 1)   2.0889   D.W.(12)   1.4207

 AR_0 =  + 0.48240 * AR_1 + 0.37161 * AR_2
          (5.98630)        (4.66119)
```

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

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.	Sm CoGen	Industrial
	Sm CoGen	Commercial	Industrial	Sm CoGen	Commercial	Industrial	ECSD	EISD	(MDth)	(MDth)	(MDth)	(MDth)
2006	6,253	3,757	1,374	6,253	3,757	1,374	1,221,508	104,642	0	0	0	0
2007	6,353	2,560	1,483	6,353	2,560	1,483	1,231,525	103,150	0	0	0	0
2008	6,861	2,546	1,886	6,861	2,546	1,886	1,223,383	103,475	0	0	0	0
2009	7,268	2,536	1,670	7,268	2,536	1,670	1,163,333	97,425	0	0	0	0
2010	6,371	2,559	1,912	6,371	2,559	1,912	1,156,592	95,967	0	0	0	0
2011	6,577	2,525	2,019	6,577	2,525	2,019	1,165,033	96,792	0	0	0	0
2012	7,015	2,390	2,262	7,015	2,390	2,262	1,195,792	98,575	0	0	0	0
2013	6,872	2,193	2,162	6,872	2,193	2,162	1,227,742	99,742	0	0	0	0
2014	6,616	1,912	2,088	6,616	1,912	2,088	1,253,375	102,558	0	0	0	0
2015	6,526	2,066	2,289	6,526	2,066	2,289	1,288,966	106,581	0	0	0	0
2016	7,460	2,155	2,336	7,460	2,155	2,336	1,322,407	108,222	0	0	0	0
2017	8,829	2,010	2,361	8,829	2,010	2,361	1,344,267	107,970	0	0	0	0
2018	9,130	2,272	2,314	9,210	2,283	2,332	1,368,886	109,940	-5	-1	-80	-13
2019	9,258	2,312	2,334	9,352	2,332	2,357	1,395,461	111,408	-10	-1	-94	-14
2020	9,328	2,344	2,344	9,422	2,375	2,373	1,418,765	112,270	-16	-2	-94	-14
2021	9,343	2,354	2,342	9,448	2,401	2,380	1,432,527	112,616	-24	-2	-105	-15
2022	9,341	2,362	2,337	9,461	2,423	2,383	1,444,531	112,794	-32	-3	-120	-16
2023	9,341	2,365	2,328	9,458	2,443	2,382	1,455,029	112,750	-40	-4	-117	-16

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.	Sm CoGen	Industrial
Month	Sm CoGen	Commercial	Industrial	Sm CoGen	Commercial	Industrial	ECSD	EISD	(MDth)	(MDth)	(MDth)	(MDth)
Jan-06	440.5	453.7	119.7	440.5	453.7	119.7	1,196,900	103,900	0.0	0.0	0.0	0.0
Feb-06	482.3	449.3	128.8	482.3	449.3	128.8	1,206,500	104,400	0.0	0.0	0.0	0.0
Mar-06	452.1	409.3	108.2	452.1	409.3	108.2	1,213,100	105,000	0.0	0.0	0.0	0.0
Apr-06	458.3	474.6	130.8	458.3	474.6	130.8	1,215,100	104,600	0.0	0.0	0.0	0.0
May-06	478.6	351.8	134.1	478.6	351.8	134.1	1,223,600	104,900	0.0	0.0	0.0	0.0
Jun-06	509.0	244.8	126.5	509.0	244.8	126.5	1,231,800	105,400	0.0	0.0	0.0	0.0
Jul-06	515.5	231.9	133.6	515.5	231.9	133.6	1,217,300	105,300	0.0	0.0	0.0	0.0
Aug-06	575.8	206.3	98.9	575.8	206.3	98.9	1,221,900	104,900	0.0	0.0	0.0	0.0
Sep-06	586.2	222.2	117.8	586.2	222.2	117.8	1,227,000	104,700	0.0	0.0	0.0	0.0
Oct-06	642.8	214.9	97.9	642.8	214.9	97.9	1,227,800	104,100	0.0	0.0	0.0	0.0
Nov-06	557.5	257.5	96.4	557.5	257.5	96.4	1,237,600	104,300	0.0	0.0	0.0	0.0
Dec-06	554.0	240.2	80.9	554.0	240.2	80.9	1,239,500	104,200	0.0	0.0	0.0	0.0
Jan-07	534.6	235.9	100.4	534.6	235.9	100.4	1,209,500	103,300	0.0	0.0	0.0	0.0
Feb-07	521.6	274.8	127.9	521.6	274.8	127.9	1,218,800	103,100	0.0	0.0	0.0	0.0
Mar-07	505.7	236.5	97.4	505.7	236.5	97.4	1,226,900	103,400	0.0	0.0	0.0	0.0
Apr-07	529.4	263.3	123.3	529.4	263.3	123.3	1,226,500	102,300	0.0	0.0	0.0	0.0
May-07	492.1	228.3	122.3	492.1	228.3	122.3	1,235,300	102,400	0.0	0.0	0.0	0.0
Jun-07	552.0	207.0	123.9	552.0	207.0	123.9	1,243,600	102,500	0.0	0.0	0.0	0.0
Jul-07	516.9	169.5	118.6	516.9	169.5	118.6	1,233,300	103,400	0.0	0.0	0.0	0.0
Aug-07	561.6	167.8	127.4	561.6	167.8	127.4	1,234,400	103,100	0.0	0.0	0.0	0.0
Sep-07	573.0	172.0	141.3	573.0	172.0	141.3	1,234,500	102,800	0.0	0.0	0.0	0.0
Oct-07	547.2	162.9	118.7	547.2	162.9	118.7	1,232,800	103,400	0.0	0.0	0.0	0.0
Nov-07	526.8	201.1	140.0	526.8	201.1	140.0	1,239,100	103,800	0.0	0.0	0.0	0.0
Dec-07	492.6	240.6	142.0	492.6	240.6	142.0	1,243,600	104,300	0.0	0.0	0.0	0.0
Jan-08	512.7	244.4	138.1	512.7	244.4	138.1	1,213,300	103,300	0.0	0.0	0.0	0.0
Feb-08	531.0	263.2	147.7	531.0	263.2	147.7	1,222,500	103,300	0.0	0.0	0.0	0.0
Mar-08	488.8	233.0	165.5	488.8	233.0	165.5	1,227,900	103,700	0.0	0.0	0.0	0.0
Apr-08	517.9	234.3	164.5	517.9	234.3	164.5	1,228,100	103,600	0.0	0.0	0.0	0.0
May-08	495.9	192.1	166.6	495.9	192.1	166.6	1,232,200	103,700	0.0	0.0	0.0	0.0
Jun-08	547.0	208.4	171.5	547.0	208.4	171.5	1,235,900	104,000	0.0	0.0	0.0	0.0
Jul-08	608.1	171.2	169.1	608.1	171.2	169.1	1,224,000	103,800	0.0	0.0	0.0	0.0
Aug-08	638.6	182.4	172.7	638.6	182.4	172.7	1,223,700	104,100	0.0	0.0	0.0	0.0
Sep-08	665.8	196.6	170.8	665.8	196.6	170.8	1,220,400	103,700	0.0	0.0	0.0	0.0
Oct-08	657.2	209.0	150.2	657.2	209.0	150.2	1,219,100	103,500	0.0	0.0	0.0	0.0
Nov-08	618.7	238.4	145.6	618.7	238.4	145.6	1,218,800	102,800	0.0	0.0	0.0	0.0
Dec-08	579.8	172.6	124.2	579.8	172.6	124.2	1,214,700	102,200	0.0	0.0	0.0	0.0
Jan-09	552.8	216.3	117.6	552.8	216.3	117.6	1,177,400	102,400	0.0	0.0	0.0	0.0
Feb-09	520.2	224.2	123.4	520.2	224.2	123.4	1,174,600	101,400	0.0	0.0	0.0	0.0
Mar-09	523.1	232.7	149.7	523.1	232.7	149.7	1,173,700	100,300	0.0	0.0	0.0	0.0
Apr-09	603.3	235.2	143.8	603.3	235.2	143.8	1,168,900	98,600	0.0	0.0	0.0	0.0
May-09	598.0	274.0	118.7	598.0	274.0	118.7	1,172,000	97,500	0.0	0.0	0.0	0.0
Jun-09	651.5	181.9	110.2	651.5	181.9	110.2	1,171,400	97,000	0.0	0.0	0.0	0.0
Jul-09	610.6	176.4	147.9	610.6	176.4	147.9	1,148,000	96,300	0.0	0.0	0.0	0.0
Aug-09	713.0	174.7	146.0	713.0	174.7	146.0	1,148,800	95,800	0.0	0.0	0.0	0.0
Sep-09	664.7	204.6	159.0	664.7	204.6	159.0	1,144,700	95,300	0.0	0.0	0.0	0.0
Oct-09	670.1	204.3	146.9	670.1	204.3	146.9	1,156,000	95,000	0.0	0.0	0.0	0.0
Nov-09	659.9	198.1	171.5	659.9	198.1	171.5	1,161,700	94,700	0.0	0.0	0.0	0.0
Dec-09	501.0	214.1	135.5	501.0	214.1	135.5	1,162,800	94,800	0.0	0.0	0.0	0.0

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.	Sm CoGen	Industrial
Month	Sm CoGen	Commercial	Industrial	Sm CoGen	Commercial	Industrial	ECSD	EISD	(MDth)	(MDth)	(MDth)	(MDth)
Jan-10	545.7	223.0	144.0	545.7	223.0	144.0	1,133,600	95,000	0.0	0.0	0.0	0.0
Feb-10	544.5	220.6	138.3	544.5	220.6	138.3	1,137,900	94,900	0.0	0.0	0.0	0.0
Mar-10	493.1	206.2	128.2	493.1	206.2	128.2	1,142,600	95,500	0.0	0.0	0.0	0.0
Apr-10	562.2	207.0	157.0	562.2	207.0	157.0	1,155,300	96,300	0.0	0.0	0.0	0.0
May-10	518.4	202.3	142.8	518.4	202.3	142.8	1,166,500	96,300	0.0	0.0	0.0	0.0
Jun-10	519.9	221.2	169.0	519.9	221.2	169.0	1,168,400	96,200	0.0	0.0	0.0	0.0
Jul-10	532.8	204.3	178.4	532.8	204.3	178.4	1,156,200	96,000	0.0	0.0	0.0	0.0
Aug-10	551.2	216.1	169.4	551.2	216.1	169.4	1,159,100	96,300	0.0	0.0	0.0	0.0
Sep-10	531.0	207.9	177.2	531.0	207.9	177.2	1,157,800	96,100	0.0	0.0	0.0	0.0
Oct-10	520.2	199.5	176.3	520.2	199.5	176.3	1,163,600	96,100	0.0	0.0	0.0	0.0
Nov-10	501.0	228.3	176.5	501.0	228.3	176.5	1,167,800	96,200	0.0	0.0	0.0	0.0
Dec-10	550.5	223.0	155.0	550.5	223.0	155.0	1,170,300	96,700	0.0	0.0	0.0	0.0
Jan-11	545.1	246.1	144.0	545.1	246.1	144.0	1,148,700	96,300	0.0	0.0	0.0	0.0
Feb-11	532.2	229.5	168.8	532.2	229.5	168.8	1,156,700	96,200	0.0	0.0	0.0	0.0
Mar-11	473.1	226.4	167.9	473.1	226.4	167.9	1,160,900	96,400	0.0	0.0	0.0	0.0
Apr-11	560.3	223.0	165.2	560.3	223.0	165.2	1,163,500	96,300	0.0	0.0	0.0	0.0
May-11	538.6	196.6	152.3	538.6	196.6	152.3	1,166,500	96,500	0.0	0.0	0.0	0.0
Jun-11	574.3	197.8	175.0	574.3	197.8	175.0	1,169,500	97,100	0.0	0.0	0.0	0.0
Jul-11	557.5	189.0	179.9	557.5	189.0	179.9	1,158,000	96,900	0.0	0.0	0.0	0.0
Aug-11	579.9	203.0	186.5	579.9	203.0	186.5	1,160,500	97,000	0.0	0.0	0.0	0.0
Sep-11	592.4	186.9	190.3	592.4	186.9	190.3	1,164,400	97,100	0.0	0.0	0.0	0.0
Oct-11	569.8	186.4	169.1	569.8	186.4	169.1	1,170,600	97,000	0.0	0.0	0.0	0.0
Nov-11	508.9	235.3	176.8	508.9	235.3	176.8	1,179,300	97,100	0.0	0.0	0.0	0.0
Dec-11	544.5	205.2	143.1	544.5	205.2	143.1	1,181,800	97,600	0.0	0.0	0.0	0.0
Jan-12	550.3	211.5	178.1	550.3	211.5	178.1	1,159,100	96,400	0.0	0.0	0.0	0.0
Feb-12	536.4	199.7	191.4	536.4	199.7	191.4	1,168,400	96,700	0.0	0.0	0.0	0.0
Mar-12	572.9	216.2	193.5	572.9	216.2	193.5	1,175,500	96,800	0.0	0.0	0.0	0.0
Apr-12	543.7	194.9	192.6	543.7	194.9	192.6	1,192,600	97,700	0.0	0.0	0.0	0.0
May-12	583.8	193.8	204.5	583.8	193.8	204.5	1,201,700	98,200	0.0	0.0	0.0	0.0
Jun-12	577.0	181.4	184.8	577.0	181.4	184.8	1,209,200	98,500	0.0	0.0	0.0	0.0
Jul-12	614.6	183.3	201.1	614.6	183.3	201.1	1,193,100	99,400	0.0	0.0	0.0	0.0
Aug-12	648.5	170.2	213.0	648.5	170.2	213.0	1,198,800	99,800	0.0	0.0	0.0	0.0
Sep-12	637.5	153.4	187.7	637.5	153.4	187.7	1,199,100	99,500	0.0	0.0	0.0	0.0
Oct-12	593.8	207.1	195.8	593.8	207.1	195.8	1,209,500	99,600	0.0	0.0	0.0	0.0
Nov-12	579.8	246.2	175.4	579.8	246.2	175.4	1,220,000	100,000	0.0	0.0	0.0	0.0
Dec-12	576.3	231.9	144.1	576.3	231.9	144.1	1,222,500	100,300	0.0	0.0	0.0	0.0
Jan-13	570.7	261.6	180.2	570.7	261.6	180.2	1,199,500	99,100	0.0	0.0	0.0	0.0
Feb-13	517.6	222.7	174.0	517.6	222.7	174.0	1,208,100	99,400	0.0	0.0	0.0	0.0
Mar-13	590.1	205.1	189.7	590.1	205.1	189.7	1,215,600	99,500	0.0	0.0	0.0	0.0
Apr-13	564.5	210.2	199.8	564.5	210.2	199.8	1,221,600	99,500	0.0	0.0	0.0	0.0
May-13	596.3	165.6	181.8	596.3	165.6	181.8	1,227,000	99,300	0.0	0.0	0.0	0.0
Jun-13	585.2	144.9	195.6	585.2	144.9	195.6	1,233,900	99,200	0.0	0.0	0.0	0.0
Jul-13	632.1	138.9	182.3	632.1	138.9	182.3	1,222,000	99,700	0.0	0.0	0.0	0.0
Aug-13	605.3	140.7	195.8	605.3	140.7	195.8	1,227,100	99,700	0.0	0.0	0.0	0.0
Sep-13	589.2	149.1	126.8	589.2	149.1	126.8	1,227,900	99,800	0.0	0.0	0.0	0.0
Oct-13	610.1	158.8	202.2	610.1	158.8	202.2	1,242,500	100,200	0.0	0.0	0.0	0.0
Nov-13	480.3	198.8	183.2	480.3	198.8	183.2	1,253,200	100,600	0.0	0.0	0.0	0.0
Dec-13	530.8	196.8	150.5	530.8	196.8	150.5	1,254,500	100,900	0.0	0.0	0.0	0.0

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.	Sm CoGen	Industrial
Month	Sm CoGen	Commercial	Industrial	Sm CoGen	Commercial	Industrial	ECSD	EISD	(MDth)	(MDth)	(MDth)	(MDth)
Jan-14	554.7	176.7	203.1	554.7	176.7	203.1	1,225,000	100,500	0.0	0.0	0.0	0.0
Feb-14	464.9	171.6	164.5	464.9	171.6	164.5	1,234,300	100,700	0.0	0.0	0.0	0.0
Mar-14	535.6	215.1	143.6	535.6	215.1	143.6	1,241,800	100,800	0.0	0.0	0.0	0.0
Apr-14	553.0	171.6	189.7	553.0	171.6	189.7	1,245,300	101,600	0.0	0.0	0.0	0.0
May-14	562.2	142.8	187.1	562.2	142.8	187.1	1,251,700	101,900	0.0	0.0	0.0	0.0
Jun-14	555.6	131.4	178.0	555.6	131.4	178.0	1,258,800	102,400	0.0	0.0	0.0	0.0
Jul-14	577.1	132.8	198.2	577.1	132.8	198.2	1,247,100	102,900	0.0	0.0	0.0	0.0
Aug-14	579.6	131.7	165.5	579.6	131.7	165.5	1,255,800	103,200	0.0	0.0	0.0	0.0
Sep-14	598.3	122.9	175.8	598.3	122.9	175.8	1,255,300	103,300	0.0	0.0	0.0	0.0
Oct-14	545.5	189.5	191.0	545.5	189.5	191.0	1,266,200	104,000	0.0	0.0	0.0	0.0
Nov-14	556.4	152.7	164.3	556.4	152.7	164.3	1,278,700	104,400	0.0	0.0	0.0	0.0
Dec-14	533.4	173.1	127.6	533.4	173.1	127.6	1,280,500	105,000	0.0	0.0	0.0	0.0
Jan-15	531.8	175.6	175.7	531.8	175.6	175.7	1,257,185	104,973	0.0	0.0	0.0	0.0
Feb-15	499.5	143.8	167.7	499.5	143.8	167.7	1,266,560	105,045	0.0	0.0	0.0	0.0
Mar-15	579.2	149.7	273.4	579.2	149.7	273.4	1,274,290	105,012	0.0	0.0	0.0	0.0
Apr-15	539.7	180.0	203.6	539.7	180.0	203.6	1,275,927	105,431	0.0	0.0	0.0	0.0
May-15	573.7	149.0	200.2	573.7	149.0	200.2	1,284,336	105,885	0.0	0.0	0.0	0.0
Jun-15	590.9	142.7	186.3	590.9	142.7	186.3	1,293,615	106,546	0.0	0.0	0.0	0.0
Jul-15	595.0	148.3	203.9	595.0	148.3	203.9	1,285,673	107,755	0.0	0.0	0.0	0.0
Aug-15	586.5	157.1	175.1	586.5	157.1	175.1	1,294,560	107,661	0.0	0.0	0.0	0.0
Sep-15	561.7	147.7	159.3	561.7	147.7	159.3	1,293,935	107,362	0.0	0.0	0.0	0.0
Oct-15	546.8	195.0	169.0	546.8	195.0	169.0	1,305,606	107,552	0.0	0.0	0.0	0.0
Nov-15	452.0	225.6	180.2	452.0	225.6	180.2	1,317,318	107,700	0.0	0.0	0.0	0.0
Dec-15	469.7	251.3	194.0	469.7	251.3	194.0	1,318,584	108,053	0.0	0.0	0.0	0.0
Jan-16	525.5	247.4	178.3	525.5	247.4	178.3	1,293,912	107,583	0.0	0.0	0.0	0.0
Feb-16	529.4	201.9	191.9	529.4	201.9	191.9	1,303,840	107,573	0.0	0.0	0.0	0.0
Mar-16	554.3	202.2	201.0	554.3	202.2	201.0	1,311,242	107,457	0.0	0.0	0.0	0.0
Apr-16	542.0	171.6	193.5	542.0	171.6	193.5	1,313,782	108,118	0.0	0.0	0.0	0.0
May-16	575.3	161.4	203.6	575.3	161.4	203.6	1,320,351	108,184	0.0	0.0	0.0	0.0
Jun-16	555.0	151.0	219.0	555.0	151.0	219.0	1,328,026	108,463	0.0	0.0	0.0	0.0
Jul-16	657.4	155.6	183.8	657.4	155.6	183.8	1,316,413	109,086	0.0	0.0	0.0	0.0
Aug-16	706.9	154.9	213.4	706.9	154.9	213.4	1,325,734	108,805	0.0	0.0	0.0	0.0
Sep-16	675.6	160.3	196.9	675.6	160.3	196.9	1,324,587	108,317	0.0	0.0	0.0	0.0
Oct-16	643.6	170.4	194.8	643.6	170.4	194.8	1,337,118	108,353	0.0	0.0	0.0	0.0
Nov-16	728.6	189.0	178.9	728.6	189.0	178.9	1,346,984	108,289	0.0	0.0	0.0	0.0
Dec-16	766.3	189.1	180.5	766.3	189.1	180.5	1,346,894	108,431	0.0	0.0	0.0	0.0
Jan-17	677.2	209.9	218.6	677.2	209.9	218.6	1,320,915	107,676	0.0	0.0	0.0	0.0
Feb-17	677.7	163.8	204.6	677.7	163.8	204.6	1,329,271	107,526	0.0	0.0	0.0	0.0
Mar-17	756.2	186.8	208.1	756.2	186.8	208.1	1,335,497	107,270	0.0	0.0	0.0	0.0
Apr-17	682.2	176.6	216.4	682.2	176.6	216.4	1,335,824	107,761	0.0	0.0	0.0	0.0
May-17	672.0	161.4	193.2	672.0	161.4	193.2	1,342,579	107,715	0.0	0.0	0.0	0.0
Jun-17	754.3	150.6	219.2	754.3	150.6	219.2	1,349,678	107,880	0.0	0.0	0.0	0.0
Jul-17	687.2	171.4	195.5	687.2	171.4	195.5	1,336,536	107,898	0.0	0.0	0.0	0.0
Aug-17	833.1	153.5	205.4	833.1	153.5	205.4	1,345,537	107,996	0.0	0.0	0.0	0.0
Sep-17	750.5	132.5	153.1	750.5	132.5	153.1	1,344,345	107,886	0.0	0.0	0.0	0.0
Oct-17	748.3	154.5	180.6	748.3	154.5	180.6	1,356,411	108,368	0.0	0.0	0.0	0.0
Nov-17	832.7	158.8	173.3	832.7	158.8	173.3	1,366,993	108,608	0.0	0.0	0.0	0.0
Dec-17	758.0	190.1	193.3	758.0	190.1	193.3	1,367,618	109,056	0.0	0.0	0.0	0.0

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.	Sm CoGen	Industrial
Month	Sm CoGen	Commercial	Industrial	Sm CoGen	Commercial	Industrial	ECSD	EISD	(MDth)	(MDth)	(MDth)	(MDth)
Jan-18	750.3	185.3	191.1	756.9	186.1	192.6	1,341,969	108,701	-0.9	-0.4	-6.6	-1.1
Feb-18	751.5	186.7	191.1	758.1	187.6	192.6	1,351,534	108,753	-0.9	-0.4	-6.6	-1.1
Mar-18	751.9	187.8	191.0	758.6	188.7	192.5	1,358,876	108,697	-0.9	-0.4	-6.6	-1.1
Apr-18	756.1	188.1	191.9	762.8	189.0	193.4	1,360,952	109,300	-0.9	-0.4	-6.6	-1.1
May-18	758.2	189.2	192.3	764.8	190.1	193.8	1,368,077	109,556	-0.9	-0.4	-6.7	-1.1
Jun-18	761.4	190.4	193.0	768.1	191.2	194.5	1,375,367	110,026	-0.9	-0.4	-6.7	-1.1
Jul-18	766.9	188.3	194.4	773.6	189.2	195.9	1,362,171	110,889	-0.9	-0.4	-6.7	-1.1
Aug-18	766.5	189.7	194.1	773.2	190.6	195.6	1,371,206	110,751	-0.9	-0.4	-6.7	-1.1
Sep-18	764.9	189.5	193.5	771.6	190.3	195.0	1,369,798	110,400	-0.9	-0.4	-6.7	-1.1
Oct-18	765.5	191.3	193.5	772.2	192.2	195.0	1,381,617	110,453	-0.9	-0.4	-6.7	-1.1
Nov-18	767.0	192.9	193.8	773.7	193.8	195.3	1,392,151	110,663	-0.9	-0.4	-6.7	-1.1
Dec-18	769.7	193.1	194.5	776.5	193.9	196.0	1,392,919	111,085	-0.9	-0.4	-6.8	-1.1
Jan-19	767.0	188.2	193.5	774.8	189.8	195.5	1,366,701	110,764	-1.6	-0.8	-7.8	-1.1
Feb-19	766.9	189.8	193.4	774.7	191.4	195.3	1,376,964	110,709	-1.6	-0.8	-7.8	-1.1
Mar-19	766.1	191.1	193.1	773.9	192.7	195.1	1,384,904	110,545	-1.6	-0.8	-7.8	-1.1
Apr-19	769.6	191.5	194.1	777.4	193.1	196.0	1,387,704	111,115	-1.6	-0.8	-7.8	-1.1
May-19	770.2	192.6	194.2	778.1	194.3	196.1	1,395,158	111,203	-1.6	-0.8	-7.8	-1.1
Jun-19	772.1	193.8	194.7	780.0	195.4	196.6	1,402,578	111,509	-1.6	-0.8	-7.9	-1.1
Jul-19	775.3	191.8	195.5	783.2	193.4	197.5	1,389,652	112,048	-1.6	-0.8	-7.9	-1.1
Aug-19	774.6	193.2	195.3	782.5	194.8	197.2	1,398,535	111,899	-1.6	-0.8	-7.9	-1.1
Sep-19	772.6	192.9	194.7	780.4	194.5	196.6	1,396,785	111,536	-1.6	-0.8	-7.9	-1.1
Oct-19	773.3	194.7	194.9	781.2	196.3	196.8	1,408,412	111,651	-1.6	-0.8	-7.9	-1.1
Nov-19	774.2	196.3	195.1	782.0	197.9	197.0	1,418,769	111,785	-1.6	-0.8	-7.9	-1.1
Dec-19	776.2	196.4	195.6	784.1	198.0	197.6	1,419,371	112,133	-1.6	-0.8	-7.9	-1.1
Jan-20	773.6	191.2	194.4	781.4	193.8	196.8	1,392,440	111,653	-2.6	-1.3	-7.8	-1.1
Feb-20	773.3	192.8	194.3	781.1	195.5	196.7	1,402,913	111,597	-2.6	-1.3	-7.8	-1.1
Mar-20	772.4	194.1	194.0	780.2	196.7	196.4	1,411,025	111,430	-2.6	-1.3	-7.8	-1.1
Apr-20	775.7	194.8	194.9	783.5	197.4	197.3	1,415,351	111,994	-2.6	-1.3	-7.8	-1.1
May-20	776.3	195.7	195.1	784.1	198.3	197.5	1,421,524	112,091	-2.6	-1.3	-7.8	-1.1
Jun-20	778.1	196.7	195.6	786.0	199.3	198.0	1,427,587	112,407	-2.6	-1.3	-7.9	-1.1
Jul-20	781.7	194.4	196.6	789.5	197.0	199.0	1,412,853	113,021	-2.6	-1.3	-7.9	-1.1
Aug-20	780.5	195.6	196.2	788.4	198.2	198.7	1,420,689	112,817	-2.6	-1.3	-7.9	-1.1
Sep-20	778.1	195.1	195.6	786.0	197.8	198.0	1,417,753	112,397	-2.6	-1.3	-7.9	-1.1
Oct-20	778.6	196.7	195.7	786.4	199.4	198.1	1,428,068	112,472	-2.6	-1.3	-7.9	-1.1
Nov-20	779.0	198.2	195.8	786.8	200.8	198.2	1,437,617	112,540	-2.6	-1.3	-7.9	-1.1
Dec-20	780.6	198.2	196.2	788.5	200.8	198.7	1,437,359	112,824	-2.6	-1.3	-7.9	-1.1
Jan-21	776.5	192.7	194.6	785.2	196.5	197.7	1,409,955	112,258	-3.9	-1.9	-8.7	-1.2
Feb-21	775.9	194.1	194.4	784.6	198.0	197.5	1,419,167	112,152	-3.9	-1.9	-8.7	-1.2
Mar-21	774.7	195.2	194.1	783.4	199.0	197.2	1,426,000	111,936	-3.9	-1.9	-8.7	-1.2
Apr-21	777.8	195.4	195.0	786.5	199.3	198.1	1,427,349	112,470	-3.9	-1.9	-8.7	-1.2
May-21	778.0	196.4	195.0	786.7	200.3	198.1	1,433,914	112,502	-3.9	-1.9	-8.7	-1.2
Jun-21	779.4	197.4	195.4	788.1	201.3	198.5	1,440,247	112,753	-3.9	-1.9	-8.7	-1.2
Jul-21	782.2	195.2	196.2	791.0	199.1	199.3	1,426,098	113,245	-3.9	-1.9	-8.8	-1.2
Aug-21	781.0	196.4	195.9	789.8	200.3	199.0	1,433,932	113,034	-3.9	-1.9	-8.7	-1.2
Sep-21	778.6	196.0	195.2	787.3	199.8	198.3	1,430,962	112,607	-3.9	-1.9	-8.7	-1.2
Oct-21	778.9	197.6	195.3	787.6	201.5	198.4	1,441,505	112,662	-3.9	-1.9	-8.7	-1.2
Nov-21	779.4	199.0	195.4	788.1	202.9	198.5	1,450,861	112,739	-3.9	-1.9	-8.7	-1.2
Dec-21	781.0	199.0	195.9	789.8	202.8	199.0	1,450,336	113,030	-3.9	-1.9	-8.7	-1.2

SDGE Noncore Commercial, Industrial and Small 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.	Sm CoGen	Industrial
Month	Sm CoGen	Commercial	Industrial	Sm CoGen	Commercial	Industrial	ECSD	EISD	(MDth)	(MDth)	(MDth)	(MDth)
Jan-22	776.7	193.4	194.3	786.7	198.5	198.1	1,422,611	112,493	-5.1	-2.5	-10.0	-1.4
Feb-22	776.0	194.8	194.1	786.0	199.9	197.9	1,431,732	112,373	-5.1	-2.5	-10.0	-1.4
Mar-22	774.7	195.9	193.7	784.6	201.0	197.5	1,438,419	112,142	-5.1	-2.5	-9.9	-1.4
Apr-22	777.6	196.0	194.5	787.6	201.1	198.3	1,439,436	112,645	-5.1	-2.5	-10.0	-1.4
May-22	777.8	197.0	194.6	787.8	202.1	198.4	1,445,969	112,679	-5.1	-2.5	-10.0	-1.4
Jun-22	779.2	198.0	195.0	789.2	203.1	198.8	1,452,218	112,935	-5.1	-2.5	-10.0	-1.4
Jul-22	782.2	195.8	195.8	792.2	200.9	199.7	1,437,808	113,453	-5.1	-2.5	-10.0	-1.4
Aug-22	780.9	197.0	195.5	790.9	202.1	199.3	1,445,667	113,222	-5.1	-2.5	-10.0	-1.4
Sep-22	778.3	196.5	194.7	788.3	201.6	198.6	1,442,666	112,775	-5.1	-2.5	-10.0	-1.4
Oct-22	778.6	198.2	194.8	788.6	203.3	198.6	1,453,351	112,824	-5.1	-2.5	-10.0	-1.4
Nov-22	778.9	199.6	194.9	788.9	204.7	198.7	1,462,596	112,867	-5.1	-2.5	-10.0	-1.4
Dec-22	780.3	199.5	195.3	790.4	204.6	199.1	1,461,898	113,126	-5.1	-2.5	-10.0	-1.4
Jan-23	777.2	193.8	193.7	787.0	200.3	198.2	1,434,089	112,541	-6.5	-3.1	-9.7	-1.4
Feb-23	776.4	195.2	193.4	786.1	201.7	197.9	1,443,057	112,401	-6.5	-3.1	-9.7	-1.4
Mar-23	775.0	196.2	193.0	784.7	202.7	197.5	1,449,571	112,150	-6.5	-3.1	-9.7	-1.4
Apr-23	777.8	196.3	193.8	787.5	202.8	198.3	1,450,217	112,634	-6.5	-3.1	-9.7	-1.4
May-23	777.9	197.3	193.8	787.6	203.8	198.4	1,456,690	112,649	-6.5	-3.1	-9.7	-1.4
Jun-23	779.2	198.3	194.2	789.0	204.8	198.7	1,462,800	112,884	-6.5	-3.1	-9.7	-1.4
Jul-23	781.9	196.0	195.0	791.7	202.5	199.5	1,448,139	113,360	-6.5	-3.1	-9.8	-1.4
Aug-23	780.6	197.2	194.6	790.4	203.7	199.1	1,455,878	113,131	-6.5	-3.1	-9.8	-1.4
Sep-23	778.1	196.7	193.9	787.8	203.2	198.4	1,452,715	112,687	-6.5	-3.1	-9.7	-1.4
Oct-23	778.3	198.3	194.0	788.0	204.8	198.5	1,463,352	112,719	-6.5	-3.1	-9.7	-1.4
Nov-23	778.6	199.7	194.1	788.4	206.2	198.6	1,472,374	112,783	-6.5	-3.1	-9.7	-1.4
Dec-23	780.2	199.6	194.5	790.0	206.1	199.0	1,471,466	113,062	-6.5	-3.1	-9.8	-1.4

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 small cogeneration (capacity < 20 Mw), large cogeneration (capacity > 20 Mw) and Power Plant gas demand.

The gas demand forecast for small cogeneration is discussed in previous section. Small cogeneration gas demand is billed according to the two-tiered EG rate structure. The projected gas demand by tier assigns 28.746% of the total cogeneration demand to tier 1; the remaining 71.254% is assigned to tier 2. These ratios are calculated based on 2017 historical data. Tables 1a and 1b show the monthly forecasts of cogeneration gas demand by EG rate tier.

The gas demand forecasts for large cogeneration and Power Plant are provided by Mr. Huang based on the power market simulation model he uses. Forecast details are discussed by Mr. Huang in his prepared testimony and his workpapers. Large cogeneration and Power plant gas demand is also billed at the EG rate structure. Tables 2a and 2b show the monthly forecasts of power plant gas demand by EG rate tier

Using the August 2020 data as an example, the resulting EG-tier1 and EG-tier 2 forecasts of gas demand would be:

Tier 1:

EG-Tier1_MDth = (224.4 MDth for Small CoGen)
+ (117.1 MDth for Large CoGen/Power Plant)
= (341.4 MDth).

Tier 2:

EG-Tier2_MDth = (556.1 MDth for Small CoGen)
+ (5,886.5 MDth for Large CoGen/Power Plant)
EG-Tier2_MDth = (6,442.6 MDth).

Note that the calculations above may reflect small rounding errors.

These results (noting that 1 MDth = 10 MTherms) are consistent with values 3,414 MTherms and data 64,426 MTherms, respectively, for tier1 and tier2 gas demand shown in the SDG&E consolidated gas demand forecast work papers for August 2020.

Table 1a Small Cogeneration Gas Demand (1/2)

Year	Month	Total Small CoGen (MDth)	Small CoGen Tier 1 (Mdth)	Small CoGen Tier 2 (Mdth)
2017	Jan	677.2	272.6	404.5
2017	Feb	677.7	285.2	392.5
2017	Mar	756.2	197.2	559.0
2017	Apr	682.2	205.0	477.2
2017	May	672.0	210.7	461.3
2017	Jun	754.3	205.4	548.9
2017	Jul	687.2	186.1	501.1
2017	Aug	833.1	209.2	623.9
2017	Sep	750.5	199.2	551.3
2017	Oct	748.3	179.3	569.1
2017	Nov	832.7	200.1	632.6
2017	Dec	758.0	188.1	569.9
2018	Jan	750.3	215.7	534.6
2018	Feb	751.5	216.0	535.5
2018	Mar	751.9	216.2	535.8
2018	Apr	756.1	217.4	538.8
2018	May	758.2	217.9	540.2
2018	Jun	761.4	218.9	542.5
2018	Jul	766.9	220.4	546.4
2018	Aug	766.5	220.3	546.2
2018	Sep	764.9	219.9	545.0
2018	Oct	765.5	220.0	545.4
2018	Nov	767.0	220.5	546.5
2018	Dec	769.7	221.3	548.4
2019	Jan	767.0	220.5	546.5
2019	Feb	766.9	220.5	546.5
2019	Mar	766.1	220.2	545.9
2019	Apr	769.6	221.2	548.4
2019	May	770.2	221.4	548.8
2019	Jun	772.1	222.0	550.2
2019	Jul	775.3	222.9	552.5
2019	Aug	774.6	222.7	551.9
2019	Sep	772.6	222.1	550.5
2019	Oct	773.3	222.3	551.0
2019	Nov	774.2	222.5	551.6
2019	Dec	776.2	223.1	553.1
2020	Jan	773.6	222.4	551.2
2020	Feb	773.3	222.3	551.0
2020	Mar	772.4	222.0	550.4
2020	Apr	775.7	223.0	552.7
2020	May	776.3	223.1	553.1
2020	Jun	778.1	223.7	554.4

Table 1b Small Cogeneration Gas Demand (2/2)

Year	Month	Total Small CoGen (MDth)	Small CoGen Tier 1 (Mdth)	Small CoGen Tier 2 (Mdth)
2020	Jul	781.7	224.7	557.0
2020	Aug	780.5	224.4	556.1
2020	Sep	778.1	223.7	554.4
2020	Oct	778.6	223.8	554.8
2020	Nov	779.0	223.9	555.0
2020	Dec	780.6	224.4	556.2
2021	Jan	776.5	223.2	553.3
2021	Feb	775.9	223.1	552.9
2021	Mar	774.7	222.7	552.0
2021	Apr	777.8	223.6	554.2
2021	May	778.0	223.6	554.3
2021	Jun	779.4	224.1	555.4
2021	Jul	782.2	224.9	557.4
2021	Aug	781.0	224.5	556.5
2021	Sep	778.6	223.8	554.8
2021	Oct	778.9	223.9	555.0
2021	Nov	779.4	224.0	555.3
2021	Dec	781.0	224.5	556.5
2022	Jan	776.7	223.3	553.4
2022	Feb	776.0	223.1	552.9
2022	Mar	774.7	222.7	552.0
2022	Apr	777.6	223.5	554.0
2022	May	777.8	223.6	554.2
2022	Jun	779.2	224.0	555.2
2022	Jul	782.2	224.9	557.4
2022	Aug	780.9	224.5	556.4
2022	Sep	778.3	223.7	554.6
2022	Oct	778.6	223.8	554.8
2022	Nov	778.9	223.9	555.0
2022	Dec	780.3	224.3	556.0
2023	Jan	777.2	223.4	553.8
2023	Feb	776.4	223.2	553.2
2023	Mar	775.0	222.8	552.2
2023	Apr	777.8	223.6	554.2
2023	May	777.9	223.6	554.3
2023	Jun	779.2	224.0	555.2
2023	Jul	781.9	224.8	557.2
2023	Aug	780.6	224.4	556.2
2023	Sep	778.1	223.7	554.4
2023	Oct	778.3	223.7	554.5
2023	Nov	778.6	223.8	554.8
2023	Dec	780.2	224.3	555.9

Table 2a Large Cogeneration / Power Plant Gas Demand (1/2)

Year	Month	Total Lg CoGen/PowerPlant (MDth)	Lg CoGen/PowerPlant Tier 1 (Mdth)	Lg CoGen/PowerPlant Tier 2 (Mdth)
2017	Jan	4,908.8	11.8	4,897.0
2017	Feb	3,868.3	24.8	3,843.5
2017	Mar	3,108.0	43.3	3,064.7
2017	Apr	3,021.2	54.9	2,966.4
2017	May	3,574.4	51.4	3,523.0
2017	Jun	4,779.5	115.5	4,664.1
2017	Jul	5,550.8	77.4	5,473.4
2017	Aug	6,290.3	130.6	6,159.6
2017	Sep	5,411.6	94.1	5,317.5
2017	Oct	5,717.9	122.6	5,595.3
2017	Nov	3,740.3	109.1	3,631.3
2017	Dec	3,175.8	78.3	3,097.5
2018	Jan	3,032.9	0.8	3,032.1
2018	Feb	2,501.8	12.2	2,489.6
2018	Mar	1,718.3	9.5	1,708.7
2018	Apr	3,338.1	14.6	3,323.5
2018	May	3,414.4	45.7	3,368.6
2018	Jun	2,990.9	70.9	2,920.0
2018	Jul	6,004.5	133.2	5,871.3
2018	Aug	6,204.2	154.0	6,050.2
2018	Sep	5,698.0	146.0	5,552.0
2018	Oct	4,300.0	134.2	4,165.8
2018	Nov	4,347.5	121.6	4,225.9
2018	Dec	4,024.6	0.3	4,024.3
2019	Jan	3,589.7	0.0	3,589.7
2019	Feb	2,318.6	1.0	2,317.6
2019	Mar	2,871.5	0.0	2,871.5
2019	Apr	3,440.9	4.3	3,436.6
2019	May	3,395.7	9.6	3,386.0
2019	Jun	3,149.5	44.9	3,104.6
2019	Jul	4,611.7	119.7	4,492.0
2019	Aug	6,256.2	137.2	6,119.0
2019	Sep	5,824.8	147.4	5,677.4
2019	Oct	4,201.7	29.7	4,172.0
2019	Nov	2,663.3	4.8	2,658.5
2019	Dec	3,554.2	0.3	3,553.9
2020	Jan	4,191.7	0.0	4,191.7
2020	Feb	2,915.6	1.9	2,913.6
2020	Mar	2,717.9	0.0	2,717.9
2020	Apr	2,852.8	0.3	2,852.5
2020	May	2,704.4	4.9	2,699.5
2020	Jun	2,751.2	35.6	2,715.6

Table 2b Large Cogeneration / Power Plant Gas Demand (2/2)

Year	Month	Total Lg CoGen/PowerPlant (MDth)	Lg CoGen/PowerPlant Tier 1 (Mdth)	Lg CoGen/PowerPlant Tier 2 (Mdth)
2020	Jul	5,110.7	79.4	5,031.4
2020	Aug	6,003.5	117.1	5,886.5
2020	Sep	5,441.9	102.4	5,339.5
2020	Oct	3,877.1	4.6	3,872.5
2020	Nov	2,313.0	0.0	2,313.0
2020	Dec	3,317.6	0.0	3,317.6
2021	Jan	3,479.6	0.0	3,479.6
2021	Feb	2,645.9	0.5	2,645.4
2021	Mar	2,201.9	0.0	2,201.9
2021	Apr	2,913.7	0.0	2,913.7
2021	May	2,792.9	0.0	2,792.9
2021	Jun	3,163.1	13.2	3,150.0
2021	Jul	5,165.1	85.4	5,079.7
2021	Aug	5,957.4	105.2	5,852.2
2021	Sep	5,059.2	70.1	4,989.1
2021	Oct	4,680.2	0.0	4,680.2
2021	Nov	2,668.3	0.0	2,668.3
2021	Dec	3,224.7	0.0	3,224.7
2022	Jan	3,412.7	0.0	3,412.7
2022	Feb	2,434.3	0.0	2,434.3
2022	Mar	2,341.6	0.0	2,341.6
2022	Apr	3,027.8	0.0	3,027.8
2022	May	2,688.0	0.0	2,688.0
2022	Jun	3,129.5	17.2	3,112.3
2022	Jul	4,612.1	67.0	4,545.1
2022	Aug	5,532.9	111.5	5,421.3
2022	Sep	4,627.3	52.1	4,575.2
2022	Oct	4,391.8	0.0	4,391.8
2022	Nov	3,168.0	0.0	3,168.0
2022	Dec	3,541.5	0.0	3,541.5
2023	Jan	3,129.5	0.0	3,129.5
2023	Feb	2,645.9	0.0	2,645.9
2023	Mar	2,787.1	0.0	2,787.1
2023	Apr	2,738.8	0.0	2,738.8
2023	May	2,847.3	0.0	2,847.3
2023	Jun	3,194.2	2.6	3,191.7
2023	Jul	4,561.7	53.4	4,508.4
2023	Aug	5,408.5	65.2	5,343.3
2023	Sep	4,167.2	31.3	4,135.9
2023	Oct	3,397.5	0.0	3,397.5
2023	Nov	3,341.8	0.0	3,341.8
2023	Dec	3,429.3	0.0	3,429.3

SoCalGas Other Wholesale Gas Demand

Gas Demand Forecast for Wholesale Customers Other than SDG&E

Workpapers 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 2018 through 2023 for core and noncore market segments. The gas consumption shown for 2017 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 (2018-2023) Average Year HDD:

Market	Temp	Year	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6
Core	Avg Hdd	2018	711.9	701.6	717.7	592.0	475.0	389.3
Noncore	Avg Hdd	2018	130.4	134.9	119.0	120.1	110.0	107.5
Core	Avg Hdd	2019	715.8	702.7	720.8	594.2	476.1	390.7
Noncore	Avg Hdd	2019	129.5	132.1	113.0	114.8	104.8	105.4
Core	Avg Hdd	2020	716.4	721.2	722.8	596.5	478.1	391.7
Noncore	Avg Hdd	2020	129.3	129.2	114.8	117.6	106.3	105.4
Core	Avg Hdd	2021	720.3	707.4	726.3	598.4	479.6	393.2
Noncore	Avg Hdd	2021	130.3	130.0	115.8	117.6	108.0	106.3
Core	Avg Hdd	2022	721.2	711.2	727.7	601.1	481.3	394.3
Noncore	Avg Hdd	2022	128.4	129.3	113.5	116.3	106.3	105.4
Core	Avg Hdd	2023	724.8	712.1	731.4	602.6	483.2	395.8
Noncore	Avg Hdd	2023	129.2	131.3	115.4	117.5	107.1	106.0

Table CLB-1b City of Long Beach Gas Demand (2018-2023) Average Year HDD:

Market	Temp	Year	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	**TOTAL**
Core	Avg Hdd	2018	384.0	366.1	395.3	412.5	601.2	792.0	**6,538.7**
Noncore	Avg Hdd	2018	101.5	117.6	102.2	102.4	113.1	133.1	**1,391.8**
Core	Avg Hdd	2019	384.9	367.3	396.3	413.7	602.6	796.1	**6,561.3**
Noncore	Avg Hdd	2019	97.7	110.7	95.2	99.3	107.1	128.4	**1,338.1**
Core	Avg Hdd	2020	386.3	368.2	397.6	414.8	605.1	797.6	**6,596.3**
Noncore	Avg Hdd	2020	101.0	114.5	98.9	101.6	110.5	131.9	**1,360.9**
Core	Avg Hdd	2021	387.3	369.5	398.6	416.1	606.7	801.3	**6,604.5**
Noncore	Avg Hdd	2021	99.3	113.6	98.1	100.9	109.2	130.4	**1,359.7**
Core	Avg Hdd	2022	388.7	370.4	399.9	417.2	608.9	803.2	**6,625.1**
Noncore	Avg Hdd	2022	99.2	112.7	97.2	100.5	108.6	130.1	**1,347.3**
Core	Avg Hdd	2023	389.7	371.8	400.9	418.5	610.6	806.5	**6,647.9**
Noncore	Avg Hdd	2023	100.4	114.5	98.9	101.3	110.4	131.3	**1,363.2**

Table CLB-2a City of Long Beach Gas Demand (2018-2023) Cold Year HDD:

Market	Temp	Year	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6
Core	Cold Hdd	2018	817.3	802.5	805.9	650.5	501.0	402.5
Noncore	Cold Hdd	2018	134.2	138.7	122.5	123.6	113.2	110.6
Core	Cold Hdd	2019	821.6	804.0	809.3	652.9	502.1	403.9
Noncore	Cold Hdd	2019	133.2	135.9	116.3	118.1	107.9	108.5
Core	Cold Hdd	2020	822.5	823.3	811.6	655.4	504.2	404.9
Noncore	Cold Hdd	2020	133.0	132.9	118.1	121.0	109.4	108.5
Core	Cold Hdd	2021	826.8	809.4	815.4	657.5	505.7	406.5
Noncore	Cold Hdd	2021	134.1	133.8	119.2	121.0	111.1	109.5
Core	Cold Hdd	2022	828.1	813.6	817.1	660.4	507.6	407.6
Noncore	Cold Hdd	2022	132.1	133.0	116.8	119.7	109.4	108.5
Core	Cold Hdd	2023	832.1	814.8	821.1	662.1	509.5	409.1
Noncore	Cold Hdd	2023	133.0	135.1	118.8	120.9	110.2	109.1

Table CLB-2b City of Long Beach Gas Demand (2018-2023) Cold Year HDD:

Market	Temp	Year	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	**TOTAL**
Core	Cold Hdd	2018	394.9	376.6	406.8	430.8	662.8	911.9	**7,163.4**
Noncore	Cold Hdd	2018	104.5	121.1	105.2	105.4	116.4	136.9	**1,432.4**
Core	Cold Hdd	2019	395.9	377.8	407.7	432.0	664.4	916.5	**7,188.2**
Noncore	Cold Hdd	2019	100.6	114.0	98.0	102.2	110.3	132.1	**1,377.2**
Core	Cold Hdd	2020	397.3	378.7	409.0	433.2	667.1	918.4	**7,225.7**
Noncore	Cold Hdd	2020	104.0	117.9	101.9	104.6	113.7	135.7	**1,400.7**
Core	Cold Hdd	2021	398.3	380.0	410.1	434.5	668.9	922.5	**7,235.7**
Noncore	Cold Hdd	2021	102.3	116.9	101.0	103.9	112.4	134.2	**1,399.4**
Core	Cold Hdd	2022	399.8	381.0	411.4	435.7	671.4	924.9	**7,258.5**
Noncore	Cold Hdd	2022	102.1	116.0	100.1	103.5	111.7	133.9	**1,386.7**
Core	Cold Hdd	2023	400.8	382.4	412.5	437.1	673.3	928.6	**7,283.5**
Noncore	Cold Hdd	2023	103.3	117.8	101.8	104.3	113.6	135.1	**1,403.0**

SOUTHWEST GAS

The gas demand forecasts for Southwest Gas (SWG) were provided by SWG for 2018 through 2023; the gas consumption shown for 2017 in the consolidated gas demand tables are recorded deliveries (billing month basis and excluded 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 and noncore) is based on the gas demand forecast provided by SWG.

Table SWG -1a SCG Deliveries to Southwest Gas (2018-2023) Average Year HDD:

Market	Temp	Year	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6
Core	Avg Hdd	2018	1,013.0	848.2	663.6	490.8	280.7	222.2
Noncore	Avg Hdd	2018	39.6	42.8	40.9	36.3	33.7	34.9
Core	Avg Hdd	2019	1,022.4	856.1	669.8	495.4	283.4	224.3
Noncore	Avg Hdd	2019	39.6	42.8	40.9	36.3	33.7	34.9
Core	Avg Hdd	2020	1,031.8	875.4	675.9	500.0	285.9	226.3
Noncore	Avg Hdd	2020	39.6	42.8	40.9	36.3	33.7	34.9
Core	Avg Hdd	2021	1,041.3	871.8	682.1	504.5	288.5	228.4
Noncore	Avg Hdd	2021	39.6	42.8	40.9	36.3	33.7	34.9
Core	Avg Hdd	2022	1,050.7	879.7	688.3	509.1	291.1	230.4
Noncore	Avg Hdd	2022	39.6	42.8	40.9	36.3	33.7	34.9
Core	Avg Hdd	2023	1,060.1	887.6	694.4	513.7	293.7	232.4
Noncore	Avg Hdd	2023	39.6	42.8	40.9	36.3	33.7	34.9

Table SWG -1b SCG Deliveries to Southwest Gas (2018-2023) Average Year HDD:

Market	Temp	Year	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	**TOTAL**
Core	Avg Hdd	2018	206.5	206.3	200.9	287.9	603.1	1,004.4	**6,027.6**
Noncore	Avg Hdd	2018	32.8	34.3	32.1	35.4	38.1	43.3	**444.3**
Core	Avg Hdd	2019	208.4	208.2	202.7	290.6	608.7	1,013.6	**6,083.4**
Noncore	Avg Hdd	2019	32.8	34.3	32.1	35.4	38.1	43.3	**444.3**
Core	Avg Hdd	2020	210.3	210.1	204.6	293.2	614.3	1,022.9	**6,150.7**
Noncore	Avg Hdd	2020	32.8	34.3	32.1	35.4	38.1	43.3	**444.3**
Core	Avg Hdd	2021	212.2	211.9	206.4	295.9	619.9	1,032.1	**6,195.0**
Noncore	Avg Hdd	2021	32.8	34.3	32.1	35.4	38.1	43.3	**444.3**
Core	Avg Hdd	2022	214.0	213.9	208.2	298.6	625.4	1,041.4	**6,250.8**
Noncore	Avg Hdd	2022	32.8	34.3	32.1	35.4	38.1	43.3	**444.3**
Core	Avg Hdd	2023	215.9	215.8	210.1	301.2	631.0	1,050.6	**6,306.6**
Noncore	Avg Hdd	2023	32.8	34.3	32.1	35.4	38.1	43.3	**444.3**

Table SWG -2a SoCalGas Deliveries to Southwest Gas (2018-2023) Cold Year HDD:

Market	Temp	Year	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6
Core	Avg Hdd	2018	1,177.2	904.0	725.7	527.2	295.6	226.9
Noncore	Avg Hdd	2018	43.4	45.7	46.5	40.4	35.2	35.6
Core	Avg Hdd	2019	1,188.2	912.4	732.5	532.1	298.4	229.0
Noncore	Avg Hdd	2019	43.4	45.7	46.5	40.4	35.2	35.6
Core	Avg Hdd	2020	1,199.1	932.2	739.2	537.0	301.1	231.1
Noncore	Avg Hdd	2020	43.4	45.7	46.5	40.4	35.2	35.6
Core	Avg Hdd	2021	1,210.1	929.2	746.0	542.0	303.8	233.1
Noncore	Avg Hdd	2021	43.4	45.7	46.5	40.4	35.2	35.6
Core	Avg Hdd	2022	1,221.1	937.6	752.7	546.9	306.5	235.2
Noncore	Avg Hdd	2022	43.4	45.7	46.5	40.4	35.2	35.6
Core	Avg Hdd	2023	1,232.1	945.9	759.4	551.8	309.3	237.3
Noncore	Avg Hdd	2023	43.4	45.7	46.5	40.4	35.2	35.6

Table SWG -2b SoCalGas Deliveries to Southwest Gas (2018-2023) Cold Year HDD:

Market	Temp	Year	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	**TOTAL**
Core	Avg Hdd	2018	206.5	206.3	203.6	302.8	662.4	1,082.1	**6,520.2**
Noncore	Avg Hdd	2018	32.8	34.3	33.1	37.4	42.7	46.3	**473.3**
Core	Avg Hdd	2019	208.4	208.2	205.4	305.6	668.5	1,092.1	**6,580.7**
Noncore	Avg Hdd	2019	32.8	34.3	33.1	37.4	42.7	46.3	**473.3**
Core	Avg Hdd	2020	210.3	210.1	207.3	308.4	674.6	1,102.1	**6,652.5**
Noncore	Avg Hdd	2020	32.8	34.3	33.1	37.4	42.7	46.3	**473.3**
Core	Avg Hdd	2021	212.2	211.9	209.2	311.2	680.8	1,112.0	**6,701.5**
Noncore	Avg Hdd	2021	32.8	34.3	33.1	37.4	42.7	46.3	**473.3**
Core	Avg Hdd	2022	214.0	213.9	211.0	314.1	686.9	1,122.0	**6,761.9**
Noncore	Avg Hdd	2022	32.8	34.3	33.1	37.4	42.7	46.3	**473.3**
Core	Avg Hdd	2023	215.9	215.8	212.9	316.9	693.0	1,132.0	**6,822.3**
Noncore	Avg Hdd	2023	32.8	34.3	33.1	37.4	42.7	46.3	**473.3**

CITY OF VERNON

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

Table COV-1 City of Vernon Demand (2018-2023):

Year	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6
2018	702.3	647.4	710.3	702.2	727.5	743.6
2019	726.1	661.4	770.1	803.6	828.9	805.3
2020	797.2	688.6	735.4	788.3	765.7	776.2
2021	783.9	683.8	744.6	775.3	765.9	789.1
2022	783.4	696.8	756.0	758.7	772.5	787.5
2023	756.9	695.9	756.0	728.6	762.1	772.3

Table COV-2 City of Vernon Demand (2018-2023):

Year	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	**TOTAL**
2018	841.3	818.8	817.0	822.6	784.3	727.1	**9,044.4**
2019	913.7	923.3	919.8	891.6	740.3	755.9	**9,740.0**
2020	879.4	917.3	905.8	869.3	758.7	779.9	**9,661.8**
2021	904.1	927.1	912.1	882.8	762.0	790.6	**9,721.3**
2022	886.5	897.9	890.3	880.9	766.7	806.7	**9,683.9**
2023	867.0	849.0	831.7	779.2	750.3	764.4	**9,313.4**

ECOGAS

The monthly data for year 2017 shown in the consolidated gas demand tables are from SoCalGas' recorded data; the monthly forecasts for years 2018 through 2023 were provided from this wholesale customer's staff. These values are the same as those shown in the SoCalGas Consolidated Gas Demand Forecast workpapers.

Table ECOGAS -1 ECOGAS Demand (2018-2023):

Year	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6
2018	884.4	827.6	893.2	850.1	893.1	864.3
2019	977.3	882.7	977.3	945.8	977.3	945.8
2020	982.2	918.8	982.2	950.5	982.2	950.5
2021	987.1	887.1	987.1	955.3	987.1	955.3
2022	992.0	891.6	992.0	960.0	992.0	960.0
2023	997.0	896.0	997.0	964.8	997.0	964.8

Table ECOGAS -2 ECOGAS Demand (2018-2023):

Year	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	**TOTAL**
2018	893.1	893.1	935.7	964.5	935.7	972.4	**10,807.1**
2019	977.3	977.3	945.8	977.3	945.8	977.3	**11,506.9**
2020	982.2	982.2	950.5	982.2	950.5	982.2	**11,596.1**
2021	987.1	987.1	955.3	987.1	955.3	987.1	**11,617.8**
2022	992.0	992.0	960.0	992.0	960.0	992.0	**11,675.9**
2023	997.0	997.0	964.8	997.0	964.8	997.0	**11,734.3**

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

Table of Contents

I. Conversion Between Energy and Volumetric Units

The estimated conversion of Dth to Mcf was calculated from SoCalGas' system-wide gas consumption for year 2017. The value we've used is 1.0343.

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 are tracked via the SoCalGas 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 are calculated over the time frame of April 2015 through March 2018. Table 1 below shows the monthly data and the summary calculations.

Table 1

SoCalGas Company Use Fuel Data as Percentage of Receipts

						Receipts
Month	Transmission	Storage	"Other"	Total		PGA: Net Avail.-for Disposition
	(Dth)	(Dth)	(Dth)	(Dth)		(Dth)
Apr-15	162,669	371,480	25,072	559,220		69,403,860
May-15	159,523	321,735	55,425	536,683		67,248,949
Jun-15	177,841	181,703	15,699	375,243		75,083,321
Jul-15	196,664	226,686	12,828	436,179		80,950,313
Aug-15	209,164	238,108	38,001	485,273		84,821,668
Sep-15	200,282	289,915	19,986	510,184		82,098,130
Oct-15	168,596	277,547	50,721	496,864		79,017,068
Nov-15	130,189	71,489	21,595	223,273		81,859,450
Dec-15	137,001	95,595	16,310	248,907		104,292,154
Jan-16	124,170	75,226	103,444	302,840		101,540,928
Feb-16	91,464	38,262	24,779	154,505		77,286,463
Mar-16	91,112	53,859	19,497	164,468		72,848,752
Apr-16	68,022	48,011	15,460	131,493		66,725,644
May-16	74,079	64,849	21,140	160,067		78,107,779
Jun-16	93,238	93,629	13,975	200,842		72,693,976
Jul-16	101,097	75,106	17,550	193,753		77,314,439
Aug-16	125,831	68,280	45,798	239,909		82,889,440
Sep-16	103,574	61,967	23,168	188,709		75,489,945
Oct-16	88,122	36,414	16,376	140,913		75,942,494
Nov-16	109,653	47,377	31,760	188,789		79,107,834
Dec-16	170,601	41,210	21,939	233,750		99,789,969
Jan-17	196,896	25,625	39,717	262,238		106,586,093
Feb-17	153,776	38,280	26,041	218,098		85,456,694
Mar-17	124,535	46,735	11,797	183,066		76,865,449
Apr-17	82,030	49,916	29,575	161,521		68,365,673
May-17	96,140	105,235	19,447	220,822		71,916,720
Jun-17	143,537	113,158	18,620	275,316		71,136,878
Jul-17	157,303	102,787	45,109	305,199		76,049,978
Aug-17	175,020	121,060	20,667	316,748		82,924,211
Sep-17	201,494	168,914	19,533	389,941		74,468,301
Oct-17	149,010	99,711	18,294	267,015		71,960,954
Nov-17	115,252	62,123	63,385	240,760		70,416,185
Dec-17	102,156	32,317	21,254	155,728		86,925,456
Jan-18	67,363	33,916	109,008	210,287		85,114,153
Feb-18	76,826	28,864	19,305	124,995		82,290,079
Mar-18	116,407	32,608	17,257	166,272		83,880,230
36-Month (Apr-15 - Mar-18) Total:	4,740,639	3,839,699	1,089,532	**9,669,870**		**2,878,869,629**
As %-of-Receipts:	0.165%	0.133%	0.038%	**0.336%**		

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

SoCalGas Company Monthly Un-Accounted-For (UAF)

Month	Recorded Receipts	Recorded Deliveries	Un-Accounted-For (UAF) = Receipts - Deliveries	UAF as % of Receipts
	(Dth)	(Dth)	(Dth)	(%)
Apr-15	69,403,860	69,219,207	184,653	0.27%
May-15	67,248,949	67,305,924	-56,975	-0.08%
Jun-15	75,083,321	73,529,544	1,553,777	2.07%
Jul-15	80,950,313	80,638,699	311,614	0.38%
Aug-15	84,821,668	84,811,337	10,331	0.01%
Sep-15	82,098,130	81,847,093	251,037	0.31%
Oct-15	79,017,068	79,134,404	-117,336	-0.15%
Nov-15	81,859,450	81,779,975	79,475	0.10%
Dec-15	104,292,154	102,039,131	2,253,023	2.16%
Jan-16	101,540,928	100,466,891	1,074,037	1.06%
Feb-16	77,286,463	73,728,660	3,557,803	4.60%
Mar-16	72,848,752	72,222,784	625,968	0.86%
Apr-16	66,725,644	66,889,772	-164,128	-0.25%
May-16	78,107,779	77,723,468	384,311	0.49%
Jun-16	72,693,976	72,512,747	181,229	0.25%
Jul-16	77,314,439	77,025,332	289,107	0.37%
Aug-16	82,889,440	82,565,853	323,587	0.39%
Sep-16	75,489,945	74,577,019	912,926	1.21%
Oct-16	75,942,494	75,329,794	612,700	0.81%
Nov-16	79,107,834	77,500,933	1,606,901	2.03%
Dec-16	99,789,969	97,276,387	2,513,582	2.52%
Jan-17	106,586,093	104,838,576	1,747,517	1.64%
Feb-17	85,456,694	84,863,013	593,681	0.69%
Mar-17	76,865,449	76,062,176	803,273	1.05%
Apr-17	68,365,673	67,097,178	1,268,495	1.86%
May-17	71,916,720	71,936,980	-20,260	-0.03%
Jun-17	71,136,878	70,305,397	831,481	1.17%
Jul-17	76,049,978	76,267,486	-217,508	-0.29%
Aug-17	82,924,211	83,035,309	-111,098	-0.13%
Sep-17	74,468,301	74,636,305	-168,004	-0.23%
Oct-17	71,960,954	71,722,053	238,901	0.33%
Nov-17	70,416,185	68,854,807	1,561,378	2.22%
Dec-17	86,925,456	86,104,805	820,651	0.94%
Jan-18	85,114,153	83,503,675	1,610,478	1.89%
Feb-18	82,290,079	82,097,149	192,930	0.23%
Mar-18	83,880,230	82,771,378	1,108,851	1.32%
Total	**2,878,869,629**	**2,852,221,242**	**26,648,388**	**0.926%**

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

Q_{out} = Gas Demand through customers' meters,
Q_{in} = Gas Available for Disposition ("receipts"),
Co-Use-Fuel = $F \times Q_{in}$,
UAF = $U \times Q_{in}$,
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 x Q_{in} = f x Q_{out} , and substituting for Q_{in} from (3)yields,

(5) F x Q_{out} [1 / (1 – F – U)] = f x Q_{out} ,

(5') [F / (1 – F – U)] x Q_{out} = f x 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) x f .

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

f = 0.340% = [0.336% / (100% - 0.336% - 0.926%)],

u = 0.937% = [0.926% / (100% - 0.336% - 0.926%)], and

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

Table of Contents

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 2017. The value is 1.0397 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 are 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 2015 through March 2018. Table 1 below shows the monthly data and the summary calculations.

Table 1

SDG&E Company Use Fuel Data as Percentage of "Receipts"

						Receipts
Month	Transmission	Storage	"Other"	Total		PGA: Net Avail.- for Disposition
	(Dth)	(Dth)	(Dth)	(Dth)		(Dth)
Apr-15	2,454	0	5,305	7,759		7,643,668
May-15	4,376	0	5,096	9,472		7,759,980
Jun-15	20,400	0	5,102	25,501		10,091,809
Jul-15	25,706	0	5,354	31,059		10,721,331
Aug-15	46,145	0	5,643	51,788		11,577,632
Sep-15	44,396	0	5,649	50,045		11,250,458
Oct-15	41,857	0	5,124	46,980		11,770,947
Nov-15	42,213	0	4,983	47,195		10,975,754
Dec-15	58,855	0	5,036	63,890		12,821,999
Jan-16	44,043	0	6,037	50,079		12,239,624
Feb-16	13,733	0	5,392	19,125		6,457,666
Mar-16	13,820	0	4,538	18,358		7,873,363
Apr-16	1,160	0	4,604	5,764		6,529,444
May-16	1,307	0	4,106	5,413		6,872,438
Jun-16	14,965	0	3,762	18,727		8,154,888
Jul-16	16,012	0	3,624	19,636		9,706,859
Aug-16	25,234	0	3,410	28,644		10,183,041
Sep-16	19,174	0	3,349	22,523		9,261,853
Oct-16	8,632	0	3,221	11,852		9,906,273
Nov-16	28,463	0	4,983	33,445		9,909,871
Dec-16	42,930	0	3,604	46,533		11,919,929
Jan-17	56,640	0	4,204	60,843		12,931,902
Feb-17	34,477	0	7,412	41,889		10,161,304
Mar-17	1,525	0	2,489	4,014		8,859,779
Apr-17	1,546	0	3,447	4,993		7,763,765
May-17	10,254	0	773	11,027		8,327,585
Jun-17	24,078	0	3,126	27,204		9,018,489
Jul-17	21,853	0	4,319	26,171		9,399,464
Aug-17	28,763	0	2,936	31,699		10,276,430
Sep-17	23,379	0	583	23,962		9,209,295
Oct-17	25,598	0	3,075	28,673		9,961,471
Nov-17	7,779	0	3,680	11,459		8,710,601
Dec-17	1,582	0	1,421	3,003		9,877,945
Jan-18	3,821	0	2,734	6,555		9,733,662
Feb-18	13,385	0	1,593	14,978		9,126,984
Mar-18	4,864	0	3,849	8,713		7,474,919
36-Month (Apr-15 - Mar-18) Total:	775,414	0	143,559	**918,973**		**344,462,419**
As %-of-Receipts:	0.225%	0.000%	0.042%	**0.267%**		

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:

(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 Monthly Un-Accounted-For (UAF)

Month	Recorded Receipts	Recorded Deliveries	Billing Adjustments to UAF	Adjusted UAF = (Receipts less Deliveries) plus Bill Adj	UAF % of Receipts
	(Dth)	(Dth)	(Dth)	(Dth)	(%)
Apr-15	7,643,668	7,754,996	127,304	15,976	1.67%
May-15	7,759,980	7,371,370	-427,276	-38,666	-0.50%
Jun-15	10,091,809	9,869,374	-441,450	-219,015	-2.17%
Jul-15	10,721,331	10,631,640	7,159	96,850	0.90%
Aug-15	11,577,632	10,380,867	-1,057,195	139,571	1.21%
Sep-15	11,250,458	11,043,576	445,825	652,707	5.80%
Oct-15	11,770,947	10,985,832	347,116	1,132,231	9.62%
Nov-15	10,975,754	10,746,747	459,534	688,541	6.27%
Dec-15	12,821,999	11,222,047	-1,381,680	218,272	1.70%
Jan-16	12,239,624	12,616,555	628,969	252,038	2.06%
Feb-16	6,457,666	8,630,681	180,571	-1,992,444	-30.85%
Mar-16	7,873,363	9,019,382	1,075,317	-70,702	-0.90%
Apr-16	6,529,444	6,822,371	338,168	45,241	0.69%
May-16	6,872,438	6,753,497	64,764	183,704	2.67%
Jun-16	8,154,888	8,090,292	-627,270	-562,674	-6.90%
Jul-16	9,706,859	9,937,000	244,367	14,226	0.15%
Aug-16	10,183,041	10,255,127	128,902	56,815	0.56%
Sep-16	9,261,853	9,338,386	117,373	40,839	0.44%
Oct-16	9,906,273	9,822,146	87,243	171,369	1.73%
Nov-16	9,909,871	8,933,788	-832,669	143,413	1.45%
Dec-16	11,919,929	10,867,018	-727,460	325,452	2.73%
Jan-17	12,931,902	12,328,100	-500,310	103,492	0.80%
Feb-17	10,161,304	11,383,467	1,176,780	-45,383	-0.45%
Mar-17	8,859,779	9,005,846	331,431	185,364	2.09%
Apr-17	7,763,765	8,408,404	959,672	315,033	4.06%
May-17	8,327,585	7,991,552	-572,545	-236,512	-2.84%
Jun-17	9,018,489	8,773,395	-160,348	84,747	0.94%
Jul-17	9,399,464	9,481,148	9,240	-72,444	-0.77%
Aug-17	10,276,430	9,391,850	-788,878	95,702	0.93%
Sep-17	9,209,295	9,846,201	547,888	-89,018	-0.97%
Oct-17	9,961,471	8,741,657	-654,115	565,699	5.68%
Nov-17	8,710,601	9,477,817	374,570	-392,646	-4.51%
Dec-17	9,877,945	8,638,009	-1,473,050	-233,114	-2.36%
Jan-18	9,733,662	10,002,121	696,006	427,547	4.39%
Feb-18	9,126,984	9,770,571	432,692	-210,895	-2.31%
Mar-18	7,474,919	7,902,506	580,802	153,216	2.05%
Totals	**344,462,419**	**342,235,334**	**-282,554**	**1,944,531**	**0.565%**

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

Q_{out} = Gas Demand through customers' meters,
Q_{in} = Gas Available for Disposition ("receipts"),
Co-Use-Fuel = $F \times Q_{in}$,
UAF = $U \times Q_{in}$,
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 x Q_{in} = f x Q_{out} , and substituting for Q_{in} from (3) yields,

(5) F x Q_{out} [1 / (1 – F – U)] = f x Q_{out} ,

(5') [F / (1 – F – U)] x Q_{out} = f x 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) x f .

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

f = 0.269% = [0.267% / (100% - 0.267% - 0.565%)],

u = 0.569% = [0.565% / (100% - 0.267% - 0.565%)], and

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

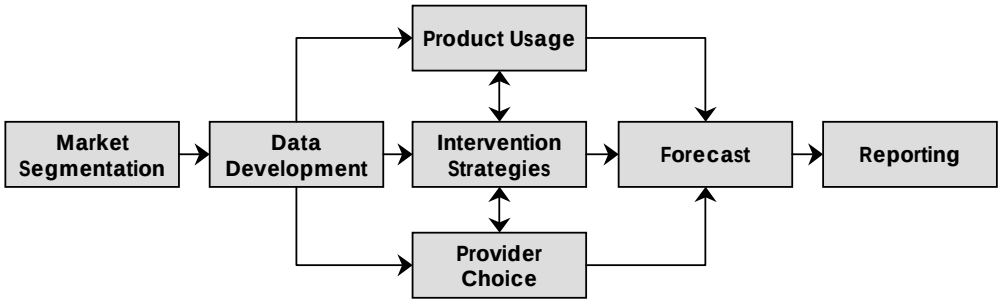
End Use Forecaster has other dimensions that capture factors affecting product demands. Perhaps the most important of these is End Use Forecaster's "vintaging" capability. Vintaging refers to product or service turnover that is a function of either physical lives or contract period. Accurate assessments 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

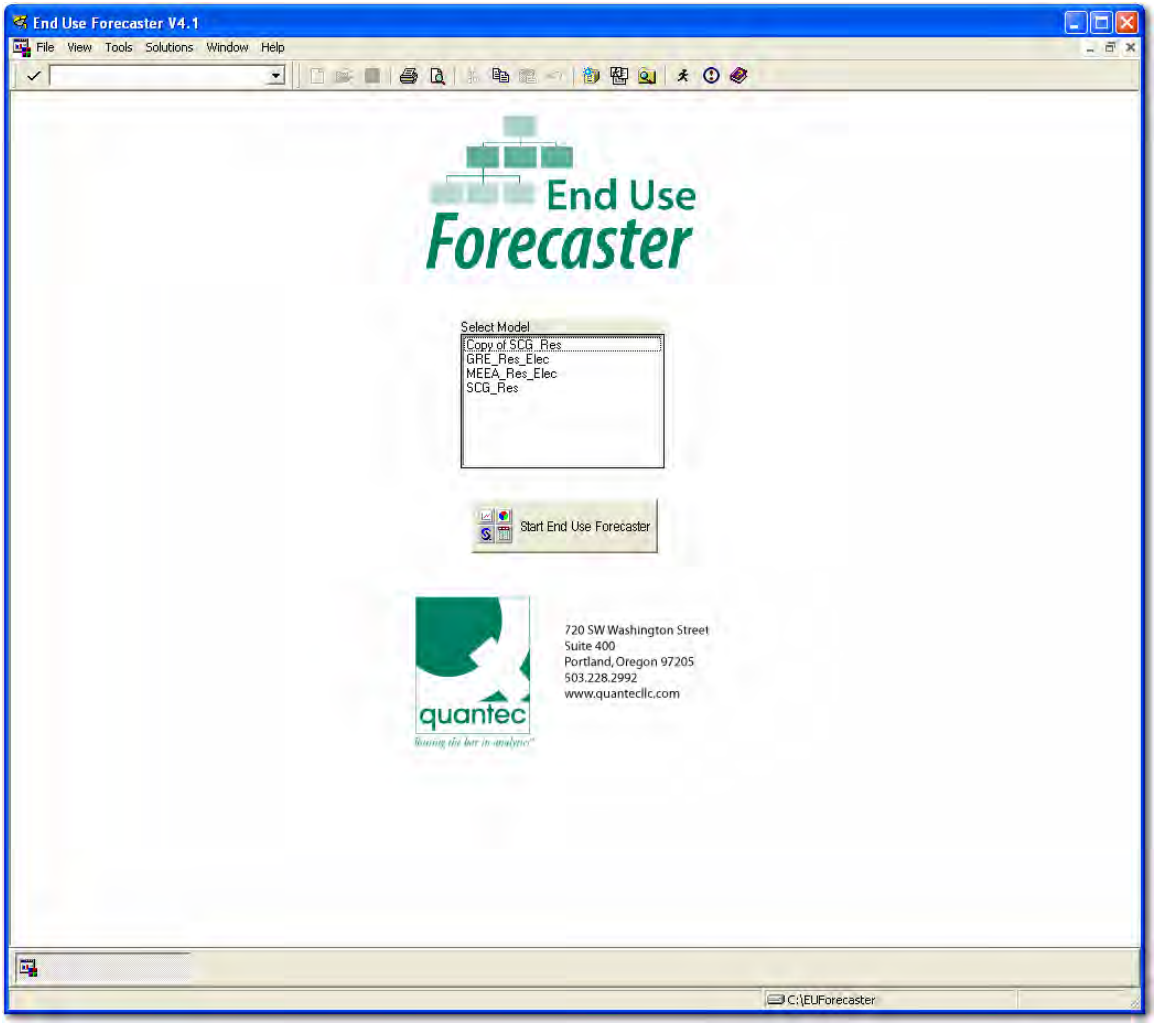
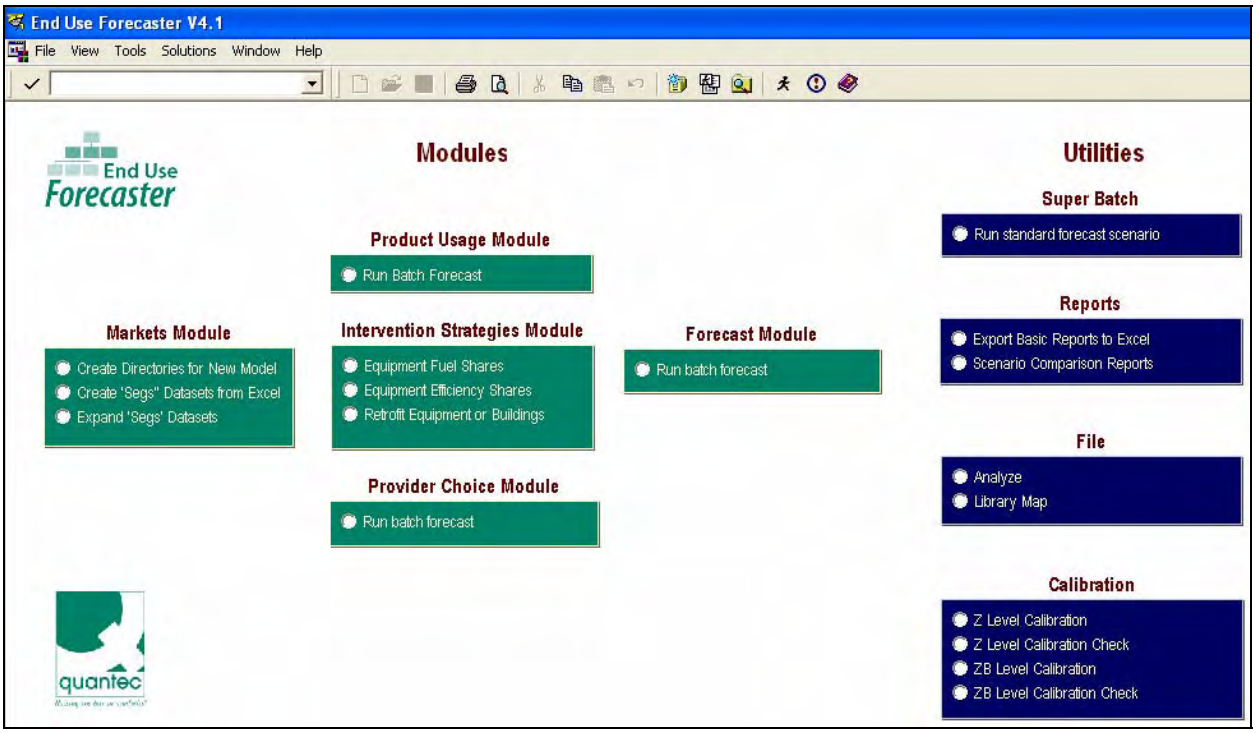


Figure 3. Main Dashboard



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.

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[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

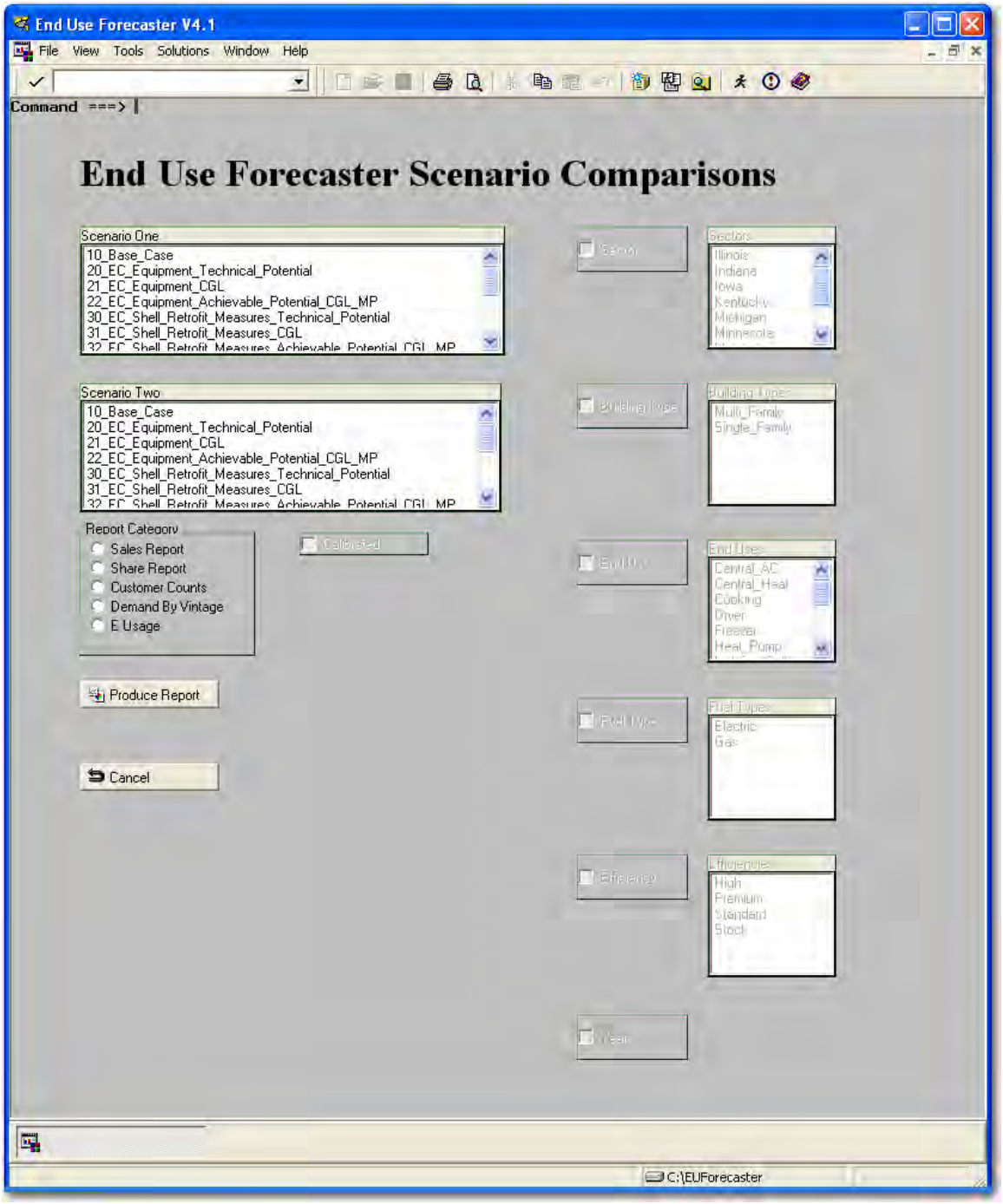
The Forecast Module incorporates all the information compiled from the other modules – Usage, Choice, and Intervention Strategies – related to the overall economic growth of the market segment and equipment lifetime (decay) functions to create the final forecast for a given scenario.

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

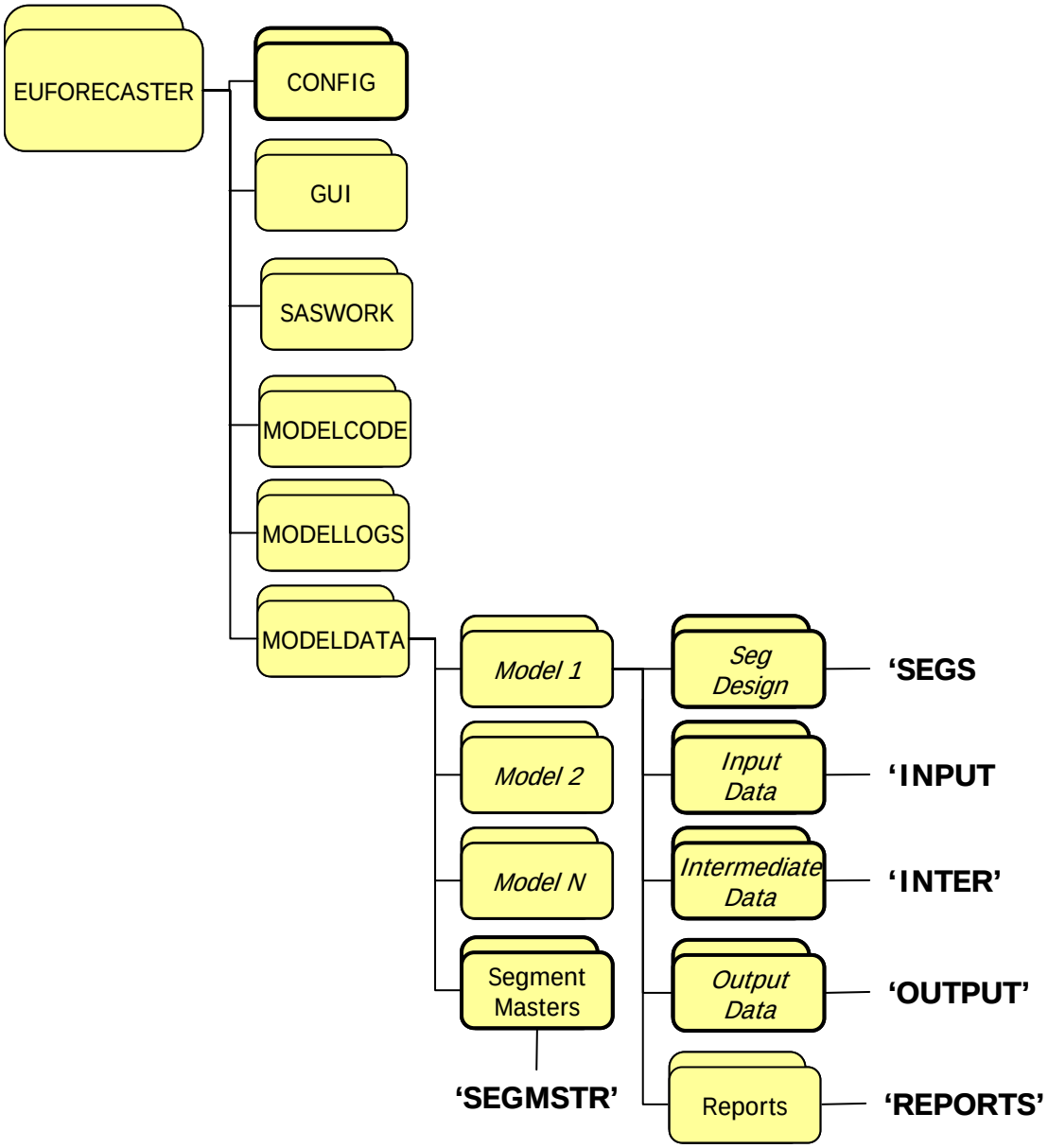
cases, where the documentation does not refer to a specific scenario, datasets are referred to with an **"_xx**" suffix, such as **saturations_xx**.

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

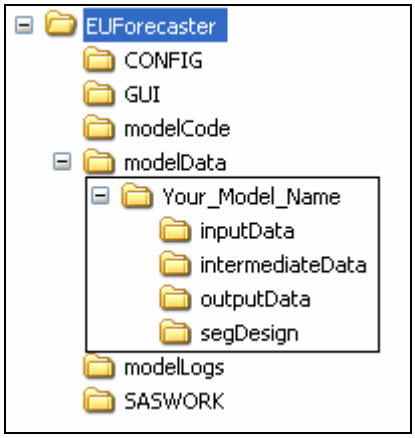
The execution of the first task – creation of a customized market segmentation design – is based on four steps, listed briefly below and then described in greater detail.

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.

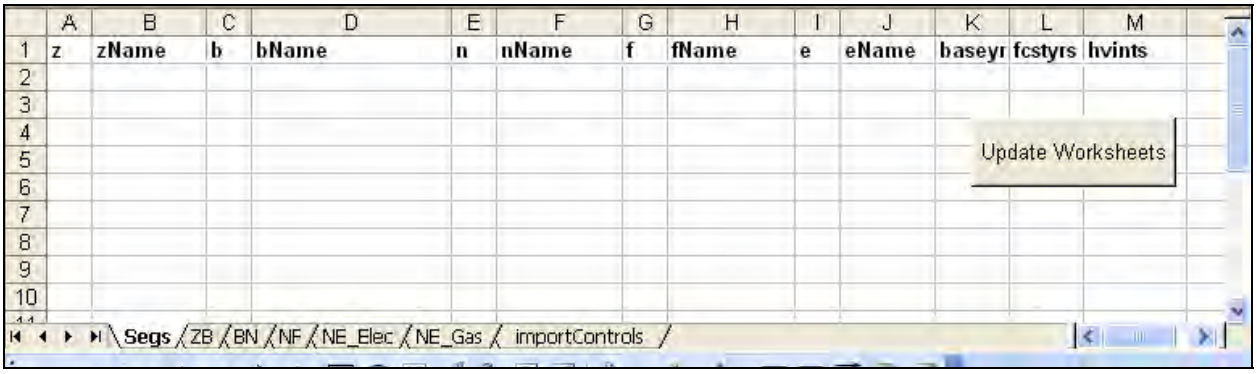
Table 3 summarizes the intended use of each of these dimensions. Note that while the model must include all five dimension, you are not required to use all of them. For example, suppose you want a design with alternative providers at Dimension 4 and do not wish to complicate the model with product/service 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:

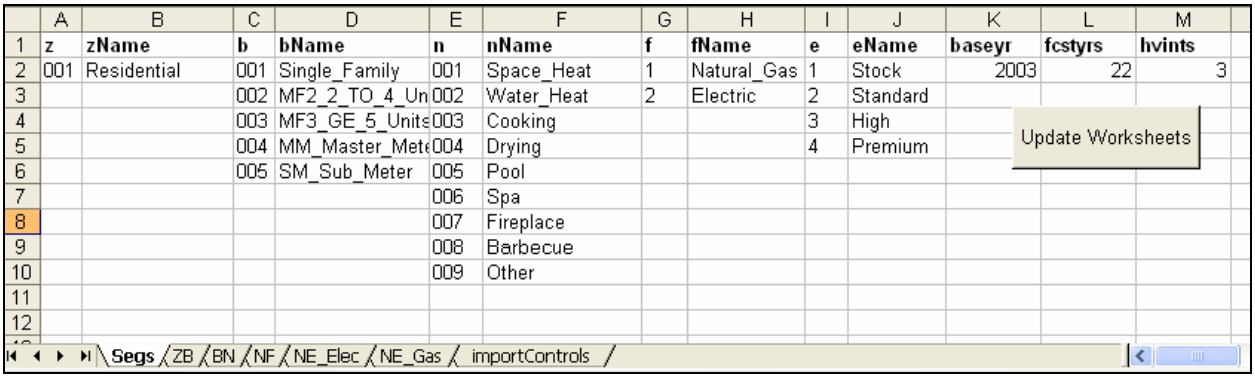
Figure 7. Empty "Segs" Tab in Seg_Design_Template.xls



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



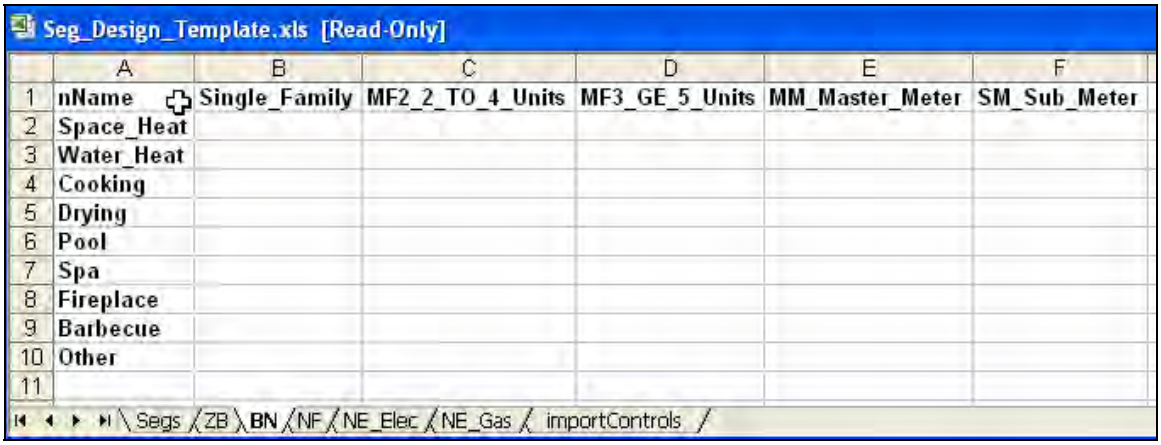
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	**z**	**zName**	**b**	**bName**	**n**	**nName**	**f**	**fName**	**e**	**eName**	**baseyr**	**fcstyrs**	**hvints**
2	001	Residential	001	Single_Family	001	Space_Heat	1	Natural_Gas	1	Stock	2003	22	3
3			002	MF2_2_TO_4_Un	002	Water_Heat	2	Electric	2	Standard			
4			003	MF3_GE_5_Units	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 /

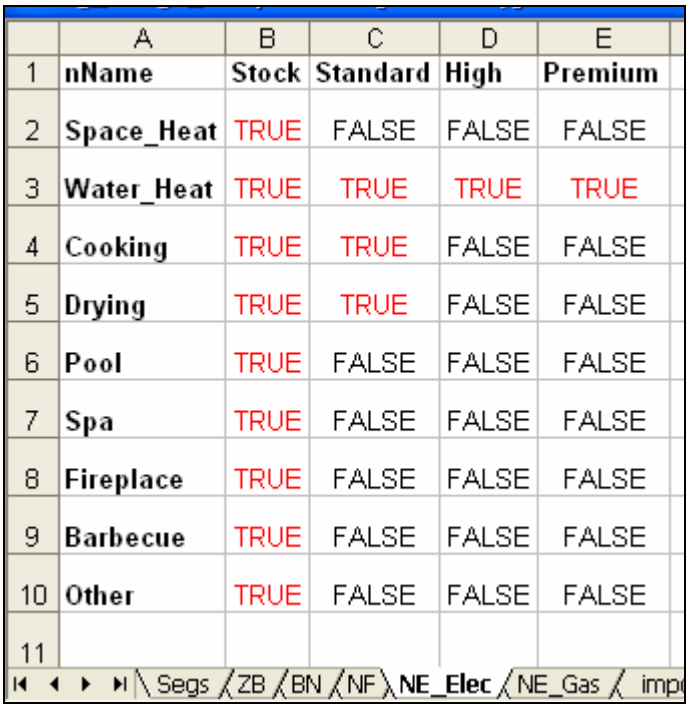
Again, the segmentation is hierarchical. The purpose of the newly-populated tabs ("ZB," "BN," "NF," "NE_Elec," and "NE_Gas") is to allow the specification of which dimensions belong together – starting at the top of the hierarchy and moving down – in the segmentation design. For example, with the ZB 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					

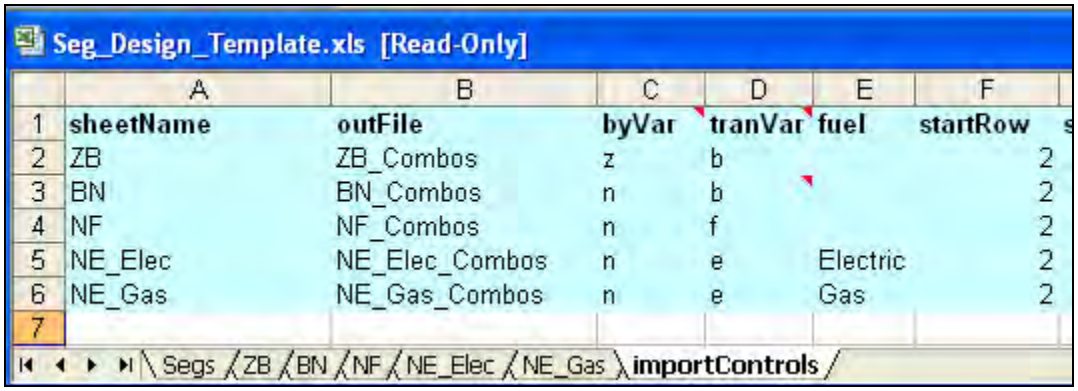
Segs | ZB | BN | NF | NE_Elec | NE_Gas | impo

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



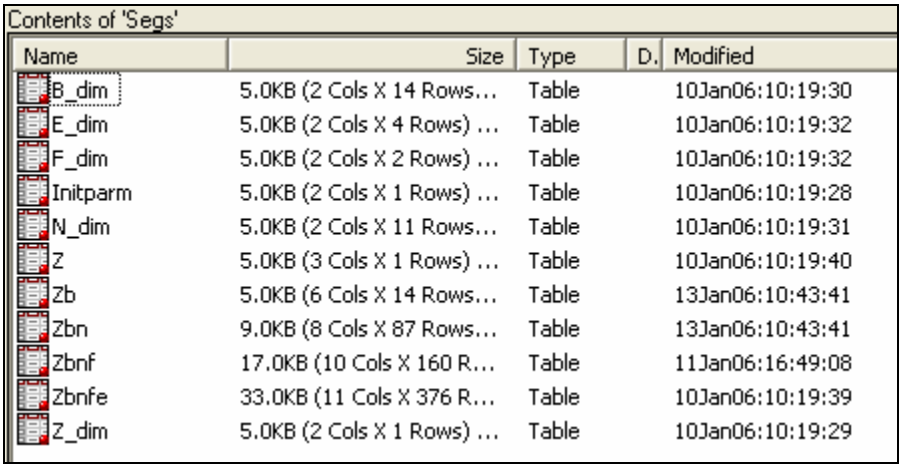
	A	B	C	D	E	F
1	**sheetName**	**outFile**	**byVar**	**tranVar**	**fuel**	**startRow**
2	ZB	ZB_Combos	z	b		2
3	BN	BN_Combos	n	b		2
4	NF	NF_Combos	n	f		2
5	NE_Elec	NE_Elec_Combos	n	e	Electric	2
6	NE_Gas	NE_Gas_Combos	n	e	Gas	2
7						

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.

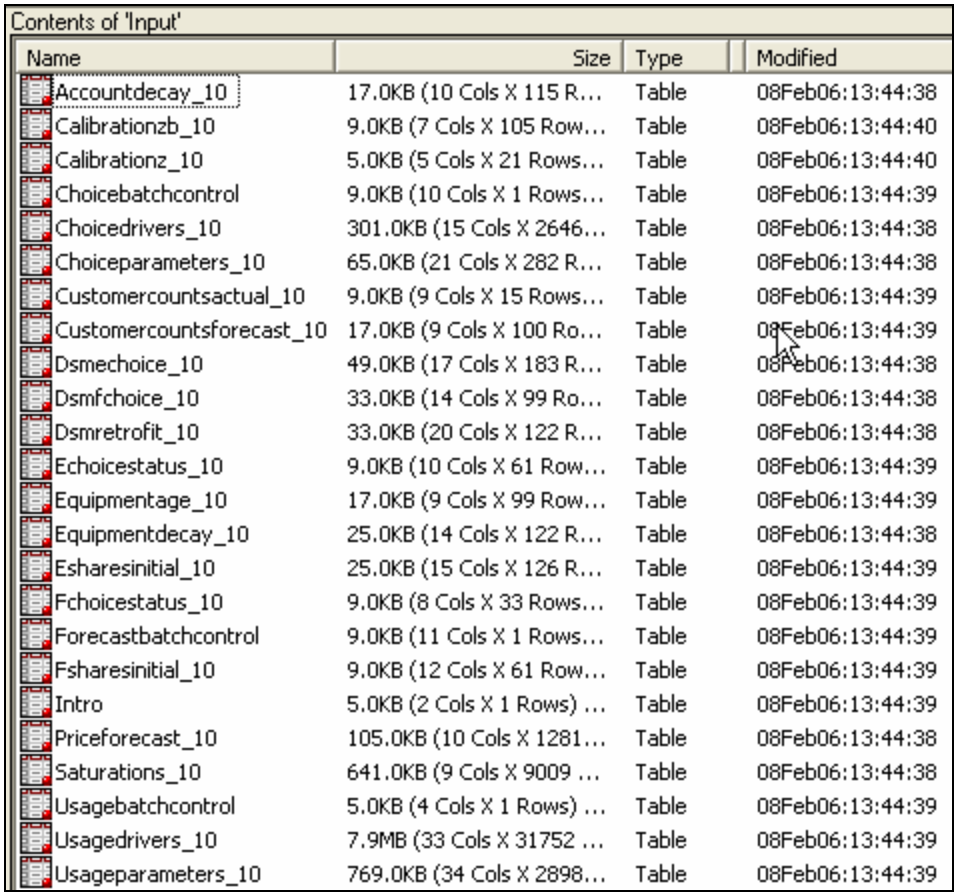
Figure 12. Contents of Segs Library



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



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

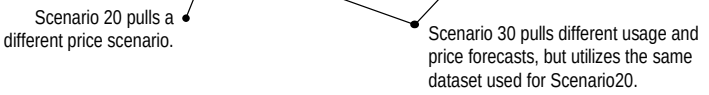
End Use Forecaster automatically creates the base case scenario, denoted by "_10," for each of these datasets. Additional scenarios can be designated in each batch dataset by:

- 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



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"

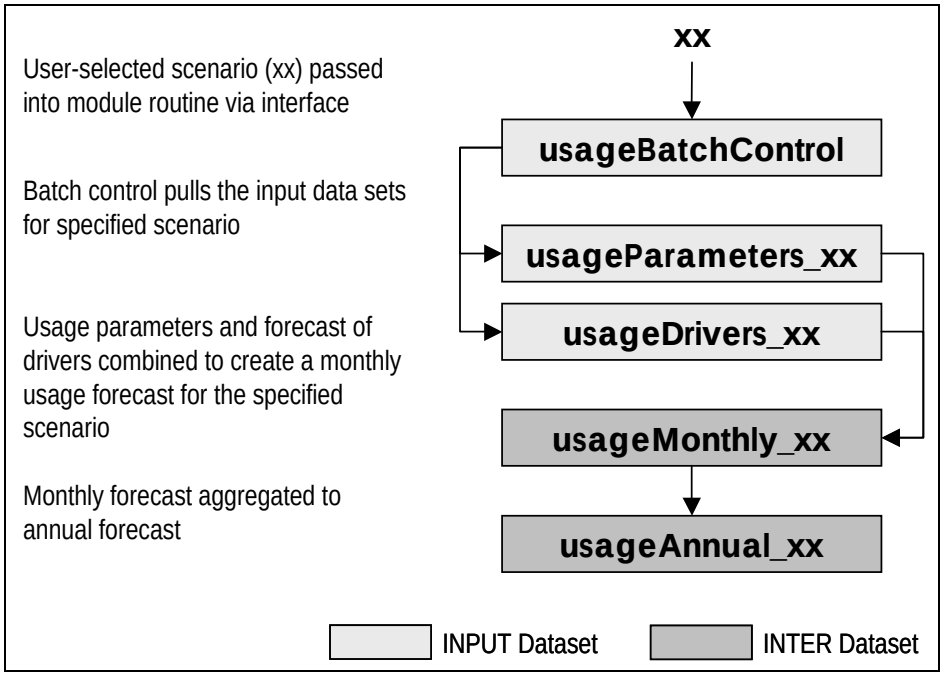


Table 5. Product Usage Module Data Library

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 Sxx
INPUT	usageDrivers_xx	Usage forecast drivers	Dimensions 1, 2, 3, 4, and 5, year, month	Usage forecast drivers X0 through X0 for input scenario Sxx

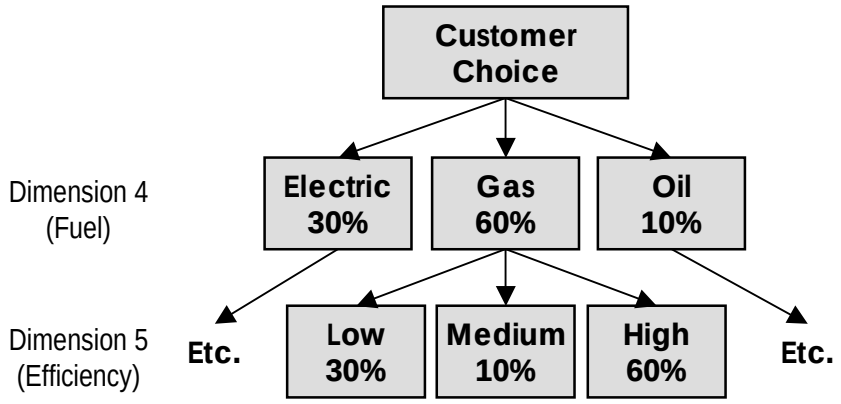
V. Provider Choice Module

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

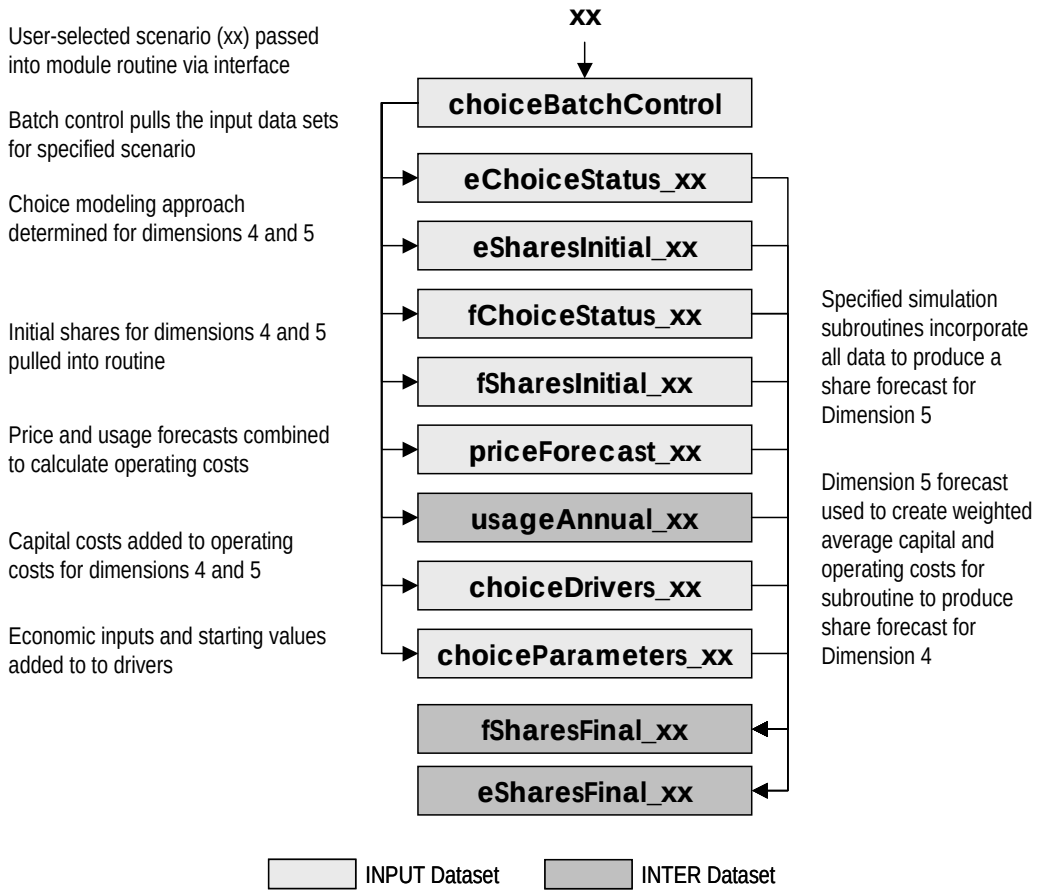
Figure 17 shows the data and analysis flow through the Provider Choice Module.

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**).

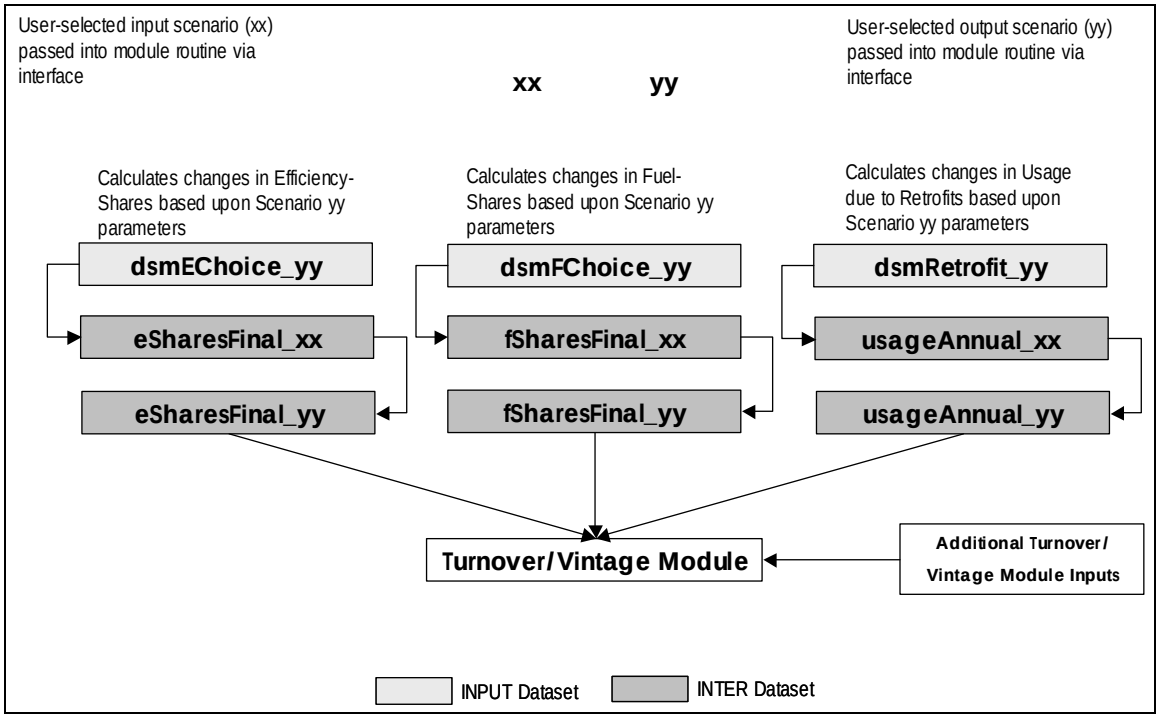
The Market Segmentation module creates base case files ("_10" files) where there is no intervention for each of these program categories. These files serve as templates that allow the user to create different scenarios of interest. To create strategies, you must copy these files to another scenario number 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

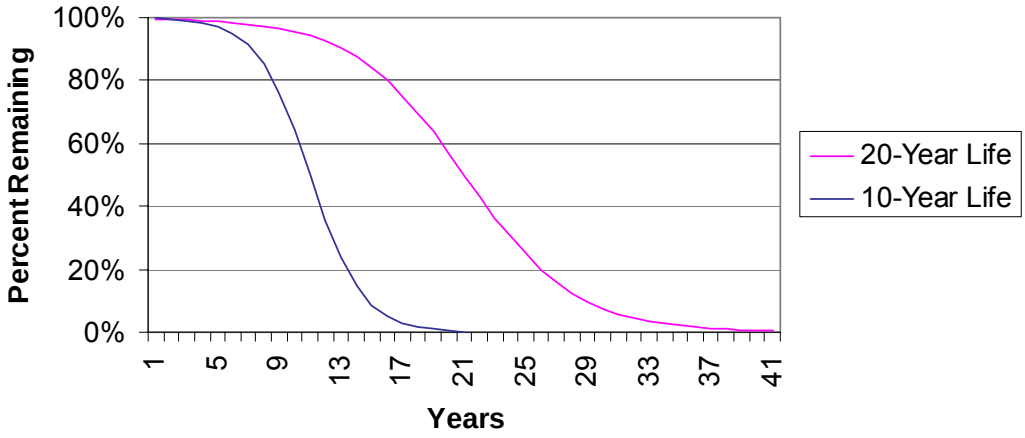
[3] These are discrete analogs to the continuous time distributions.

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:

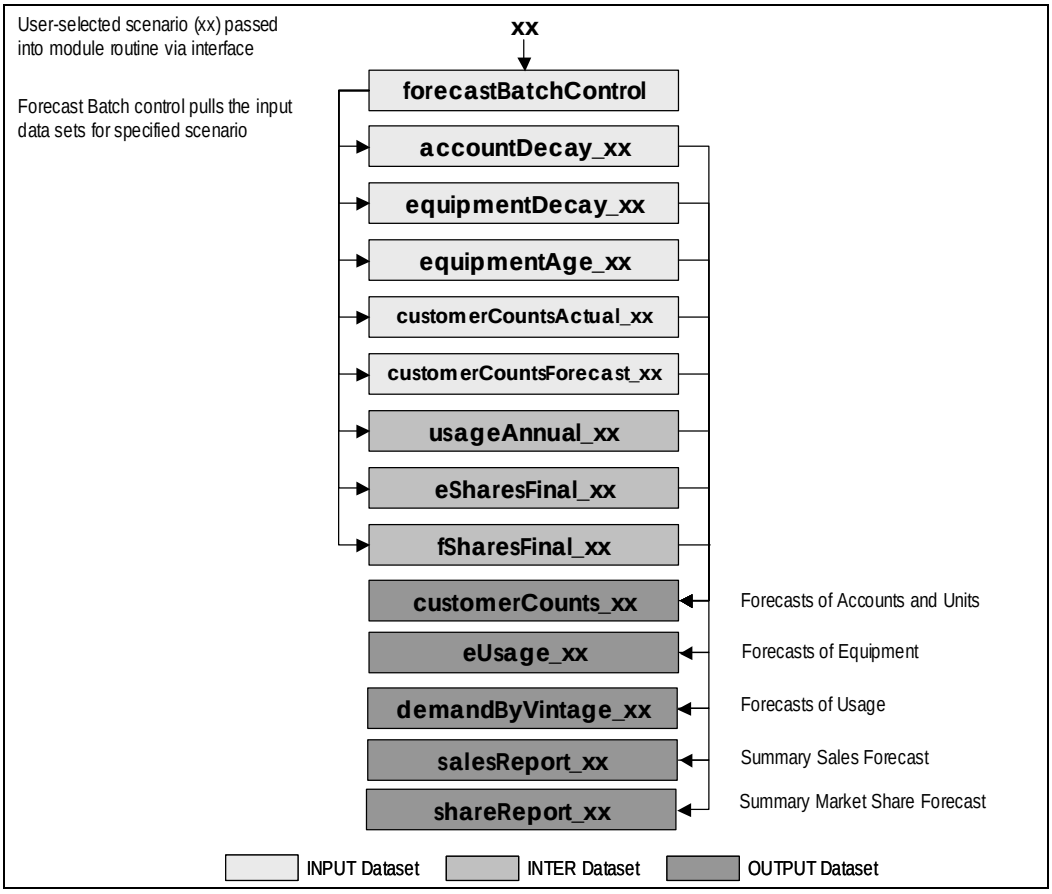
1. Merges all input data across Dimensions 1-3, including:
   - Existing accounts, plus a distribution of accounts across historical building vintages
   - New construction forecast, plus capture rates for new and conversion buildings
   - Dimension 3 saturation, equal to the number of Dimension 2 customers 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 2020-2022.

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

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

where the subscript "t" is a date specified as *month-year* combination (e.g., Dec-2021) from Jan-2020 through Dec-2022. For example, using the December 2021 specific month and the residential core market segment for each Company the following specific results are obtained:

SoCalGas' Residential Core:

$$\begin{aligned}(\text{Residential Excess Winter Gas Demand})_{\text{Dec-2021}} &= (\text{Cold-Year Gas Demand})_{\text{Dec-2021}} - (\text{TCAP Period Cold-Year Gas Demand per Month}) \\ &= (393{,}281 \text{ MTherms}) - (2{,}584{,}453 \text{ MTherms} / 12) \\ &= (393{,}281 \text{ MTherms}) - (215{,}371 \text{ MTherms}) \\ &= (177{,}910 \text{ MTherms})_{\text{Dec-2021}}\end{aligned}$$

SDG&E's Residential Core:

$$\begin{aligned}(\text{Residential Excess Winter Gas Demand})_{\text{Dec-2021}} &= (\text{Cold-Year Gas Demand})_{\text{Dec-2021}} - (\text{TCAP Period Cold-Year Gas Demand per Month}) \\ &= (\ 50{,}301 \text{ MTherms}) - (343{,}408 \text{ MTherms} / 12) \\ &= (\ 50{,}301 \text{ MTherms}) - (\ 28{,}617 \text{ MTherms}) \\ &= (\ 21{,}684 \text{ MTherms})_{\text{Dec-2021}}\end{aligned}$$

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)							
2020	Jan	162,668	29,178	0	0	0	**191,846**
	Feb	116,632	23,760	0	0	0	**140,392**
	Mar	66,546	13,967	0	0	0	**80,513**
	Apr	14,641	4,200	0	0	0	**18,841**
	May	0	0	4	154	0	**158**
	Jun	0	0	0	701	0	**701**
	Jul	0	0	6	1,171	0	**1,177**
	Aug	0	0	18	1,004	214	**1,236**
	Sep	0	0	18	726	0	**744**
	Oct	0	0	15	231	661	**907**
	Nov	28,208	7,850	8	0	0	**36,066**
	Dec	182,794	33,662	0	0	0	**216,456**
2021	Jan	158,031	27,152	0	0	0	**185,183**
	Feb	112,559	21,826	0	0	0	**134,385**
	Mar	63,088	12,188	0	0	379	**75,654**
	Apr	11,819	2,568	0	0	0	**14,388**
	May	0	0	4	154	489	**647**
	Jun	0	0	0	701	0	**701**
	Jul	0	0	6	1,171	0	**1,177**
	Aug	0	0	18	1,004	1,041	**2,064**
	Sep	0	0	18	726	382	**1,126**
	Oct	0	0	15	231	1,513	**1,759**
	Nov	25,220	6,166	8	0	237	**31,631**
	Dec	177,910	31,571	0	0	0	**209,481**
2022	Jan	152,325	24,650	0	0	0	**176,975**
	Feb	107,548	19,437	0	0	0	**126,985**
	Mar	58,833	9,992	0	0	1,214	**70,039**
	Apr	8,348	557	0	0	17	**8,921**
	May	0	0	4	154	1,331	**1,489**
	Jun	0	0	0	701	591	**1,292**
	Jul	0	0	6	1,171	501	**1,678**
	Aug	0	0	18	1,004	1,915	**2,937**
	Sep	0	0	18	726	1,219	**1,963**
	Oct	0	0	15	231	2,412	**2,658**
	Nov	21,544	4,090	8	0	1,067	**26,708**
	Dec	171,900	28,985	0	0	615	**201,501**
TCAP Period:							
	Total EWD (Mth):	546,871	100,599	69	3,987	5,265	**656,793**
	Total EWD (Bcf):	52.9	9.7	0.0	0.4	0.5	**63.5**

Table 2: SDG&E Excess Winter Gas Demand

		Residential	Nonresidential Core GN-3	Nonresidential Core G-NGV	**Total Core**
Excess Winter Demand--EWD (Mth)					
2020	Jan	20,806	6,154	0	**26,960**
	Feb	14,989	4,864	0	**19,853**
	Mar	10,400	3,225	20	**13,646**
	Apr	2,902	1,123	0	**4,025**
	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	0	**0**
	Nov	2,361	777	0	**3,139**
	Dec	22,183	6,525	0	**28,707**
2021	Jan	20,321	6,051	0	**26,371**
	Feb	14,561	4,765	0	**19,326**
	Mar	10,017	3,132	167	**13,317**
	Apr	2,592	1,040	14	**3,646**
	May	0	0	48	**48**
	Jun	0	0	40	**40**
	Jul	0	0	34	**34**
	Aug	0	0	111	**111**
	Sep	0	0	0	**0**
	Oct	0	0	136	**136**
	Nov	2,057	695	0	**2,753**
	Dec	21,684	6,420	0	**28,104**
2022	Jan	19,505	5,872	0	**25,378**
	Feb	13,841	4,595	3	**18,440**
	Mar	9,374	2,974	325	**12,672**
	Apr	2,072	896	159	**3,127**
	May	0	0	197	**197**
	Jun	0	0	188	**188**
	Jul	0	0	182	**182**
	Aug	0	0	264	**264**
	Sep	0	0	0	**0**
	Oct	0	0	290	**290**
	Nov	1,546	554	106	**2,207**
	Dec	20,846	6,239	87	**27,172**
TCAP Period:					
	Total EWD (Mth):	70,686	21,968	790	**93,444**
	Total EWD (Bcf):	6.8	2.1	0.1	**9.0**

The tables below show the Excess Winter Gas Demand totals that are used to allocate the total core storage inventory of 82.5 Bcf:

SoCalGas:

SoCalGas		Nonresidential Core				Total
	Residential	G-10	G-AC	G-GE	G-NGV	SCG Core
"Excess Winter Demand"	52.88	9.73	0.01	0.39	0.51	63.50
for Inventory Allocation in BCF						

SDG&E:

SDG&E		Nonresidential Core		Total		SCG & SDG&E
	Residential	GN-3	G-NGV	SDG&E Core		Core Totals
"Excess Winter Demand"	6.80	2.11	0.08	8.99		72.49
for Inventory Allocation in BCF						

To allocate core withdrawal capacity, the respective company's core peak day gas demand over the TCAP period are used. The core peak day gas demand data are provided in the Consolidated Gas Demand material of these workpapers. The values as proportions of SoCalGas' and SDG&E's respective core peak day load totals are shown below:

SoCalGas		Nonresidential Core			
	Residential	G-10	G-AC	G-GE	G-NGV
(Scg Core PkDay % of Total)	79.41%	18.92%	0.003%	0.103%	1.560%

SDG&E		Nonresidential Core	
	Residential	GN-3	G-NGV
(Sdge Core PkDay % of Total)	71.41%	27.06%	1.53%

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:

(Core Pk Day Load)			Pk Day Alloc
	3-Yr Avg		Storage Wdr'l
	(MThm/d)		(MMcf/d)
SoCalGas	30,434.2	88.07%	1,761.4
SDG&E	4,122.6	11.93%	238.6
Total	**34,556.8**		**2,000.0**

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

SoCalGas Core Storage Allocations by Customer Class

Storage Asset	Residential	G-10	G-AC	G-GE	G-NGV	Total SCG Core
Inventory Allocation (BCF)	60.2	11.1	0.0	0.4	0.6	72.3
Injection (MMcfd)	324.6	59.7	0.0	2.4	3.1	389.8
Withdrawal (MMcfd)	1,398.8	333.3	0.0	1.8	27.5	1,761.4

SDG&E Core Storage Allocations by Customer Class

Storage Asset	Residential	GN-3	G-NGV		Total SDG&E Core	SCG & SDG&E Core Totals
Inventory Allocation (BCF)	7.7	2.4	0.1		10.2	82.5
Injection (MMcfd)	41.7	13.0	0.5		55.2	445.0
Withdrawal (MMcfd)	170.4	64.6	3.7		238.6	2,000.0

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

Inventory:

60.2 Bcf = (52.88 / 72.49) x 82.5 Bcf

Injection:

324.6 MMcf/d = (52.88 / 72.49) x 445 MMcf/d

Withdrawal:

1,398.8 MMcf/d = (88.07%) x (2,000 MMcf/d) x (79.41%)

Note that the calculations above may reflect small rounding errors.

2006 LUAF Study for SoCalGas
And
SDG&E

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**	**2006 Total Gas Delivered MCF:**	**963,340,871**
1991 LUAF % of Total Gas Delivered:	**1.03%**	**2006 LUAF % of Total Gas Delivered:**	**0.73180%**
1991Total LUAF:	**10,849,800**	**2006 Total LUAF MCF:**	**7,049,738**

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

*Ambient Temperature Effect on Instrumentation

		LUAF Factor Total	LUAF Factor NC	LUAF Factor Core
2006 Total MMBtus Delivered:	**993,855,331**	0.73%	0.21%	0.52%
		Allocation	**Allocation NC**	**Allocation Core**
2006 Total MMBtu LUAF:	**7,273,043**	100%	28.90%	71.10%
2006 System Average BTU Factor:	**1.0316757**			

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 N2 and CO2 factors for Super compressibility calculation. Electronic Correctors assumed 0% CO2 and N2 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; N2=1.592;CO2=1.507
Note 2: Electronic Correctors Billing Assumes SG=0.6 and N2=CO2=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

	2006 Sample Meters			Total 2006 System	
SDG&E Sample Meter Volumes	Recorded Volume (MSCF)	UAF Volume (MCF)	UAF Factor	Recorded Volume MSCF	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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