2018 CALIFORNIA GAS REPORT
Redacted Workpapers

Prepared By:

SoCalGas
A Sempra Energy utility®

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2018 CALIFORNIA GAS REPORT

HISTORICAL DATA
JULY 2018

The Gas Company

A Sempra Energy utility™

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND SENDOUT - MMCF/DAY

RECORDED YEARS 2013 TO 2017

Line	CAPACITY AVAILABLE		2013	2014	2015	2016	2017
1	California Source Gas						
	Out-of-State Gas						
2	California Offshore -POPCO / PIOC						
3	El Paso Natural Gas Co.						
4	Transwestern Pipeline Co.						
5	Kern / Mojave						
6	PGT / PG&E						
7	Other						
8	Total Out-of-State Gas						
9	TOTAL CAPACITY AVAILABLE						
	GAS SUPPLY TAKEN						
10	California Source Gas		153	143	122	89	84
	Out-of-State Gas						
11	Other Out-of-State		2,514	2,538	2,397	2,342	2,434
12	Total Out-of-State Gas		2,514	2,538	2,397	2,342	2,434
13	TOTAL SUPPLY TAKEN		2,667	2,681	2,519	2,431	2,518
14	Net Underground Storage Withdrawal		106	(63)	40	80	(14)
15	TOTAL THROUGHPUT (1)(2)		2,773	2,618	2,559	2,511	2,504
	DELIVERIES BY END-USE						
16	Core	Residential	646	541	548	557	565
17		Commercial	222	202	207	213	214
18		Industrial	62	58	58	55	55
19		NGV	31	33	35	36	38
20		Subtotal	961	834	848	861	872
21	Noncore	Commercial	60	53	52	57	56
22		Industrial	368	379	362	391	389
23		EOR Steaming	35	44	46	39	39
24		Electric Generation	848	863	795	740	713
25		Subtotal	1,311	1,339	1,255	1,228	1,198
26	Wholesale/International		465	410	428	390	401
27	Co. Use & LUAF		36	35	28	31	33
28	SYSTEM TOTAL-THROUGHPUT (1)(2)		2,773	2,618	2,559	2,511	2,504
	TRANSPORTATION AND EXCHANGE						
29	Core	All End Uses	45	49	52	56	62
30	Noncore	Commercial/Industrial	428	432	414	449	446
31		EOR Steaming	35	44	46	39	39
32		Electric Generation	848	863	795	740	713
33		Subtotal-Retail	1,356	1,388	1,307	1,284	1,260
34	Wholesale/International		465	410	428	390	401
35	TOTAL TRANSPORTATION & EXCHANGE		1,821	1,798	1,735	1,674	1,660
36	CURTAILMENT (3)						
37	REFUSAL						
38		Total BTU Factor (Dth/Mcf)	1.0266	1.0300	1.0353	1.0345	1.0343

NOTES:
(1) The wholesale volumes only reflect natural gas supplied by SoCalGas; and, do not include supplies from other sources. Refer to the supply source data provided in each utility's report for a complete accounting of their supply sources.
(2) Deliveries by end-use includes sales, transportation, and exchange volumes and data includes effect of prior period adjustments.
(3) The table does not explicitly show any curtailment numbers for the recorded years because, during some curtailment events, the estimate of the curtailed volume is not available. While the table does not explicitly show any curtailment numbers for the recorded years, the noncore customer usage data implicitly captures the effects of any curtailment events.

2018 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS
JULY 2018

The Gas Company

A Sempra Energy utility™

TABLE 1-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2018 THRU 2022

AVERAGE TEMPERATURE YEAR

LINE			2018	2019	2020	2021	2022	LINE
	CAPACITY AVAILABLE							
1	California Line 85 Zone (California Producers)		60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	2
	Out-of-State Gas							
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		870	1,200	1,590	1,590	1,590	5
6	Total Out-of-State Gas		2,845	3,175	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,055	3,385	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN							
8	California Source Gas [5/]		51	51	51	51	51	8
9	Out-of-State		2,574	2,540	2,515	2,493	2,468	9
10	TOTAL SUPPLY TAKEN		2,625	2,591	2,566	2,544	2,519	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,625	2,591	2,566	2,544	2,519	12
	REQUIREMENTS FORECAST BY END-USE [7/]							
13	CORE [8/]	Residential	648	640	629	622	612	13
14		Commercial	223	221	218	214	209	14
15		Industrial	57	57	56	55	54	15
16		NGV	40	43	45	47	50	16
17		Subtotal-CORE	968	960	948	939	925	17
18	NONCORE	Commercial	50	50	49	49	49	18
19		Industrial	390	387	386	383	380	19
20		EOR Steaming	46	46	45	46	46	20
21		Electric Generation (EG)	733	710	705	694	692	21
22		Subtotal-NONCORE	1,218	1,192	1,186	1,172	1,166	22
23	WHOLESALE &	Core	188	188	188	188	187	23
24	INTERNATIONAL	Noncore Excl. EG	51	53	53	53	54	24
25		Electric Generation (EG)	167	165	159	159	156	25
26		Subtotal-WHOLESALE & INTL.	406	406	401	401	397	26
27		Co. Use & LUAF	33	33	32	32	32	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,625	2,591	2,566	2,544	2,519	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	65	65	66	66	66	29
30	NONCORE	Commercial/Industrial	439	437	435	432	429	30
31		EOR Steaming	46	46	45	46	46	31
32		Electric Generation (EG)	733	710	705	694	692	32
33		Subtotal-RETAIL	1,283	1,258	1,252	1,239	1,232	33
34	WHOLESALE & INTERNATIONAL	All End Uses	406	406	401	401	397	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,689	1,663	1,652	1,639	1,629	35
	CURTAILMENT (RETAIL & WHOLESALE)							
36		Core	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.

5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.

6/ Excludes own-source gas supply of 0.7 0.7 0.6 0.6 0.6
gas procurement by the City of Long Beach

7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

8/ Core end-use demand exclusive of core aggregation
transportation (CAT) in MDth/d: 934 925 912 903 888

TABLE 2-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2023 THRU 2035

AVERAGE TEMPERATURE YEAR

LINE			2023	2024	2025	2030	2035	LINE
	CAPACITY AVAILABLE							
1	California Line 85 Zone (California Producers)		60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	2
	Out-of-State Gas							
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN							
8	California Source Gas [5/]		51	51	51	51	51	8
9	Out-of-State		2,429	2,393	2,371	2,259	2,262	9
10	TOTAL SUPPLY TAKEN		2,480	2,444	2,422	2,310	2,313	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,480	2,444	2,422	2,310	2,313	12
	REQUIREMENTS FORECAST BY END-USE [7/]							
13	CORE [8/]	Residential	597	583	573	523	510	13
14		Commercial	203	196	191	169	168	14
15		Industrial	52	50	49	41	37	15
16		NGV	53	55	59	77	100	16
17		Subtotal-CORE	905	885	871	810	815	17
18	NONCORE	Commercial	49	48	48	47	46	18
19		Industrial	373	368	363	344	336	19
20		EOR Steaming	46	45	46	46	46	20
21		Electric Generation (EG)	684	676	673	646	645	21
22		Subtotal-NONCORE	1,152	1,137	1,129	1,083	1,073	22
23	WHOLESALE &	Core	187	186	187	188	194	23
24	INTERNATIONAL	Noncore Excl. EG	54	54	54	55	55	24
25		Electric Generation (EG)	151	150	149	147	146	25
26		Subtotal-WHOLESALE & INTL.	392	390	390	389	395	26
27		Co. Use & LUAF	31	31	31	29	29	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,480	2,444	2,422	2,310	2,313	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	66	66	66	70	79	29
30	NONCORE	Commercial/Industrial	422	416	411	391	383	30
31		EOR Steaming	46	45	46	46	46	31
32		Electric Generation (EG)	684	676	673	646	645	32
33		Subtotal-RETAIL	1,218	1,203	1,196	1,152	1,152	33
	WHOLESALE &							
34	INTERNATIONAL	All End Uses	392	390	390	389	395	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,610	1,594	1,586	1,541	1,547	35
	CURTAILMENT (RETAIL & WHOLESALE)							
36		Core	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

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2018 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS - AVERAGE TEMPERATURE YEAR
JULY 2018

TABLE 1-SCG

SOUTHERN CALIFORNIA GAS COMPANY

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ESTIMATED YEARS 2018 THRU 2022

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LINE			2018	2019	2020	2021	2022	LINE
	CAPACITY AVAILABLE							
1	California Line 85 Zone (California Producers)		60	60	60	60	60	1
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4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		870	1,200	1,590	1,590	1,590	5
6	Total Out-of-State Gas		2,845	3,175	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,055	3,385	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN							
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	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	65	65	66	66	66	29
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35	TOTAL TRANSPORTATION & EXCHANGE		1,689	1,663	1,652	1,639	1,629	35
	CURTAILMENT (RETAIL & WHOLESALE)							
36		Core	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	38

NOTES:

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ESTIMATED YEARS 2023 THRU 2035

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	Out-of-State Gas							
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN							
8	California Source Gas [5/]		51	51	51	51	51	8
9	Out-of-State		2,429	2,393	2,371	2,259	2,262	9
10	TOTAL SUPPLY TAKEN		2,480	2,444	2,422	2,310	2,313	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,480	2,444	2,422	2,310	2,313	12
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14		Commercial	203	196	191	169	168	14
15		Industrial	52	50	49	41	37	15
16		NGV	53	55	59	77	100	16
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18	NONCORE	Commercial	49	48	48	47	46	18
19		Industrial	373	368	363	344	336	19
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25		Electric Generation (EG)	151	150	149	147	146	25
26		Subtotal-WHOLESALE & INTL.	392	390	390	389	395	26
27		Co. Use & LUAF	31	31	31	29	29	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,480	2,444	2,422	2,310	2,313	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	66	66	66	70	79	29
30	NONCORE	Commercial/Industrial	422	416	411	391	383	30
31		EOR Steaming	46	45	46	46	46	31
32		Electric Generation (EG)	684	676	673	646	645	32
33		Subtotal-RETAIL	1,218	1,203	1,196	1,152	1,152	33
	WHOLESALE &							
34	INTERNATIONAL	All End Uses	392	390	390	389	395	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,610	1,594	1,586	1,541	1,547	35
	CURTAILMENT (RETAIL & WHOLESALE)							
36		Core	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

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6/ Excludes own-source gas supply of 0.5 0.5 0.5 0.4 0.4
gas procurement by the City of Long Beach

7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

8/ Core end-use demand exclusive of core aggregation
transportation (CAT) in MDth/d: 867 847 833 766 762

Work Paper: TABLE 1-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2018

AVERAGE TEMPERATURE with BASE HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		870	870	870	870	870	870	870	870	870	870	870	870	870	5
6	Total Out-of-State Gas		2,845	2,845	2,845	2,845	2,845	2,845	2,845	2,845	2,845	2,845	2,845	2,845	2,845	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,055	3,055	3,055	3,055	3,055	3,055	3,055	3,055	3,055	3,055	3,055	3,055	3,055	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		2,902	2,864	2,497	2,505	2,186	2,133	2,475	2,595	2,560	2,350	2,731	3,104	2,574	9
10	TOTAL SUPPLY TAKEN		2,953	2,915	2,548	2,556	2,237	2,184	2,526	2,646	2,611	2,401	2,782	3,155	2,625	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,953	2,915	2,548	2,556	2,237	2,184	2,526	2,646	2,611	2,401	2,782	3,155	2,625	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,058	1,033	804	688	481	383	356	355	363	438	725	1,111	648	13
14		Commercial	288	299	245	232	192	183	174	173	179	185	238	297	223	14
15		Industrial	57	67	60	58	52	54	49	51	55	57	62	60	57	15
16		NGV	37	39	41	39	41	40	39	42	42	44	42	39	40	16
17		Subtotal-CORE	1,440	1,438	1,150	1,017	766	659	618	622	639	723	1,066	1,508	968	17
18	NONCORE	Commercial	60	59	54	51	45	41	38	41	50	45	51	61	50	18
19		Industrial	384	379	382	385	385	388	401	401	397	397	389	387	390	19
20		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	20
21		Electric Generation (EG)	522	493	509	628	623	707	993	1,101	1,046	797	755	607	733	21
22		Subtotal-NONCORE	1,011	977	991	1,109	1,098	1,181	1,478	1,588	1,538	1,285	1,240	1,100	1,218	22
23	WHOLESALE &	Core	282	282	232	201	150	128	119	118	121	134	204	289	188	23
24	INTERNATIONAL	Noncore Excl. EG	50	53	50	50	49	50	49	49	52	51	52	53	51	24
25		Electric Generation (EG)	133	127	92	148	146	138	231	237	228	177	184	166	167	25
26		Subtotal-WHOLESALE & INT	465	463	374	398	345	315	399	404	401	362	440	508	406	26
27		Co. Use & LUAF	37	37	32	32	28	28	32	33	33	30	35	40	33	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,953	2,915	2,548	2,556	2,237	2,184	2,526	2,646	2,611	2,401	2,782	3,155	2,625	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	78	81	70	66	57	55	52	55	56	59	70	83	65	29
30	NONCORE	Commercial/Industrial	443	438	437	436	430	429	439	442	446	442	440	447	439	30
31		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	31
32		Electric Generation (EG)	522	493	509	628	623	707	993	1,101	1,046	797	755	607	733	32
33		Subtotal-RETAIL	1,088	1,058	1,061	1,175	1,155	1,236	1,529	1,642	1,594	1,344	1,310	1,183	1,283	33
34	WHOLESALE & INTERNATIONAL	All End Uses	465	463	374	398	345	315	399	404	401	362	440	508	406	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,553	1,521	1,435	1,573	1,500	1,551	1,928	2,046	1,994	1,707	1,750	1,690	1,689	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.

5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.

6/ Excludes own-source gas supply of 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7
gas procurement by the City of Long Beach

7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

8/ Core end-use demand exclusive of core aggregation
transportation (CAT) in MDth/d: 1,409 1,403 1,117 983 733 626 585 586 603 687 1,030 1,474 934

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SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2019

AVERAGE TEMPERATURE with BASE HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	5
6	Total Out-of-State Gas		3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,385	3,385	3,385	3,385	3,385	3,385	3,385	3,385	3,385	3,385	3,385	3,385	3,385	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		2,949	2,838	2,576	2,493	2,142	2,132	2,384	2,608	2,575	2,323	2,434	3,035	2,540	9
10	TOTAL SUPPLY TAKEN		3,000	2,889	2,627	2,544	2,193	2,183	2,435	2,659	2,626	2,374	2,485	3,086	2,591	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,000	2,889	2,627	2,544	2,193	2,183	2,435	2,659	2,626	2,374	2,485	3,086	2,591	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,046	1,020	795	679	475	378	352	351	358	433	716	1,098	640	13
14		Commercial	285	297	243	230	190	181	172	172	178	183	236	295	221	14
15		Industrial	57	67	60	58	52	53	49	51	55	56	61	60	57	15
16		NGV	39	41	43	41	43	43	41	45	44	46	44	41	43	16
17		Subtotal-CORE	1,426	1,424	1,140	1,008	761	655	614	618	636	718	1,058	1,494	960	17
18	NONCORE	Commercial	59	59	54	51	45	41	38	41	49	45	51	60	50	18
19		Industrial	382	376	379	383	383	386	400	399	396	396	386	384	387	19
20		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	20
21		Electric Generation (EG)	561	488	561	616	580	701	947	1,110	1,058	777	530	570	710	21
22		Subtotal-NONCORE	1,048	969	1,039	1,095	1,053	1,174	1,430	1,595	1,548	1,263	1,012	1,059	1,192	22
23	WHOLESALE &	Core	282	283	233	201	150	128	119	118	121	135	204	289	188	23
24	INTERNATIONAL	Noncore Excl. EG	53	55	52	53	52	53	52	52	52	52	53	53	53	24
25		Electric Generation (EG)	152	122	130	155	148	145	189	242	235	176	128	152	165	25
26		Subtotal-WHOLESALE & INTL	487	459	415	409	350	326	360	412	409	362	384	494	406	26
27		Co. Use & LUAF	38	36	33	32	28	28	31	34	33	30	31	39	33	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,000	2,889	2,627	2,544	2,193	2,183	2,435	2,659	2,626	2,374	2,485	3,086	2,591	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	78	81	70	66	58	55	52	55	57	60	71	83	65	29
30	NONCORE	Commercial/Industrial	441	435	433	434	428	428	438	440	445	441	437	444	437	30
31		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	31
32		Electric Generation (EG)	561	488	561	616	580	701	947	1,110	1,058	777	530	570	710	32
33		Subtotal-RETAIL	1,126	1,050	1,109	1,161	1,111	1,229	1,482	1,651	1,605	1,323	1,082	1,143	1,258	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	487	459	415	409	350	326	360	412	409	362	384	494	406	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,613	1,509	1,524	1,570	1,462	1,555	1,843	2,063	2,014	1,685	1,467	1,637	1,663	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,395 1,389 1,107 974 727 621 581 582 599 681 1,021 1,459 925

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SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2020

AVERAGE TEMPERATURE with BASE HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		3,029	2,755	2,442	2,382	2,019	2,021	2,384	2,573	2,529	2,370	2,545	3,132	2,515	9
10	TOTAL SUPPLY TAKEN		3,080	2,806	2,493	2,433	2,070	2,072	2,435	2,624	2,580	2,421	2,596	3,183	2,566	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,080	2,806	2,493	2,433	2,070	2,072	2,435	2,624	2,580	2,421	2,596	3,183	2,566	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,031	971	784	670	468	373	347	346	353	427	706	1,083	629	13
14		Commercial	281	283	240	227	188	179	170	169	175	181	233	291	218	14
15		Industrial	57	64	59	57	52	53	48	50	55	56	61	59	56	15
16		NGV	41	42	45	43	45	45	43	47	47	49	46	43	45	16
17		Subtotal-CORE	1,410	1,359	1,128	997	754	649	608	613	630	712	1,046	1,476	948	17
18	NONCORE	Commercial	59	57	54	51	45	41	38	41	49	45	51	60	49	18
19		Industrial	381	371	378	381	381	384	398	398	394	394	384	383	386	19
20		EOR Steaming	46	44	46	46	46	46	46	46	46	46	46	46	45	20
21		Electric Generation (EG)	637	473	447	538	491	613	938	1,089	1,031	841	661	690	705	21
22		Subtotal-NONCORE	1,123	945	925	1,015	963	1,084	1,420	1,573	1,520	1,326	1,142	1,179	1,186	22
23	WHOLESALE &	Core	282	274	233	201	150	129	120	118	121	135	204	289	188	23
24	INTERNATIONAL	Noncore Excl. EG	53	55	53	53	52	53	52	52	53	52	53	53	53	24
25		Electric Generation (EG)	173	138	124	135	125	131	204	234	222	165	117	145	159	25
26		Subtotal-WHOLESALE & INTL	508	467	410	390	327	313	376	405	396	352	374	488	401	26
27		Co. Use & LUAF	39	35	31	31	26	26	31	33	33	31	33	40	32	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,080	2,806	2,493	2,433	2,070	2,072	2,435	2,624	2,580	2,421	2,596	3,183	2,566	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	78	78	71	66	58	56	53	56	57	60	71	83	66	29
30	NONCORE	Commercial/Industrial	440	428	432	432	426	425	436	439	443	439	435	443	435	30
31		EOR Steaming	46	44	46	46	46	46	46	46	46	46	46	46	45	31
32		Electric Generation (EG)	637	473	447	538	491	613	938	1,089	1,031	841	661	690	705	32
33		Subtotal-RETAIL	1,202	1,024	995	1,082	1,021	1,140	1,473	1,630	1,578	1,386	1,213	1,262	1,252	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	508	467	410	390	327	313	376	405	396	352	374	488	401	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,710	1,491	1,405	1,472	1,349	1,452	1,848	2,034	1,974	1,738	1,587	1,750	1,652	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,377 1,325 1,093 963 719 614 575 576 592 674 1,009 1,440 912

Work Paper: TABLE 1-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2021

AVERAGE TEMPERATURE with BASE HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		3,040	2,796	2,388	2,421	2,096	2,081	2,310	2,453	2,410	2,344	2,485	3,105	2,493	9
10	TOTAL SUPPLY TAKEN		3,091	2,847	2,439	2,472	2,147	2,132	2,361	2,504	2,461	2,395	2,536	3,156	2,544	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,091	2,847	2,439	2,472	2,147	2,132	2,361	2,504	2,461	2,395	2,536	3,156	2,544	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,017	992	773	661	462	368	342	341	348	421	696	1,068	622	13
14		Commercial	276	287	235	223	184	175	167	166	172	178	229	285	214	14
15		Industrial	56	65	58	56	51	52	48	50	54	55	60	58	55	15
16		NGV	43	45	48	46	48	47	46	50	49	51	49	46	47	16
17		Subtotal-CORE	1,391	1,389	1,114	985	745	642	602	607	624	704	1,034	1,457	939	17
18	NONCORE	Commercial	59	59	54	51	45	41	38	41	49	45	51	60	49	18
19		Industrial	379	373	375	378	378	382	395	395	391	391	381	380	383	19
20		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	20
21		Electric Generation (EG)	692	472	426	591	576	668	872	981	936	801	607	688	694	21
22		Subtotal-NONCORE	1,176	950	900	1,065	1,044	1,136	1,351	1,462	1,422	1,283	1,085	1,174	1,172	22
23	WHOLESALE &	Core	282	282	232	201	150	129	120	119	121	135	204	289	188	23
24	INTERNATIONAL	Noncore Excl. EG	54	56	53	54	53	54	53	53	53	53	54	54	53	24
25		Electric Generation (EG)	150	133	108	136	127	144	206	232	210	190	128	142	159	25
26		Subtotal-WHOLESALE & INTL	485	471	394	391	330	327	378	404	384	378	386	485	401	26
27		Co. Use & LUAF	39	36	31	31	27	27	30	32	31	30	32	40	32	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,091	2,847	2,439	2,472	2,147	2,132	2,361	2,504	2,461	2,395	2,536	3,156	2,544	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	78	81	71	67	59	56	53	57	58	61	71	83	66	29
30	NONCORE	Commercial/Industrial	438	432	429	429	423	423	433	435	440	436	432	440	432	30
31		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	31
32		Electric Generation (EG)	692	472	426	591	576	668	872	981	936	801	607	688	694	32
33		Subtotal-RETAIL	1,254	1,031	971	1,132	1,103	1,192	1,404	1,519	1,480	1,344	1,156	1,258	1,239	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	485	471	394	391	330	327	378	404	384	378	386	485	401	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,739	1,502	1,365	1,523	1,433	1,518	1,782	1,922	1,864	1,722	1,542	1,742	1,639	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,358 1,353 1,079 950 710 607 568 569 585 665 995 1,420 903

Work Paper: TABLE 1-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2022

AVERAGE TEMPERATURE with BASE HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		2,969	2,843	2,470	2,383	2,094	2,061	2,263	2,376	2,339	2,279	2,477	3,078	2,468	9
10	TOTAL SUPPLY TAKEN		3,020	2,894	2,521	2,434	2,145	2,112	2,314	2,427	2,390	2,330	2,528	3,129	2,519	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,020	2,894	2,521	2,434	2,145	2,112	2,314	2,427	2,390	2,330	2,528	3,129	2,519	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	999	975	760	649	454	362	336	335	343	413	684	1,050	612	13
14		Commercial	269	280	230	217	180	171	163	162	168	173	223	278	209	14
15		Industrial	54	63	57	55	50	51	46	48	52	54	58	57	54	15
16		NGV	46	48	50	48	51	50	48	52	52	54	51	48	50	16
17		Subtotal-CORE	1,369	1,367	1,097	970	734	634	594	599	615	695	1,018	1,433	925	17
18	NONCORE	Commercial	59	59	54	51	44	41	38	41	49	45	51	60	49	18
19		Industrial	376	370	371	374	375	378	391	391	387	387	378	377	380	19
20		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	20
21		Electric Generation (EG)	652	553	525	569	593	662	857	932	894	761	603	682	692	21
22		Subtotal-NONCORE	1,133	1,027	996	1,040	1,057	1,126	1,331	1,409	1,375	1,238	1,077	1,164	1,166	22
23	WHOLESALE &	Core	280	280	231	200	150	128	119	118	121	135	203	287	187	23
24	INTERNATIONAL	Noncore Excl. EG	54	56	54	54	53	54	53	53	53	53	54	54	54	24
25		Electric Generation (EG)	147	126	112	139	124	143	187	218	195	181	144	152	156	25
26		Subtotal-WHOLESALE & INTL	481	463	397	393	326	325	360	389	369	368	401	493	397	26
27		Co. Use & LUAF	38	37	32	31	27	27	29	31	30	29	32	39	32	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,020	2,894	2,521	2,434	2,145	2,112	2,314	2,427	2,390	2,330	2,528	3,129	2,519	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	78	81	71	67	59	56	53	57	58	61	71	83	66	29
30	NONCORE	Commercial/Industrial	435	429	425	425	419	419	429	431	436	432	428	436	429	30
31		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	31
32		Electric Generation (EG)	652	553	525	569	593	662	857	932	894	761	603	682	692	32
33		Subtotal-RETAIL	1,210	1,108	1,067	1,106	1,116	1,182	1,385	1,466	1,434	1,300	1,149	1,247	1,232	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	481	463	397	393	326	325	360	389	369	368	401	493	397	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,691	1,571	1,464	1,499	1,443	1,507	1,745	1,855	1,803	1,668	1,550	1,740	1,629	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,335 1,330 1,061 934 699 597 559 560 576 655 979 1,396 888

Work Paper: TABLE 2-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2023

AVERAGE TEMPERATURE with BASE HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		2,906	2,844	2,470	2,395	2,111	2,047	2,230	2,306	2,231	2,140	2,478	3,010	2,429	9
10	TOTAL SUPPLY TAKEN		2,957	2,895	2,521	2,446	2,162	2,098	2,281	2,357	2,282	2,191	2,529	3,061	2,480	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,957	2,895	2,521	2,446	2,162	2,098	2,281	2,357	2,282	2,191	2,529	3,061	2,480	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	976	952	742	634	443	353	328	327	335	404	668	1,025	597	13
14		Commercial	261	271	222	210	174	166	158	157	163	168	216	269	203	14
15		Industrial	53	61	55	53	48	49	45	47	51	52	57	55	52	15
16		NGV	48	51	53	51	53	53	51	55	55	57	54	51	53	16
17		Subtotal-CORE	1,337	1,336	1,072	949	719	621	582	587	603	681	996	1,400	905	17
22	NONCORE	Subtotal-NONCORE	1,112	1,053	1,006	1,084	1,085	1,124	1,312	1,357	1,298	1,149	1,096	1,133	1,152	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INTL	471	470	411	382	331	327	358	384	352	334	406	488	392	26
27		Co. Use & LUAF	37	37	32	31	27	26	29	30	29	28	32	39	31	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,957	2,895	2,521	2,446	2,162	2,098	2,281	2,357	2,282	2,191	2,529	3,061	2,480	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	77	80	71	66	59	56	54	57	59	62	71	83	66	29
30	NONCORE	All End Uses	1,112	1,053	1,006	1,084	1,085	1,124	1,312	1,357	1,298	1,149	1,096	1,133	1,152	30
33		Subtotal-RETAIL	1,189	1,133	1,077	1,151	1,144	1,181	1,366	1,414	1,356	1,211	1,167	1,216	1,218	33
34	WHOLESALE & INTERNATIONAL	All End Uses	471	470	411	382	331	327	358	384	352	334	406	488	392	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,660	1,603	1,487	1,533	1,475	1,507	1,724	1,798	1,708	1,544	1,573	1,704	1,610	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.

5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.

6/ Excludes own-source gas supply of	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

gas procurement by the City of Long Beach

7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,303	1,299	1,036	912	683	584	547	548	563	640	956	1,363	867

Work Paper: TABLE 2-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2024

AVERAGE TEMPERATURE with BASE HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE 4/		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas 5/		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		2,880	2,736	2,456	2,324	2,061	2,013	2,212	2,289	2,231	2,076	2,456	2,984	2,393	9
10	TOTAL SUPPLY TAKEN		2,931	2,787	2,507	2,375	2,112	2,064	2,263	2,340	2,282	2,127	2,507	3,035	2,444	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 6/		2,931	2,787	2,507	2,375	2,112	2,064	2,263	2,340	2,282	2,127	2,507	3,035	2,444	12
	REQUIREMENTS FORECAST BY END-USE 7/															
13	CORE 8/	Residential	956	900	726	621	434	346	321	321	328	395	654	1,004	583	13
14		Commercial	252	254	215	204	169	161	153	153	158	163	210	261	196	14
15		Industrial	51	58	54	52	47	48	44	46	49	51	55	54	50	15
16		NGV	51	51	56	53	56	56	53	58	58	60	57	54	55	16
17		Subtotal-CORE	1,310	1,263	1,051	930	706	610	572	577	593	669	976	1,372	885	17
22	NONCORE	Subtotal-NONCORE	1,111	1,034	1,015	1,032	1,049	1,106	1,306	1,355	1,311	1,099	1,088	1,136	1,137	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INTL	474	454	409	383	329	322	356	378	349	332	410	489	390	26
27		Co. Use & LUAF	37	35	32	30	27	26	29	30	29	27	32	38	31	27
28	SYSTEM TOTAL THROUGHPUT 6/		2,931	2,787	2,507	2,375	2,112	2,064	2,263	2,340	2,282	2,127	2,507	3,035	2,444	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	76	77	70	66	59	57	54	58	59	62	71	82	66	29
30	NONCORE	All End Uses	1,111	1,034	1,015	1,032	1,049	1,106	1,306	1,355	1,311	1,099	1,088	1,136	1,137	30
33		Subtotal-RETAIL	1,187	1,111	1,085	1,099	1,108	1,162	1,360	1,413	1,370	1,161	1,160	1,218	1,203	33
34	WHOLESALE & INTERNATIONAL	All End Uses	474	454	409	383	329	322	356	378	349	332	410	489	390	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,661	1,565	1,494	1,481	1,438	1,485	1,716	1,791	1,719	1,493	1,570	1,707	1,594	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,276 1,227 1,015 894 669 572 536 537 552 628 936 1,334 847

Work Paper: TABLE 2-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2025

AVERAGE TEMPERATURE with BASE HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		2,866	2,755	2,368	2,234	2,017	1,976	2,198	2,292	2,247	2,060	2,476	2,975	2,371	9
10	TOTAL SUPPLY TAKEN		2,917	2,806	2,419	2,285	2,068	2,027	2,249	2,343	2,298	2,111	2,527	3,026	2,422	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,917	2,806	2,419	2,285	2,068	2,027	2,249	2,343	2,298	2,111	2,527	3,026	2,422	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	936	914	712	609	426	339	315	314	321	387	641	983	573	13
14		Commercial	245	255	209	198	164	156	149	148	153	158	203	253	191	14
15		Industrial	50	58	52	50	45	46	42	44	48	49	53	52	49	15
16		NGV	54	56	59	56	59	59	56	62	61	63	60	57	59	16
17		Subtotal-CORE	1,284	1,283	1,032	913	694	600	563	568	583	658	958	1,345	871	17
22	NONCORE	Subtotal-NONCORE	1,119	1,019	948	962	1,022	1,083	1,309	1,370	1,333	1,092	1,130	1,152	1,129	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INTL	476	469	409	381	326	318	350	374	352	334	407	490	390	26
27		Co. Use & LUAF	37	35	31	29	26	26	28	30	29	27	32	38	31	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,917	2,806	2,419	2,285	2,068	2,027	2,249	2,343	2,298	2,111	2,527	3,026	2,422	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	76	79	70	66	59	57	54	58	60	63	71	82	66	29
30	NONCORE	All End Uses	1,119	1,019	948	962	1,022	1,083	1,309	1,370	1,333	1,092	1,130	1,152	1,129	30
33		Subtotal-RETAIL	1,195	1,098	1,018	1,028	1,081	1,140	1,363	1,429	1,393	1,155	1,202	1,234	1,196	33
34	WHOLESALE & INTERNATIONAL	All End Uses	476	469	409	381	326	318	350	374	352	334	407	490	390	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,672	1,567	1,427	1,410	1,407	1,458	1,713	1,803	1,745	1,489	1,608	1,725	1,586	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,250 1,245 994 876 656 562 526 527 542 616 917 1,306 833

Work Paper: TABLE 2-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2030

AVERAGE TEMPERATURE with BASE HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE 4/		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas 5/		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		2,730	2,641	2,181	2,040	1,806	1,797	2,279	2,378	2,193	1,940	2,296	2,846	2,259	9
10	TOTAL SUPPLY TAKEN		2,781	2,692	2,232	2,091	1,857	1,848	2,330	2,429	2,244	1,991	2,347	2,897	2,310	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 6/		2,781	2,692	2,232	2,091	1,857	1,848	2,330	2,429	2,244	1,991	2,347	2,897	2,310	12
	REQUIREMENTS FORECAST BY END-USE 7/															
13	CORE 8/	Residential	854	833	649	555	388	309	287	287	293	353	585	897	523	13
14		Commercial	217	226	185	175	146	139	133	132	137	140	180	224	169	14
15		Industrial	42	49	44	42	38	39	36	37	40	41	45	44	41	15
16		NGV	70	73	77	74	78	77	74	80	80	83	79	74	77	16
17		Subtotal-CORE	1,182	1,181	955	847	650	564	529	536	549	618	889	1,239	810	17
22	NONCORE	Subtotal-NONCORE	1,084	1,007	865	868	878	952	1,383	1,454	1,299	1,023	1,037	1,127	1,083	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INTL	479	470	383	351	307	309	389	408	367	326	391	494	389	26
27		Co. Use & LUAF	35	34	28	26	23	23	29	31	28	25	30	37	29	27
28	SYSTEM TOTAL THROUGHPUT 6/		2,781	2,692	2,232	2,091	1,857	1,848	2,330	2,429	2,244	1,991	2,347	2,897	2,310	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	77	80	73	69	63	61	58	64	64	68	75	84	70	29
30	NONCORE	All End Uses	1,084	1,007	865	868	878	952	1,383	1,454	1,299	1,023	1,037	1,127	1,083	30
33		Subtotal-RETAIL	1,161	1,087	938	937	941	1,013	1,441	1,517	1,364	1,090	1,112	1,211	1,152	33
34	WHOLESALE & INTERNATIONAL	All End Uses	479	470	383	351	307	309	389	408	367	326	391	494	389	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,640	1,557	1,321	1,288	1,248	1,322	1,830	1,925	1,731	1,416	1,502	1,705	1,541	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4
gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation
transportation (CAT) in MDth/d: 1,143 1,139 913 804 607 520 488 489 502 569 842 1,195 766

Work Paper: TABLE 2-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2035

AVERAGE TEMPERATURE with BASE HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		2,722	2,635	2,181	2,041	1,814	1,805	2,286	2,387	2,201	1,949	2,297	2,838	2,262	9
10	TOTAL SUPPLY TAKEN		2,773	2,686	2,232	2,092	1,865	1,856	2,337	2,438	2,252	2,000	2,348	2,889	2,313	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,773	2,686	2,232	2,092	1,865	1,856	2,337	2,438	2,252	2,000	2,348	2,889	2,313	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	833	813	633	541	378	301	280	279	285	345	570	875	510	13
14		Commercial	216	225	184	175	145	139	132	132	136	140	180	223	168	14
15		Industrial	37	44	39	38	34	35	32	33	36	37	40	39	37	15
16		NGV	91	96	101	96	102	100	96	105	104	108	103	97	100	16
17		Subtotal-CORE	1,178	1,177	958	850	659	575	541	550	562	630	894	1,234	815	17
22	NONCORE	Subtotal-NONCORE	1,075	998	856	859	869	943	1,373	1,444	1,289	1,013	1,027	1,118	1,073	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INTL	486	477	390	357	312	315	395	413	372	332	397	500	395	26
27		Co. Use & LUAF	35	34	28	26	24	23	29	31	28	25	30	36	29	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,773	2,686	2,232	2,092	1,865	1,856	2,337	2,438	2,252	2,000	2,348	2,889	2,313	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	85	89	82	78	73	70	67	74	75	79	85	94	79	29
30	NONCORE	All End Uses	1,075	998	856	859	869	943	1,373	1,444	1,289	1,013	1,027	1,118	1,073	30
33		Subtotal-RETAIL	1,160	1,087	939	936	942	1,013	1,440	1,518	1,364	1,092	1,112	1,212	1,152	33
34	WHOLESALE & INTERNATIONAL	All End Uses	486	477	390	357	312	315	395	413	372	332	397	500	395	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,646	1,563	1,328	1,293	1,254	1,328	1,834	1,931	1,737	1,423	1,509	1,712	1,547	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,130 1,126 905 799 607 522 490 492 504 570 836 1,180 762

2018 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS - COLD TEMPERATURE YEAR
JULY 2018

TABLE 3-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2018 THRU 2022

COLD TEMPERATURE YEAR (1 IN 35 COLD YEAR EVENT) & DRY HYDRO YEAR

LINE			2018	2019	2020	2021	2022	LINE
	CAPACITY AVAILABLE							
1	California Line 85 Zone (California Producers)		60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	2
	Out-of-State Gas							
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		870	1,200	1,590	1,590	1,590	5
6	Total Out-of-State Gas		2,845	3,175	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,055	3,385	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN							
8	California Source Gas [5/]		51	51	51	51	51	8
9	Out-of-State		2,664	2,719	2,693	2,691	2,637	9
10	TOTAL SUPPLY TAKEN		2,715	2,770	2,744	2,742	2,688	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,715	2,770	2,744	2,742	2,688	12
	REQUIREMENTS FORECAST BY END-USE [7/]							
13	CORE [8/]	Residential	710	703	692	685	675	13
14		Commercial	233	231	227	224	219	14
15		Industrial	58	58	57	56	55	15
16		NGV	40	43	45	47	50	16
17		Subtotal-CORE	1,042	1,034	1,021	1,013	999	17
18	NONCORE	Commercial	51	51	50	50	50	18
19		Industrial	390	387	386	383	380	19
20		EOR Steaming	46	46	45	46	46	20
21		Electric Generation (EG)	733	781	774	782	750	21
22		Subtotal-NONCORE	1,219	1,265	1,255	1,261	1,226	22
23	WHOLESALE &	Core	202	202	202	202	201	23
24	INTERNATIONAL	Noncore Excl. EG	51	53	53	54	54	24
25		Electric Generation (EG)	167	181	177	178	174	25
26		Subtotal-WHOLESALE & INTL.	420	436	432	434	429	26
27		Co. Use & LUAF	34	35	35	35	34	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,715	2,770	2,744	2,742	2,688	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	67	68	68	69	69	29
30	NONCORE	Commercial/Industrial	440	438	436	434	430	30
31		EOR Steaming	46	46	45	46	46	31
32		Electric Generation (EG)	733	781	774	782	750	32
33		Subtotal-RETAIL	1,286	1,333	1,323	1,329	1,294	33
	WHOLESALE &							
34	INTERNATIONAL	All End Uses	420	436	432	434	429	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,706	1,769	1,755	1,763	1,723	35
	CURTAILMENT (RETAIL & WHOLESALE)							
36		Core	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.

5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economi

6/ Excludes own-source gas supply of 0.8 0.7 0.7 0.7 0.6
gas procurement by the City of Long Beach

7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

8/ Core end-use demand exclusive of core aggregation
transportation (CAT) in MDth/d: 1,008 999 986 977 962

TABLE 4-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2023 THRU 2035

COLD TEMPERATURE YEAR (1 IN 35 COLD YEAR EVENT) & DRY HYDRO YEAR

LINE			2023	2024	2025	2030	2035	LINE
	CAPACITY AVAILABLE							
1	California Line 85 Zone (California Producers)		60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	2
	Out-of-State Gas							
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN							
8	California Source Gas [5/]		51	51	51	51	51	8
9	Out-of-State		2,575	2,546	2,523	2,396	2,399	9
10	TOTAL SUPPLY TAKEN		2,626	2,597	2,574	2,447	2,450	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,626	2,597	2,574	2,447	2,450	12
	REQUIREMENTS FORECAST BY END-USE [7/]							
13	CORE [8/]	Residential	660	646	636	585	572	13
14		Commercial	212	206	200	179	178	14
15		Industrial	54	52	50	43	38	15
16		NGV	53	55	59	77	100	16
17		Subtotal-CORE	979	959	945	883	888	17
18	NONCORE	Commercial	50	49	49	48	48	18
19		Industrial	373	368	363	344	336	19
20		EOR Steaming	46	45	46	46	46	20
21		Electric Generation (EG)	725	724	719	688	686	21
22		Subtotal-NONCORE	1,193	1,187	1,177	1,125	1,115	22
23	WHOLESALE &	Core	201	200	201	202	208	23
24	INTERNATIONAL	Noncore Excl. EG	54	54	54	55	56	24
25		Electric Generation (EG)	166	164	164	152	152	25
26		Subtotal-WHOLESALE & INTL.	421	419	419	409	415	26
27		Co. Use & LUAF	33	33	32	31	31	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,626	2,597	2,574	2,447	2,450	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	68	68	69	72	81	29
30	NONCORE	Commercial/Industrial	423	417	412	392	384	30
31		EOR Steaming	46	45	46	46	46	31
32		Electric Generation (EG)	725	724	719	688	686	32
33		Subtotal-RETAIL	1,262	1,255	1,246	1,197	1,197	33
	WHOLESALE &							
34	INTERNATIONAL	All End Uses	421	419	419	409	415	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,683	1,673	1,665	1,605	1,612	35
	CURTAILMENT (RETAIL & WHOLESALE)							
36		Core	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.

5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economic

6/ Excludes own-source gas supply of 0.6 0.6 0.5 0.5 0.5
gas procurement by the City of Long Beach

7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

8/ Core end-use demand exclusive of core aggregation
transportation (CAT) in MDth/d: 941 921 906 839 835

2018 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS
JULY 2018

The Gas Company

A Sempra Energy utility™

Work Paper: TABLE 3-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2018

COLD TEMPERATURE with DRY HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		870	870	870	870	870	870	870	870	870	870	870	870	870	5
6	Total Out-of-State Gas		2,845	2,845	2,845	2,845	2,845	2,845	2,845	2,845	2,845	2,845	2,845	2,845	2,845	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,055	3,055	3,055	3,055	3,055	3,055	3,055	3,055	3,055	3,055	3,055	3,055	3,055	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		3,117	3,064	2,636	2,609	2,227	2,144	2,478	2,598	2,565	2,378	2,845	3,330	2,664	9
10	TOTAL SUPPLY TAKEN		3,168	3,115	2,687	2,660	2,278	2,195	2,529	2,649	2,616	2,429	2,896	3,381	2,715	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,168	3,115	2,687	2,660	2,278	2,195	2,529	2,649	2,616	2,429	2,896	3,381	2,715	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,207	1,174	900	759	509	390	358	357	366	457	804	1,271	710	13
14		Commercial	311	321	260	243	196	184	174	173	180	188	251	322	233	14
15		Industrial	59	70	63	60	53	54	49	52	56	58	64	62	58	15
16		NGV	37	39	41	39	41	40	39	42	42	44	42	39	40	16
17		Subtotal-CORE	1,614	1,603	1,263	1,100	799	669	619	624	644	746	1,160	1,695	1,042	17
18	NONCORE	Commercial	62	62	56	52	45	41	38	41	50	46	53	63	51	18
19		Industrial	384	379	382	385	385	388	401	401	397	397	389	387	390	19
20		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	20
21		Electric Generation (EG)	522	493	509	628	623	707	993	1,101	1,046	797	755	607	733	21
22		Subtotal-NONCORE	1,013	980	993	1,111	1,098	1,181	1,478	1,588	1,538	1,286	1,242	1,102	1,219	22
23	WHOLESALE &	Core	318	312	255	217	157	130	120	118	121	138	221	322	202	23
24	INTERNATIONAL	Noncore Excl. EG	50	53	50	50	49	50	49	49	52	51	52	53	51	24
25		Electric Generation (EG)	133	127	92	148	146	138	231	237	228	177	184	166	167	25
26		Subtotal-WHOLESALE & INT	501	493	397	415	352	318	399	404	401	366	457	541	420	26
27		Co. Use & LUAF	40	39	34	34	29	28	32	33	33	31	37	43	34	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,168	3,115	2,687	2,660	2,278	2,195	2,529	2,649	2,616	2,429	2,896	3,381	2,715	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	83	86	74	68	58	55	52	55	56	60	73	89	67	29
30	NONCORE	Commercial/Industrial	446	441	438	437	430	429	439	442	446	443	441	450	440	30
31		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	31
32		Electric Generation (EG)	522	493	509	628	623	707	993	1,101	1,046	797	755	607	733	32
33		Subtotal-RETAIL	1,096	1,066	1,067	1,179	1,157	1,236	1,529	1,643	1,594	1,345	1,315	1,191	1,286	33
34	WHOLESALE & INTERNATIONAL	All End Uses	501	493	397	415	352	318	399	404	401	366	457	541	420	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,597	1,559	1,464	1,594	1,509	1,554	1,929	2,047	1,995	1,711	1,772	1,732	1,706	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.

5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.

6/ Excludes own-source gas supply of 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8
gas procurement by the City of Long Beach

7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,583 1,569 1,230 1,067 766 635 587 589 608 710 1,124 1,661 1,008

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SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2019

COLD TEMPERATURE with DRY HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	5
6	Total Out-of-State Gas		3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,385	3,385	3,385	3,385	3,385	3,385	3,385	3,385	3,385	3,385	3,385	3,385	3,385	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		3,248	3,092	2,788	2,682	2,275	2,235	2,529	2,792	2,685	2,383	2,600	3,334	2,719	9
10	TOTAL SUPPLY TAKEN		3,299	3,143	2,839	2,733	2,326	2,286	2,580	2,843	2,736	2,434	2,651	3,385	2,770	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,299	3,143	2,839	2,733	2,326	2,286	2,580	2,843	2,736	2,434	2,651	3,385	2,770	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,194	1,161	890	751	503	386	354	353	362	452	795	1,258	703	13
14		Commercial	308	318	258	241	195	182	172	172	178	186	248	319	231	14
15		Industrial	59	69	62	59	53	54	49	51	56	58	64	62	58	15
16		NGV	39	41	43	41	43	43	41	45	44	46	44	41	43	16
17		Subtotal-CORE	1,600	1,590	1,253	1,092	794	665	616	621	641	742	1,151	1,680	1,034	17
18	NONCORE	Commercial	62	62	56	52	45	41	38	41	49	46	52	63	51	18
19		Industrial	382	376	379	383	383	386	400	399	396	396	386	384	387	19
20		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	20
21		Electric Generation (EG)	625	531	614	691	659	767	1,062	1,255	1,143	807	576	622	781	21
22		Subtotal-NONCORE	1,115	1,014	1,094	1,172	1,133	1,240	1,546	1,741	1,633	1,294	1,059	1,114	1,265	22
23	WHOLESALE &	Core	318	312	256	218	157	130	120	118	122	138	221	322	202	23
24	INTERNATIONAL	Noncore Excl. EG	53	55	53	53	52	53	52	52	52	52	53	53	53	24
25		Electric Generation (EG)	172	131	147	165	161	169	214	275	253	177	134	172	181	25
26		Subtotal-WHOLESALE & INTL	543	499	456	436	370	352	386	445	427	367	408	547	436	26
27		Co. Use & LUAF	42	40	36	34	29	29	33	36	35	31	33	43	35	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,299	3,143	2,839	2,733	2,326	2,286	2,580	2,843	2,736	2,434	2,651	3,385	2,770	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	83	86	74	69	59	55	52	56	57	60	74	89	68	29
30	NONCORE	Commercial/Industrial	444	438	435	435	428	428	438	440	445	441	438	447	438	30
31		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	31
32		Electric Generation (EG)	625	531	614	691	659	767	1,062	1,255	1,143	807	576	622	781	32
33		Subtotal-RETAIL	1,198	1,101	1,168	1,241	1,192	1,295	1,598	1,797	1,690	1,354	1,133	1,204	1,333	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	543	499	456	436	370	352	386	445	427	367	408	547	436	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,741	1,600	1,624	1,676	1,562	1,647	1,984	2,242	2,117	1,722	1,541	1,751	1,769	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,568 1,555 1,220 1,058 760 630 583 584 604 705 1,114 1,646 999

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SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2020

COLD TEMPERATURE with DRY HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		3,325	3,004	2,655	2,567	2,148	2,096	2,523	2,734	2,634	2,431	2,727	3,458	2,693	9
10	TOTAL SUPPLY TAKEN		3,376	3,055	2,706	2,618	2,199	2,147	2,574	2,785	2,685	2,482	2,778	3,509	2,744	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,376	3,055	2,706	2,618	2,199	2,147	2,574	2,785	2,685	2,482	2,778	3,509	2,744	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,179	1,107	879	741	497	381	349	348	357	446	785	1,242	692	13
14		Commercial	304	304	255	238	192	180	170	170	176	184	245	315	227	14
15		Industrial	58	66	62	59	52	53	48	51	56	58	63	62	57	15
16		NGV	41	42	45	43	45	45	43	47	47	49	46	43	45	16
17		Subtotal-CORE	1,583	1,518	1,241	1,081	787	659	611	616	636	736	1,140	1,662	1,021	17
18	NONCORE	Commercial	62	59	56	52	45	41	38	41	49	46	52	63	50	18
19		Industrial	381	371	378	381	381	384	398	398	394	394	384	383	386	19
20		EOR Steaming	46	44	46	46	46	46	46	46	46	46	46	46	45	20
21		Electric Generation (EG)	700	515	499	606	561	659	1,045	1,213	1,111	873	716	767	774	21
22		Subtotal-NONCORE	1,189	990	978	1,085	1,033	1,130	1,527	1,698	1,600	1,359	1,199	1,259	1,255	22
23	WHOLESALE &	Core	318	303	256	218	157	131	120	119	122	139	222	322	202	23
24	INTERNATIONAL	Noncore Excl. EG	54	55	53	54	53	53	53	53	53	53	54	54	53	24
25		Electric Generation (EG)	190	150	143	147	141	146	231	265	240	166	129	168	177	25
26		Subtotal-WHOLESALE & INTL	562	508	453	419	351	331	404	436	415	357	404	544	432	26
27		Co. Use & LUAF	43	39	34	33	28	27	32	35	34	31	35	44	35	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,376	3,055	2,706	2,618	2,199	2,147	2,574	2,785	2,685	2,482	2,778	3,509	2,744	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	84	83	74	69	59	56	53	56	58	61	74	89	68	29
30	NONCORE	Commercial/Industrial	443	431	433	433	427	426	436	439	443	440	437	446	436	30
31		EOR Steaming	46	44	46	46	46	46	46	46	46	46	46	46	45	31
32		Electric Generation (EG)	700	515	499	606	561	659	1,045	1,213	1,111	873	716	767	774	32
33		Subtotal-RETAIL	1,272	1,073	1,053	1,154	1,093	1,186	1,579	1,754	1,658	1,420	1,273	1,348	1,323	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	562	508	453	419	351	331	404	436	415	357	404	544	432	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,834	1,582	1,505	1,573	1,444	1,517	1,984	2,190	2,073	1,777	1,677	1,893	1,755	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,550 1,484 1,206 1,047 753 624 577 579 598 698 1,102 1,627 986

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SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2021

COLD TEMPERATURE with DRY HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		3,369	3,132	2,642	2,637	2,253	2,173	2,456	2,621	2,511	2,413	2,702	3,400	2,691	9
10	TOTAL SUPPLY TAKEN		3,420	3,183	2,693	2,688	2,304	2,224	2,507	2,672	2,562	2,464	2,753	3,451	2,742	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,420	3,183	2,693	2,688	2,304	2,224	2,507	2,672	2,562	2,464	2,753	3,451	2,742	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,165	1,132	868	732	491	377	345	344	353	441	775	1,227	685	13
14		Commercial	299	309	250	234	189	176	167	166	173	180	241	310	224	14
15		Industrial	57	67	61	58	51	52	48	50	55	57	62	61	56	15
16		NGV	43	45	48	46	48	47	46	50	49	51	49	46	47	16
17		Subtotal-CORE	1,564	1,554	1,227	1,069	779	653	605	610	630	729	1,127	1,643	1,013	17
18	NONCORE	Commercial	62	61	56	52	45	41	38	41	49	45	52	63	50	18
19		Industrial	379	373	375	378	378	382	395	395	391	391	381	380	383	19
20		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	20
21		Electric Generation (EG)	785	596	530	684	661	724	987	1,110	1,011	838	693	740	782	21
22		Subtotal-NONCORE	1,271	1,076	1,006	1,159	1,130	1,192	1,466	1,591	1,497	1,320	1,172	1,228	1,261	22
23	WHOLESALE &	Core	317	312	255	217	157	131	120	119	122	139	221	321	202	23
24	INTERNATIONAL	Noncore Excl. EG	54	56	54	54	53	54	53	53	53	53	54	54	54	24
25		Electric Generation (EG)	171	145	117	153	156	167	231	264	228	192	143	160	178	25
26		Subtotal-WHOLESALE & INTL	542	513	426	425	366	351	404	436	404	384	418	535	434	26
27		Co. Use & LUAF	43	40	34	34	29	28	32	34	32	31	35	44	35	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,420	3,183	2,693	2,688	2,304	2,224	2,507	2,672	2,562	2,464	2,753	3,451	2,742	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	83	86	75	69	60	56	53	57	58	62	74	89	69	29
30	NONCORE	Commercial/Industrial	441	435	430	430	423	423	433	435	440	436	434	443	434	30
31		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	31
32		Electric Generation (EG)	785	596	530	684	661	724	987	1,110	1,011	838	693	740	782	32
33		Subtotal-RETAIL	1,354	1,162	1,081	1,229	1,190	1,248	1,519	1,648	1,555	1,382	1,247	1,318	1,329	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	542	513	426	425	366	351	404	436	404	384	418	535	434	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,897	1,675	1,507	1,654	1,556	1,600	1,923	2,084	1,959	1,766	1,665	1,853	1,763	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7 gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,531 1,518 1,192 1,034 744 617 571 572 591 690 1,089 1,607 977

Work Paper: TABLE 3-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2022

COLD TEMPERATURE with DRY HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		3,281	3,138	2,638	2,580	2,188	2,123	2,393	2,506	2,429	2,345	2,673	3,367	2,637	9
10	TOTAL SUPPLY TAKEN		3,332	3,189	2,689	2,631	2,239	2,174	2,444	2,557	2,480	2,396	2,724	3,418	2,688	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,332	3,189	2,689	2,631	2,239	2,174	2,444	2,557	2,480	2,396	2,724	3,418	2,688	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,147	1,115	855	721	483	371	340	339	348	434	764	1,208	675	13
14		Commercial	292	302	244	228	184	172	163	163	169	176	236	303	219	14
15		Industrial	56	66	59	57	50	51	46	49	53	55	61	59	55	15
16		NGV	46	48	50	48	51	50	48	52	52	54	51	48	50	16
17		Subtotal-CORE	1,541	1,531	1,209	1,054	769	645	598	603	622	720	1,111	1,619	999	17
18	NONCORE	Commercial	62	61	55	52	45	41	38	41	49	45	52	63	50	18
19		Industrial	376	370	371	374	375	378	391	391	387	387	378	377	380	19
20		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	20
21		Electric Generation (EG)	730	627	539	646	618	695	955	1,027	957	795	677	729	750	21
22		Subtotal-NONCORE	1,213	1,104	1,011	1,118	1,083	1,159	1,429	1,503	1,438	1,272	1,152	1,214	1,226	22
23	WHOLESALE &	Core	315	310	254	216	156	130	120	119	122	138	220	319	201	23
24	INTERNATIONAL	Noncore Excl. EG	54	56	54	54	53	54	53	53	54	53	54	54	54	24
25		Electric Generation (EG)	167	148	126	155	150	159	213	247	214	183	153	169	174	25
26		Subtotal-WHOLESALE & INTL	537	514	434	426	360	344	386	419	389	374	427	543	429	26
27		Co. Use & LUAF	42	40	34	33	28	27	31	32	31	30	34	43	34	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,332	3,189	2,689	2,631	2,239	2,174	2,444	2,557	2,480	2,396	2,724	3,418	2,688	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	83	86	75	69	60	57	54	57	59	62	74	89	69	29
30	NONCORE	Commercial/Industrial	437	431	427	426	420	419	429	431	436	432	430	439	430	30
31		EOR Steaming	46	46	46	46	46	46	46	46	46	46	46	46	46	31
32		Electric Generation (EG)	730	627	539	646	618	695	955	1,027	957	795	677	729	750	32
33		Subtotal-RETAIL	1,296	1,190	1,086	1,187	1,143	1,216	1,482	1,561	1,497	1,335	1,226	1,303	1,294	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	537	514	434	426	360	344	386	419	389	374	427	543	429	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,833	1,704	1,520	1,613	1,503	1,559	1,868	1,979	1,886	1,709	1,653	1,846	1,723	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,508 1,495 1,174 1,018 733 608 563 564 582 680 1,073 1,582 962

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SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2023

COLD TEMPERATURE with DRY HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE 4/		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas 5/		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		3,180	3,090	2,638	2,543	2,165	2,087	2,341	2,409	2,329	2,216	2,661	3,272	2,575	9
10	TOTAL SUPPLY TAKEN		3,231	3,141	2,689	2,594	2,216	2,138	2,392	2,460	2,380	2,267	2,712	3,323	2,626	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 6/		3,231	3,141	2,689	2,594	2,216	2,138	2,392	2,460	2,380	2,267	2,712	3,323	2,626	12
	REQUIREMENTS FORECAST BY END-USE 7/															
13	CORE 8/	Residential	1,122	1,091	837	705	473	363	332	331	340	424	747	1,182	660	13
14		Commercial	284	293	237	221	179	167	158	158	163	171	228	294	212	14
15		Industrial	54	64	58	55	49	50	45	47	52	54	59	58	54	15
16		NGV	48	51	53	51	53	53	51	55	55	57	54	51	53	16
17		Subtotal-CORE	1,508	1,498	1,184	1,032	754	632	586	592	610	706	1,089	1,584	979	17
22	NONCORE	Subtotal-NONCORE	1,153	1,087	1,022	1,113	1,091	1,143	1,395	1,433	1,370	1,182	1,156	1,165	1,193	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INTL	529	516	448	416	344	335	380	405	369	351	433	531	421	26
27		Co. Use & LUAF	41	40	34	33	28	27	30	31	30	29	34	42	33	27
28	SYSTEM TOTAL THROUGHPUT 6/		3,231	3,141	2,689	2,594	2,216	2,138	2,392	2,460	2,380	2,267	2,712	3,323	2,626	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	82	85	74	69	60	57	54	58	59	62	74	89	68	29
30	NONCORE	All End Uses	1,153	1,087	1,022	1,113	1,091	1,143	1,395	1,433	1,370	1,182	1,156	1,165	1,193	30
33		Subtotal-RETAIL	1,235	1,172	1,096	1,182	1,151	1,200	1,449	1,490	1,429	1,244	1,230	1,254	1,262	33
34	WHOLESALE & INTERNATIONAL	All End Uses	529	516	448	416	344	335	380	405	369	351	433	531	421	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,764	1,688	1,544	1,598	1,495	1,535	1,829	1,895	1,799	1,595	1,663	1,785	1,683	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.

5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.

6/ Excludes own-source gas supply of 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6
gas procurement by the City of Long Beach

7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

8/ Core end-use demand exclusive of core aggregation
transportation (CAT) in MDth/d: 1,474 1,462 1,148 996 717 595 551 553 570 666 1,049 1,547 941

Work Paper: TABLE 4-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2024

COLD TEMPERATURE with DRY HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE 4/		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas 5/		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		3,149	2,972	2,640	2,476	2,095	2,068	2,340	2,395	2,323	2,196	2,654	3,245	2,546	9
10	TOTAL SUPPLY TAKEN		3,200	3,023	2,691	2,527	2,146	2,119	2,391	2,446	2,374	2,247	2,705	3,296	2,597	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 6/		3,200	3,023	2,691	2,527	2,146	2,119	2,391	2,446	2,374	2,247	2,705	3,296	2,597	12
	REQUIREMENTS FORECAST BY END-USE 7/															
13	CORE 8/	Residential	1,101	1,033	821	692	464	356	326	325	334	416	733	1,159	646	13
14		Commercial	275	275	230	215	173	162	154	153	159	166	222	286	206	14
15		Industrial	53	60	56	53	47	48	44	46	50	52	57	56	52	15
16		NGV	51	51	56	53	56	56	53	58	58	60	57	54	55	16
17		Subtotal-CORE	1,480	1,420	1,163	1,014	741	622	577	583	600	694	1,069	1,555	959	17
22	NONCORE	Subtotal-NONCORE	1,154	1,066	1,042	1,067	1,035	1,136	1,407	1,434	1,379	1,175	1,169	1,168	1,187	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INTL	526	500	451	414	343	334	377	398	365	350	433	532	419	26
27		Co. Use & LUAF	40	38	34	32	27	27	30	31	30	28	34	42	33	27
28	SYSTEM TOTAL THROUGHPUT 6/		3,200	3,023	2,691	2,527	2,146	2,119	2,391	2,446	2,374	2,247	2,705	3,296	2,597	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	82	82	74	69	60	57	54	58	59	63	74	88	68	29
30	NONCORE	All End Uses	1,154	1,066	1,042	1,067	1,035	1,136	1,407	1,434	1,379	1,175	1,169	1,168	1,187	30
33		Subtotal-RETAIL	1,236	1,147	1,117	1,136	1,095	1,193	1,461	1,492	1,438	1,238	1,243	1,256	1,255	33
34	WHOLESALE & INTERNATIONAL	All End Uses	526	500	451	414	343	334	377	398	365	350	433	532	419	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,762	1,647	1,568	1,550	1,439	1,527	1,838	1,890	1,803	1,588	1,677	1,788	1,673	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.

5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.

6/ Excludes own-source gas supply of 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 gas procurement by the City of Long Beach

7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d: 1,446 1,384 1,126 977 704 584 541 542 560 653 1,029 1,517 921

Work Paper: TABLE 4-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2025

COLD TEMPERATURE with DRY HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE 4/		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas 5/		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		3,128	3,017	2,553	2,415	2,068	2,020	2,320	2,430	2,325	2,163	2,628	3,234	2,523	9
10	TOTAL SUPPLY TAKEN		3,179	3,068	2,604	2,466	2,119	2,071	2,371	2,481	2,376	2,214	2,679	3,285	2,574	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 6/		3,179	3,068	2,604	2,466	2,119	2,071	2,371	2,481	2,376	2,214	2,679	3,285	2,574	12
	REQUIREMENTS FORECAST BY END-USE 7/															
13	CORE 8/	Residential	1,081	1,051	806	679	455	349	320	319	328	409	719	1,138	636	13
14		Commercial	268	277	224	209	168	157	149	148	154	161	216	278	200	14
15		Industrial	51	60	54	52	46	47	42	45	49	51	56	54	50	15
16		NGV	54	56	59	56	59	59	56	62	61	63	60	57	59	16
17		Subtotal-CORE	1,453	1,444	1,143	996	729	612	568	574	591	684	1,051	1,527	945	17
22	NONCORE	Subtotal-NONCORE	1,158	1,067	977	1,025	1,015	1,103	1,401	1,473	1,390	1,156	1,166	1,183	1,177	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INTL	528	518	451	415	348	330	371	403	365	347	428	534	419	26
27		Co. Use & LUAF	40	39	33	31	27	26	30	31	30	28	34	41	32	27
28	SYSTEM TOTAL THROUGHPUT 6/		3,179	3,068	2,604	2,466	2,119	2,071	2,371	2,481	2,376	2,214	2,679	3,285	2,574	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	81	84	74	69	61	57	54	59	60	63	74	88	69	29
30	NONCORE	All End Uses	1,158	1,067	977	1,025	1,015	1,103	1,401	1,473	1,390	1,156	1,166	1,183	1,177	30
33		Subtotal-RETAIL	1,239	1,151	1,051	1,094	1,076	1,160	1,455	1,531	1,450	1,219	1,240	1,271	1,246	33
34	WHOLESALE & INTERNATIONAL	All End Uses	528	518	451	415	348	330	371	403	365	347	428	534	419	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,767	1,669	1,502	1,508	1,424	1,490	1,827	1,934	1,815	1,566	1,668	1,806	1,665	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.

5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.

6/ Excludes own-source gas supply of	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

gas procurement by the City of Long Beach

7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,419	1,406	1,105	959	691	574	531	533	550	642	1,010	1,488	906

Work Paper: **TABLE 4-SCG**

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2030

COLD TEMPERATURE with DRY HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		2,976	2,882	2,350	2,207	1,867	1,861	2,395	2,480	2,284	2,002	2,437	3,034	2,396	9
10	TOTAL SUPPLY TAKEN		3,027	2,933	2,401	2,258	1,918	1,912	2,446	2,531	2,335	2,053	2,488	3,085	2,447	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,027	2,933	2,401	2,258	1,918	1,912	2,446	2,531	2,335	2,053	2,488	3,085	2,447	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	994	966	741	625	419	321	294	294	301	376	662	1,047	585	13
14		Commercial	240	247	200	186	150	140	133	132	137	143	193	249	179	14
15		Industrial	43	51	46	44	39	40	36	38	41	43	47	46	43	15
16		NGV	70	73	77	74	78	77	74	80	80	83	79	74	77	16
17		Subtotal-CORE	1,347	1,339	1,064	929	685	578	537	544	559	645	980	1,416	883	17
22	NONCORE	Subtotal-NONCORE	1,124	1,055	900	926	892	999	1,471	1,524	1,366	1,050	1,069	1,111	1,125	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INTL	518	503	407	376	317	311	408	431	381	331	408	519	409	26
27		Co. Use & LUAF	38	37	30	28	24	24	31	32	29	26	31	39	31	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,027	2,933	2,401	2,258	1,918	1,912	2,446	2,531	2,335	2,053	2,488	3,085	2,447	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	82	85	76	71	64	61	58	64	65	68	78	90	72	29
30	NONCORE	All End Uses	1,124	1,055	900	926	892	999	1,471	1,524	1,366	1,050	1,069	1,111	1,125	30
33		Subtotal-RETAIL	1,207	1,140	976	997	956	1,060	1,529	1,588	1,430	1,119	1,147	1,201	1,197	33
34	WHOLESALE & INTERNATIONAL	All End Uses	518	503	407	376	317	311	408	431	381	331	408	519	409	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,724	1,643	1,384	1,373	1,273	1,371	1,936	2,019	1,811	1,450	1,554	1,720	1,605	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:

1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)

2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)

3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.

5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.

6/ Excludes own-source gas supply of 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5
gas procurement by the City of Long Beach

7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.

8/ Core end-use demand exclusive of core aggregation
transportation (CAT) in MDth/d: 1,308 1,296 1,022 887 642 534 495 497 512 596 933 1,372 839

Work Paper: TABLE 4-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2035

COLD TEMPERATURE with DRY HYDRO YEAR

LINE			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg	LINE
	CAPACITY AVAILABLE															
1	California Line 85 Zone (California Producers)		60	60	60	60	60	60	60	60	60	60	60	60	60	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	3,775	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		51	51	51	51	51	51	51	51	51	51	51	51	51	8
9	Out-of-State		2,967	2,875	2,350	2,207	1,874	1,869	2,403	2,489	2,293	2,010	2,438	3,026	2,399	9
10	TOTAL SUPPLY TAKEN		3,018	2,926	2,401	2,258	1,925	1,920	2,454	2,540	2,344	2,061	2,489	3,077	2,450	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,018	2,926	2,401	2,258	1,925	1,920	2,454	2,540	2,344	2,061	2,489	3,077	2,450	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	972	945	725	611	410	314	288	287	295	368	647	1,023	572	13
14		Commercial	239	247	199	186	149	140	132	132	137	143	192	248	178	14
15		Industrial	39	46	41	39	35	35	32	34	37	38	42	41	38	15
16		NGV	91	96	101	96	102	100	96	105	104	108	103	97	100	16
17		Subtotal-CORE	1,341	1,333	1,066	932	695	589	549	558	572	657	985	1,410	888	17
22	NONCORE	Subtotal-NONCORE	1,115	1,046	891	916	883	990	1,461	1,514	1,356	1,041	1,060	1,102	1,115	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INTL	524	510	414	382	322	317	413	436	386	337	414	526	415	26
27		Co. Use & LUAF	38	37	30	28	24	24	31	32	30	26	31	39	31	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,018	2,926	2,401	2,258	1,925	1,920	2,454	2,540	2,344	2,061	2,489	3,077	2,450	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	91	94	86	80	74	70	67	74	75	79	88	99	81	29
30	NONCORE	All End Uses	1,115	1,046	891	916	883	990	1,461	1,514	1,356	1,041	1,060	1,102	1,115	30
33		Subtotal-RETAIL	1,205	1,139	977	997	957	1,060	1,528	1,588	1,431	1,120	1,148	1,201	1,197	33
34	WHOLESALE & INTERNATIONAL	All End Uses	524	510	414	382	322	317	413	436	386	337	414	526	415	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,730	1,650	1,391	1,378	1,279	1,377	1,941	2,025	1,816	1,457	1,562	1,728	1,612	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38
			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
			1,293	1,282	1,014	881	643	537	498	500	514	598	927	1,356	835	

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)
4/ Represents the outlook for firm receipt capacities at the time of publication; subject to change over the span of the CGR timeframe.
5/ Average 2017 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of gas procurement by the City of Long Beach
7/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.
8/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:

2018 CALIFORNIA GAS REPORT

CUSTOMER FORECAST
JULY 2018

The Gas Company

A Sempra Energy utility™

Southern Californai Gas Company ACTIVE Meter Forecast

PAYAN FORECAST GRC

Year	Active SF	Active MF	Active MM	Active tot Res	Active Com	Active Ind	Active Total	Growth	
2000	3,158,252	1,597,527	44,860	4,800,639	185,845	22,071	5,008,555		
2001	3,210,899	1,604,796	44,487	4,860,183	187,676	21,859	5,069,718	61,163	
2002	3,268,930	1,612,709	44,215	4,925,855	189,804	21,396	5,137,054	67,336	
2003	3,322,120	1,621,230	43,861	4,987,211	190,114	20,848	5,198,173	61,119	
2004	3,377,588	1,633,083	43,540	5,054,210	191,291	20,734	5,266,235	68,062	
2005	3,434,786	1,637,608	43,177	5,115,570	192,270	20,590	5,328,430	62,195	
2006	3,488,997	1,647,654	42,695	5,179,346	192,321	20,307	5,391,974	63,544	
2007	3,524,381	1,665,905	42,386	5,232,672	192,862	20,257	5,445,791	53,817	
2008	3,531,044	1,681,864	42,026	5,254,934	191,906	20,140	5,466,979	21,189	
2009	3,547,653	1,681,251	41,710	5,270,615	190,000	19,699	5,480,314	13,335	
2010	3,570,361	1,697,335	41,485	5,309,182	188,141	19,346	5,516,668	36,354	
2011	3,585,183	1,716,280	41,242	5,342,705	187,337	19,136	5,549,178	32,510	
2012	3,598,669	1,730,663	41,038	5,370,370	186,996	18,989	5,576,355	27,177	
2013	3,614,927	1,743,855	40,895	5,399,678	187,544	18,891	5,606,113	29,758	
2014	3,632,903	1,759,544	40,689	5,433,136	187,321	18,704	5,639,161	33,049	
2015	3,647,531	1,773,721	40,504	5,461,756	187,844	17,528	5,667,128	27,966	
2016	3,666,098	1,788,972	40,333	5,495,403	188,465	17,050	5,700,917	33,790	
2017*	**3,693,882**	**1,803,793**	**40,296**	**5,537,971**	**189,138**	**16,743**	**5,743,852**	**<------- actuals**	
2018	3,710,509	1,818,357	39,828	5,568,693	189,072	16,661	5,774,426	42,612	
2019	3,736,774	1,838,199	39,567	5,614,540	189,178	16,575	5,820,293	45,866	
2020	3,764,515	1,859,529	39,308	5,663,352	189,281	16,462	5,869,095	48,802	
2021	3,793,014	1,882,017	39,051	5,714,082	189,313	16,319	5,919,714	50,619	
2022	3,821,837	1,905,527	38,796	5,766,159	189,316	16,183	5,971,658	51,943	
2,023	3,850,673	1,929,752	38,542	5,818,967	189,340	16,042	6,024,349	52,692	
2,024	3,879,332	1,954,327	38,290	5,871,949	189,425	15,894	6,077,267	52,918	
2,025	3,907,702	1,979,107	38,039	5,924,848	189,521	15,736	6,130,106	52,838	
2,026	3,935,734	2,004,132	37,791	5,977,657	189,600	15,570	6,182,827	52,721	
2,027	3,963,348	2,029,378	37,543	6,030,269	189,662	15,409	6,235,341	52,514	
2,028	3,990,330	2,054,647	37,298	6,082,274	189,720	15,237	6,287,231	51,890	
2,029	4,016,789	2,079,846	37,054	6,133,688	189,789	15,057	6,338,534	51,303	
2,030	4,043,234	2,105,133	36,812	6,185,178	189,870	14,876	6,389,924	51,390	
2,031	4,069,740	2,130,625	36,571	6,236,935	189,943	14,698	6,441,576	51,652	
2,032	4,095,957	2,156,291	36,332	6,288,580	190,040	14,523	6,493,143	51,567	
2,033	4,121,931	2,182,091	36,094	6,340,116	190,114	14,348	6,544,578	51,435	
2,034	4,148,086	2,208,085	35,858	6,392,028	190,189	14,178	6,596,395	51,817	
2,035	4,177,079	2,234,369	35,623	6,447,071	190,270	14,013	6,651,354	54,959	
2,036	4,203,813	2,260,979	35,390	6,500,183	190,365	13,854	6,704,401	53,047	
2,037	4,230,612	2,287,778	35,159	6,553,549	190,458	13,696	6,757,702	53,301	
2,038	4,257,579	2,314,601	34,929	6,607,109	190,544	13,537	6,811,190	53,487	
2,039	4,284,518	2,341,294	34,700	6,660,512	190,625	13,383	6,864,521	53,332	
2,040	4,311,454	2,367,763	34,473	6,713,690	190,716	13,231	6,917,637	53,116	
2,041	4,338,532	2,394,034	34,248	6,766,814	190,810	13,082	6,970,706	53,069	

ACTUALS Through 2017

Southern Californai Gas Company Meter Forecast

Meter PAYAN FORECAST GRC

Year	Connected SF	Connected MF	Connected MM	Connected Total Tot Res	Connected Com	Connected Ind	Connected Total	Growth
2000	3,216,122	1,674,027	45,607	4,935,755	228,320	28,725	5,192,801	
2001	3,265,670	1,678,626	45,223	4,989,519	230,468	28,653	5,248,640	55,840
2002	3,318,980	1,684,653	44,899	5,048,532	232,865	28,323	5,309,719	61,079
2003	3,372,732	1,695,409	44,524	5,112,666	234,585	28,195	5,375,446	65,726
2004	3,429,816	1,710,554	44,160	5,184,530	236,312	28,309	5,449,150	73,705
2005	3,492,924	1,720,189	43,802	5,256,916	237,831	28,277	5,523,023	73,873
2006	3,555,620	1,734,730	43,337	5,333,686	239,463	28,207	5,601,356	78,333
2007	3,600,301	1,755,752	43,040	5,399,093	240,947	28,330	5,668,370	67,014
2008	3,625,746	1,776,761	42,699	5,445,205	242,314	28,502	5,716,020	47,651
2009	3,640,755	1,793,706	42,414	5,476,875	243,427	28,589	5,748,890	32,870
2010	3,653,320	1,807,003	42,186	5,502,509	243,937	28,641	5,775,086	26,196
2011	3,663,000	1,814,702	41,945	5,519,646	244,426	28,621	5,792,693	17,607
2012	3,671,608	1,822,820	41,729	5,536,157	244,927	28,556	5,809,640	16,947
2013	3,683,207	1,831,916	41,549	5,556,673	245,498	28,440	5,830,610	20,970
2014	3,697,989	1,843,410	41,380	5,582,778	245,756	28,321	5,856,856	26,245
2015	3,714,070	1,855,988	41,261	5,611,319	247,202	27,169	5,885,690	28,835
2016	3,731,022	1,869,233	41,085	5,641,340	248,039	26,165	5,915,543	29,853
2017*	**3,751,864**	**1,879,668**	**40,960**	**5,672,492**	**248,494**	**25,824**	**5,946,810**	<------- act
2018	3,777,135	1,903,426	40,550	5,721,110	248,579	25,538	5,995,226	43,905
2019	3,803,871	1,924,196	40,284	5,768,351	248,718	25,405	6,042,474	47,248
2020	3,832,110	1,946,523	40,021	5,818,654	248,854	25,231	6,092,739	50,265
2021	3,861,121	1,970,062	39,759	5,870,943	248,895	25,013	6,144,851	52,111
2022	3,890,462	1,994,670	39,499	5,924,631	248,899	24,805	6,198,334	53,483
2023	3,919,816	2,020,028	39,241	5,979,085	248,931	24,589	6,252,604	54,270
2024	3,948,989	2,045,751	38,984	6,033,725	249,043	24,361	6,307,128	54,524
2025	3,977,869	2,071,690	38,729	6,088,287	249,169	24,119	6,361,576	54,448
2026	4,006,404	2,097,884	38,476	6,142,764	249,272	23,866	6,415,902	54,326
2027	4,034,514	2,124,310	38,224	6,197,048	249,354	23,618	6,470,020	54,118
2028	4,061,980	2,150,760	37,974	6,250,714	249,431	23,354	6,523,498	53,478
2029	4,088,914	2,177,136	37,726	6,303,776	249,521	23,079	6,576,375	52,877
2030	4,115,834	2,203,605	37,479	6,356,918	249,627	22,802	6,629,347	52,972
2031	4,142,816	2,230,289	37,234	6,410,338	249,724	22,528	6,682,590	53,243
2032	4,169,504	2,257,155	36,990	6,463,649	249,851	22,260	6,735,760	53,170
2033	4,195,944	2,284,161	36,748	6,516,853	249,948	21,991	6,788,793	53,032
2034	4,222,569	2,311,369	36,508	6,570,445	250,047	21,731	6,842,223	53,430
2035	4,249,432	2,338,881	36,269	6,624,582	250,154	21,478	6,896,214	53,991
2036	4,276,629	2,366,736	36,032	6,679,396	250,278	21,235	6,950,908	54,695
2037	4,303,892	2,394,786	35,796	6,734,475	250,400	20,992	7,005,867	54,959
2038	4,331,326	2,422,863	35,562	6,789,751	250,513	20,749	7,061,013	55,146
2039	4,358,732	2,450,804	35,329	6,844,865	250,621	20,513	7,115,998	54,985
2040	4,386,134	2,478,509	35,098	6,899,741	250,740	20,279	7,170,761	54,763
2041	4,413,682	2,506,008	34,869	6,954,558	250,863	20,051	7,225,473	54,712

ACTUALS Through 2017

2018 CALIFORNIA GAS REPORT

EUFORECASTER
JULY 2018

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. 37

Table 1. Alternative Market Segmentation Designs – Utility Industry Example

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

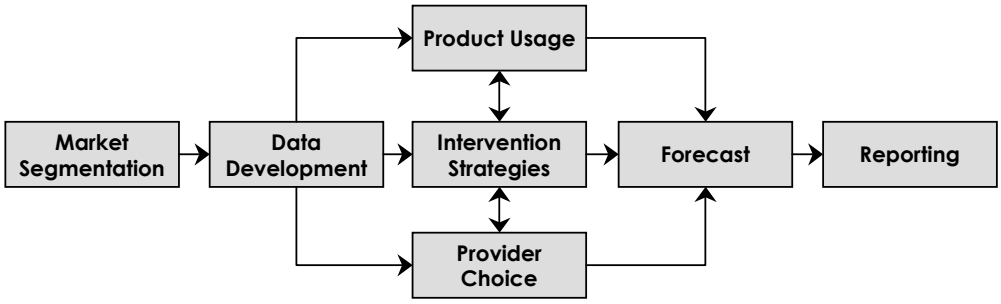
End Use Forecaster has other dimensions that capture factors affecting product demands. Perhaps the most important of these is End Use Forecaster's "vintaging" capability. Vintaging refers to product or service turnover that is a function of either physical lives or contract period. Accurate assessments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

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

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

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

Figure 1. End Use Forecaster Modules and Structure



Interface Design

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

Figure 2. Welcome Screen

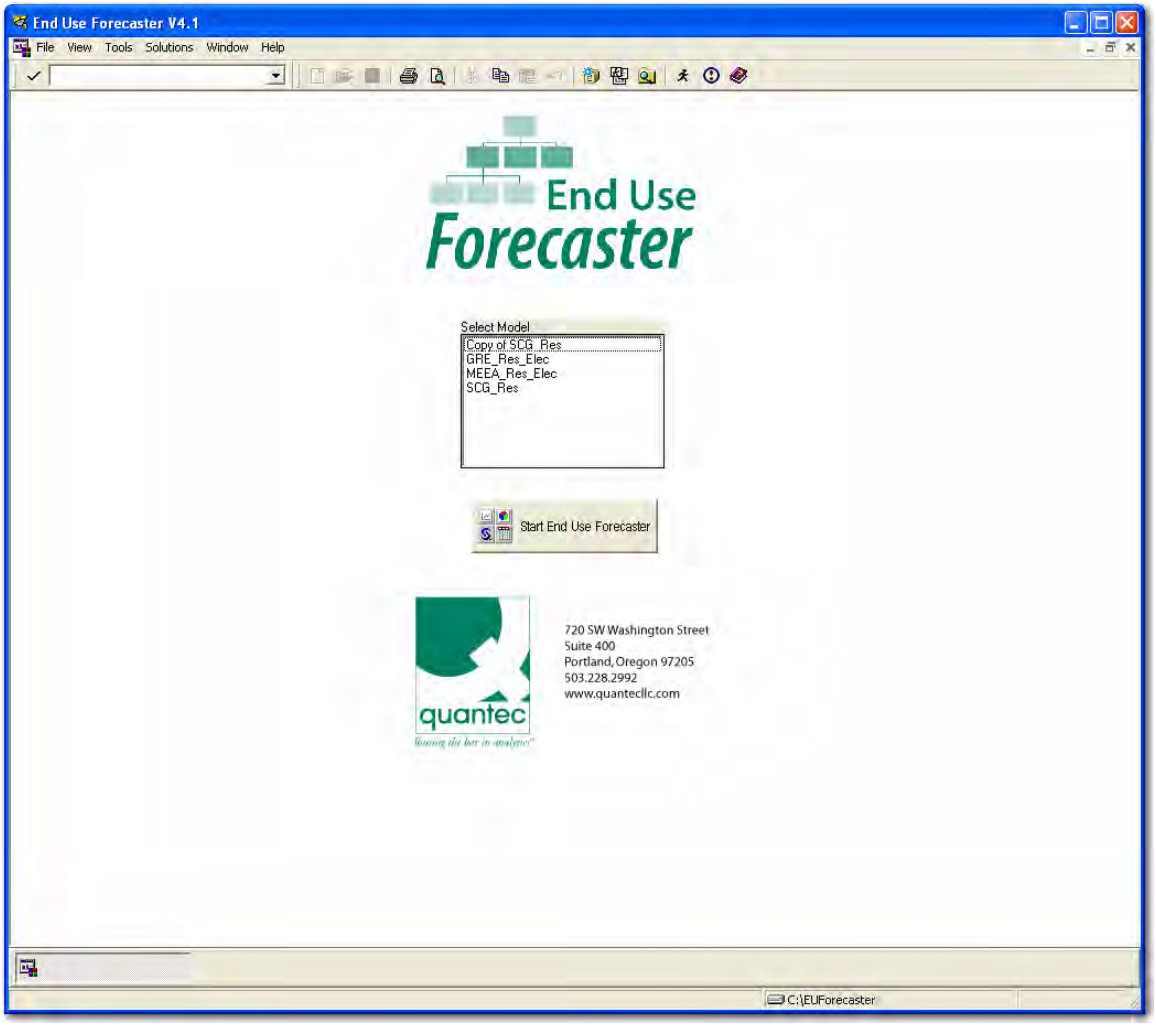
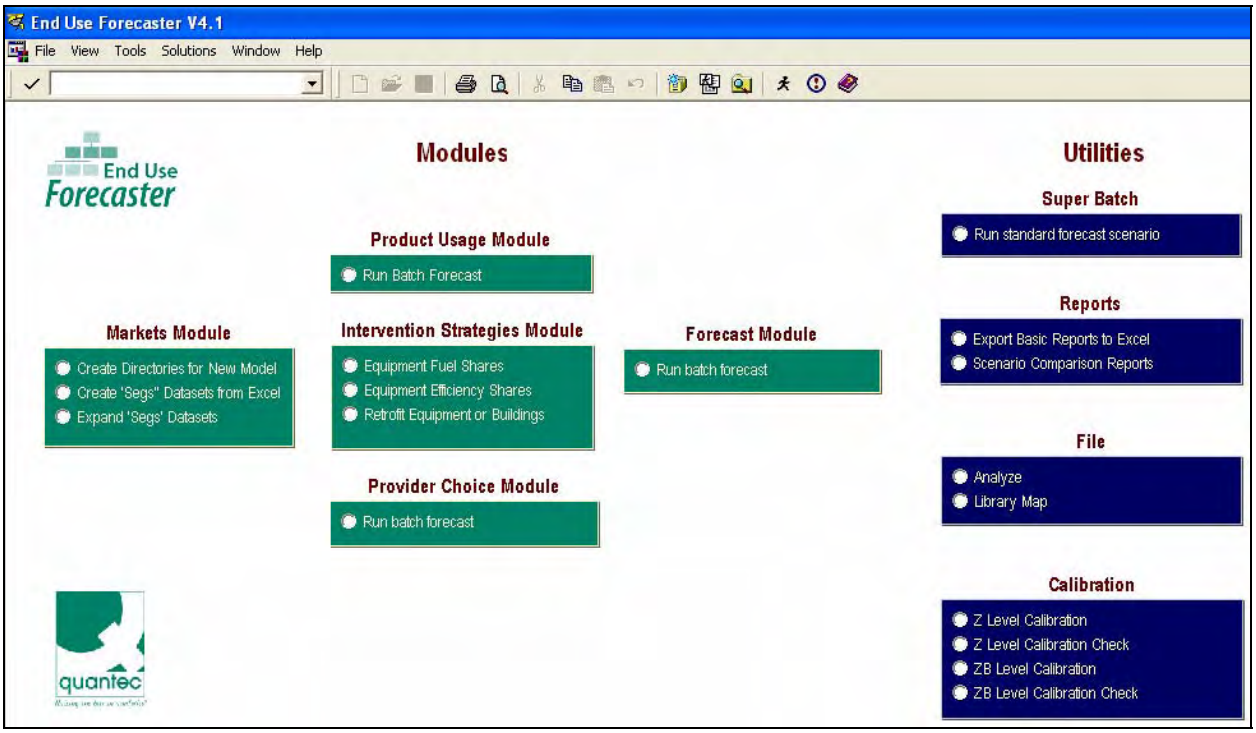


Figure 3. Main Dashboard



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

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

Data Exchange

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

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

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

Market Segmentation

Market Segments

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

Strategic Information Needs

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

Data Development and Entry

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

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

Data Entry Formats

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

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

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

Product Usage Module: Modeling Equipment Consumption

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

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

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

Provider Choice Module: Modeling Customer Service and Purchase Decisions

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

Modes of Choice Modeling

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

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

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

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

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

Average versus Marginal Shares

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

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

Intervention Strategies Module: Analyzing Marketing Scenarios and DSM Potential

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

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

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

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

Forecast Module: Putting It All Together

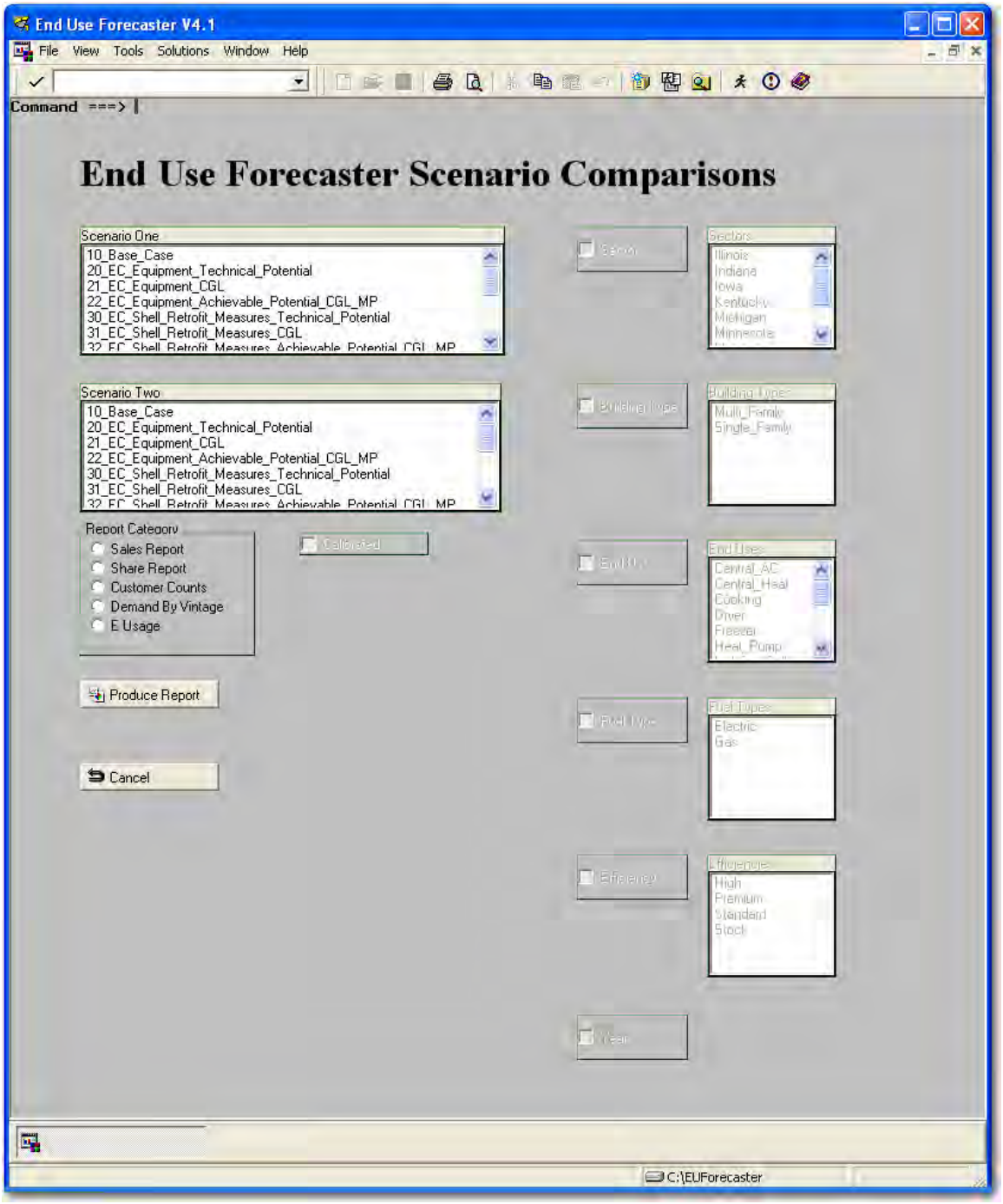
The Forecast Module incorporates all the information compiled from the other modules – Usage, Choice, and Intervention Strategies – related to the overall economic growth of the market segment and equipment lifetime (decay) functions to create the final forecast for a given scenario.

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

Reporting: Getting the Projections Out to Decision-Makers

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

Figure 4. Report Customization



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

II. Application Structure

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

Hardware and Software

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

Hardware

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

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

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

Software

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

- Base SAS

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

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

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

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

Conventions

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

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

End Use Forecaster's modules run user-specified scenarios. To differentiate among these scenarios, scenario-specific datasets have a numeric suffix, such as **priceForecast_10**. In general

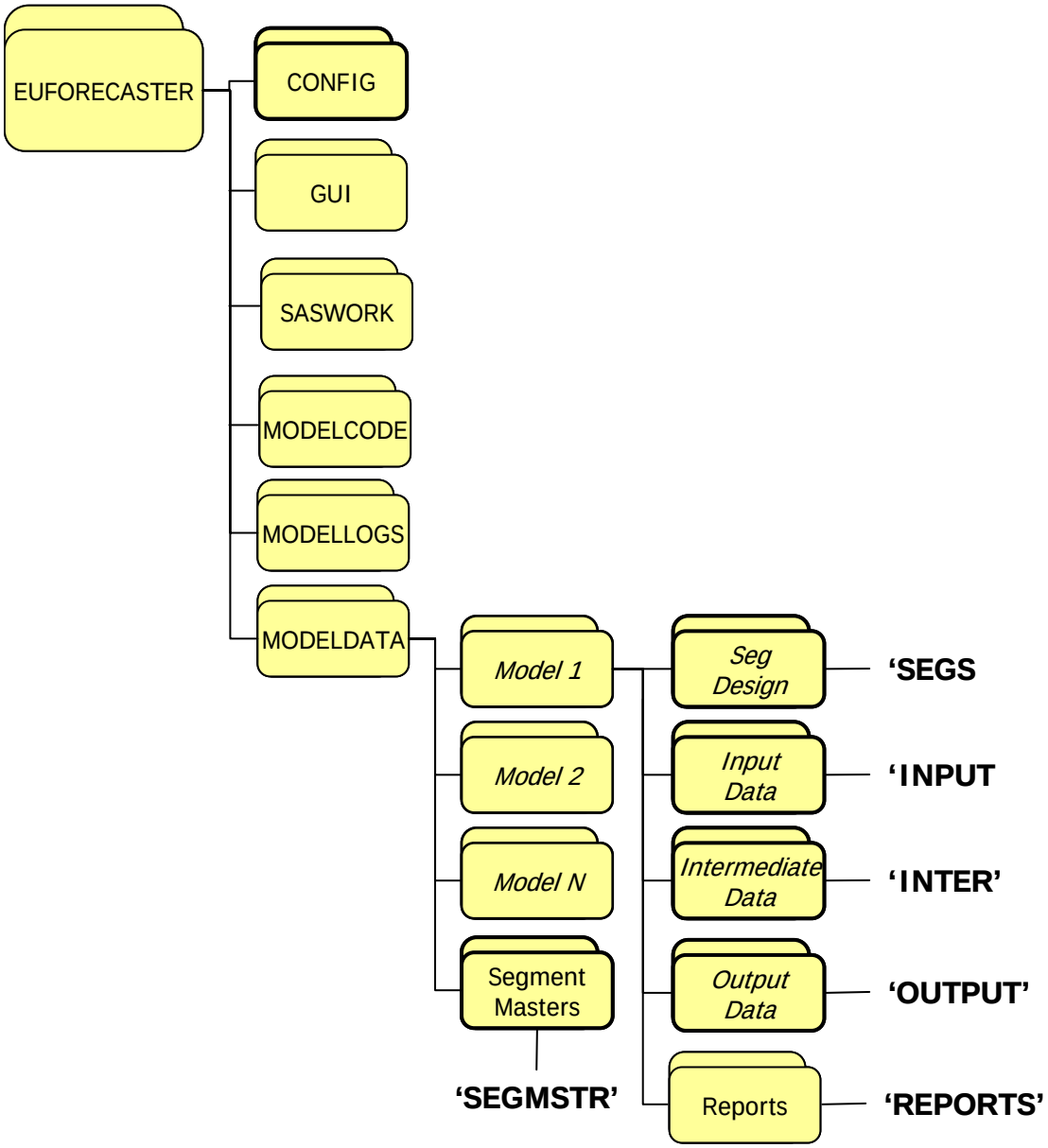
cases, where the documentation does not refer to a specific scenario, datasets are referred to with an **"_xx**" suffix, such as **saturations_xx**.

Model Organization

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

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

Figure 5. End Use Forecaster Folder Structure



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

Table 2. End Use Forecaster Folders

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

III. Market Segmentation and Data Entry Modules

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

Development of Market Segmentation Design

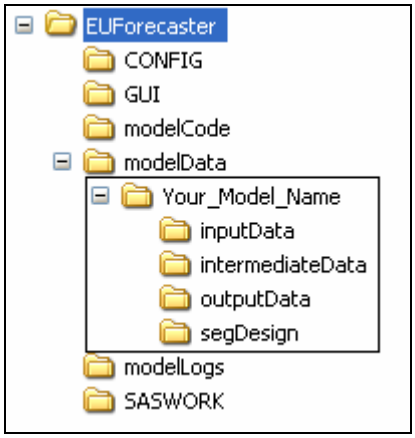
The execution of the first task – creation of a customized market segmentation design – is based on four steps, listed briefly below and then described in greater detail.

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

Creation of Model Data Folders

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

Figure 6. Data Folder Structure



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

Population of Seg_Design_Template.xls

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

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

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

Dimension 1 always refers to geography, customer size, customer behavior, customer class, and/or any other features that separate groups of customers. Note that all of the aforementioned

factors can be used within Dimension 1 (e.g., north-residential, north-commercial, south-residential, south-commercial, etc.).

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

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

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

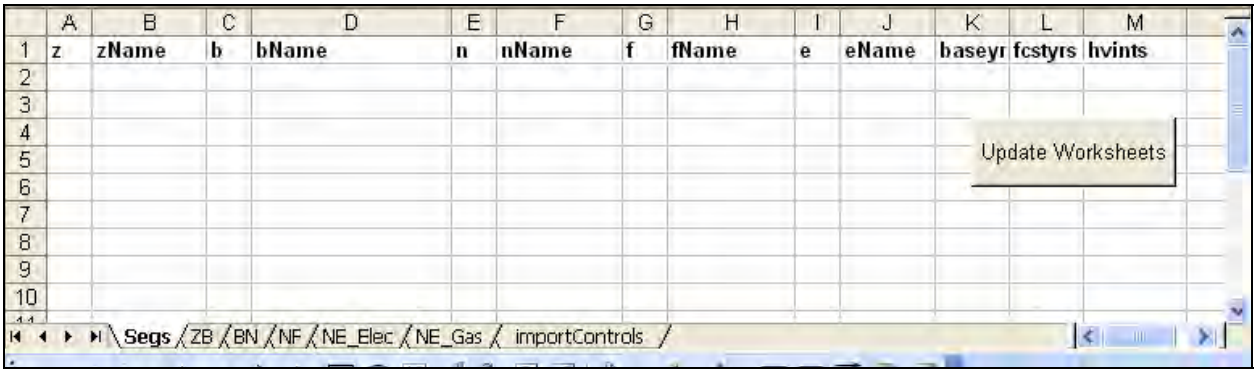
Table 3 summarizes the intended use of each of these dimensions. Note that while the model must include all five dimension, you are not required to use all of them. For example, suppose you want a design with alternative providers at Dimension 4 and do not wish to complicate the model with product/service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

Table 3. End Use Forecaster Dimension Use Summary

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

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

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



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

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

Figure 8. Example of Populated "Segs" Tab in Seg_Design_Template.xls

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

Update Worksheets

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

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

Figure 9. Example of Unpopulated "BN" Tab in Seg_Design_Template.xls

Seg_Design_Template.xls [Read-Only]

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

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

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

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

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

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

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

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

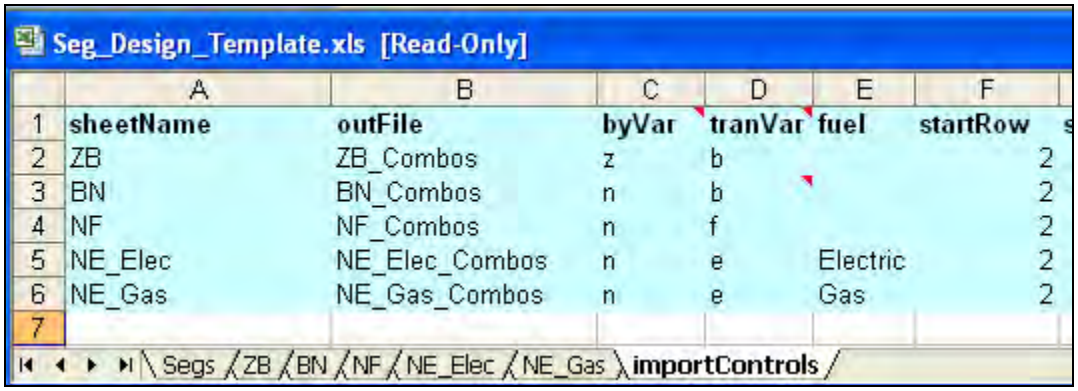
Segs / ZB / BN / NF / NE_Elec / NE_Gas / imp

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

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

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

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



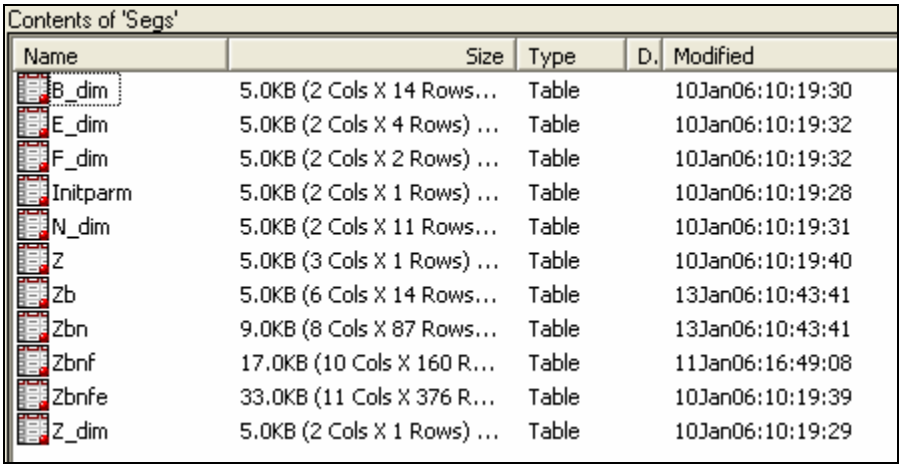
	A	B	C	D	E	F
1	**sheetName**	**outFile**	**byVar**	**tranVar**	**fuel**	**startRow**
2	ZB	ZB_Combos	z	b		2
3	BN	BN_Combos	n	b		2
4	NF	NF_Combos	n	f		2
5	NE_Elec	NE_Elec_Combos	n	e	Electric	2
6	NE_Gas	NE_Gas_Combos	n	e	Gas	2
7						

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.

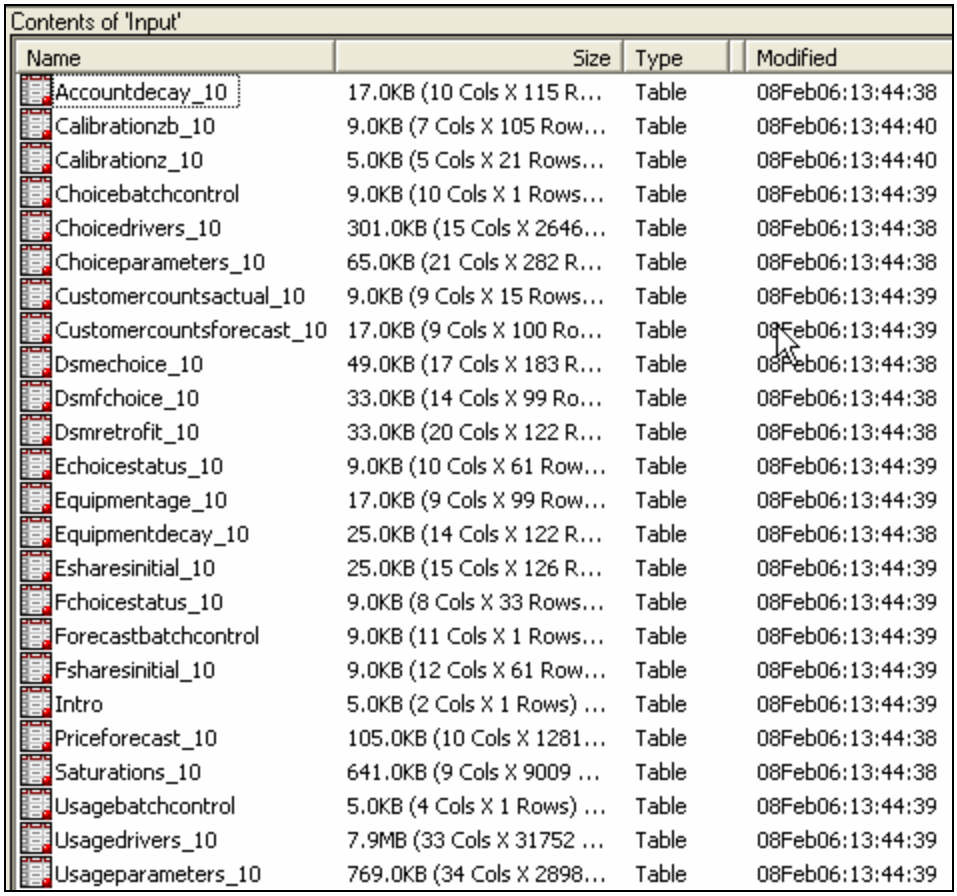
Figure 12. Contents of Segs Library



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

Scenario 20 pulls a different price scenario.

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

IV. Product Usage Module

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

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

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

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

where:

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

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

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

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

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

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

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

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

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

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

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

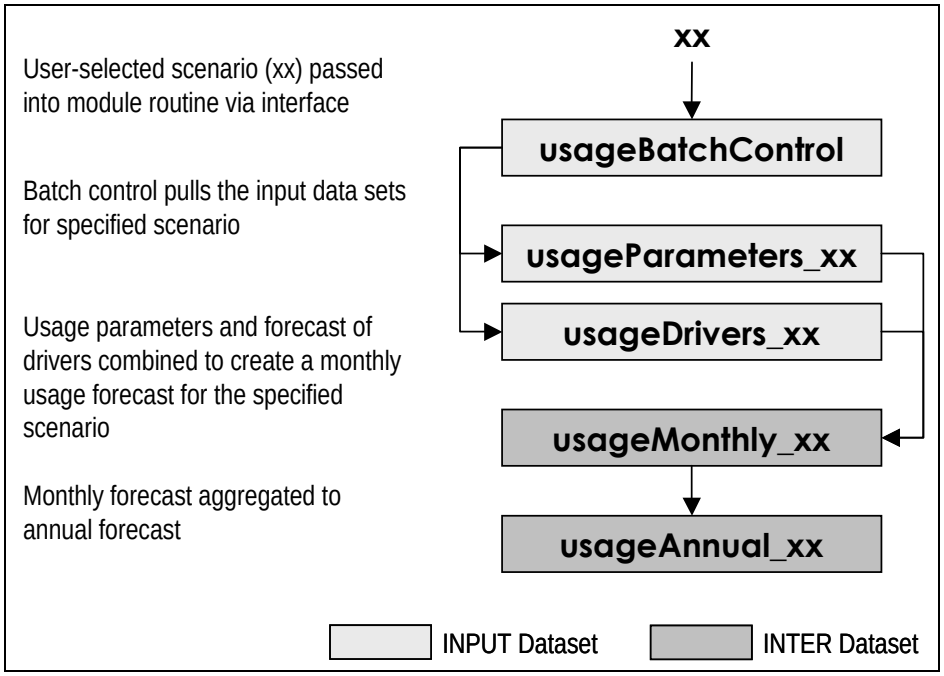


Table 5. Product Usage Module Data Library

Library	Dataset	Description	File/Record Dimensions	Variables/Attributes
INPUT	usageBatchControls	Usage forecast input scenarios	1 record per Output scenario	Usage equation input scenario, forecast driver input scenario, vintage adjustment input scenario, output scenario
INPUT	UsageParameters_xx	Usage forecast equation parameters	Dimensions 1, 2, 3, 4, 5, and vintage	Usage equation parameters B0 through B0 for input scenario 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

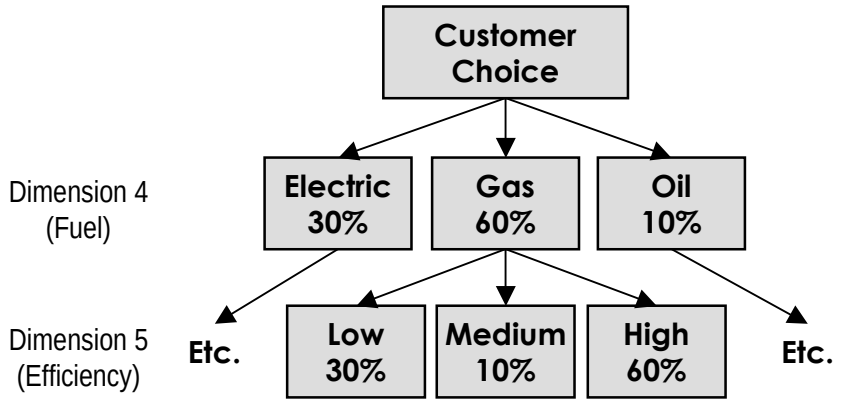
V. Provider Choice Module

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

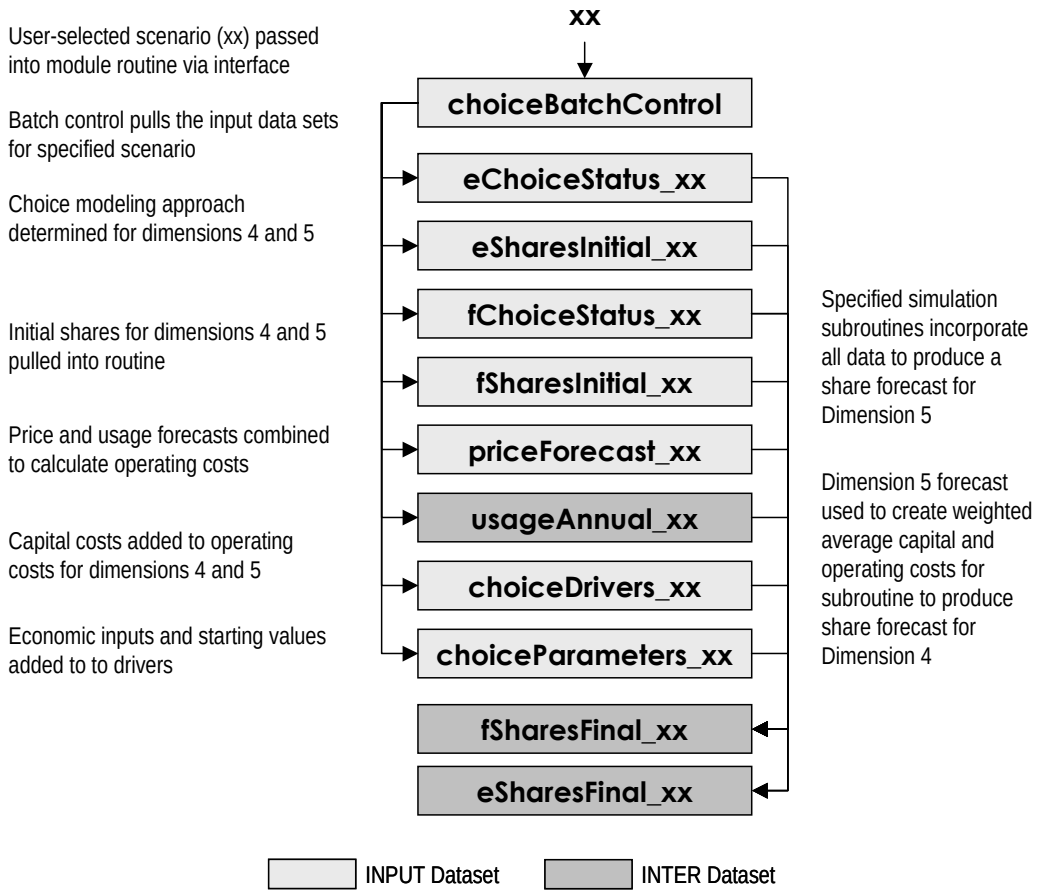
Figure 17 shows the data and analysis flow through the Provider Choice Module.

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**).

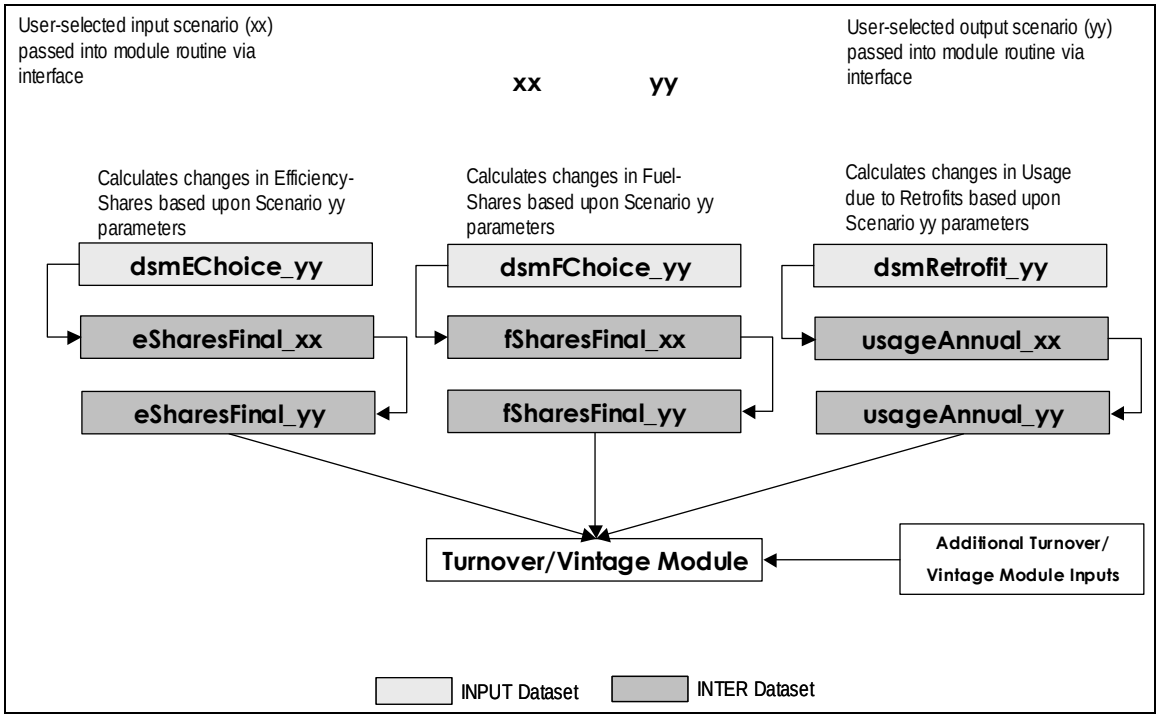
The Market Segmentation module creates base case files ("_10" files) where there is no intervention for each of these program categories. These files serve as templates that allow the user to create different scenarios of interest. To create strategies, you must copy these files to another scenario number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

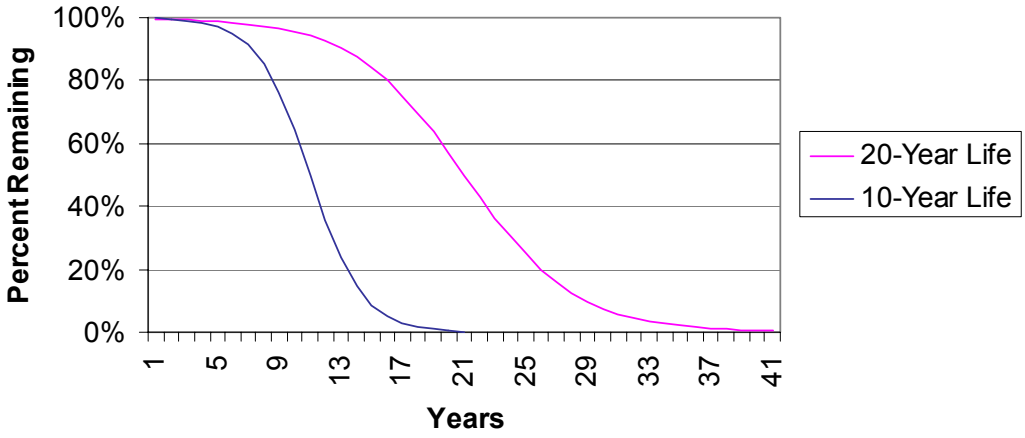
[3] These are discrete analogs to the continuous time distributions.

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:

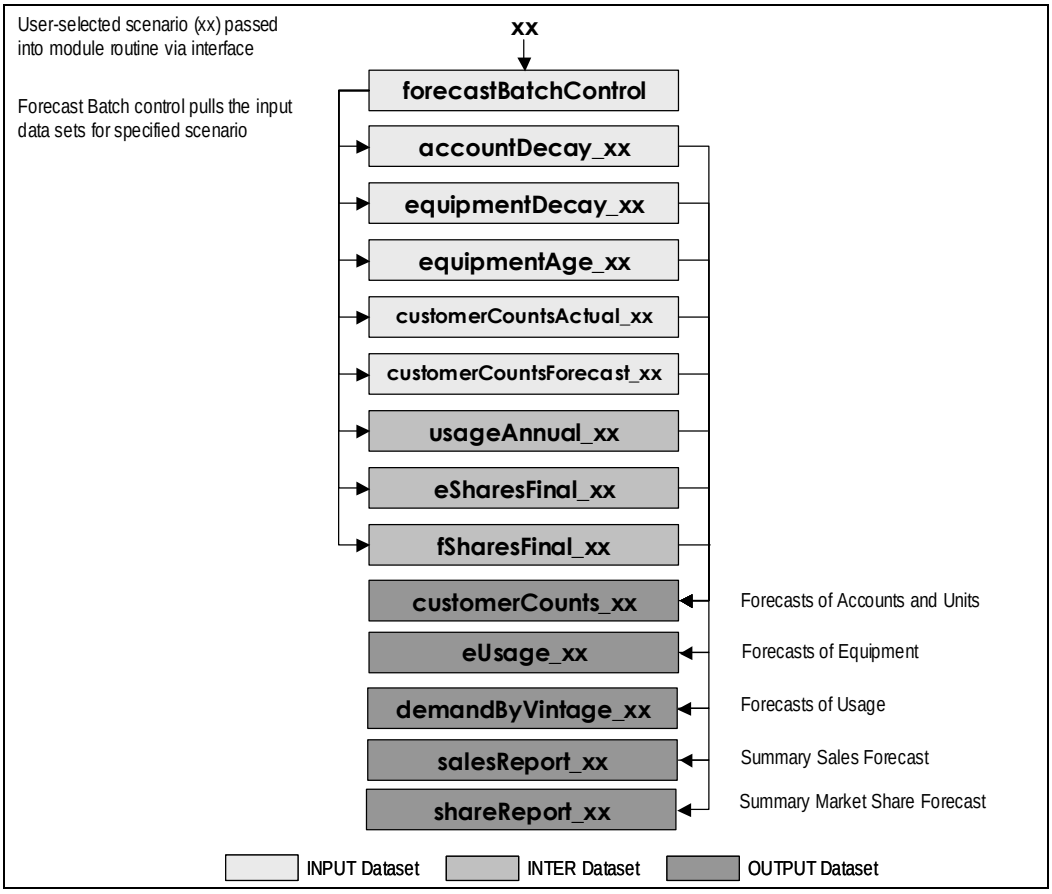
1. Merges all input data across Dimensions 1-3, including:
   - Existing accounts, plus a distribution of accounts across historical building vintages
   - New construction forecast, plus capture rates for new and conversion buildings
   - Dimension 3 saturation, equal to the number of Dimension 2 customers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

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RESIDENTIAL

Southern California Gas Residential End-Use Model

I. Residential End-Use Model Description

Introduction:

SoCalGas used the End Use Forecaster model to generate annual gas demand forecasts for the residential market. The software's market segmentation and end-use modeling framework analyzes the impacts of competitive strategies (gas vs. electricity) and market scenarios on gas demand and market shares. The model separates the residential market into five building types (B-level).

These groups are identified by the premise code classification found in the company billing files. The five residential groups are:

- Single-Family(SF);
- Multi-Family <= 4 units (MF2);
- Multi-Family > 4 units (MF3);
- Master Metered (MM); and
- Sub-Metered (SM).

The residential model identifies eight end-uses (N-level) that are the primary drivers of natural gas demand:

- Space heating;
- Water heating;
- Cooking;
- Drying;
- Pool heating;
- Spa heating;
- Fireplace; and
- Barbeque.

The model assumes two fuel choices (F-level) for end-uses:

- Natural gas; and
- Electricity.

The model assumes up to four efficiency levels (E-level) for the various end-uses. In general, the efficiency levels are:

- Stock;
- Standard;
- High efficiency; and
- Premium efficiency.

See Figure 1 for a classification of the number of efficiency levels for each end-use by customer segment type.

A set of post-model adjustments were applied to the model's annual demand forecast. The first adjustment calibrates to the recorded 2017 weather-adjusted demand. Next, the annual forecast was parceled out to a series of monthly forecasts by a process which involves two steps. These two steps consist of (1) using the fitted equation for customer demand to generate a forecast of use per customer that varies with the number of calendar days and heating degree days in a given month and (2) calculating a series of weights based on the customer's predicted monthly usage share in total annual consumption. The shares obtained from the latter step were then applied to annual totals to derive the stream of monthly forecasts which are conditional on the particular weather design specification for the entire year. An adjustment to the forecast offsets the throughput by the energy efficiency savings. Annual conservation benefits associated with AMI are estimated by SoCalGas to represent 1% of the core gas throughput in the post deployment period. The residential load was reduced by the expected AMI energy savings for customers with non-AMI meters.

Figures 2-5 illustrate the monthly forecasts for each weather scenario.

Data Sources:

The information used to perform the modeling and to generate the forecast includes historical 2017 consumption and customer counts; meter counts, growth, and decay; use per customer by vintage and unit energy consumption (UEC) values; fuel costs and price elasticity; equipment capital costs and availability; building and equipment lives and decay. The historical 2017 data is in Figure 6.

Meter Counts, Growth and Decay:

Regression equations were developed for each of the 5 building types. The meter count forecast is a company-specific forecast based on actual meter counts within the SoCalGas service territory. Data on meter decay rates were obtained from the Energy Information Administration (EIA). See Figure 7 for the meter forecast used as an input to the End-Use Model.

Use Per Customer by Vintage and UEC:

Use per customer and Unit Energy Consumption (UEC) data were based on company marketing data and the California Measurement Advisory Council. See Figure 8 for the appliance UEC's.

Fuel Costs and Price Elasticity:

Average and marginal gas prices ($/therm) were calculated from forecasts of the residential rate components. Residential rates have two consumption tiers. We used the simple average of the second tiers' projected monthly prices for each forecast year as the marginal rate. The marginal rate was used for each housing segment type.

For a given housing segment type, the average gas commodity rate was calculated using a pair of weights for the two consumption tiers applied to the simple average of each tier's monthly rate. The average commodity rate in each forecast year was developed using the same consumption tier weights, but with the forecasts of rates for each residential rate tier. The average gas price each year was then calculated by including the non-volumetric customer charges with the year's average gas commodity price. Figure 9 illustrates the gas price forecasts.

Electric Price Data:

Both average prices (cents/kWh) and marginal prices (cents/kWh) were developed as electricity price inputs. Forecasts for the SCE residential customer class were developed based on the California Energy Commission's December 2017 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.

To impute average electricity prices to each residential housing type, we simply calculated the ratio of the housing type's average gas price to the overall residential gas price for each housing type, then multiplied by the overall average electricity price.

The marginal prices for each residential housing type were calculated by multiplying each year's respective average price by a ratio. These ratios were 1.513 for the SF, MF2 and MF3 housing types, 1.034 for the MM housing type and 1.125 for the SM housing type. These various ratios ware estimated from analyses of SCE Schedule D rate schedule for housing types SF, MF2 and MF3; SCE Schedule DM for housing type MM; and SCE Schedule D as applied to sub-metered buildings for housing type SM. Copies of these rate schedules were obtained from the SCE web-site in March 2006.

Equipment Capital Costs and Availability:

Data on equipment capital costs and availability were from EIA, the Residential Appliance Saturation Survey (RASS), Energy Star (EPA & DOE), and SoCalGas company data. See Figures 11 and 12 for gas and electric appliance equipment
cost.

Building and Equipment Lives and Decay:

Building decay rates are based on the building shell lifetimes, where the lifetime is defined as the length of time it takes for either a demolition or a major renovation to occur. For single-family residential buildings, an exponential rate of decay of 0.3% per year was assumed. See Figure 13 for the building decay rates.
Data on equipment lives and decay rates are based on EIA, RASS, Energy Star, and SoCalGas company data. See Figure 14 for the average lifetimes of gas appliances.

Saturations, Fuel and Efficiency Shares:

Saturation values, fuel shares, and efficiency shares were extracted from SoCalGas company data files and the most recent the RASS survey. Please see Figures 15-18 for saturations, fuel, and efficiency shares.

AMI:
Mass deployment of AMI gas modules began in 2011. The conservation benefits estimated by SoCalGas represent approximately 1% of core gas throughput in post-2018 (post deployment year). The conservation benefits were incorporated in the forecast as a post-model adjustment.

II. Residential End-Use Model Data

Southern California Gas Company
2018 California Gas Report
Figure 1: Number of Efficiency Levels by End Use by Customer Segment

	Space Heating		Water Heating		Cooking		Drying		Pool		Spa		Fireplace		BBQ	
	Gas	Electric	Gas	Electric	Gas	Electric	Gas	Electric	Gas	Electric	Gas	Electric	Gas	Electric	Gas	Electric
Single Family	4	4	4	4	2	2	2	2	1	1	1	1	1	1	1	1
Multi-Family <= 4 Units	4	4	4	4	2	2	2	2	0	0	0	0	0	0	1	1
Multi-Family > 4 Units	4	4	4	4	2	2	2	2	0	0	0	0	0	0	1	1
Master Meter	4	4	4	4	2	2	2	2	0	0	0	0	0	0	1	1
Sub-Meter	4	4	4	4	2	2	2	2	0	0	0	0	0	0	1	1

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Figure 2: Average Temperature Year Demand Forecast (MDth)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2017	34,207	30,153	26,004	21,512	15,545	11,980	11,504	11,478	11,348	14,153	22,670	35,925	246,479
2018	33,928	29,907	25,792	21,336	15,419	11,882	11,410	11,384	11,255	14,037	22,485	35,631	244,466
2019	33,522	29,549	25,483	21,081	15,234	11,740	11,273	11,248	11,121	13,869	22,216	35,205	241,541
2020	33,053	29,135	25,126	20,786	15,021	11,576	11,116	11,091	10,965	13,675	21,905	34,712	238,159
2021	32,594	28,731	24,778	20,498	14,812	11,415	10,961	10,937	10,813	13,485	21,601	34,231	234,857
2022	32,044	28,246	24,359	20,151	14,562	11,223	10,776	10,752	10,630	13,258	21,236	33,652	230,889
2023	31,288	27,580	23,785	19,676	14,219	10,958	10,522	10,499	10,380	12,945	20,735	32,859	225,445
2024	30,641	27,009	23,293	19,269	13,925	10,731	10,304	10,281	10,165	12,677	20,306	32,179	220,781
2025	30,025	26,466	22,825	18,882	13,645	10,516	10,097	10,075	9,961	12,422	19,898	31,532	216,344
2026	29,462	25,970	22,397	18,528	13,389	10,319	9,908	9,886	9,774	12,190	19,525	30,942	212,291
2027	28,967	25,534	22,021	18,217	13,164	10,145	9,742	9,720	9,610	11,985	19,197	30,422	208,723
2028	28,444	25,073	21,623	17,888	12,926	9,962	9,566	9,544	9,436	11,768	18,850	29,872	204,954
2029	27,876	24,572	21,191	17,531	12,668	9,763	9,375	9,354	9,248	11,533	18,474	29,276	200,861
2030	27,380	24,135	20,815	17,219	12,443	9,589	9,208	9,187	9,083	11,328	18,146	28,755	197,289
2031	27,123	23,909	20,619	17,057	12,326	9,499	9,122	9,101	8,998	11,222	17,975	28,485	195,436
2032	26,893	23,705	20,444	16,912	12,221	9,419	9,044	9,024	8,922	11,126	17,822	28,243	193,776
2033	26,845	23,663	20,408	16,882	12,200	9,402	9,028	9,008	8,906	11,107	17,791	28,193	193,432
2034	26,735	23,566	20,324	16,813	12,150	9,363	8,991	8,971	8,869	11,061	17,718	28,077	192,636
2035	26,703	23,538	20,299	16,793	12,135	9,352	8,980	8,960	8,858	11,048	17,696	28,043	192,406

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Figure 3: Cold Temperature Year Demand Forecast (MDth)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2017	38,963	34,218	29,056	23,706	16,425	12,195	11,543	11,512	11,431	14,743	25,105	41,037	269,934
2018	38,697	33,985	28,858	23,545	16,313	12,112	11,465	11,434	11,353	14,642	24,933	40,757	268,092
2019	38,285	33,622	28,550	23,294	16,139	11,982	11,342	11,312	11,232	14,486	24,668	40,323	265,235
2020	37,804	33,200	28,192	23,001	15,936	11,832	11,200	11,170	11,091	14,304	24,358	39,817	261,905
2021	37,340	32,793	27,846	22,719	15,741	11,687	11,063	11,033	10,955	14,129	24,059	39,328	258,692
2022	36,770	32,292	27,420	22,372	15,500	11,508	10,894	10,864	10,788	13,913	23,691	38,727	254,739
2023	35,968	31,588	26,822	21,884	15,162	11,257	10,656	10,627	10,552	13,609	23,175	37,883	249,183
2024	35,288	30,991	26,316	21,471	14,876	11,045	10,455	10,427	10,353	13,352	22,737	37,167	244,476
2025	34,644	30,425	25,835	21,078	14,604	10,843	10,264	10,236	10,164	13,108	22,322	36,488	240,010
2026	34,053	29,906	25,394	20,719	14,355	10,658	10,089	10,062	9,991	12,885	21,941	35,866	235,918
2027	33,536	29,452	25,009	20,404	14,137	10,496	9,935	9,909	9,839	12,689	21,608	35,321	232,334
2028	32,986	28,969	24,599	20,070	13,905	10,324	9,773	9,746	9,678	12,481	21,254	34,742	228,527
2029	32,384	28,440	24,150	19,704	13,651	10,136	9,594	9,569	9,501	12,253	20,866	34,108	224,356
2030	31,865	27,985	23,763	19,388	13,433	9,973	9,441	9,415	9,349	12,057	20,532	33,562	220,762
2031	31,598	27,750	23,564	19,225	13,320	9,890	9,361	9,336	9,270	11,956	20,359	33,280	218,909
2032	31,356	27,538	23,383	19,078	13,218	9,814	9,290	9,265	9,199	11,864	20,204	33,026	217,236
2033	31,308	27,496	23,348	19,049	13,198	9,799	9,276	9,251	9,185	11,846	20,173	32,975	216,902
2034	31,190	27,392	23,259	18,977	13,148	9,762	9,241	9,216	9,151	11,801	20,096	32,850	216,083
2035	31,156	27,362	23,234	18,957	13,134	9,751	9,231	9,206	9,141	11,789	20,075	32,815	215,851

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Figure 4: Hot Temperature Year Demand Forecast (MDth)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2017	29,452	26,088	22,953	19,318	14,666	11,766	11,464	11,444	11,265	13,563	20,235	30,812	223,023
2018	29,163	25,832	22,728	19,128	14,522	11,650	11,352	11,332	11,154	13,430	20,037	30,511	220,839
2019	28,768	25,483	22,420	18,869	14,326	11,493	11,198	11,178	11,003	13,248	19,765	30,097	217,848
2020	28,315	25,081	22,066	18,572	14,100	11,311	11,021	11,002	10,830	13,039	19,454	29,623	214,414
2021	27,867	24,684	21,717	18,278	13,877	11,133	10,847	10,828	10,658	12,833	19,146	29,154	211,022
2022	27,341	24,218	21,307	17,933	13,615	10,922	10,642	10,623	10,457	12,591	18,785	28,604	207,039
2023	26,637	23,594	20,759	17,471	13,264	10,641	10,368	10,350	10,188	12,266	18,301	27,867	201,706
2024	26,026	23,054	20,283	17,071	12,960	10,397	10,131	10,113	9,955	11,985	17,881	27,229	197,085
2025	25,444	22,538	19,829	16,689	12,671	10,165	9,904	9,886	9,732	11,717	17,482	26,620	192,677
2026	24,914	22,069	19,416	16,341	12,407	9,953	9,698	9,681	9,529	11,473	17,117	26,065	188,664
2027	24,445	21,653	19,051	16,034	12,173	9,766	9,515	9,498	9,350	11,257	16,795	25,575	185,111
2028	23,952	21,217	18,667	15,711	11,928	9,569	9,323	9,307	9,161	11,030	16,457	25,059	181,380
2029	23,422	20,747	18,254	15,363	11,664	9,357	9,117	9,101	8,959	10,786	16,092	24,504	177,365
2030	22,954	20,332	17,888	15,055	11,430	9,170	8,935	8,919	8,779	10,570	15,770	24,014	173,816
2031	22,709	20,115	17,698	14,895	11,308	9,072	8,839	8,824	8,686	10,458	15,602	23,758	171,964
2032	22,491	19,923	17,528	14,752	11,200	8,985	8,755	8,739	8,602	10,357	15,453	23,531	170,316
2033	22,444	19,881	17,492	14,721	11,177	8,966	8,736	8,721	8,585	10,336	15,421	23,481	169,961
2034	22,342	19,791	17,412	14,655	11,126	8,926	8,697	8,681	8,545	10,289	15,350	23,375	169,188
2035	22,312	19,764	17,389	14,635	11,111	8,914	8,685	8,670	8,534	10,275	15,330	23,343	168,961

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Figure 5: Base Temperature Year Demand Forecast (MDth)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
2017	11,306	10,577	11,306	10,941	11,306	10,941	11,306	11,306	10,941	11,306	10,941	11,306	133,483
2018	11,066	10,352	11,066	10,709	11,066	10,709	11,066	11,066	10,709	11,066	10,709	11,066	130,645
2019	10,790	10,094	10,790	10,442	10,790	10,442	10,790	10,790	10,442	10,790	10,442	10,790	127,397
2020	10,483	9,807	10,483	10,145	10,483	10,145	10,483	10,483	10,145	10,483	10,145	10,483	123,766
2021	10,167	9,511	10,167	9,839	10,167	9,839	10,167	10,167	9,839	10,167	9,839	10,167	120,033
2022	9,824	9,191	9,824	9,507	9,824	9,507	9,824	9,824	9,507	9,824	9,507	9,824	115,991
2023	9,409	8,802	9,409	9,105	9,409	9,105	9,409	9,409	9,105	9,409	9,105	9,409	111,083
2024	9,031	8,449	9,031	8,740	9,031	8,740	9,031	9,031	8,740	9,031	8,740	9,031	106,627
2025	8,667	8,108	8,667	8,388	8,667	8,388	8,667	8,667	8,388	8,667	8,388	8,667	102,331
2026	8,340	7,802	8,340	8,071	8,340	8,071	8,340	8,340	8,071	8,340	8,071	8,340	98,467
2027	8,044	7,525	8,044	7,785	8,044	7,785	8,044	8,044	7,785	8,044	7,785	8,044	94,975
2028	7,741	7,241	7,741	7,491	7,741	7,491	7,741	7,741	7,491	7,741	7,491	7,741	91,389
2029	7,426	6,947	7,426	7,186	7,426	7,186	7,426	7,426	7,186	7,426	7,186	7,426	87,671
2030	7,132	6,672	7,132	6,902	7,132	6,902	7,132	7,132	6,902	7,132	6,902	7,132	84,206
2031	6,976	6,526	6,976	6,751	6,976	6,751	6,976	6,976	6,751	6,976	6,751	6,976	82,358
2032	6,840	6,399	6,840	6,620	6,840	6,620	6,840	6,840	6,620	6,840	6,620	6,840	80,758
2033	6,807	6,367	6,807	6,587	6,807	6,587	6,807	6,807	6,587	6,807	6,587	6,807	80,361
2034	6,749	6,313	6,749	6,531	6,749	6,531	6,749	6,749	6,531	6,749	6,531	6,749	79,678
2035	6,730	6,296	6,730	6,513	6,730	6,513	6,730	6,730	6,513	6,730	6,513	6,730	79,461

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Figure 6: 2017 Historical Data

Segment	2017 Therm Sales	2017 Meter Count	2017 Meter Count: Pre-1979 Customers	2017 Meter Count: 1979-2016 Customers	2017 Meter Count: 2017 "New" Customers	Avg Annual Consumption: Pre-1979 Customers	Avg Annual Consumption: 1979-2016 Customers	Avg Annual Consumption: 2017 "New" Customers	Price Elasticity
Single Family	1,735,240,312	3,742,704	2,409,585	1,312,290	20,829	464	465	337	-0.1053
Multi-Family <= 4 Units	182,211,284	552,881	405,384	145,121	2,376	334	318	251	-0.11171
Multi-Family > 4 Units	359,351,881	1,203,899	701,151	495,862	6,885	305	290	244	-0.07145
Master Meter	141,169,129	36,731	32,706	3,897	128	3,377	7,334	16,750	-0.0688
Sub-Meter	46,814,430	1,756	1,651	105	0	26,344	31,532	0	-0.1053

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Figure 7: Meter Count Forecast

Year	Single Family	Multi-Family <= 4 Units	Multi-Family > 4 Units	Master Meter	Sub-Meter
2017	3,742,704	552,881	1,203,899	36,731	1,756
2018	3,766,828	558,772	1,216,727	36,731	1,756
2019	3,793,093	565,017	1,230,325	36,731	1,756
2020	3,820,834	571,730	1,244,942	36,731	1,756
2021	3,849,333	578,807	1,260,353	36,731	1,756
2022	3,878,156	586,206	1,276,464	36,731	1,756
2023	3,906,992	593,830	1,293,065	36,731	1,756
2024	3,935,651	601,564	1,309,906	36,731	1,756
2025	3,964,021	609,362	1,326,887	36,731	1,756
2026	3,992,053	617,238	1,344,037	36,731	1,756
2027	4,019,667	625,183	1,361,338	36,731	1,756
2028	4,046,649	633,136	1,378,654	36,731	1,756
2029	4,073,108	641,066	1,395,922	36,731	1,756
2030	4,099,553	649,024	1,413,251	36,731	1,756
2031	4,126,059	657,047	1,430,721	36,731	1,756
2032	4,152,276	665,125	1,448,310	36,731	1,756
2033	4,178,250	673,244	1,465,990	36,731	1,756
2034	4,204,405	681,425	1,483,803	36,731	1,756
2035	4,233,398	689,697	1,501,815	36,731	1,756

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Figure 8: Appliance Unit Energy Consumption (Gas in Therms, Electric in Kwh)

		Single Family		Multi-Family <= 4 Units		Multi-Family > 4 Units		Master Meter		Sub-Meter	
End-Use	**Efficiency**	**Gas**	**Electric**	**Gas**	**Electric**	**Gas**	**Electric**	**Gas**	**Electric**	**Gas**	**Electric**
Space Heating	Stock	270	4,110	150	730	110	730	130	730	250	1,340
	Standard	250	3,730	140	670	100	670	120	670	230	1,210
	High	230	3,450	130	620	100	620	110	620	220	1,120
	Premium	210	3,170	120	570	90	570	100	570	200	1,030
Water Heating	Stock	170	2,440	130	2,440	100	2,440	120	2,440	160	2,010
	Standard	150	2,220	120	2,220	100	2,220	110	2,220	150	1,830
	High	140	2,110	110	2,110	100	2,110	100	2,110	140	1,740
	Premium	140	2,050	110	2,050	90	2,050	100	2,050	140	1,690
Cooking	Stock	28	574	26	465	26	465	26	465	25	514
	Standard	24	488	22	395	22	395	22	395	21	437
Drying	Stock	41	1,442	35	1,442	30	1,442	33	1,442	35	873
	Standard	39	1,370	33	1,370	28	1,370	31	1,370	33	830
Pool	Stock	123	3,431	-	-	-	-	-	-	-	-
Spa	Stock	100	290	-	-	-	-	-	-	-	-
Fireplace	Stock	17	0	-	-	-	-	-	-	-	-
BBQ	Stock	16	0	15	0	13	0	14	0	16	0

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Figure 9: Average and Marginal Gas Prices ($/therm)

Year	Res Price Deflator	R SF Average Price	R SF Marginal Price	R MF2 Average Price	R MF2 Marginal Price	R MF3 Average Price	R MF3 Marginal Price	R MM Average Price	R MM Marginal Price	R SM Average Price	R SM Marginal Price
2017	97.7	1.1188	1.1588	1.1076	1.1588	1.0807	1.1588	1.0840	1.1588	1.1194	1.1588
2018	100.0	1.0997	1.1397	1.0885	1.1397	1.0616	1.1397	1.0649	1.1397	1.1003	1.1397
2019	102.4	1.1186	1.1580	1.1076	1.1580	1.0811	1.1580	1.0843	1.1580	1.1192	1.1580
2020	105.1	1.1502	1.1911	1.1388	1.1911	1.1114	1.1911	1.1147	1.1911	1.1509	1.1911
2021	107.8	1.1673	1.2084	1.1558	1.2084	1.1282	1.2084	1.1316	1.2084	1.1680	1.2084
2022	110.5	1.2253	1.2672	1.2136	1.2672	1.1854	1.2672	1.1889	1.2672	1.2260	1.2672
2023	113.2	1.3532	1.3985	1.3406	1.3985	1.3103	1.3985	1.3140	1.3985	1.3540	1.3985
2024	116.0	1.4502	1.4971	1.4372	1.4971	1.4057	1.4971	1.4095	1.4971	1.4510	1.4971
2025	118.8	1.5421	1.5905	1.5286	1.5905	1.4961	1.5905	1.5001	1.5905	1.5429	1.5905
2026	121.6	1.6409	1.6920	1.6266	1.6920	1.5923	1.6920	1.5965	1.6920	1.6417	1.6920
2027	124.3	1.7295	1.7821	1.7149	1.7821	1.6796	1.7821	1.6839	1.7821	1.7304	1.7821
2028	127.1	1.8328	1.8871	1.8177	1.8871	1.7812	1.8871	1.7857	1.8871	1.8337	1.8871
2029	129.9	1.9610	2.0185	1.9450	2.0185	1.9064	2.0185	1.9111	2.0185	1.9620	2.0185
2030	132.7	2.0605	2.1196	2.0440	2.1196	2.0043	2.1196	2.0092	2.1196	2.0615	2.1196
2031	135.5	2.1499	2.2105	2.1330	2.2105	2.0923	2.2105	2.0973	2.2105	2.1509	2.2105
2032	138.4	2.2476	2.3106	2.2301	2.3106	2.1878	2.3106	2.1929	2.3106	2.2487	2.3106
2033	141.2	2.3339	2.3983	2.3159	2.3983	2.2726	2.3983	2.2779	2.3983	2.3349	2.3983
2034	144.1	2.4455	2.5117	2.4270	2.5117	2.3825	2.5117	2.3879	2.5117	2.4466	2.5117
2035	147.1	2.5527	2.6215	2.5335	2.6215	2.4872	2.6215	2.4929	2.6215	2.5538	2.6215

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Figure 10: Average and Marginal Electricity Prices (Cents/KWh)

Year	R SF Average Price	R SF Marginal Price	R MF2 Average Price	R MF2 Marginal Price	R MF3 Average Price	R MF3 Marginal Price	R MM Average Price	R MM Marginal Price	R SM Average Price	R SM Marginal Price
2017	18.10	27.39	17.92	27.12	17.49	26.46	17.54	18.14	18.11	20.38
2018	19.00	28.75	18.81	28.46	18.34	27.76	18.40	19.03	19.01	21.40
2019	20.03	30.31	19.83	30.01	19.36	29.30	19.42	20.08	20.04	22.56
2020	20.51	31.04	20.31	30.73	19.82	29.99	19.88	20.56	20.52	23.10
2021	21.09	31.92	20.88	31.60	20.39	30.85	20.45	21.14	21.10	23.75
2022	21.74	32.90	21.54	32.59	21.04	31.83	21.10	21.82	21.76	24.48
2023	21.96	33.23	21.76	32.93	21.27	32.18	21.33	22.05	21.98	24.73
2024	22.65	34.28	22.45	33.97	21.96	33.22	22.02	22.77	22.66	25.50
2025	23.49	35.55	23.29	35.24	22.79	34.49	22.85	23.63	23.51	26.45
2026	24.32	36.81	24.11	36.49	23.60	35.72	23.67	24.47	24.34	27.39
2027	24.88	37.65	24.67	37.33	24.16	36.56	24.22	25.05	24.89	28.01
2028	25.48	38.55	25.27	38.23	24.76	37.47	24.82	25.67	25.49	28.68
2029	25.89	39.17	25.68	38.85	25.17	38.08	25.23	26.09	25.90	29.15
2030	26.21	39.66	26.00	39.35	25.50	38.58	25.56	26.43	26.22	29.51
2031	27.00	40.86	26.79	40.54	26.28	39.76	26.34	27.24	27.01	30.40
2032	27.81	42.08	27.59	41.75	27.07	40.95	27.13	28.05	27.82	31.31
2033	28.63	43.32	28.41	42.99	27.88	42.18	27.94	28.89	28.64	32.23
2034	29.47	44.60	29.25	44.26	28.71	43.45	28.78	29.76	29.48	33.18
2035	30.34	45.91	30.11	45.56	29.56	44.73	29.63	30.64	30.35	34.16

Southern California Gas Company
2018 California Gas Report
Figure 11: Gas Appliance Equipment Cost (Nominal $)

End-Use	Customer Class	Stock Efficiency	Standard Efficiency	High Efficiency	Premium Efficiency
Space Heating	Single Family	4,000	4,600	4,800	5,000
	Multi-Family 2-4 Unit	2,000	2,300	2,400	2,500
	Multi-Family > 4 Unit	1,600	1,840	1,920	1,980
	Master Meter	1,000	1,150	1,200	1,250
	Sub-metered	1,600	1,840	1,920	1,980
Water Heating	Single Family	550	650	700	750
	Multi-Family 2-4 Unit	330	390	420	450
	Multi-Family > 4 Unit	330	390	420	450
	Master Meter	330	390	420	450
	Sub-metered	330	390	420	450
Cooking	Single Family	500	1,400	-	-
	Multi-Family 2-4 Unit	300	1,400	-	-
	Multi-Family > 4 Unit	250	1,400	-	-
	Master Meter	250	1,400	-	-
	Sub-metered	250	1,400	-	-
Drying	Single Family	328	482	-	-
	Multi-Family 2-4 Unit	328	482	-	-
	Multi-Family > 4 Unit	328	482	-	-
	Master Meter	328	482	-	-
	Sub-metered	328	482	-	-
Pool	Single Family	1,200	-	-	-
Spa	Single Family	2,000	-	-	-
Fireplace	Single Family	150	-	-	-
Barbecue	Single Family	1,000	-	-	-
	Multi-Family 2-4 Unit	600	-	-	-
	Multi-Family > 4 Unit	600	-	-	-
	Master Meter	600	-	-	-
	Sub-metered	600	-	-	-

Southern California Gas Company
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Figure 12: Electric Appliance Equipment Cost (Nominal $)

End-Use	Customer Class	Stock Efficiency	Standard Efficiency	High Efficiency	Premium Efficiency
Space Heating	Single Family	4,100	-	-	-
	Multi-Family 2-4 Units	2,050	-	-	-
	Multi-Family > 4 Unit	1,640	-	-	-
	Master Meter	1,025	-	-	-
	Sub-metered	1,640	-	-	-
Water Heating	Single Family	550	650	700	750
	Multi-Family 2-4 Units	330	390	420	450
	Multi-Family > 4 Unit	330	390	420	450
	Master Meter	330	390	420	450
	Sub-metered	330	390	420	450
Cooking	Single Family	500	1,400	-	-
	Multi-Family 2-4 Units	300	1,400	-	-
	Multi-Family > 4 Unit	250	1,400	-	-
	Master Meter	250	1,400	-	-
	Sub-metered	250	1,400	-	-
Drying	Single Family	328	482	-	-
	Multi-Family 2-4 Units	328	482	-	-
	Multi-Family > 4 Unit	328	482	-	-
	Master Meter	328	482	-	-
	Sub-metered	328	482	-	-
Pool	Single Family	1,200	-	-	-
Spa	Single Family	2,000	-	-	-
Fireplace	Single Family	150	-	-	-
Barbecue	Single Family	1,000	-	-	-
	Multi-Family 2-4 Units	600	-	-	-
	Multi-Family > 4 Unit	600	-	-	-
	Master Meter	600	-	-	-
	Sub-metered	600	-	-	-

Southern California Gas Company
Figure 13: Building Lives and Decay Rate

Building Type	Building decay Rate
Single Family	0.003
Multi-Family 2-4 Units	0.006
Multi-Family > 4 Units	0.006
Master Meter	0.008
Sub-Meter	0.008

Southern California Gas Company
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Figure 14: Gas Appliance Age (Years)

		Single Family		Multi-Family 2-4 Units		Multi-Family > 4 Units		Master Meter		Sub-metered	
End-Use	**Vintage**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**	**Average**	**Max**
Space Heating	Pre-1979	17	17	15	15	15	15	16	16	16	16
	1979-2004	10	17	12	15	11	15	11	16	11	16
	2005-Current	3	17	4	15	4	15	4	16	4	16
Water Heating	Pre-1979	7	7	7	8	6	8	6	8	6	8
	1979-2004	7	7	8	8	8	8	8	8	8	8
	2005-Current	3	7	2	8	4	8	4	8	4	8
Cooking	Pre-1979	12	12	10	10	10	11	14	14	14	14
	1979-2004	10	12	9	10	11	11	11	14	11	14
	2005-Current	2	12	2	10	4	11	3	14	3	14
Drying	Pre-1979	8	8	7	9	6	8	8	8	8	8
	1979-2004	8	8	9	9	8	8	8	8	8	8
	2005-Current	6	8	3	9	3	8	4	8	4	8
Pool	Pre-1979	13	13	-	-	-	-	-	-	-	-
	1979-2004	9	13	-	-	-	-	-	-	-	-
	2005-Current	3	13	-	-	-	-	-	-	-	-
Spa	Pre-1979	11	11	-	-	-	-	-	-	-	-
	1979-2004	8	11	-	-	-	-	-	-	-	-
	2005-Current	3	11	-	-	-	-	-	-	-	-
Fireplace	Pre-1979	15	15	-	-	-	-	-	-	-	-
	1979-2004	15	15	-	-	-	-	-	-	-	-
	2005-Current	15	15	-	-	-	-	-	-	-	-
Barbecue	Pre-1979	7	7	5	6	5	5	5	9	5	9
	1979-2004	7	7	6	6	5	5	9	9	9	9
	2005-Current	5	7	3	6	5	5	2	9	2	9
Other	Pre-1979	15	15	15	15	15	15	15	15	15	15
	1979-2004	15	15	15	15	15	15	15	15	15	15
	2005-Current	15	15	15	15	15	15	15	15	15	15

Southern California Gas Company
2018 California Gas Report
Figure 15: End-Use Saturations

End-Use	Vintage	Single Family	Multi-Family 2-4 Units	Multi-Family > 4 Units	Master Meter	Sub-metered
Space Heating	Pre-1979	1.00000	1.00000	1.00000	1.00000	1.00000
	1979-2004	1.00000	1.00000	1.00000	1.00000	1.00000
	2005-Current	1.00000	1.00000	1.00000	1.00000	0.00000
Water Heating	Pre-1979	1.00000	1.00000	1.00000	1.00000	1.00000
	1979-2004	1.00000	1.00000	1.00000	1.00000	1.00000
	2005-Current	1.00000	1.00000	1.00000	1.00000	0.00000
Cooking	Pre-1979	1.00000	1.00000	0.99633	1.00000	1.00000
	1979-2004	1.00000	1.00000	1.00000	1.00000	1.00000
	2005-Current	1.00000	1.00000	1.00000	1.00000	0.00000
Drying	Pre-1979	0.85795	0.63122	0.20040	0.47158	0.47158
	1979-2004	0.89516	0.69314	0.42764	0.57182	0.57182
	2005-Current	0.92508	0.75324	0.74161	0.74768	0.00000
Pool	Pre-1979	0.15644	-	-	-	-
	1979-2004	0.17913	-	-	-	-
	2005-Current	0.16916	-	-	-	-
Spa	Pre-1979	0.12651	-	-	-	-
	1979-2004	0.21695	-	-	-	-
	2005-Current	0.19134	-	-	-	-
Fireplace	Pre-1979	0.22973	-	-	-	-
	1979-2004	0.27252	-	-	-	-
	2005-Current	0.26269	-	-	-	-
Barbecue	Pre-1979	0.13716	0.09015	0.04723	0.07424	0.07424
	1979-2004	0.25180	0.13557	0.06165	0.10179	0.10179
	2005-Current	0.31442	0.23862	0.07818	0.16198	0.00000
Other	Pre-1979	1.00000	1.00000	1.00000	1.00000	1.00000
	1979-2004	1.00000	1.00000	1.00000	1.00000	1.00000
	2005-Current	1.00000	1.00000	1.00000	1.00000	N/A

Southern California Gas Company
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Figure 16: Gas Fuel Shares (average)

End-Use	Single Family	Multi-Family 2-4 Units	Multi-Family > 4 Units	Master Meter	Sub-metered
Space Heating	0.98200	0.94116	0.91179	0.92461	0.92461
Water Heating	0.97630	0.95244	0.89871	0.92997	0.92997
Cooking	0.83890	0.80100	0.82622	0.81058	0.81058
Drying	0.80258	0.74410	0.59654	0.70306	0.70306
Pool	0.49003	-	-	-	-
Spa	0.60804	-	-	-	-
Fireplace	0.56361	-	-	-	-
Barbecue	0.95008	0.90406	0.85803	0.89234	0.89234
Other	1.00000	1.00000	1.00000	1.00000	1.00000

Southern California Gas Company
2018 California Gas Report
Figure 17: Gas Efficiency Shares

End-Use	Customer Class	Stock Existing	Stock New	Standard Existing	Standard New	High Existing	High New	Premium Existing	Premium New
Space Heating	Single Family	0.59	0.59	0.34	0.34	0.06	0.06	0.01	0.01
	Multi-Family 2-4 Units	0.70	0.70	0.28	0.28	0.01	0.01	0.01	0.01
	Multi-Family > 4 Units	0.50	0.50	0.48	0.48	0.01	0.01	0.01	0.01
	Master Meter	0.50	0.50	0.48	0.48	0.01	0.01	0.01	0.01
	Sub-metered	0.59	0.59	0.34	0.34	0.06	0.06	0.01	0.01
Water Heating	Single Family	0.10	0.10	0.68	0.68	0.21	0.21	0.01	0.01
	Multi-Family 2-4 Units	0.22	0.22	0.61	0.61	0.16	0.16	0.01	0.01
	Multi-Family > 4 Units	0.13	0.13	0.76	0.76	0.10	0.10	0.01	0.01
	Master Meter	0.13	0.13	0.76	0.76	0.10	0.10	0.01	0.01
	Sub-metered	0.10	0.10	0.68	0.68	0.21	0.21	0.01	0.01
Cooking	Single Family	0.90	0.90	0.10	0.10	-	-	-	-
	Multi-Family 2-4 Units	0.95	0.95	0.05	0.05	-	-	-	-
	Multi-Family > 4 Units	0.95	0.95	0.05	0.05	-	-	-	-
	Master Meter	0.95	0.95	0.05	0.05	-	-	-	-
	Sub-metered	0.95	0.95	0.05	0.05	-	-	-	-
Drying	Single Family	0.75	0.75	0.25	0.25	-	-	-	-
	Multi-Family 2-4 Units	0.75	0.75	0.25	0.25	-	-	-	-
	Multi-Family > 4 Units	0.75	0.75	0.25	0.25	-	-	-	-
	Master Meter	0.75	0.75	0.25	0.25	-	-	-	-
	Sub-metered	0.75	0.75	0.25	0.25	-	-	-	-
Pool	Single Family	1.00	1.00	-	-	-	-	-	-
Spa	Single Family	1.00	1.00	-	-	-	-	-	-
Fireplace	Single Family	1.00	1.00	-	-	-	-	-	-
Barbecue	Single Family	1.00	1.00	-	-	-	-	-	-
	Multi-Family 2-4 Units	1.00	1.00	-	-	-	-	-	-
	Multi-Family > 4 Units	1.00	1.00	-	-	-	-	-	-
	Master Meter	1.00	1.00	-	-	-	-	-	-
	Sub-metered	1.00	1.00	-	-	-	-	-	-
Other	Single Family	1.00	1.00	-	-	-	-	-	-
	Multi-Family 2-4 Units	1.00	1.00	-	-	-	-	-	-
	Multi-Family > 4 Units	1.00	1.00	-	-	-	-	-	-
	Master Meter	1.00	1.00	-	-	-	-	-	-
	Sub-metered	1.00	1.00	-	-	-	-	-	-

Southern California Gas Company
2018 California Gas Report
Figure 18: Electric Efficiency Shares

End-Use	Customer Class	Stock Existing	Stock New	Standard Existing	Standard New	High Existing	High New	Premium Existing	Premium New
Space Heating	Single Family	1.00	1.00	-	-	-	-	-	-
	Multi-Family 2-4 Units	1.00	1.00	-	-	-	-	-	-
	Multi-Family > 4 Units	1.00	1.00	-	-	-	-	-	-
	Master Meter	1.00	1.00	-	-	-	-	-	-
	Sub-metered	1.00	1.00	-	-	-	-	-	-
Water Heating	Single Family	0.10	0.10	0.68	0.68	0.21	0.21	0.01	0.01
	Multi-Family 2-4 Units	0.22	0.22	0.61	0.61	0.16	0.16	0.01	0.01
	Multi-Family > 4 Units	0.13	0.13	0.76	0.76	0.10	0.10	0.01	0.01
	Master Meter	0.13	0.13	0.76	0.76	0.10	0.10	0.01	0.01
	Sub-metered	0.10	0.10	0.68	0.68	0.21	0.21	0.01	0.01
Cooking	Single Family	0.90	0.90	0.10	0.10	-	-	-	-
	Multi-Family 2-4 Units	0.95	0.95	0.05	0.05	-	-	-	-
	Multi-Family > 4 Units	0.95	0.95	0.05	0.05	-	-	-	-
	Master Meter	0.95	0.95	0.05	0.05	-	-	-	-
	Sub-metered	0.95	0.95	0.05	0.05	-	-	-	-
Drying	Single Family	0.75	0.75	0.25	0.25	-	-	-	-
	Multi-Family 2-4 Units	0.75	0.75	0.25	0.25	-	-	-	-
	Multi-Family > 4 Units	0.75	0.75	0.25	0.25	-	-	-	-
	Master Meter	0.75	0.75	0.25	0.25	-	-	-	-
	Sub-metered	0.75	0.75	0.25	0.25	-	-	-	-
Pool	Single Family	1.00	1.00	-	-	-	-	-	-
Spa	Single Family	1.00	1.00	-	-	-	-	-	-
Fireplace	Single Family	1.00	1.00	-	-	-	-	-	-
Barbecue	Single Family	1.00	1.00	-	-	-	-	-	-
	Multi-Family 2-4 Units	1.00	1.00	-	-	-	-	-	-
	Multi-Family > 4 Units	1.00	1.00	-	-	-	-	-	-
	Master Meter	1.00	1.00	-	-	-	-	-	-
	Sub-metered	1.00	1.00	-	-	-	-	-	-

2018 CALIFORNIA GAS REPORT

CORE COMMERCIAL & INDUSTRIAL

Core Commercial and Industrial End Use Model
2018 California Gas Report

Introduction

The G10 commercial and industrial gas demand forecast used the EUForecaster model to generate annual gas demand forecasts for the years 2018 through 2035.

The model segments the G-10 commercial and industrial markets into 14 sectors and 11 sectors by type of business activity, respectively. Business activity is determined by the NAICS code assigned to the customer and carried on the customer's billing record. A second segmentation within each specific business type involved further disaggregation into end-uses.

The gas demand forecast that results from the EUForecaster model is at the annual design HDD total of 1,320 for an Average Year. The gas demand forecasts under Cold, Hot and Base temperature were then constructed based on Cold Year (Hdd = 1,594), Hot Year (Hdd=1,046) and Base Year (Hdd=0) annual assumptions.

This *end use* forecasts under the above four temperature scenarios are then adjusted for a set of *post-model* adjustments. These adjustments consist of *reductions* for the EE/DSM savings provided by the EE/DSM group. An addition to load associated with (existing) G10 commercial and industrial customers who install electric self-generation equipment was included. This program was established initially by the State of California through AB970 and is now known as SGIP. Other adjustments to the load consist of the anticipated core to noncore migration expected and a reduction in load for the City of Vernon customers. The final adjustment adds both the Gas AC and Gas Engine demand forecasts into commercial G10 forecast. All of these post-model adjustments are summarized in tables that follow.

Data Sources

The key set of information used to perform the modeling and to generate the forecast includes historical year 2017 consumption and customer counts, employment forecasts, gas and electric energy use intensity (EUI) values, end-use saturations, fuel and efficiency shares, gas and electric price forecasts, equipment age, use per meter for existing and new customers, and equipment cost. A description of each component follows.

A. Historical Year 2017 Sales:

The historical data are extracted from the billing tables in the Customer Information System (CIS). The gas consumption by business type was adjusted to our 1,320 average year HDD.

B. Employment Data:

The level of employment in each business type is used as a measure of economic activity in the G-10 commercial and industrial demand forecast models. The employment data series matches the NAICS categories used to develop the historical consumption data. The employment data were compiled and totaled for the 12 counties comprising SoCalGas' service territory. The forecast data comes from Global Insight's Regional forecast released in 2018 and based on Global Insight's latest US Economic Forecast. The historical 2017 data comes from the California Employment Development Department.

Data Sources

The key set of information used to perform the modeling and to generate the forecast includes historical year 2017 consumption and customer counts, employment forecasts, gas and electric energy use intensity (EUI) values, end-use saturations, fuel and efficiency shares, gas and electric price forecasts, equipment age, use per meter for existing and new customers, and equipment cost. A description of each component follows.

A. Historical Year 2017 Sales:

The historical data are extracted from the billing tables in the Customer Information System (CIS). The gas consumption by business type was adjusted to our 1,320 average year HDD.

B. Employment Data:

The level of employment in each business type is used as a measure of economic activity in the G-10 commercial and industrial demand forecast models. The employment data series matches the NAICS categories used to develop the historical consumption data. The employment data were compiled and totaled for the 12 counties comprising SoCalGas' service territory. The forecast data is based on Global Insight's Regional forecast.

Gas Price Data:

Average and marginal gas prices ($/therm) were calculated from forecasts of the G-10 rate components. We used detailed consumption data on our core G-10 C&I, customers, to separate monthly consumption for customers by each respective C&I business type into the respective G-10 consumption tiers. (The most recent 12-month calendar period, January 2017 through December 2017, was used.)

For a given business type, the average gas commodity rate for the 12-month period was calculated for each year. The average commodity rate in each forecast year was developed using the same monthly consumption pattern, but with the forecasts of rates for each G-10 rate tier. The average gas price each year was then calculated by including the non-volumetric customer charges with the year's average gas commodity rate.

Each respective business type's marginal gas commodity rate (for each month) was calculated by "pricing" the entire month's consumption at the G-10 rate's tier that was the last tier with non-zero consumption, the marginal consumption tier, for the customers of the given business type. The marginal gas price was then calculated as the simple average of the 12 monthly marginal commodity rates. The forecasts for each year used the same monthly consumption pattern, but used the projected G-10 price of the marginal consumption tier.

Electric Price Data:

Both average prices (cents/kWh) and marginal prices (cents/kWh) were developed as electricity price inputs. Forecasts for the SCE commercial and industrial customer classes were developed based on the California Energy Commission's December 2017 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.

The CEC did not did not provide an explicit projection of retail prices for medium sized commercial customers, a relationship for the retail price for this group was assumed to be at 88% of the retail price projected for SCE's commercial customer class. These were the average electricity prices for the core industrial market overall.

The marginal prices were calculated by multiplying each year's respecitve average price by a rattio. This ratio, 0.789 was estimated from an analysis of the SCE GS-2 rate schedule posted on their web-site. (These customers were assumed to be large non-self-generation customers who were on time-of-use rates.

To impute, in each year, average and marginal electricity prices to each core business type, a ratio of the average (or marginall) gas price to the overall core market gas price for each business type was constructed and then multiplied by the overall average (or marginal) electricity price.

E. Building and Equipment Decay Rates:

Building decay rates are based on buildings' lifetimes, where the lifetime is defined as the length of time it takes for either a demolition or a major renovation in which major systems are replaced. For existing core buildings and facilities, an exponential rate of decay of 1% per year was assumed, consistent with an average remaining life for existing buildings of 100 years. (A building decay rate concept is not relevant to non-core large gas transport customers. In both the commercial and industrial non-core models the existing building decay rate was set equal to zero.)

All new construction decay rates were assumed to be zero over the forecast horizon. This assumption was required because the growth of new buildings and facilities was tied directly to the econometric models.

End-Use lifetimes were derived from a variety of sources.

Commercial:

Space heat: 25 years
Water heat: 15 years
AC/compressor: 20 years
All other commercial end-uses: 15 years

Industrial:

Fire-tube boiler: 25 years
Water-tube boiler: 25 years
Engine (motors): 25 years
All other industrial end-uses: 20 years

F. Equipment Saturations, Fuel Shares, and Efficiency Shares:

EUForecaster defines saturation as the percentage of customers in any segment that has a particular end use, independent of fuel shares. EUForecaster adjusted core commercial fuel shares according to a set of fuel-choice equations over the forecast horizon.

End-use saturations in the industrial model were initially set equal to 100%. Industrial end-use gas fuel shares were initially approximated. We then used an iterative procedure to further adjust industrial saturation and fuel shares such that the EUForecaster sales totals matched SoCalGas industrial sales figures, and our estimates of electric usage by SoCalGas customers. Finally, all commercial and industrial fuel shares were held constant over the forecast horizon.

Energy efficiency varied within the major gas end-uses/processes, including all boilers, space heat, and water heat. Four levels of efficiency were assigned to gas equipment: low, medium (standard) high, and premium for core commercial and three levels of efficiency were assigned to gas equipment: low, medium (standard), and high for core industrial market. California and federal standards have effectively eliminated the lowest efficiency alternatives for several gas end-uses from being purchased as new or replacement equipment. The lowest efficiency alternative for these end uses is, therefore, allowed to exist in the base year stock, but the customer must then purchase either medium (e.g., equipment that just meets Government standards), high or premium efficiency equipment as these units decay.

For existing equipment stock, the low efficiency share was set to 50%, whereas the medium efficiency share ranges from 40 to 45%, and the high efficiency share ranges from 5 to 10%.

EUForecaster's choice module prorates the low share to the medium, high and premium alternatives in proportion to their shares noted above. Therefore, replacement and new construction efficiency shares for medium range from 80% to 90%, and high ranges from 10% to 20%.

G. DSM Forecast:

The end-use gas demand forecast developed with EUForecaster does not capture the effects of SoCalGas' EE/DSM programs. Energy savings goals from the CPUC's mandated energy efficiency/energy conservation programs for the core commercial and industrial were provided by SoCalGas' DSM department. These savings are subtracted from the forecast generated by the core commercial and industrial forecasts generated by EUForecaster.

Gas Air Conditioning and Gas Engines

A special tariff for gas air-conditioning rates went into effect at the end of 1993, while a special tariff for gas engine rates started in early 1995. The forecasts of core gas air conditioning and gas engine demand are based on the latest information provided by customers. Both segments are forecasted based on the expected number of customers in each market times their usage per customer.

AMI

Annual conservation benefits associated with AMI are estimated by SoCalGas to represent 1% of core gas throughput in the post-deployment period.

The Core Commercial and the Core Industrial loads were reduced by AMI's projected savings

CORE COMMERCIAL WORKPAPERS

Southern California Gas Company
Core Commercial Market
2017 Historical Base Year Data Inputs

Segment	2017 Therm Sales	2017 Meter Count	2017 Meter Count, Existing/Old customers	2017 Meter Count New	Avg Use Per Meter Existing Customers	Avg Use Per Meter New Customers	Price Elasticity
Office	69,661,885	42,124	41,960	164	**1,652**	2,166	-0.135376
Restaurant	265,444,159	39,638	39,118	520	**6,698**	6,580	-0.091877
Retail	56,711,651	23,554	23,405	149	**2,403**	3,124	-0.265060
Laundry	61,959,561	4,020	4,010	10	**15,403**	19,549	-0.122795
Warehouse	14,331,013	7,308	7,278	30	**1,956**	3,029	-0.043035
School	34,431,893	6,727	6,718	9	**5,116**	6,541	-0.000001
College	25,727,915	2,815	2,802	13	**9,156**	5,652	-0.037179
Health	59,352,244	6,891	6,868	23	**8,586**	16,633	-0.096826
Lodging	61,148,660	4,815	4,791	24	**12,561**	40,381	-0.105697
Misc	82,312,303	34,266	33,975	291	**2,320**	12,002	-0.000001
Government	24648141	3711	3695	16	**6660**	2484	-0.095709
TCU	24126636	6160	6147	13	**3913**	5696	-0.129301
Construction	8848279	5693	5654	39	**1547**	2624	-0.161076
Agriculture	40337250	1398	1390	8	**28906**	19720	-0.315282

Southern California Gas Company
Core Commercial Market
Saturations

zname	bname	nname	SAT	SOURCE
Commercial	Lodging	Cook_top	0.0840	CBECS
Commercial	Lodging	Drying	0.8200	CI_1996_STUDY
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

Southern California Gas Company
Core Commercial Market
Saturations

zname	bname	nname	SAT	SOURCE
Commercial	Warehouse	Other	1.0000	DEFAULT
Commercial	Warehouse	Space_Heat	0.2310	SDGE_EUI_STUDY
Commercial	Warehouse	Water_Heat	0.8800	SDGE_EUI_STUDY

Southern California Gas Company
Core Commerical Market
F Share Values by End Use

SAT_LOOKUP	SOURCE	FASHARE_ORIG	BNSUM_SAT	FASHARE_SDGE
OfficeSpace_Heat	SDGE_EUI_STUDY	0.7460000000000000	0.8720000000000000	0.8555045871559630
OfficeSpace_Heat	SDGE_EUI_STUDY	0.1260000000000000	0.8720000000000000	0.1444954128440370
OfficeWater_Heat	SDGE_EUI_STUDY	0.1620000000000000	0.9770000000000000	0.1658137154554760
OfficeWater_Heat	SDGE_EUI_STUDY	0.8150000000000000	0.9770000000000000	0.8341862845445240
OfficeCooking	SDGE_EUI_STUDY	0.0180000000000000	0.8700000000000000	0.0206896551724138
OfficeCooking	SDGE_EUI_STUDY	0.8520000000000000	0.8700000000000000	0.9793103448275860
OfficeAC_Compressor	CI_1996_STUDY	0.0600000000000000	1.0000000000000000	0.0600000000000000
OfficeAC_Compressor	CI_1996_STUDY	0.9400000000000000	1.0000000000000000	0.9400000000000000
OfficeOther	DEFAULT	0.1750000000000000	0.1750000000000000	1.0000000000000000
RestaurantSpace_Heat	SDGE_EUI_STUDY	0.4830000000000000	0.8180000000000000	0.5904645476772620
RestaurantSpace_Heat	SDGE_EUI_STUDY	0.3350000000000000	0.8180000000000000	0.4095354523227380
RestaurantWater_Heat	SDGE_EUI_STUDY	0.8840000000000000	0.9800000000000000	0.9020408163265310
RestaurantWater_Heat	SDGE_EUI_STUDY	0.0960000000000000	0.9800000000000000	0.0979591836734694
RestaurantCook_top	SCG_COOKING_STUDY	0.7330000000000000	0.7500000000000000	0.9773333333333330
RestaurantCook_top	SCG_COOKING_STUDY	0.0170000000000000	0.7500000000000000	0.0226666666666667
RestaurantFryer	SCG_COOKING_STUDY	0.6600000000000000	0.7290000000000000	0.9053497942386830
RestaurantFryer	SCG_COOKING_STUDY	0.0690000000000000	0.7290000000000000	0.0946502057613169
RestaurantGriddle	SCG_COOKING_STUDY	0.5570000000000000	0.5740000000000000	0.9703832752613240
RestaurantGriddle	SCG_COOKING_STUDY	0.0170000000000000	0.5740000000000000	0.0296167247386760
RestaurantOther_Cooking	SDGE_EUI_STUDY	0.6600000000000000	1.0000000000000000	0.6600000000000000
RestaurantOther_Cooking	SDGE_EUI_STUDY	0.3400000000000000	1.0000000000000000	0.3400000000000000
RestaurantAC_Compressor	CI_1996_STUDY	0.0600000000000000	1.0000000000000000	0.0600000000000000
RestaurantAC_Compressor	CI_1996_STUDY	0.9400000000000000	1.0000000000000000	0.9400000000000000
RestaurantOther	DEFAULT	0.0050000000000000	0.0050000000000000	1.0000000000000000
RetailSpace_Heat	SDGE_EUI_STUDY	0.3990000000000000	0.7710000000000000	0.5175097276264590
RetailSpace_Heat	SDGE_EUI_STUDY	0.3720000000000000	0.7710000000000000	0.4824902723735410
RetailWater_Heat	SDGE_EUI_STUDY	0.2800000000000000	0.9030000000000000	0.3100775193798450
RetailWater_Heat	SDGE_EUI_STUDY	0.6230000000000000	0.9030000000000000	0.6899224806201550
RetailCooking	SDGE_EUI_STUDY	0.0740000000000000	0.7900000000000000	0.0936708860759494
RetailCooking	SDGE_EUI_STUDY	0.7160000000000000	0.7900000000000000	0.9063291139240510
RetailOther	DEFAULT	1.0000000000000000	1.0000000000000000	1.0000000000000000
LaundrySpace_Heat	CI_1996_STUDY	0.6000000000000000	1.0400000000000000	0.5769230769230770
LaundrySpace_Heat	CI_1996_STUDY	0.4400000000000000	1.0400000000000000	0.4230769230769230
LaundryWater_Heat	CI_1996_STUDY	0.6900000000000000	1.0200000000000000	0.6764705882352940
LaundryWater_Heat	CI_1996_STUDY	0.3300000000000000	1.0200000000000000	0.3235294117647060
LaundryDrying	CI_1996_STUDY	0.6600000000000000	1.1000000000000000	0.6000000000000000
LaundryDrying	CI_1996_STUDY	0.4400000000000000	1.1000000000000000	0.4000000000000000
LaundryOther	DEFAULT	1.0000000000000000	1.0000000000000000	1.0000000000000000
WarehouseSpace_Heat	SDGE_EUI_STUDY	0.1010000000000000	0.2310000000000000	0.4372294372294370
WarehouseSpace_Heat	SDGE_EUI_STUDY	0.1300000000000000	0.2310000000000000	0.5627705627705630
WarehouseWater_Heat	SDGE_EUI_STUDY	0.0630000000000000	0.8800000000000000	0.0715909090909091
WarehouseWater_Heat	SDGE_EUI_STUDY	0.8170000000000000	0.8800000000000000	0.9284090909090910
WarehouseEngine	Assumed same as AC	0.0600000000000000	1.0000000000000000	0.0600000000000000
WarehouseEngine	Assumed same as AC	0.9400000000000000	1.0000000000000000	0.9400000000000000
WarehouseOther	DEFAULT	1.0000000000000000	1.0000000000000000	1.0000000000000000
SchoolSpace_Heat	SDGE_EUI_STUDY	0.7280000000000000	0.9670000000000000	0.7528438469493280
SchoolSpace_Heat	SDGE_EUI_STUDY	0.2390000000000000	0.9670000000000000	0.2471561530506720
SchoolWater_Heat	SDGE_EUI_STUDY	0.6970000000000000	0.9190000000000000	0.7584330794341680
SchoolWater_Heat	SDGE_EUI_STUDY	0.2220000000000000	0.9190000000000000	0.2415669205658320
SchoolCook_top	SDGE_EUI_STUDY	0.3900000000000000	0.9100000000000000	0.4285714285714290
SchoolCook_top	SDGE_EUI_STUDY	0.5200000000000000	0.9100000000000000	0.5714285714285710
SchoolFryer	SDGE_EUI_STUDY	0.3900000000000000	0.9100000000000000	0.4285714285714290
SchoolFryer	SDGE_EUI_STUDY	0.5200000000000000	0.9100000000000000	0.5714285714285710

Southern California Gas Company
Core Commerical Market
F Share Values by End Use

SAT_LOOKUP	SOURCE	FASHARE_ORIG	BNSUM_SAT	FASHARE_SDGE
SchoolGriddle	SDGE_EUI_STUDY	0.3900000000000000	0.9100000000000000	0.4285714285714290
SchoolGriddle	SDGE_EUI_STUDY	0.5200000000000000	0.9100000000000000	0.5714285714285710
SchoolOther_Cooking	SDGE_EUI_STUDY	0.3900000000000000	0.9100000000000000	0.4285714285714290
SchoolOther_Cooking	SDGE_EUI_STUDY	0.5200000000000000	0.9100000000000000	0.5714285714285710
SchoolAC_Compressor	CI_1996_STUDY	0.0600000000000000	1.0000000000000000	0.0600000000000000
SchoolAC_Compressor	CI_1996_STUDY	0.9400000000000000	1.0000000000000000	0.9400000000000000
SchoolOther	DEFAULT	1.0000000000000000	1.0000000000000000	1.0000000000000000
CollegeSpace_Heat	SDGE_EUI_STUDY	0.2520000000000000	0.7630000000000000	0.3302752293577980
CollegeSpace_Heat	SDGE_EUI_STUDY	0.5110000000000000	0.7630000000000000	0.6697247706422020
CollegeWater_Heat	SDGE_EUI_STUDY	0.7800000000000000	0.9550000000000000	0.8167539267015710
CollegeWater_Heat	SDGE_EUI_STUDY	0.1750000000000000	0.9550000000000000	0.1832460732984290
CollegeCook_top	SDGE_EUI_STUDY	0.0350000000000000	0.7290000000000000	0.0480109739368999
CollegeCook_top	SDGE_EUI_STUDY	0.6940000000000000	0.7290000000000000	0.9519890260631000
CollegeFryer	SDGE_EUI_STUDY	0.0350000000000000	0.7290000000000000	0.0480109739368999
CollegeFryer	SDGE_EUI_STUDY	0.6940000000000000	0.7290000000000000	0.9519890260631000
CollegeGriddle	SDGE_EUI_STUDY	0.0350000000000000	0.7290000000000000	0.0480109739368999
CollegeGriddle	SDGE_EUI_STUDY	0.6940000000000000	0.7290000000000000	0.9519890260631000
CollegeOther_Cooking	SDGE_EUI_STUDY	0.0350000000000000	0.7290000000000000	0.0480109739368999
CollegeOther_Cooking	SDGE_EUI_STUDY	0.6940000000000000	0.7290000000000000	0.9519890260631000
CollegeAC_Compressor	CI_1996_STUDY	0.0600000000000000	1.0000000000000000	0.0600000000000000
CollegeAC_Compressor	CI_1996_STUDY	0.9400000000000000	1.0000000000000000	0.9400000000000000
CollegeOther	DEFAULT	0.0930000000000000	0.0930000000000000	1.0000000000000000
HealthSpace_Heat	SDGE_EUI_STUDY	0.6180000000000000	0.9360000000000000	0.6602564102564100
HealthSpace_Heat	SDGE_EUI_STUDY	0.3180000000000000	0.9360000000000000	0.3397435897435900
HealthWater_Heat	SDGE_EUI_STUDY	0.7220000000000000	0.8760000000000000	0.8242009132420090
HealthWater_Heat	SDGE_EUI_STUDY	0.1540000000000000	0.8760000000000000	0.1757990867579910
HealthCook_top	SDGE_EUI_STUDY	0.0870000000000000	0.9170000000000000	0.0948745910577972
HealthCook_top	SDGE_EUI_STUDY	0.8300000000000000	0.9170000000000000	0.9051254089422030
HealthFryer	SDGE_EUI_STUDY	0.0870000000000000	0.9170000000000000	0.0948745910577972
HealthFryer	SDGE_EUI_STUDY	0.8300000000000000	0.9170000000000000	0.9051254089422030
HealthGriddle	SDGE_EUI_STUDY	0.0870000000000000	0.9170000000000000	0.0948745910577972
HealthGriddle	SDGE_EUI_STUDY	0.8300000000000000	0.9170000000000000	0.9051254089422030
HealthOther_Cooking	SDGE_EUI_STUDY	0.6600000000000000	1.0000000000000000	0.6600000000000000
HealthOther_Cooking	SDGE_EUI_STUDY	0.3400000000000000	1.0000000000000000	0.3400000000000000
HealthDrying	CI_1996_STUDY	0.6600000000000000	1.1000000000000000	0.6000000000000000
HealthDrying	CI_1996_STUDY	0.4400000000000000	1.1000000000000000	0.4000000000000000
HealthAC_Compressor	CI_1996_STUDY	0.0600000000000000	1.0000000000000000	0.0600000000000000
HealthAC_Compressor	CI_1996_STUDY	0.9400000000000000	1.0000000000000000	0.9400000000000000
HealthOther	DEFAULT	0.2110000000000000	0.2110000000000000	1.0000000000000000
LodgingSpace_Heat	SDGE_EUI_STUDY	0.2430000000000000	0.8950000000000000	0.2715083798882680
LodgingSpace_Heat	SDGE_EUI_STUDY	0.6520000000000000	0.8950000000000000	0.7284916201117320
LodgingWater_Heat	SDGE_EUI_STUDY	0.9410000000000000	0.9510000000000000	0.9894847528916930
LodgingWater_Heat	SDGE_EUI_STUDY	0.0100000000000000	0.9510000000000000	0.0105152471083070
LodgingCook_top	SDGE_EUI_STUDY	0.3210000000000000	0.7140000000000000	0.4495798319327730
LodgingCook_top	SDGE_EUI_STUDY	0.3930000000000000	0.7140000000000000	0.5504201680672270
LodgingFryer	SDGE_EUI_STUDY	0.3210000000000000	0.7140000000000000	0.4495798319327730
LodgingFryer	SDGE_EUI_STUDY	0.3930000000000000	0.7140000000000000	0.5504201680672270
LodgingGriddle	SDGE_EUI_STUDY	0.3210000000000000	0.7140000000000000	0.4495798319327730
LodgingGriddle	SDGE_EUI_STUDY	0.3930000000000000	0.7140000000000000	0.5504201680672270
LodgingOther_Cooking	SDGE_EUI_STUDY	0.3210000000000000	0.7140000000000000	0.4495798319327730
LodgingOther_Cooking	SDGE_EUI_STUDY	0.3930000000000000	0.7140000000000000	0.5504201680672270
LodgingDrying	CI_1996_STUDY	0.6600000000000000	1.1000000000000000	0.6000000000000000
LodgingDrying	CI_1996_STUDY	0.4400000000000000	1.1000000000000000	0.4000000000000000

Southern California Gas Company
Core Commerical Market
F Share Values by End Use

SAT_LOOKUP	SOURCE	FASHARE_ORIG	BNSUM_SAT	FASHARE_SDGE
LodgingAC_Compressor	CI_1996_STUDY	0.0600000000000000	1.0000000000000000	0.0600000000000000
LodgingAC_Compressor	CI_1996_STUDY	0.9400000000000000	1.0000000000000000	0.9400000000000000
LodgingOther	DEFAULT	0.4330000000000000	0.4330000000000000	1.0000000000000000
MiscSpace_Heat	SDGE_EUI_STUDY	0.3820000000000000	0.6950000000000000	0.5496402877697840
MiscSpace_Heat	SDGE_EUI_STUDY	0.3130000000000000	0.6950000000000000	0.4503597122302160
MiscWater_Heat	SDGE_EUI_STUDY	0.5040000000000000	0.9050000000000000	0.5569060773480660
MiscWater_Heat	SDGE_EUI_STUDY	0.4010000000000000	0.9050000000000000	0.4430939226519340
MiscCook_top	SCG_COOKING_STUDY	0.7330000000000000	0.7500000000000000	0.9773333333333330
MiscCook_top	SCG_COOKING_STUDY	0.0170000000000000	0.7500000000000000	0.0226666666666667
MiscFryer	SCG_COOKING_STUDY	0.6600000000000000	0.7290000000000000	0.9053497942386830
MiscFryer	SCG_COOKING_STUDY	0.0690000000000000	0.7290000000000000	0.0946502057613169
MiscGriddle	SCG_COOKING_STUDY	0.5570000000000000	0.5740000000000000	0.9703832752613240
MiscGriddle	SCG_COOKING_STUDY	0.0170000000000000	0.5740000000000000	0.0296167247386760
MiscOther_Cooking	SDGE_EUI_STUDY	0.6600000000000000	1.0000000000000000	0.6600000000000000
MiscOther_Cooking	SDGE_EUI_STUDY	0.3400000000000000	1.0000000000000000	0.3400000000000000
MiscAC_Compressor	CI_1996_STUDY	0.0600000000000000	1.0000000000000000	0.0600000000000000
MiscAC_Compressor	CI_1996_STUDY	0.9400000000000000	1.0000000000000000	0.9400000000000000
MiscOther	DEFAULT	0.0600000000000000	0.0600000000000000	1.0000000000000000
GovernmentSpace_Heat	SDGE_EUI_STUDY	0.7460000000000000	0.8720000000000000	0.8555045871559630
GovernmentSpace_Heat	SDGE_EUI_STUDY	0.1260000000000000	0.8720000000000000	0.1444954128440370
GovernmentWater_Heat	SDGE_EUI_STUDY	0.1620000000000000	0.9770000000000000	0.1658137154554760
GovernmentWater_Heat	SDGE_EUI_STUDY	0.8150000000000000	0.9770000000000000	0.8341862845445240
GovernmentCook_top	SCG_COOKING_STUDY	0.7330000000000000	0.7500000000000000	0.9773333333333330
GovernmentCook_top	SCG_COOKING_STUDY	0.0170000000000000	0.7500000000000000	0.0226666666666667
GovernmentFryer	SCG_COOKING_STUDY	0.6600000000000000	0.7290000000000000	0.9053497942386830
GovernmentFryer	SCG_COOKING_STUDY	0.0690000000000000	0.7290000000000000	0.0946502057613169
GovernmentGriddle	SCG_COOKING_STUDY	0.5570000000000000	0.5740000000000000	0.9703832752613240
GovernmentGriddle	SCG_COOKING_STUDY	0.0170000000000000	0.5740000000000000	0.0296167247386760
GovernmentOther_Cooking	SDGE_EUI_STUDY	0.6600000000000000	1.0000000000000000	0.6600000000000000
GovernmentOther_Cooking	SDGE_EUI_STUDY	0.3400000000000000	1.0000000000000000	0.3400000000000000
GovernmentAC_Compressor	CI_1996_STUDY	0.0600000000000000	1.0000000000000000	0.0600000000000000
GovernmentAC_Compressor	CI_1996_STUDY	0.9400000000000000	1.0000000000000000	0.9400000000000000
GovernmentOther	DEFAULT	0.1750000000000000	0.1750000000000000	1.0000000000000000
TCUSpace_Heat	CI_1996_STUDY	0.6000000000000000	1.0400000000000000	0.5769230769230770
TCUSpace_Heat	CI_1996_STUDY	0.4400000000000000	1.0400000000000000	0.4230769230769230
TCUWater_Heat	CI_1996_STUDY	0.6900000000000000	1.0200000000000000	0.6764705882352940
TCUWater_Heat	CI_1996_STUDY	0.3300000000000000	1.0200000000000000	0.3235294117647060
TCUEngine	Assumed same as AC	0.0600000000000000	1.0000000000000000	0.0600000000000000
TCUEngine	Assumed same as AC	0.9400000000000000	1.0000000000000000	0.9400000000000000
TCUOther	DEFAULT	1.0000000000000000	1.0000000000000000	1.0000000000000000
ConstructionSpace_Heat	CI_1996_STUDY	0.6000000000000000	1.0400000000000000	0.5769230769230770
ConstructionSpace_Heat	CI_1996_STUDY	0.4400000000000000	1.0400000000000000	0.4230769230769230
ConstructionWater_Heat	CI_1996_STUDY	0.6900000000000000	1.0200000000000000	0.6764705882352940
ConstructionWater_Heat	CI_1996_STUDY	0.3300000000000000	1.0200000000000000	0.3235294117647060
ConstructionOther	DEFAULT	1.0000000000000000	1.0000000000000000	1.0000000000000000
AgricultureSpace_Heat	CI_1996_STUDY	0.6000000000000000	1.0400000000000000	0.5769230769230770
AgricultureSpace_Heat	CI_1996_STUDY	0.4400000000000000	1.0400000000000000	0.4230769230769230
AgricultureWater_Heat	CI_1996_STUDY	0.6900000000000000	1.0200000000000000	0.6764705882352940
AgricultureWater_Heat	CI_1996_STUDY	0.3300000000000000	1.0200000000000000	0.3235294117647060
AgricultureDrying	NEED DATA	1.0000000000000000	1.0000000000000000	1.0000000000000000
AgricultureDrying	NEED DATA	0.0000000000000000	1.0000000000000000	0.0000000000000000
AgricultureEngine	Assumed same as AC	0.0600000000000000	1.0000000000000000	0.0600000000000000
AgricultureEngine	Assumed same as AC	0.9400000000000000	1.0000000000000000	0.9400000000000000

Southern California Gas Company
Core Commerical Market
F Share Values by End Use

SAT_LOOKUP	SOURCE	FASHARE_ORIG	BNSUM_SAT	FASHARE_SDGE
AgricultureOther	DEFAULT	1.0000000000000000	1.0000000000000000	1.0000000000000000
GrocerySpace_Heat	SDGE_EUI_STUDY	0.4830000000000000	0.6470000000000000	0.7465224111282840
GrocerySpace_Heat	SDGE_EUI_STUDY	0.1640000000000000	0.6470000000000000	0.2534775888717160
GroceryWater_Heat	SDGE_EUI_STUDY	0.6950000000000000	0.9810000000000000	0.7084607543323140
GroceryWater_Heat	SDGE_EUI_STUDY	0.2860000000000000	0.9810000000000000	0.2915392456676860
GroceryCook_top	SDGE_EUI_STUDY	0.3210000000000000	0.9010000000000000	0.3562708102108770
GroceryCook_top	SDGE_EUI_STUDY	0.5800000000000000	0.9010000000000000	0.6437291897891230
GroceryFryer	SDGE_EUI_STUDY	0.3210000000000000	0.9010000000000000	0.3562708102108770
GroceryFryer	SDGE_EUI_STUDY	0.5800000000000000	0.9010000000000000	0.6437291897891230
GroceryGriddle	SDGE_EUI_STUDY	0.3210000000000000	0.9010000000000000	0.3562708102108770
GroceryGriddle	SDGE_EUI_STUDY	0.5800000000000000	0.9010000000000000	0.6437291897891230
GroceryOther_Cooking	SDGE_EUI_STUDY	0.3210000000000000	0.9010000000000000	0.3562708102108770
GroceryOther_Cooking	SDGE_EUI_STUDY	0.5800000000000000	0.9010000000000000	0.6437291897891230
GroceryAC_Compressor	CI_1996_STUDY	0.0600000000000000	1.0000000000000000	0.0600000000000000
GroceryAC_Compressor	CI_1996_STUDY	0.9400000000000000	1.0000000000000000	0.9400000000000000
GroceryOther	DEFAULT	1.0000000000000000	1.0000000000000000	1.0000000000000000

Southern California Gas Company
Core Commercial Market
EUI Data

bname	nname	fname	_NAME_	Stock_Existing	Standard_Existing	High_Existing	Premium_Existing
Agriculture	Drying	Electric	B0	0.3120000	0.2808000	N/A	N/A
Agriculture	Drying	Natural_Gas	B0	0.2013300	0.1811970	N/A	N/A
Agriculture	Engine	Electric	B0	1.3416000	1.2074400	N/A	N/A
Agriculture	Engine	Natural_Gas	B0	0.8657190	0.7791471	N/A	N/A
Agriculture	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
Agriculture	Space_Heat	Electric	B0	0.6010000	0.5409000	N/A	N/A
Agriculture	Space_Heat	Natural_Gas	B0	0.1468600	0.1321740	0.1202783	0.1083827
Agriculture	Water_Heat	Electric	B0	0.3120000	0.2808000	0.2732184	0.2656368
Agriculture	Water_Heat	Natural_Gas	B0	0.2013300	0.1811970	0.1585474	0.1358978
College	AC_Compressor	Electric	B0	3.4630000	3.1167000	N/A	N/A
College	AC_Compressor	Natural_Gas	B0	0.1181922	0.1063730	N/A	N/A
College	Cook_top	Electric	B0	0.7620000	0.6858000	N/A	N/A
College	Cook_top	Natural_Gas	B0	0.0486000	0.0437400	N/A	N/A
College	Fryer	Electric	B0	0.7620000	0.6858000	N/A	N/A
College	Fryer	Natural_Gas	B0	0.0485700	0.0437130	N/A	N/A
College	Griddle	Electric	B0	0.7620000	0.6858000	N/A	N/A
College	Griddle	Natural_Gas	B0	0.0485700	0.0437130	N/A	N/A
College	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
College	Other_Cooking	Electric	B0	0.7620000	0.6858000	N/A	N/A
College	Other_Cooking	Natural_Gas	B0	0.0486000	0.0437400	N/A	N/A
College	Space_Heat	Electric	B0	0.1990000	0.1791000	N/A	N/A
College	Space_Heat	Natural_Gas	B0	0.2664300	0.2397870	0.2182062	0.1966253
College	Water_Heat	Electric	B0	0.6400000	0.5760000	0.5604480	0.5448960
College	Water_Heat	Natural_Gas	B0	0.2871500	0.2584350	0.2261306	0.1938263
Construction	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
Construction	Space_Heat	Electric	B0	0.6010000	0.5409000	N/A	N/A
Construction	Space_Heat	Natural_Gas	B0	0.1468600	0.1321740	0.1202783	0.1083827
Construction	Water_Heat	Electric	B0	0.3120000	0.2808000	0.2732184	0.2656368
Construction	Water_Heat	Natural_Gas	B0	0.2013300	0.1811970	0.1585474	0.1358978
Government	AC_Compressor	Electric	B0	3.0560000	2.7504000	N/A	N/A
Government	AC_Compressor	Natural_Gas	B0	0.1043013	0.0938712	N/A	N/A
Government	Cook_top	Electric	B0	0.4510000	0.4059000	N/A	N/A
Government	Cook_top	Natural_Gas	B0	0.0346000	0.0311400	N/A	N/A
Government	Fryer	Electric	B0	0.4510000	0.4059000	N/A	N/A
Government	Fryer	Natural_Gas	B0	0.0345900	0.0311310	N/A	N/A
Government	Griddle	Electric	B0	0.4510000	0.4059000	N/A	N/A
Government	Griddle	Natural_Gas	B0	0.0345900	0.0311310	N/A	N/A
Government	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
Government	Other_Cooking	Electric	B0	0.4510000	0.4059000	N/A	N/A
Government	Other_Cooking	Natural_Gas	B0	0.0346000	0.0311400	N/A	N/A
Government	Space_Heat	Electric	B0	0.8450000	N/A	N/A	N/A
Government	Space_Heat	Natural_Gas	B0	0.3046400	0.2741760	0.2495002	0.2248243
Government	Water_Heat	Electric	B0	0.1790000	0.1611000	0.1567503	0.1524006
Government	Water_Heat	Natural_Gas	B0	0.0473900	0.0426510	0.0373196	0.0319883
Grocery	AC_Compressor	Electric	B0	5.5860000	5.0274000	N/A	N/A
Grocery	AC_Compressor	Natural_Gas	B0	0.1906502	0.1715852	N/A	N/A
Grocery	Cook_top	Electric	B0	5.2450000	4.7205000	N/A	N/A
Grocery	Cook_top	Natural_Gas	B0	0.0418300	0.0376470	N/A	N/A
Grocery	Fryer	Electric	B0	5.2450000	4.7205000	N/A	N/A
Grocery	Fryer	Natural_Gas	B0	0.4183200	0.3764880	N/A	N/A
Grocery	Griddle	Electric	B0	5.2450000	4.7205000	N/A	N/A
Grocery	Griddle	Natural_Gas	B0	0.4183200	0.3764880	N/A	N/A
Grocery	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
Grocery	Other_Cooking	Electric	B0	5.2450000	4.7205000	N/A	N/A
Grocery	Other_Cooking	Natural_Gas	B0	0.0418300	0.0376470	N/A	N/A
Grocery	Space_Heat	Electric	B0	0.7350000	N/A	N/A	N/A
Grocery	Space_Heat	Natural_Gas	B0	0.0976200	0.0878580	0.0799508	0.0720436
Grocery	Water_Heat	Electric	B0	1.7630000	1.5867000	1.5438591	1.5010182

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bname	nname	fname	_NAME_	Stock_Existing	Standard_Existing	High_Existing	Premium_Existing
Grocery	Water_Heat	Natural_Gas	B0	0.3182700	0.2864430	0.2506376	0.2148323
Health	AC_Compressor	Electric	B0	3.3360000	3.0024000	N/A	N/A
Health	AC_Compressor	Natural_Gas	B0	0.1138577	0.1024719	N/A	N/A
Health	Cook_top	Electric	B0	1.1540000	1.0386000	N/A	N/A
Health	Cook_top	Natural_Gas	B0	0.2635800	0.2372220	N/A	N/A
Health	Drying	Electric	B0	0.7619500	0.6857550	N/A	N/A
Health	Drying	Natural_Gas	B0	0.1459815	0.1313834	N/A	N/A
Health	Fryer	Electric	B0	1.1540000	1.0386000	N/A	N/A
Health	Fryer	Natural_Gas	B0	0.2635800	0.2372220	N/A	N/A
Health	Griddle	Electric	B0	1.1540000	1.0386000	N/A	N/A
Health	Griddle	Natural_Gas	B0	0.2635800	0.2372220	N/A	N/A
Health	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
Health	Other_Cooking	Electric	B0	1.1540000	1.0386000	N/A	N/A
Health	Other_Cooking	Natural_Gas	B0	0.0263600	0.0237240	N/A	N/A
Health	Space_Heat	Electric	B0	0.4050000	0.3645000	N/A	N/A
Health	Space_Heat	Natural_Gas	B0	0.0689400	0.0620460	0.0564619	0.0508777
Health	Water_Heat	Electric	B0	2.1770000	1.9593000	1.9063989	1.8534978
Health	Water_Heat	Natural_Gas	B0	0.4170900	0.3753810	0.3284584	0.2815358
Laundry	Drying	Electric	B0	85.5136937	76.9623243	N/A	N/A
Laundry	Drying	Natural_Gas	B0	14.9366516	13.4429864	N/A	N/A
Laundry	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
Laundry	Space_Heat	Electric	B0	0.6010000	0.5409000	N/A	N/A
Laundry	Space_Heat	Natural_Gas	B0	0.1468600	0.1321740	0.1202783	0.1083827
Laundry	Water_Heat	Electric	B0	15.8040000	14.2236000	13.8395628	13.4555256
Laundry	Water_Heat	Natural_Gas	B0	2.7604800	2.4844320	2.1738780	1.8633240
Lodging	AC_Compressor	Electric	B0	1.6700000	1.5030000	N/A	N/A
Lodging	AC_Compressor	Natural_Gas	B0	0.0569971	0.0512974	N/A	N/A
Lodging	Cook_top	Electric	B0	39.3000000	35.3700000	N/A	N/A
Lodging	Cook_top	Natural_Gas	B0	0.3210000	0.2889000	N/A	N/A
Lodging	Drying	Electric	B0	0.9877500	0.8889750	N/A	N/A
Lodging	Drying	Natural_Gas	B0	0.1725300	0.1552770	N/A	N/A
Lodging	Fryer	Electric	B0	5.2450000	4.7205000	N/A	N/A
Lodging	Fryer	Natural_Gas	B0	0.4183200	0.3764880	N/A	N/A
Lodging	Griddle	Electric	B0	5.2450000	4.7205000	N/A	N/A
Lodging	Griddle	Natural_Gas	B0	0.4183200	0.3764880	N/A	N/A
Lodging	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
Lodging	Other_Cooking	Electric	B0	5.2450000	4.7205000	N/A	N/A
Lodging	Other_Cooking	Natural_Gas	B0	0.0410000	0.0369000	N/A	N/A
Lodging	Space_Heat	Electric	B0	0.5490000	0.4941000	N/A	N/A
Lodging	Space_Heat	Natural_Gas	B0	0.3869800	0.3482820	0.3169366	0.2855912
Lodging	Water_Heat	Electric	B0	3.9510000	3.5559000	3.4598907	3.3638814
Lodging	Water_Heat	Natural_Gas	B0	0.6901200	0.6211080	0.5434695	0.4658310
Misc	AC_Compressor	Electric	B0	3.8720000	3.4848000	N/A	N/A
Misc	AC_Compressor	Natural_Gas	B0	0.1321514	0.1189362	N/A	N/A
Misc	Cook_top	Electric	B0	0.5390000	0.4851000	N/A	N/A
Misc	Cook_top	Natural_Gas	B0	0.0430000	0.0387000	N/A	N/A
Misc	Fryer	Electric	B0	0.5390000	0.4851000	N/A	N/A
Misc	Fryer	Natural_Gas	B0	0.0430200	0.0387180	N/A	N/A
Misc	Griddle	Electric	B0	0.5390000	0.4851000	N/A	N/A
Misc	Griddle	Natural_Gas	B0	0.0430200	0.0387180	N/A	N/A
Misc	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
Misc	Other_Cooking	Electric	B0	0.5390000	0.4851000	N/A	N/A
Misc	Other_Cooking	Natural_Gas	B0	0.0430000	0.0387000	N/A	N/A
Misc	Space_Heat	Electric	B0	0.6010000	0.5409000	N/A	N/A
Misc	Space_Heat	Natural_Gas	B0	0.1468600	0.1321740	0.1202783	0.1083827
Misc	Water_Heat	Electric	B0	0.3120000	0.2808000	0.2732184	0.2656368
Misc	Water_Heat	Natural_Gas	B0	0.2013300	0.1811970	0.1585474	0.1358978
Office	AC_Compressor	Electric	B0	3.0560000	2.7504000	N/A	N/A

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bname	nname	fname	_NAME_	Stock_Existing	Standard_Existing	High_Existing	Premium_Existing
Office	AC_Compressor	Natural_Gas	B0	0.1043013	0.0938712	N/A	N/A
Office	Cooking	Electric	B0	0.4510000	0.4059000	N/A	N/A
Office	Cooking	Natural_Gas	B0	0.0345900	0.0311310	N/A	N/A
Office	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
Office	Space_Heat	Electric	B0	0.8450000	0.7605000	N/A	N/A
Office	Space_Heat	Natural_Gas	B0	0.3046400	0.2741760	0.2495002	0.2248243
Office	Water_Heat	Electric	B0	0.1790000	0.1611000	0.1567503	0.1524006
Office	Water_Heat	Natural_Gas	B0	0.0473900	0.0426510	0.0373196	0.0319883
Restaurant	AC_Compressor	Electric	B0	5.9430000	5.3487000	N/A	N/A
Restaurant	AC_Compressor	Natural_Gas	B0	0.2028346	0.1825511	N/A	N/A
Restaurant	Cook_top	Electric	B0	1.5190269	1.3671242	N/A	N/A
Restaurant	Cook_top	Natural_Gas	B0	1.1985040	1.0786536	N/A	N/A
Restaurant	Fryer	Electric	B0	6.1654621	5.5489159	N/A	N/A
Restaurant	Fryer	Natural_Gas	B0	1.0791441	0.9712297	N/A	N/A
Restaurant	Griddle	Electric	B0	1.5190269	1.3671242	N/A	N/A
Restaurant	Griddle	Natural_Gas	B0	0.9107322	0.8196590	N/A	N/A
Restaurant	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
Restaurant	Other_Cooking	Electric	B0	27.3424841	24.6082357	N/A	N/A
Restaurant	Other_Cooking	Natural_Gas	B0	0.9712297	0.8741067	N/A	N/A
Restaurant	Space_Heat	Electric	B0	0.3430000	0.3087000	N/A	N/A
Restaurant	Space_Heat	Natural_Gas	B0	0.1176700	0.1059030	0.0963717	0.0868405
Restaurant	Water_Heat	Electric	B0	4.2600000	3.8340000	3.7304820	3.6269640
Restaurant	Water_Heat	Natural_Gas	B0	0.8665900	0.7799310	0.6824396	0.5849483
Retail	Cooking	Electric	B0	0.6930000	0.6237000	N/A	N/A
Retail	Cooking	Natural_Gas	B0	0.3078600	0.2770740	N/A	N/A
Retail	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
Retail	Space_Heat	Electric	B0	1.3560000	1.2204000	N/A	N/A
Retail	Space_Heat	Natural_Gas	B0	0.2455200	0.2209680	0.2010809	0.1811938
Retail	Water_Heat	Electric	B0	0.5280000	0.4752000	0.4623696	0.4495392
Retail	Water_Heat	Natural_Gas	B0	0.1092600	0.0983340	0.0860423	0.0737505
School	AC_Compressor	Electric	B0	1.9130000	1.7217000	N/A	N/A
School	AC_Compressor	Natural_Gas	B0	0.0652907	0.0587616	N/A	N/A
School	Cook_top	Electric	B0	0.5020000	0.4518000	N/A	N/A
School	Cook_top	Natural_Gas	B0	0.0460000	0.0414000	N/A	N/A
School	Fryer	Electric	B0	0.5020000	0.4518000	N/A	N/A
School	Fryer	Natural_Gas	B0	0.0461000	0.0414900	N/A	N/A
School	Griddle	Electric	B0	0.5020000	0.4518000	N/A	N/A
School	Griddle	Natural_Gas	B0	0.0461000	0.0414900	N/A	N/A
School	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
School	Other_Cooking	Electric	B0	0.5020000	0.4518000	N/A	N/A
School	Other_Cooking	Natural_Gas	B0	0.0460000	0.0414000	N/A	N/A
School	Space_Heat	Electric	B0	0.4840000	0.4356000	N/A	N/A
School	Space_Heat	Natural_Gas	B0	0.0923800	0.0831420	0.0756592	0.0681764
School	Water_Heat	Electric	B0	0.6880000	0.6192000	0.6024816	0.5857632
School	Water_Heat	Natural_Gas	B0	0.1232800	0.1109520	0.0970830	0.0832140
TCU	Engine	Electric	B0	3.7825983	3.4043385	N/A	N/A
TCU	Engine	Natural_Gas	B0	2.4408670	2.1967803	N/A	N/A
TCU	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
TCU	Space_Heat	Electric	B0	0.6010000	0.5409000	N/A	N/A
TCU	Space_Heat	Natural_Gas	B0	0.1468600	0.1321740	0.1202783	0.1083827
TCU	Water_Heat	Electric	B0	0.3120000	0.2808000	0.2732184	0.2656368
TCU	Water_Heat	Natural_Gas	B0	0.2013300	0.1811970	0.1585474	0.1358978
Warehouse	Engine	Electric	B0	33.4700769	30.1230692	N/A	N/A
Warehouse	Engine	Natural_Gas	B0	8.8838738	7.9954865	N/A	N/A
Warehouse	Other	Natural_Gas	B0	0.00	N/A	N/A	N/A
Warehouse	Space_Heat	Electric	B0	2.3400000	2.1060000	N/A	N/A
Warehouse	Space_Heat	Natural_Gas	B0	0.6211000	0.5589900	0.5086809	0.4583718
Warehouse	Water_Heat	Electric	B0	0.1300000	0.1170000	0.1138410	0.1106820

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bname	nname	fname	_NAME_	Stock_Existing	Standard_Existing	High_Existing	Premium_Existing
Warehouse	Water_Heat	Natural_Gas	B0	0.2048000	0.1843200	0.1612800	0.1382400

Southern California Gas Company
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E Shares by Business Type , End Use and Fuel Name

bname	nname	fname	_NAME_	SAT_LOOKUP	Stock_Qtec	Standard_Qtec	High_Qtec	Premium_Qtec
Agriculture	Drying	Electric	EASHARE	AgricultureDryingElectric	0.65	0.35	N/A	N/A
Agriculture	Drying	Natural_Gas	EASHARE	AgricultureDryingNatural_Gas	0.65	0.35	N/A	N/A
Agriculture	Engine	Electric	EASHARE	AgricultureEngineElectric	0.65	0.35	N/A	N/A
Agriculture	Engine	Natural_Gas	EASHARE	AgricultureEngineNatural_Gas	0.65	0.35	N/A	N/A
Agriculture	Other	Natural_Gas	EASHARE	AgricultureOtherNatural_Gas	1	N/A	N/A	N/A
Agriculture	Space_Heat	Electric	EASHARE	AgricultureSpace_HeatElectric	1	999	999	999
Agriculture	Space_Heat	Natural_Gas	EASHARE	AgricultureSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
Agriculture	Water_Heat	Electric	EASHARE	AgricultureWater_HeatElectric	0.4	0.5	0.08	0.02
Agriculture	Water_Heat	Natural_Gas	EASHARE	AgricultureWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
College	AC_Compressor	Electric	EASHARE	CollegeAC_CompressorElectric	0.65	0.35	N/A	N/A
College	AC_Compressor	Natural_Gas	EASHARE	CollegeAC_CompressorNatural_Gas	0.65	0.35	N/A	N/A
College	Cook_top	Electric	EASHARE	CollegeCook_topElectric	0.65	0.35	N/A	N/A
College	Cook_top	Natural_Gas	EASHARE	CollegeCook_topNatural_Gas	0.65	0.35	N/A	N/A
College	Fryer	Electric	EASHARE	CollegeFryerElectric	0.65	0.35	N/A	N/A
College	Fryer	Natural_Gas	EASHARE	CollegeFryerNatural_Gas	0.65	0.35	N/A	N/A
College	Griddle	Electric	EASHARE	CollegeGriddleElectric	0.65	0.35	N/A	N/A
College	Griddle	Natural_Gas	EASHARE	CollegeGriddleNatural_Gas	0.65	0.35	N/A	N/A
College	Other	Natural_Gas	EASHARE	CollegeOtherNatural_Gas	1	N/A	N/A	N/A
College	Other_Cooking	Electric	EASHARE	CollegeOther_CookingElectric	0.65	0.35	N/A	N/A
College	Other_Cooking	Natural_Gas	EASHARE	CollegeOther_CookingNatural_Gas	0.65	0.35	N/A	N/A
College	Space_Heat	Electric	EASHARE	CollegeSpace_HeatElectric	1	999	999	999
College	Space_Heat	Natural_Gas	EASHARE	CollegeSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
College	Water_Heat	Electric	EASHARE	CollegeWater_HeatElectric	0.4	0.5	0.08	0.02
College	Water_Heat	Natural_Gas	EASHARE	CollegeWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
Construction	Other	Natural_Gas	EASHARE	ConstructionOtherNatural_Gas	1	N/A	N/A	N/A
Construction	Space_Heat	Electric	EASHARE	ConstructionSpace_HeatElectric	1	999	999	999
Construction	Space_Heat	Natural_Gas	EASHARE	ConstructionSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
Construction	Water_Heat	Electric	EASHARE	ConstructionWater_HeatElectric	0.4	0.5	0.08	0.02
Construction	Water_Heat	Natural_Gas	EASHARE	ConstructionWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
Government	AC_Compressor	Electric	EASHARE	GovernmentAC_CompressorElectric	0.65	0.35	N/A	N/A
Government	AC_Compressor	Natural_Gas	EASHARE	GovernmentAC_CompressorNatural_Gas	0.65	0.35	N/A	N/A
Government	Cook_top	Electric	EASHARE	GovernmentCook_topElectric	0.65	0.35	N/A	N/A
Government	Cook_top	Natural_Gas	EASHARE	GovernmentCook_topNatural_Gas	0.65	0.35	N/A	N/A
Government	Fryer	Electric	EASHARE	GovernmentFryerElectric	0.65	0.35	N/A	N/A
Government	Fryer	Natural_Gas	EASHARE	GovernmentFryerNatural_Gas	0.65	0.35	N/A	N/A
Government	Griddle	Electric	EASHARE	GovernmentGriddleElectric	0.65	0.35	N/A	N/A
Government	Griddle	Natural_Gas	EASHARE	GovernmentGriddleNatural_Gas	0.65	0.35	N/A	N/A
Government	Other	Natural_Gas	EASHARE	GovernmentOtherNatural_Gas	1	N/A	N/A	N/A
Government	Other_Cooking	Electric	EASHARE	GovernmentOther_CookingElectric	0.65	0.35	N/A	N/A
Government	Other_Cooking	Natural_Gas	EASHARE	GovernmentOther_CookingNatural_Gas	0.65	0.35	N/A	N/A
Government	Space_Heat	Electric	EASHARE	GovernmentSpace_HeatElectric	1	999	999	999
Government	Space_Heat	Natural_Gas	EASHARE	GovernmentSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
Government	Water_Heat	Electric	EASHARE	GovernmentWater_HeatElectric	0.4	0.5	0.08	0.02
Government	Water_Heat	Natural_Gas	EASHARE	GovernmentWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
Grocery	AC_Compressor	Electric	EASHARE	GroceryAC_CompressorElectric	0.65	0.35	N/A	N/A
Grocery	AC_Compressor	Natural_Gas	EASHARE	GroceryAC_CompressorNatural_Gas	0.65	0.35	N/A	N/A
Grocery	Cook_top	Electric	EASHARE	GroceryCook_topElectric	0.65	0.35	N/A	N/A
Grocery	Cook_top	Natural_Gas	EASHARE	GroceryCook_topNatural_Gas	0.65	0.35	N/A	N/A
Grocery	Fryer	Electric	EASHARE	GroceryFryerElectric	0.65	0.35	N/A	N/A
Grocery	Fryer	Natural_Gas	EASHARE	GroceryFryerNatural_Gas	0.65	0.35	N/A	N/A
Grocery	Griddle	Electric	EASHARE	GroceryGriddleElectric	0.65	0.35	N/A	N/A
Grocery	Griddle	Natural_Gas	EASHARE	GroceryGriddleNatural_Gas	0.65	0.35	N/A	N/A
Grocery	Other	Natural_Gas	EASHARE	GroceryOtherNatural_Gas	1	N/A	N/A	N/A
Grocery	Other_Cooking	Electric	EASHARE	GroceryOther_CookingElectric	0.65	0.35	N/A	N/A
Grocery	Other_Cooking	Natural_Gas	EASHARE	GroceryOther_CookingNatural_Gas	0.65	0.35	N/A	N/A
Grocery	Space_Heat	Electric	EASHARE	GrocerySpace_HeatElectric	1	999	999	999
Grocery	Space_Heat	Natural_Gas	EASHARE	GrocerySpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
Grocery	Water_Heat	Electric	EASHARE	GroceryWater_HeatElectric	0.4	0.5	0.08	0.02
Grocery	Water_Heat	Natural_Gas	EASHARE	GroceryWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
Health	AC_Compressor	Electric	EASHARE	HealthAC_CompressorElectric	0.65	0.35	N/A	N/A
Health	AC_Compressor	Natural_Gas	EASHARE	HealthAC_CompressorNatural_Gas	0.65	0.35	N/A	N/A
Health	Cook_top	Electric	EASHARE	HealthCook_topElectric	0.65	0.35	N/A	N/A
Health	Cook_top	Natural_Gas	EASHARE	HealthCook_topNatural_Gas	0.65	0.35	N/A	N/A
Health	Drying	Electric	EASHARE	HealthDryingElectric	0.65	0.35	N/A	N/A
Health	Drying	Natural_Gas	EASHARE	HealthDryingNatural_Gas	0.65	0.35	N/A	N/A
Health	Fryer	Electric	EASHARE	HealthFryerElectric	0.65	0.35	N/A	N/A
Health	Fryer	Natural_Gas	EASHARE	HealthFryerNatural_Gas	0.65	0.35	N/A	N/A
Health	Griddle	Electric	EASHARE	HealthGriddleElectric	0.65	0.35	N/A	N/A
Health	Griddle	Natural_Gas	EASHARE	HealthGriddleNatural_Gas	0.65	0.35	N/A	N/A
Health	Other	Natural_Gas	EASHARE	HealthOtherNatural_Gas	1	N/A	N/A	N/A
Health	Other_Cooking	Electric	EASHARE	HealthOther_CookingElectric	0.65	0.35	N/A	N/A
Health	Other_Cooking	Natural_Gas	EASHARE	HealthOther_CookingNatural_Gas	0.65	0.35	N/A	N/A
Health	Space_Heat	Electric	EASHARE	HealthSpace_HeatElectric	1	999	999	999
Health	Space_Heat	Natural_Gas	EASHARE	HealthSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
Health	Water_Heat	Electric	EASHARE	HealthWater_HeatElectric	0.4	0.5	0.08	0.02
Health	Water_Heat	Natural_Gas	EASHARE	HealthWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
Laundry	Drying	Electric	EASHARE	LaundryDryingElectric	0.65	0.35	N/A	N/A

Southern California Gas Company
Core Commercial Market
E Shares by Business Type , End Use and Fuel Name

bname	nname	fname	_NAME_	SAT_LOOKUP	Stock_Qtec	Standard_Qtec	High_Qtec	Premium_Qtec
Laundry	Drying	Natural_Gas	EASHARE	LaundryDryingNatural_Gas	0.65	0.35	N/A	N/A
Laundry	Other	Natural_Gas	EASHARE	LaundryOtherNatural_Gas	1	N/A	N/A	N/A
Laundry	Space_Heat	Electric	EASHARE	LaundrySpace_HeatElectric	1	999	999	999
Laundry	Space_Heat	Natural_Gas	EASHARE	LaundrySpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
Laundry	Water_Heat	Electric	EASHARE	LaundryWater_HeatElectric	0.4	0.5	0.08	0.02
Laundry	Water_Heat	Natural_Gas	EASHARE	LaundryWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
Lodging	AC_Compressor	Electric	EASHARE	LodgingAC_CompressorElectric	0.65	0.35	N/A	N/A
Lodging	AC_Compressor	Natural_Gas	EASHARE	LodgingAC_CompressorNatural_Gas	0.65	0.35	N/A	N/A
Lodging	Cook_top	Electric	EASHARE	LodgingCook_topElectric	0.65	0.35	N/A	N/A
Lodging	Cook_top	Natural_Gas	EASHARE	LodgingCook_topNatural_Gas	0.65	0.35	N/A	N/A
Lodging	Drying	Electric	EASHARE	LodgingDryingElectric	0.65	0.35	N/A	N/A
Lodging	Drying	Natural_Gas	EASHARE	LodgingDryingNatural_Gas	0.65	0.35	N/A	N/A
Lodging	Fryer	Electric	EASHARE	LodgingFryerElectric	0.65	0.35	N/A	N/A
Lodging	Fryer	Natural_Gas	EASHARE	LodgingFryerNatural_Gas	0.65	0.35	N/A	N/A
Lodging	Griddle	Electric	EASHARE	LodgingGriddleElectric	0.65	0.35	N/A	N/A
Lodging	Griddle	Natural_Gas	EASHARE	LodgingGriddleNatural_Gas	0.65	0.35	N/A	N/A
Lodging	Other	Natural_Gas	EASHARE	LodgingOtherNatural_Gas	1	N/A	N/A	N/A
Lodging	Other_Cooking	Electric	EASHARE	LodgingOther_CookingElectric	0.65	0.35	N/A	N/A
Lodging	Other_Cooking	Natural_Gas	EASHARE	LodgingOther_CookingNatural_Gas	0.65	0.35	N/A	N/A
Lodging	Space_Heat	Electric	EASHARE	LodgingSpace_HeatElectric	1	999	999	999
Lodging	Space_Heat	Natural_Gas	EASHARE	LodgingSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
Lodging	Water_Heat	Electric	EASHARE	LodgingWater_HeatElectric	0.4	0.5	0.08	0.02
Lodging	Water_Heat	Natural_Gas	EASHARE	LodgingWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
Misc	AC_Compressor	Electric	EASHARE	MiscAC_CompressorElectric	0.65	0.35	N/A	N/A
Misc	AC_Compressor	Natural_Gas	EASHARE	MiscAC_CompressorNatural_Gas	0.65	0.35	N/A	N/A
Misc	Cook_top	Electric	EASHARE	MiscCook_topElectric	0.65	0.35	N/A	N/A
Misc	Cook_top	Natural_Gas	EASHARE	MiscCook_topNatural_Gas	0.65	0.35	N/A	N/A
Misc	Fryer	Electric	EASHARE	MiscFryerElectric	0.65	0.35	N/A	N/A
Misc	Fryer	Natural_Gas	EASHARE	MiscFryerNatural_Gas	0.65	0.35	N/A	N/A
Misc	Griddle	Electric	EASHARE	MiscGriddleElectric	0.65	0.35	N/A	N/A
Misc	Griddle	Natural_Gas	EASHARE	MiscGriddleNatural_Gas	0.65	0.35	N/A	N/A
Misc	Other	Natural_Gas	EASHARE	MiscOtherNatural_Gas	1	N/A	N/A	N/A
Misc	Other_Cooking	Electric	EASHARE	MiscOther_CookingElectric	0.65	0.35	N/A	N/A
Misc	Other_Cooking	Natural_Gas	EASHARE	MiscOther_CookingNatural_Gas	0.65	0.35	N/A	N/A
Misc	Space_Heat	Electric	EASHARE	MiscSpace_HeatElectric	1	999	999	999
Misc	Space_Heat	Natural_Gas	EASHARE	MiscSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
Misc	Water_Heat	Electric	EASHARE	MiscWater_HeatElectric	0.4	0.5	0.08	0.02
Misc	Water_Heat	Natural_Gas	EASHARE	MiscWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
Office	AC_Compressor	Electric	EASHARE	OfficeAC_CompressorElectric	0.65	0.35	N/A	N/A
Office	AC_Compressor	Natural_Gas	EASHARE	OfficeAC_CompressorNatural_Gas	0.65	0.35	N/A	N/A
Office	Cooking	Electric	EASHARE	OfficeCookingElectric	0.65	0.35	N/A	N/A
Office	Cooking	Natural_Gas	EASHARE	OfficeCookingNatural_Gas	0.65	0.35	N/A	N/A
Office	Other	Natural_Gas	EASHARE	OfficeOtherNatural_Gas	1	N/A	N/A	N/A
Office	Space_Heat	Electric	EASHARE	OfficeSpace_HeatElectric	1	999	999	999
Office	Space_Heat	Natural_Gas	EASHARE	OfficeSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
Office	Water_Heat	Electric	EASHARE	OfficeWater_HeatElectric	0.4	0.5	0.08	0.02
Office	Water_Heat	Natural_Gas	EASHARE	OfficeWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
Restaurant	AC_Compressor	Electric	EASHARE	RestaurantAC_CompressorElectric	0.65	0.35	N/A	N/A
Restaurant	AC_Compressor	Natural_Gas	EASHARE	RestaurantAC_CompressorNatural_Gas	0.65	0.35	N/A	N/A
Restaurant	Cook_top	Electric	EASHARE	RestaurantCook_topElectric	0.65	0.35	N/A	N/A
Restaurant	Cook_top	Natural_Gas	EASHARE	RestaurantCook_topNatural_Gas	0.65	0.35	N/A	N/A
Restaurant	Fryer	Electric	EASHARE	RestaurantFryerElectric	0.65	0.35	N/A	N/A
Restaurant	Fryer	Natural_Gas	EASHARE	RestaurantFryerNatural_Gas	0.65	0.35	N/A	N/A
Restaurant	Griddle	Electric	EASHARE	RestaurantGriddleElectric	0.65	0.35	N/A	N/A
Restaurant	Griddle	Natural_Gas	EASHARE	RestaurantGriddleNatural_Gas	0.65	0.35	N/A	N/A
Restaurant	Other	Natural_Gas	EASHARE	RestaurantOtherNatural_Gas	1	N/A	N/A	N/A
Restaurant	Other_Cooking	Electric	EASHARE	RestaurantOther_CookingElectric	0.65	0.35	N/A	N/A
Restaurant	Other_Cooking	Natural_Gas	EASHARE	RestaurantOther_CookingNatural_Gas	0.65	0.35	N/A	N/A
Restaurant	Space_Heat	Electric	EASHARE	RestaurantSpace_HeatElectric	1	999	999	999
Restaurant	Space_Heat	Natural_Gas	EASHARE	RestaurantSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
Restaurant	Water_Heat	Electric	EASHARE	RestaurantWater_HeatElectric	0.4	0.5	0.08	0.02
Restaurant	Water_Heat	Natural_Gas	EASHARE	RestaurantWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
Retail	Cooking	Electric	EASHARE	RetailCookingElectric	0.65	0.35	N/A	N/A
Retail	Cooking	Natural_Gas	EASHARE	RetailCookingNatural_Gas	0.65	0.35	N/A	N/A
Retail	Other	Natural_Gas	EASHARE	RetailOtherNatural_Gas	1	N/A	N/A	N/A
Retail	Space_Heat	Electric	EASHARE	RetailSpace_HeatElectric	1	999	999	999
Retail	Space_Heat	Natural_Gas	EASHARE	RetailSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
Retail	Water_Heat	Electric	EASHARE	RetailWater_HeatElectric	0.4	0.5	0.08	0.02
Retail	Water_Heat	Natural_Gas	EASHARE	RetailWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
School	AC_Compressor	Electric	EASHARE	SchoolAC_CompressorElectric	0.65	0.35	N/A	N/A
School	AC_Compressor	Natural_Gas	EASHARE	SchoolAC_CompressorNatural_Gas	0.65	0.35	N/A	N/A
School	Cook_top	Electric	EASHARE	SchoolCook_topElectric	0.65	0.35	N/A	N/A
School	Cook_top	Natural_Gas	EASHARE	SchoolCook_topNatural_Gas	0.65	0.35	N/A	N/A
School	Fryer	Electric	EASHARE	SchoolFryerElectric	0.65	0.35	N/A	N/A
School	Fryer	Natural_Gas	EASHARE	SchoolFryerNatural_Gas	0.65	0.35	N/A	N/A
School	Griddle	Electric	EASHARE	SchoolGriddleElectric	0.65	0.35	N/A	N/A
School	Griddle	Natural_Gas	EASHARE	SchoolGriddleNatural_Gas	0.65	0.35	N/A	N/A

Southern California Gas Company
Core Commercial Market
E Shares by Business Type , End Use and Fuel Name

bname	nname	fname	_NAME_	SAT_LOOKUP	Stock_Qtec	Standard_Qtec	High_Qtec	Premium_Qtec
School	Other	Natural_Gas	EASHARE	SchoolOtherNatural_Gas	1	N/A	N/A	N/A
School	Other_Cooking	Electric	EASHARE	SchoolOther_CookingElectric	0.65	0.35	N/A	N/A
School	Other_Cooking	Natural_Gas	EASHARE	SchoolOther_CookingNatural_Gas	0.65	0.35	N/A	N/A
School	Space_Heat	Electric	EASHARE	SchoolSpace_HeatElectric	1	999	999	999
School	Space_Heat	Natural_Gas	EASHARE	SchoolSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
School	Water_Heat	Electric	EASHARE	SchoolWater_HeatElectric	0.4	0.5	0.08	0.02
School	Water_Heat	Natural_Gas	EASHARE	SchoolWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
TCU	Engine	Electric	EASHARE	TCUEngineElectric	0.65	0.35	N/A	N/A
TCU	Engine	Natural_Gas	EASHARE	TCUEngineNatural_Gas	0.65	0.35	N/A	N/A
TCU	Other	Natural_Gas	EASHARE	TCUOtherNatural_Gas	1	N/A	N/A	N/A
TCU	Space_Heat	Electric	EASHARE	TCUSpace_HeatElectric	1	999	999	999
TCU	Space_Heat	Natural_Gas	EASHARE	TCUSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
TCU	Water_Heat	Electric	EASHARE	TCUWater_HeatElectric	0.4	0.5	0.08	0.02
TCU	Water_Heat	Natural_Gas	EASHARE	TCUWater_HeatNatural_Gas	0.4	0.5	0.08	0.02
Warehouse	Engine	Electric	EASHARE	WarehouseEngineElectric	0.65	0.35	N/A	N/A
Warehouse	Engine	Natural_Gas	EASHARE	WarehouseEngineNatural_Gas	0.65	0.35	N/A	N/A
Warehouse	Other	Natural_Gas	EASHARE	WarehouseOtherNatural_Gas	1	999	N/A	N/A
Warehouse	Space_Heat	Electric	EASHARE	WarehouseSpace_HeatElectric	1	999	999	999
Warehouse	Space_Heat	Natural_Gas	EASHARE	WarehouseSpace_HeatNatural_Gas	0.65	0.3	0.04	0.01
Warehouse	Water_Heat	Electric	EASHARE	WarehouseWater_HeatElectric	0.4	0.5	0.08	0.02
Warehouse	Water_Heat	Natural_Gas	EASHARE	WarehouseWater_HeatNatural_Gas	0.4	0.5	0.08	0.02

Southern California Gas Company
Average Equipment Age
Core Commercial Market

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other
Office	1987	1983	1984	1977	1984	1983	1973	2000	1984	1988	1975
Restaurant	1987	1988	1987	1986	1986	1989	1981	1993	1985	1978	1980
Retail	1993	1983	1992	1985	1988	1992	1973	1976	1990	1994	1975
Laundry	1985	1999	2008	1995	1979	1979	1939	1975	1991	.	2006
Warehouse	1987	1984	1983	1983	2002	1995	1974	1975	1989	1996	1976
School	1993	1982	1981	1974	1979	1979	1968	1973	1980	1986	1973
College	1994	1988	1978	1980	1968	1986	1971	1979	1989	1981	1974
Health	1985	1984	1980	1976	1979	1981	1974	1975	1980	1981	1974
Lodging	1993	1990	1992	1979	1990	1991	1973	1975	1985	1984	1977
Misc	1982	1980	1982	1973	1981	1987	1970	1974	1982	1989	1971
Government	1987	1983	1981	1975	1981	1984	1986	1975	1986	1989	1973
TCU	1982	1980	1984	1982	1984	1986	1980	1975	1979	1979	1974
Construction	1986	1983	1988	1974	1993	1987	1972	1973	1993	1980	1974
Agriculture	1992	1989	1982	1965	1978	1978	1978	1976	1981	1998	1988

Southern California Gas Company
Core Commercial Market
Use Per Meter New Equipment Stock

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other	Total Building
Office	198	737	149	61	43	24	1	1	37	27	129	1406
Restaurant	171	1585	864	1377	274	517	1	1	1	1	430	5220
Retail	1889	607	303	4	12	211	1	1	1	1	1	3025
Laundry	1	9511	1	1	1	1	1	1	14889	1	1	24400
Warehouse	2526	537	1	11	1	1	1	1	1	1	1	3073
School	772	5667	24	60	3	32	1	1	2	1	1	6560
College	189	2034	1	1	1	1	1	1	1	1	516	2739
Health	2173	1739	4	1	1	1	1	1	1	1	1	3919
Lodging	2239	10609	1	7	0	1	1	1	306	1	139	13300
Misc	411	2808	161	247	46	90	1	1	37	97	236	4133
Government	1086	14687	1	1	1	1	1	1	1	5	1	15777
TCU	2	1	1	1	1	1	1	1	1	2138	5596	7736
Construction	2530	1445	1441	343	996	1	1	1	1	1	1	6754
Agriculture	1	1	1	1	1	1	1	1	379	28059	1	28439

Southern California Gas Company
Core Commercial Market
Use Per Meter (Average of All) Equipment Stock

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC		Dryer	Engine	Other	Total Building
Office	586	625	63	31	7	9	1	1		18	4	123	1466
Restaurant	232	1335	1421	1417	553	931	58	1		8	1	350	6306
Retail	276	683	476	134	25	110	4	1		37	12	375	2131
Laundry	93	9347	9	11	1	3	1	1		4034	0	148	13647
Warehouse	233	1283	332	19	1	19	1	1		76	8	504	2475
School	1037	2288	195	170	9	17	2	1		11	56	634	4420
College	2959	3813	164	127	38	87	1	1		34	149	596	7968
Health	1407	4845	335	369	57	75	3	1		250	23	304	7669
Lodging	1230	7714	534	469	106	139	3	1		705	18	629	11546
Misc	426	949	113	87	21	35	2	1		35	11	270	1949
Government	2131	2963	135	131	58	27	1	1		147	89	463	6144
TCU	963	1087	69	44	9	19	1	1		22	810	704	3728
Construction	342	867	37	10	2	3	1	1		57	1	269	1588
Agriculture	376	14095	265	57	11	80	1	1		3138	1936	4024	23982

Southern California Gas Company
Natural Gas (AVERAGE PRICE FOREACAST)
$/Therm

Year	Com Price Deflator	C Agriculture Average Price	C College Average Price	C Construction Average Price	C Government Average Price	C Health Average Price	C Laundry Average Price	C Lodging Average Price	C Misc Average Price	C Office Average Price	C Restaurant Average Price	C Retail Average Price	C School Average Price	C TCU Average Price	C Warehouse Average Price
2017	100.00	0.7909	0.7432	0.7674	0.6752	0.7556	0.7305	0.6402	0.6566	0.6704	0.7675	0.6790	0.6819	0.7548	0.5912
2018	102.78	0.7951	0.7562	0.7783	0.6864	0.7558	0.7350	0.6366	0.6561	0.6753	0.7700	0.6788	0.6775	0.7476	0.5768
2019	104.50	0.7992	0.7597	0.7821	0.6917	0.7608	0.7394	0.6436	0.6625	0.6810	0.7744	0.6848	0.6838	0.7532	0.5853
2020	107.29	0.8227	0.7832	0.8056	0.7152	0.7843	0.7629	0.6673	0.6862	0.7046	0.7979	0.7084	0.7074	0.7768	0.6091
2021	110.05	0.8473	0.8073	0.8300	0.7410	0.8098	0.7879	0.6947	0.7131	0.7308	0.8229	0.7348	0.7343	0.8029	0.6381
2022	112.70	0.8934	0.8539	0.8763	0.7862	0.8552	0.8337	0.7385	0.7573	0.7756	0.8688	0.7794	0.7785	0.8478	0.6805
2023	115.27	0.9863	0.9476	0.9696	0.8770	0.9465	0.9260	0.8263	0.8460	0.8657	0.9610	0.8691	0.8675	0.9379	0.7656
2024	117.81	1.0649	1.0268	1.0484	0.9543	1.0242	1.0042	0.9018	0.9221	0.9425	1.0392	0.9457	0.9437	1.0149	0.8395
2025	120.30	1.1398	1.1022	1.1235	1.0280	1.0983	1.0787	0.9739	0.9947	1.0158	1.1137	1.0187	1.0164	1.0883	0.9100
2026	122.78	1.2092	1.1724	1.1932	1.0957	1.1664	1.1476	1.0390	1.0606	1.0828	1.1825	1.0854	1.0825	1.1554	0.9728
2027	125.30	1.2809	1.2445	1.2650	1.1661	1.2371	1.2189	1.1078	1.1299	1.1528	1.2538	1.1552	1.1518	1.2254	1.0400
2028	127.87	1.3656	1.3298	1.3500	1.2496	1.3210	1.3032	1.1895	1.2122	1.2358	1.3381	1.2380	1.2342	1.3086	1.1202
2029	130.84	1.4604	1.4254	1.4451	1.3424	1.4143	1.3974	1.2795	1.3030	1.3279	1.4322	1.3297	1.3253	1.4008	1.2076
2030	134.11	1.5387	1.5044	1.5237	1.4191	1.4914	1.4752	1.3539	1.3782	1.4040	1.5100	1.4055	1.4006	1.4770	1.2799
2031	137.39	1.6077	1.5741	1.5930	1.4865	1.5593	1.5438	1.4191	1.4440	1.4709	1.5786	1.4720	1.4666	1.5439	1.3430
2032	140.73	1.6743	1.6412	1.6597	1.5520	1.6251	1.6100	1.4829	1.5083	1.5359	1.6448	1.5368	1.5310	1.6090	1.4053
2033	144.15	1.7396	1.7072	1.7253	1.6156	1.6892	1.6748	1.5442	1.5703	1.5989	1.7095	1.5995	1.5932	1.6721	1.4644
2034	147.68	1.8276	1.7959	1.8136	1.7019	1.7759	1.7622	1.6280	1.6549	1.6845	1.7970	1.6848	1.6779	1.7579	1.5460
2035	151.28	1.9003	1.8690	1.8865	1.7737	1.8480	1.8347	1.6986	1.7259	1.7561	1.8694	1.7562	1.7490	1.8295	1.6155

Southern California Gas Company
Natural Gas (MARGINAL PRICE FOREACAST)
$/Therm

Year	Com Price Deflator	C Agriculture Marginal Price	C College Marginal Price	C Construction Marginal Price	C Government Marginal Price	C Health Marginal Price	C Laundry Marginal Price	C Lodging Marginal Price	C Misc Marginal Price	C Office Marginal Price	C Restaurant Marginal Price	C Retail Marginal Price	C School Marginal Price	C TCU Marginal Price	C Warehouse Marginal Price
2017	100.00	0.6585	0.6525	0.6552	0.6211	0.6358	0.6284	0.5831	0.5999	0.6055	0.6497	0.6051	0.6032	0.6291	0.5588
2018	102.78	0.6610	0.6740	0.6660	0.6313	0.6305	0.6285	0.5698	0.5934	0.6040	0.6497	0.5969	0.5925	0.6167	0.5358
2019	104.50	0.6666	0.6793	0.6715	0.6380	0.6372	0.6352	0.5783	0.6012	0.6115	0.6557	0.6046	0.6003	0.6238	0.5455
2020	107.29	0.6902	0.7029	0.6951	0.6616	0.6609	0.6589	0.6021	0.6250	0.6353	0.6794	0.6283	0.6241	0.6475	0.5694
2021	110.05	0.7165	0.7287	0.7212	0.6888	0.6880	0.6861	0.6312	0.6533	0.6632	0.7059	0.6565	0.6524	0.6751	0.5995
2022	112.70	0.7612	0.7738	0.7661	0.7328	0.7320	0.7300	0.6736	0.6963	0.7065	0.7504	0.6996	0.6954	0.7187	0.6409
2023	115.27	0.8513	0.8646	0.8564	0.8212	0.8204	0.8183	0.7586	0.7827	0.7935	0.8399	0.7862	0.7817	0.8064	0.7241
2024	117.81	0.9282	0.9419	0.9335	0.8971	0.8962	0.8941	0.8324	0.8573	0.8684	0.9164	0.8609	0.8563	0.8817	0.7968
2025	120.30	1.0015	1.0156	1.0069	0.9695	0.9686	0.9664	0.9029	0.9285	0.9400	0.9893	0.9322	0.9275	0.9537	0.8663
2026	122.78	1.0685	1.0832	1.0742	1.0351	1.0342	1.0319	0.9657	0.9923	1.0043	1.0558	0.9962	0.9913	1.0186	0.9274
2027	125.30	1.1385	1.1536	1.1443	1.1042	1.1032	1.1009	1.0328	1.0602	1.0725	1.1255	1.0642	1.0591	1.0872	0.9935
2028	127.87	1.2216	1.2371	1.2276	1.1863	1.1853	1.1829	1.1129	1.1411	1.1538	1.2082	1.1452	1.1400	1.1689	1.0725
2029	130.84	1.3136	1.3299	1.3199	1.2768	1.2758	1.2733	1.2002	1.2297	1.2429	1.2997	1.2339	1.2285	1.2587	1.1581
2030	134.11	1.3898	1.4066	1.3963	1.3517	1.3507	1.3481	1.2725	1.3030	1.3166	1.3753	1.3074	1.3018	1.3329	1.2289
2031	137.39	1.4566	1.4740	1.4633	1.4173	1.4163	1.4135	1.3355	1.3670	1.3811	1.4417	1.3715	1.3657	1.3979	1.2905
2032	140.73	1.5217	1.5394	1.5285	1.4814	1.4804	1.4776	1.3978	1.4299	1.4444	1.5064	1.4346	1.4287	1.4616	1.3517
2033	144.15	1.5847	1.6030	1.5918	1.5432	1.5421	1.5392	1.4568	1.4900	1.5049	1.5689	1.4948	1.4887	1.5227	1.4093
2034	147.68	1.6703	1.6893	1.6777	1.6275	1.6263	1.6234	1.5384	1.5726	1.5880	1.6541	1.5776	1.5712	1.6063	1.4893
2035	151.28	1.7419	1.7611	1.7493	1.6983	1.6972	1.6942	1.6078	1.6426	1.6582	1.7253	1.6476	1.6412	1.6769	1.5579

Southern California Gas Company
Electric Average Prices
Cents/KWh

Year	C Agriculture Average Price	C College Average Price	C Construction Average Price	C Government Average Price	C Health Average Price	C Laundry Average Price	C Lodging Average Price	C Misc Average Price	C Office Average Price	C Restaurant Average Price	C Retail Average Price	C School Average Price	C TCU Average Price	C Warehouse Average Price
2017	19.24	18.08	18.67	16.43	18.38	17.77	15.58	15.98	16.31	18.67	16.52	16.59	18.36	14.38
2018	20.37	19.37	19.94	17.58	19.36	18.83	16.31	16.81	17.30	19.72	17.39	17.35	19.15	14.77
2019	21.21	20.16	20.76	18.35	20.19	19.62	17.08	17.58	18.07	20.55	18.17	18.15	19.99	15.53
2020	21.61	20.57	21.16	18.79	20.60	20.04	17.53	18.02	18.51	20.96	18.61	18.58	20.40	16.00
2021	22.06	21.02	21.61	19.29	21.08	20.51	18.09	18.57	19.03	21.43	19.13	19.12	20.91	16.61
2022	22.58	21.58	22.15	19.87	21.62	21.07	18.67	19.14	19.61	21.96	19.70	19.68	21.43	17.20
2023	22.09	21.22	21.71	19.64	21.20	20.74	18.50	18.95	19.39	21.52	19.46	19.43	21.00	17.15
2024	22.58	21.77	22.23	20.23	21.71	21.29	19.12	19.55	19.98	22.03	20.05	20.01	21.52	17.80
2025	23.21	22.45	22.88	20.94	22.37	21.97	19.83	20.26	20.69	22.68	20.75	20.70	22.16	18.53
2026	23.86	23.13	23.54	21.62	23.02	22.64	20.50	20.93	21.37	23.33	21.42	21.36	22.80	19.20
2027	24.26	23.57	23.96	22.09	23.43	23.09	20.98	21.40	21.83	23.75	21.88	21.82	23.21	19.70
2028	24.69	24.04	24.40	22.59	23.88	23.56	21.50	21.91	22.34	24.19	22.38	22.31	23.66	20.25
2029	25.35	24.74	25.08	23.30	24.55	24.26	22.21	22.62	23.05	24.86	23.08	23.01	24.32	20.96
2030	26.02	25.44	25.76	23.99	25.22	24.94	22.89	23.30	23.74	25.53	23.76	23.68	24.97	21.64
2031	26.51	25.96	26.27	24.51	25.71	25.46	23.40	23.81	24.26	26.03	24.27	24.18	25.46	22.15
2032	27.01	26.47	26.77	25.04	26.21	25.97	23.92	24.33	24.78	26.53	24.79	24.70	25.96	22.67
2033	27.53	27.02	27.31	25.57	26.73	26.51	24.44	24.85	25.30	27.06	25.31	25.21	26.46	23.18
2034	28.05	27.56	27.84	26.12	27.26	27.05	24.99	25.40	25.85	27.58	25.86	25.75	26.98	23.73
2035	28.58	28.11	28.37	26.68	27.79	27.59	25.55	25.96	26.41	28.11	26.41	26.30	27.51	24.30

Southern California Gas Company
Electric MARGINAL PRICES
Cents/KWh

Year	C Agriculture Marginal Price	C College Marginal Price	C Construction Marginal Price	C Government Marginal Price	C Health Marginal Price	C Laundry Marginal Price	C Lodging Marginal Price	C Misc Marginal Price	C Office Marginal Price	C Restaurant Marginal Price	C Retail Marginal Price	C School Marginal Price	C TCU Marginal Price	C Warehouse Marginal Price
2017	18.27	18.10	18.18	17.23	17.64	17.43	16.18	16.64	16.80	18.02	16.79	16.73	17.45	15.50
2018	19.43	19.81	19.57	18.56	18.53	18.47	16.75	17.44	17.75	19.10	17.54	17.41	18.13	15.75
2019	20.22	20.61	20.37	19.35	19.33	19.27	17.54	18.24	18.55	19.89	18.34	18.21	18.92	16.55
2020	20.63	21.00	20.77	19.77	19.75	19.69	17.99	18.68	18.98	20.30	18.78	18.65	19.35	17.02
2021	21.08	21.44	21.22	20.26	20.24	20.18	18.57	19.22	19.51	20.77	19.31	19.19	19.86	17.63
2022	21.62	21.98	21.76	20.82	20.79	20.74	19.13	19.78	20.07	21.32	19.87	19.75	20.42	18.21
2023	21.23	21.56	21.36	20.48	20.46	20.41	18.92	19.52	19.79	20.95	19.61	19.50	20.11	18.06
2024	21.76	22.09	21.89	21.03	21.02	20.96	19.52	20.10	20.36	21.49	20.19	20.08	20.68	18.68
2025	22.43	22.74	22.55	21.71	21.69	21.64	20.22	20.79	21.05	22.16	20.88	20.77	21.36	19.40
2026	23.10	23.42	23.23	22.38	22.36	22.31	20.88	21.46	21.71	22.83	21.54	21.43	22.02	20.05
2027	23.53	23.84	23.65	22.82	22.80	22.75	21.34	21.91	22.17	23.26	21.99	21.89	22.47	20.53
2028	23.99	24.29	24.11	23.29	23.28	23.23	21.85	22.41	22.66	23.72	22.49	22.39	22.95	21.06
2029	24.68	24.98	24.80	23.99	23.97	23.92	22.55	23.10	23.35	24.41	23.18	23.08	23.64	21.75
2030	25.36	25.67	25.48	24.67	24.65	24.60	23.22	23.78	24.03	25.10	23.86	23.75	24.32	22.43
2031	25.87	26.18	25.99	25.17	25.16	25.11	23.72	24.28	24.53	25.61	24.36	24.26	24.83	22.92
2032	26.38	26.69	26.50	25.68	25.67	25.62	24.23	24.79	25.04	26.12	24.87	24.77	25.34	23.44
2033	26.92	27.23	27.04	26.21	26.19	26.14	24.75	25.31	25.56	26.65	25.39	25.29	25.86	23.94
2034	27.45	27.77	27.57	26.75	26.73	26.68	25.28	25.85	26.10	27.19	25.93	25.83	26.40	24.48
2035	27.99	28.30	28.11	27.29	27.28	27.23	25.84	26.40	26.65	27.73	26.48	26.38	26.95	25.04

Southern California Gas Company
Core Commercial Market
Employment Forecast (in millions)

YEAR	Office	Restaurant	Retail	Laundry	Warehouse	School	College	Health	Lodging	Misc	Government	TCU	Construction	Agriculture
2017	1.2003667	0.7795004	1.0114507	0.101989	0.4984833	0.6606726	0.220224	1.2220905	0.1405063	0.57445858	0.52582398	0.5836167	0.41963653	0.2395167
2018	1.2198685	0.7822994	1.0150362	0.103215	0.5052034	0.6615444	0.220515	1.2529891	0.1444381	0.58197851	0.52664558	0.5983493	0.43955261	0.2430876
2019	1.2801186	0.7840517	1.0173088	0.102183	0.5144852	0.6670805	0.22236	1.2767144	0.1457339	0.58270079	0.53106138	0.6050372	0.45869724	0.2459024
2020	1.3245748	0.7854922	1.0191751	0.101126	0.5200029	0.6733419	0.224447	1.2925231	0.1464313	0.58726743	0.53604918	0.6069905	0.48962717	0.2478962
2021	1.3451784	0.7821973	1.0148939	0.100324	0.5226228	0.6799729	0.226658	1.3074667	0.1468859	0.57889418	0.54132891	0.6084603	0.51619005	0.248788
2022	1.3716336	0.7742639	1.0045982	0.09966	0.5250847	0.6864689	0.228823	1.3229899	0.1472768	0.57562208	0.54649838	0.6064113	0.53368976	0.2493133
2023	1.3991727	0.7661713	0.9941011	0.099108	0.5278484	0.6930485	0.231016	1.3389466	0.1476561	0.57367277	0.55173711	0.6018821	0.54321331	0.2497526
2024	1.4241548	0.7582503	0.9838214	0.098455	0.5301717	0.699908	0.233303	1.3526287	0.1479467	0.57147813	0.5571986	0.5971645	0.54978663	0.2497441
2025	1.4423386	0.7508548	0.97423	0.097848	0.5315306	0.7068138	0.235605	1.3642075	0.1476503	0.56740921	0.56269604	0.5940576	0.55706796	0.2491945
2026	1.4566634	0.7461567	0.9681394	0.097423	0.5316647	0.7136545	0.237885	1.3769987	0.1471873	0.56338196	0.56814121	0.5904997	0.56288392	0.2484605
2027	1.473103	0.7454729	0.9672547	0.097067	0.5315744	0.7201958	0.240065	1.3925652	0.147336	0.55889421	0.57334599	0.5844882	0.56934305	0.2479296
2028	1.4863024	0.7464899	0.9685742	0.096874	0.5279843	0.7260196	0.242007	1.4115384	0.1477107	0.55668572	0.57798061	0.5776429	0.5755225	0.2475706
2029	1.4971062	0.749109	0.9719754	0.096749	0.5259051	0.7300612	0.243354	1.4328967	0.1482421	0.55539816	0.58118566	0.5737285	0.58228653	0.2473387
2030	1.5136733	0.7524861	0.9763627	0.096745	0.5237008	0.7331641	0.244388	1.4552869	0.1486609	0.56296774	0.58365794	0.5721	0.59048074	0.2473935
2031	1.5324377	0.7582756	0.9838703	0.096654	0.5218616	0.7366572	0.245552	1.4758954	0.1495971	0.55559084	0.58644047	0.5710916	0.602341	0.2477609
2032	1.5514961	0.7631439	0.9901886	0.096649	0.5192458	0.7410415	0.247014	1.4980453	0.1503922	0.55449089	0.5899349	0.571024	0.61327779	0.2482716
2033	1.5681415	0.7691047	0.9979223	0.096733	0.5173181	0.7460515	0.248684	1.5195557	0.1514206	0.55411386	0.59392429	0.5702168	0.62435105	0.2488306
2034	1.5863796	0.7740495	1.0043373	0.096747	0.5146988	0.7519337	0.250645	1.5398068	0.1521443	0.55466909	0.59861082	0.5690875	0.63929555	0.2492175
2035	1.6003259	0.7796546	1.0116115	0.096718	0.5127376	0.7573696	0.252457	1.5566976	0.1531931	0.55519914	0.6029348	0.5678387	0.65691387	0.2493485

Southern California Gas Company
Core Commercial Market
Average Year Forecast

SOURCE	YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
G10Commercial	**2017**	9225.76	8654.56	7816.13	7106.91	6018.85	5469.68	5324.31	5319.91	5361.02	5779.51	7306.61	9520.90	82904.16
G10Commercial	2018	9137.65	8570.33	7737.59	7033.18	5952.51	5407.07	5262.69	5258.32	5299.15	5714.79	7231.53	9430.79	82035.60
G10Commercial	2019	9052.74	8490.61	7665.47	6967.49	5896.69	5356.23	5213.17	5208.83	5249.29	5661.14	7164.02	9343.20	81268.89
G10Commercial	2020	8933.13	8378.32	7563.94	6875.06	5818.22	5284.81	5143.61	5139.33	5179.27	5585.74	7069.03	9219.80	80190.26
G10Commercial	2021	8762.78	8218.45	7419.43	6743.56	5706.66	5183.31	5044.78	5040.58	5079.76	5478.57	6933.87	9044.05	78655.81
G10Commercial	2022	8550.06	8018.81	7239.02	6579.40	5567.45	5056.69	4921.49	4917.39	4955.63	5344.84	6765.13	8824.55	76740.47
G10Commercial	2023	8270.09	7756.18	7001.83	6363.73	5384.80	4890.70	4759.91	4755.95	4792.94	5169.46	6543.41	8535.63	74224.63
G10Commercial	2024	8012.24	7514.30	6783.38	6165.11	5216.58	4737.84	4611.11	4607.27	4643.11	5007.93	6339.20	8269.54	71907.60
G10Commercial	2025	7763.40	7280.86	6572.56	5973.42	5054.24	4590.30	4467.50	4463.78	4498.51	4852.04	6142.12	8012.73	69671.45
G10Commercial	2026	7556.66	7086.92	6397.41	5814.16	4919.36	4467.73	4348.19	4344.56	4378.37	4722.53	5978.38	7799.38	67813.65
G10Commercial	2027	7377.84	6919.18	6245.91	5676.41	4802.70	4361.72	4244.99	4241.45	4274.47	4610.51	5836.77	7614.84	66206.79
G10Commercial	2028	7192.94	6745.72	6089.26	5533.97	4682.07	4252.09	4138.28	4134.83	4167.02	4494.67	5690.32	7424.02	64545.17
G10Commercial	2029	7014.69	6578.51	5938.25	5396.66	4565.78	4146.42	4035.41	4032.04	4063.44	4383.01	5549.16	7240.07	62943.44
G10Commercial	2030	6863.52	6436.70	5810.17	5280.21	4467.16	4056.79	3948.16	3944.87	3975.60	4288.31	5429.43	7084.06	61584.98
G10Commercial	2031	6862.44	6435.68	5809.26	5279.37	4466.45	4056.15	3947.54	3944.25	3974.97	4287.63	5428.57	7082.95	61575.25
G10Commercial	2032	6843.62	6418.03	5793.31	5264.88	4454.17	4044.99	3936.68	3933.40	3964.03	4275.84	5413.67	7063.53	61406.16
G10Commercial	2033	6850.68	6424.65	5799.30	5270.32	4458.78	4049.18	3940.76	3937.47	3968.14	4280.27	5419.27	7070.82	61469.63
G10Commercial	2034	6826.57	6402.03	5778.87	5251.74	4443.05	4034.88	3926.84	3923.57	3954.12	4265.16	5400.17	7045.93	61252.93
G10Commercial	2035	6834.96	6409.90	5785.97	5258.20	4448.52	4039.86	3931.68	3928.40	3959.00	4270.41	5406.81	7054.59	61328.30

Southern California Gas Company
Core Commercial Market
Cold Year Forecast

SOURCE	YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
G10Commercial	**2017**	9963.91	9286.31	8290.94	7447.39	6155.84	5502.93	5330.96	5325.23	5374.32	5871.28	7684.33	10314.91	86548.36
G10Commercial	2018	9875.80	9202.08	8212.40	7373.66	6089.50	5440.32	5269.34	5263.64	5312.45	5806.56	7609.25	10224.80	85679.80
G10Commercial	2019	9790.89	9122.36	8140.28	7307.97	6033.68	5389.48	5219.82	5214.15	5262.59	5752.91	7541.74	10137.21	84913.09
G10Commercial	2020	9671.28	9010.07	8038.75	7215.54	5955.21	5318.06	5150.26	5144.65	5192.57	5677.51	7446.75	10013.81	83834.46
G10Commercial	2021	9500.93	8850.20	7894.24	7084.04	5843.65	5216.56	5051.43	5045.90	5093.06	5570.34	7311.59	9838.06	82300.01
G10Commercial	2022	9288.21	8650.56	7713.83	6919.88	5704.44	5089.94	4928.14	4922.71	4968.93	5436.61	7142.85	9618.56	80384.67
G10Commercial	2023	9008.24	8387.93	7476.64	6704.21	5521.79	4923.95	4766.56	4761.27	4806.24	5261.23	6921.13	9329.64	77868.83
G10Commercial	2024	8750.39	8146.05	7258.19	6505.59	5353.57	4771.09	4617.76	4612.59	4656.41	5099.70	6716.92	9063.55	75551.80
G10Commercial	2025	8501.55	7912.61	7047.37	6313.90	5191.23	4623.55	4474.15	4469.10	4511.81	4943.81	6519.84	8806.74	73315.65
G10Commercial	2026	8294.81	7718.67	6872.22	6154.64	5056.35	4500.98	4354.84	4349.88	4391.67	4814.30	6356.10	8593.39	71457.85
G10Commercial	2027	8115.99	7550.93	6720.72	6016.89	4939.69	4394.97	4251.64	4246.77	4287.77	4702.28	6214.49	8408.85	69850.99
G10Commercial	2028	7931.09	7377.47	6564.07	5874.45	4819.06	4285.34	4144.93	4140.15	4180.32	4586.44	6068.04	8218.03	68189.37
G10Commercial	2029	7752.84	7210.26	6413.06	5737.14	4702.77	4179.67	4042.06	4037.36	4076.74	4474.78	5926.88	8034.08	66587.64
G10Commercial	2030	7601.67	7068.45	6284.98	5620.69	4604.15	4090.04	3954.81	3950.19	3988.90	4380.08	5807.15	7878.07	65229.18
G10Commercial	2031	7600.59	7067.43	6284.07	5619.85	4603.44	4089.40	3954.19	3949.57	3988.27	4379.40	5806.29	7876.96	65219.45
G10Commercial	2032	7581.77	7049.78	6268.12	5605.36	4591.16	4078.24	3943.33	3938.72	3977.33	4367.61	5791.39	7857.54	65050.36
G10Commercial	2033	7588.83	7056.40	6274.11	5610.80	4595.77	4082.43	3947.41	3942.79	3981.44	4372.04	5796.99	7864.83	65113.83
G10Commercial	2034	7564.72	7033.78	6253.68	5592.22	4580.04	4068.13	3933.49	3928.89	3967.42	4356.93	5777.89	7839.94	64897.13
G10Commercial	2035	7573.11	7041.65	6260.78	5598.68	4585.51	4073.11	3938.33	3933.72	3972.30	4362.18	5784.53	7848.60	64972.50

Southern California Gas Company
Core Commercial Market
HOT Year Forecast

SOURCE	YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
G10Commercial	**2017**	8486.28	8022.81	7341.32	6766.43	5883.19	5436.43	5318.99	5315.92	5347.72	5689.07	6927.56	8725.56	79261.29
G10Commercial	2018	8398.17	7938.58	7262.78	6692.70	5816.85	5373.82	5257.37	5254.33	5285.85	5624.35	6852.48	8635.45	78392.73
G10Commercial	2019	8313.26	7858.86	7190.66	6627.01	5761.03	5322.98	5207.85	5204.84	5235.99	5570.70	6784.97	8547.86	77626.02
G10Commercial	2020	8193.65	7746.57	7089.13	6534.58	5682.56	5251.56	5138.29	5135.34	5165.97	5495.30	6689.98	8424.46	76547.39
G10Commercial	2021	8023.30	7586.70	6944.62	6403.08	5571.00	5150.06	5039.46	5036.59	5066.46	5388.13	6554.82	8248.71	75012.94
G10Commercial	2022	7810.58	7387.06	6764.21	6238.92	5431.79	5023.44	4916.17	4913.40	4942.33	5254.40	6386.08	8029.21	73097.60
G10Commercial	2023	7530.61	7124.43	6527.02	6023.25	5249.14	4857.45	4754.59	4751.96	4779.64	5079.02	6164.36	7740.29	70581.76
G10Commercial	2024	7272.76	6882.55	6308.57	5824.63	5080.92	4704.59	4605.79	4603.28	4629.81	4917.49	5960.15	7474.20	68264.73
G10Commercial	2025	7023.92	6649.11	6097.75	5632.94	4918.58	4557.05	4462.18	4459.79	4485.21	4761.60	5763.07	7217.39	66028.58
G10Commercial	2026	6817.18	6455.17	5922.60	5473.68	4783.70	4434.48	4342.87	4340.57	4365.07	4632.09	5599.33	7004.04	64170.78
G10Commercial	2027	6638.36	6287.43	5771.10	5335.93	4667.04	4328.47	4239.67	4237.46	4261.17	4520.07	5457.72	6819.50	62563.92
G10Commercial	2028	6453.46	6113.97	5614.45	5193.49	4546.41	4218.84	4132.96	4130.84	4153.72	4404.23	5311.27	6628.68	60902.30
G10Commercial	2029	6275.21	5946.76	5463.44	5056.18	4430.12	4113.17	4030.09	4028.05	4050.14	4292.57	5170.11	6444.73	59300.57
G10Commercial	2030	6124.04	5804.95	5335.36	4939.73	4331.50	4023.54	3942.84	3940.88	3962.30	4197.87	5050.38	6288.72	57942.11
G10Commercial	2031	6122.96	5803.93	5334.45	4938.89	4330.79	4022.90	3942.22	3940.26	3961.67	4197.19	5049.52	6287.61	57932.38
G10Commercial	2032	6104.14	5786.28	5318.50	4924.40	4318.51	4011.74	3931.36	3929.41	3950.73	4185.40	5034.62	6268.19	57763.29
G10Commercial	2033	6111.20	5792.90	5324.49	4929.84	4323.12	4015.93	3935.44	3933.48	3954.84	4189.83	5040.22	6275.48	57826.76
G10Commercial	2034	6087.09	5770.28	5304.06	4911.26	4307.39	4001.63	3921.52	3919.58	3940.82	4174.72	5021.12	6250.59	57610.06
G10Commercial	2035	6095.48	5778.15	5311.16	4917.72	4312.86	4006.61	3926.36	3924.41	3945.70	4179.97	5027.76	6259.25	57685.43

Southern California Gas Company
Core Commercial Market
BASE Year Forecast

SOURCE	YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
G10Commercial	**2017**	5295.97	5295.97	5295.97	5295.97	5295.97	5295.97	5295.97	5295.97	5295.97	5295.97	5295.97	5295.97	63551.64
G10Commercial	2018	5234.38	5234.38	5234.38	5234.38	5234.38	5234.38	5234.38	5234.38	5234.38	5234.38	5234.38	5234.38	62812.54
G10Commercial	2019	5184.90	5184.90	5184.90	5184.90	5184.90	5184.90	5184.90	5184.90	5184.90	5184.90	5184.90	5184.90	62218.76
G10Commercial	2020	5115.40	5115.40	5115.40	5115.40	5115.40	5115.40	5115.40	5115.40	5115.40	5115.40	5115.40	5115.40	61384.79
G10Commercial	2021	5016.65	5016.65	5016.65	5016.65	5016.65	5016.65	5016.65	5016.65	5016.65	5016.65	5016.65	5016.65	60199.83
G10Commercial	2022	4893.46	4893.46	4893.46	4893.46	4893.46	4893.46	4893.46	4893.46	4893.46	4893.46	4893.46	4893.46	58721.56
G10Commercial	2023	4732.03	4732.03	4732.03	4732.03	4732.03	4732.03	4732.03	4732.03	4732.03	4732.03	4732.03	4732.03	56784.32
G10Commercial	2024	4583.35	4583.35	4583.35	4583.35	4583.35	4583.35	4583.35	4583.35	4583.35	4583.35	4583.35	4583.35	55000.16
G10Commercial	2025	4439.86	4439.86	4439.86	4439.86	4439.86	4439.86	4439.86	4439.86	4439.86	4439.86	4439.86	4439.86	53278.27
G10Commercial	2026	4320.64	4320.64	4320.64	4320.64	4320.64	4320.64	4320.64	4320.64	4320.64	4320.64	4320.64	4320.64	51847.74
G10Commercial	2027	4217.54	4217.54	4217.54	4217.54	4217.54	4217.54	4217.54	4217.54	4217.54	4217.54	4217.54	4217.54	50610.43
G10Commercial	2028	4110.91	4110.91	4110.91	4110.91	4110.91	4110.91	4110.91	4110.91	4110.91	4110.91	4110.91	4110.91	49330.97
G10Commercial	2029	4008.13	4008.13	4008.13	4008.13	4008.13	4008.13	4008.13	4008.13	4008.13	4008.13	4008.13	4008.13	48097.61
G10Commercial	2030	3920.97	3920.97	3920.97	3920.97	3920.97	3920.97	3920.97	3920.97	3920.97	3920.97	3920.97	3920.97	47051.58
G10Commercial	2031	3920.34	3920.34	3920.34	3920.34	3920.34	3920.34	3920.34	3920.34	3920.34	3920.34	3920.34	3920.34	47044.11
G10Commercial	2032	3909.50	3909.50	3909.50	3909.50	3909.50	3909.50	3909.50	3909.50	3909.50	3909.50	3909.50	3909.50	46913.95
G10Commercial	2033	3913.57	3913.57	3913.57	3913.57	3913.57	3913.57	3913.57	3913.57	3913.57	3913.57	3913.57	3913.57	46962.85
G10Commercial	2034	3899.67	3899.67	3899.67	3899.67	3899.67	3899.67	3899.67	3899.67	3899.67	3899.67	3899.67	3899.67	46796.01
G10Commercial	2035	3904.51	3904.51	3904.51	3904.51	3904.51	3904.51	3904.51	3904.51	3904.51	3904.51	3904.51	3904.51	46854.08

Meter **For CGR2018** **GAC** **4/10/2018**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2017	8	8	8	8	8	8	9	8	9	9	8	8	8
2018	4	4	4	4	4	4	4	4	4	4	4	4	4
2019	4	4	4	4	4	4	4	4	4	4	4	4	4
2020	4	4	4	4	4	4	4	4	4	4	4	4	4
2021	4	4	4	4	4	4	4	4	4	4	4	4	4
2022	4	4	4	4	4	4	4	4	4	4	4	4	4
2023	4	4	4	4	4	4	4	4	4	4	4	4	4
2024	4	4	4	4	4	4	4	4	4	4	4	4	4
2025	4	4	4	4	4	4	4	4	4	4	4	4	4
2026	4	4	4	4	4	4	4	4	4	4	4	4	4
2027	4	4	4	4	4	4	4	4	4	4	4	4	4
2028	4	4	4	4	4	4	4	4	4	4	4	4	4
2029	4	4	4	4	4	4	4	4	4	4	4	4	4
2030	4	4	4	4	4	4	4	4	4	4	4	4	4
2031	4	4	4	4	4	4	4	4	4	4	4	4	4
2032	4	4	4	4	4	4	4	4	4	4	4	4	4
2033	4	4	4	4	4	4	4	4	4	4	4	4	4
2034	4	4	4	4	4	4	4	4	4	4	4	4	4
2035	4	4	4	4	4	4	4	4	4	4	4	4	4
2036	4	4	4	4	4	4	4	4	4	4	4	4	4
2037	4	4	4	4	4	4	4	4	4	4	4	4	4
2038	4	4	4	4	4	4	4	4	4	4	4	4	4
2039	4	4	4	4	4	4	4	4	4	4	4	4	4
2040	4	4	4	4	4	4	4	4	4	4	4	4	4

Mdth

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2017	3.56	3.51	3.72	5.65	5.17	5.11	7.86	12.36	11.67	9.79	8.41	5.79	82.60
2018	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2019	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2020	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2021	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2022	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2023	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2024	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2025	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2026	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2027	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2028	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2029	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2030	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2031	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2032	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2033	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2034	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2035	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2036	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2037	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2038	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2039	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63
2040	2.15	2.95	2.28	2.10	3.88	1.78	4.10	5.31	5.29	4.92	4.27	2.61	41.63

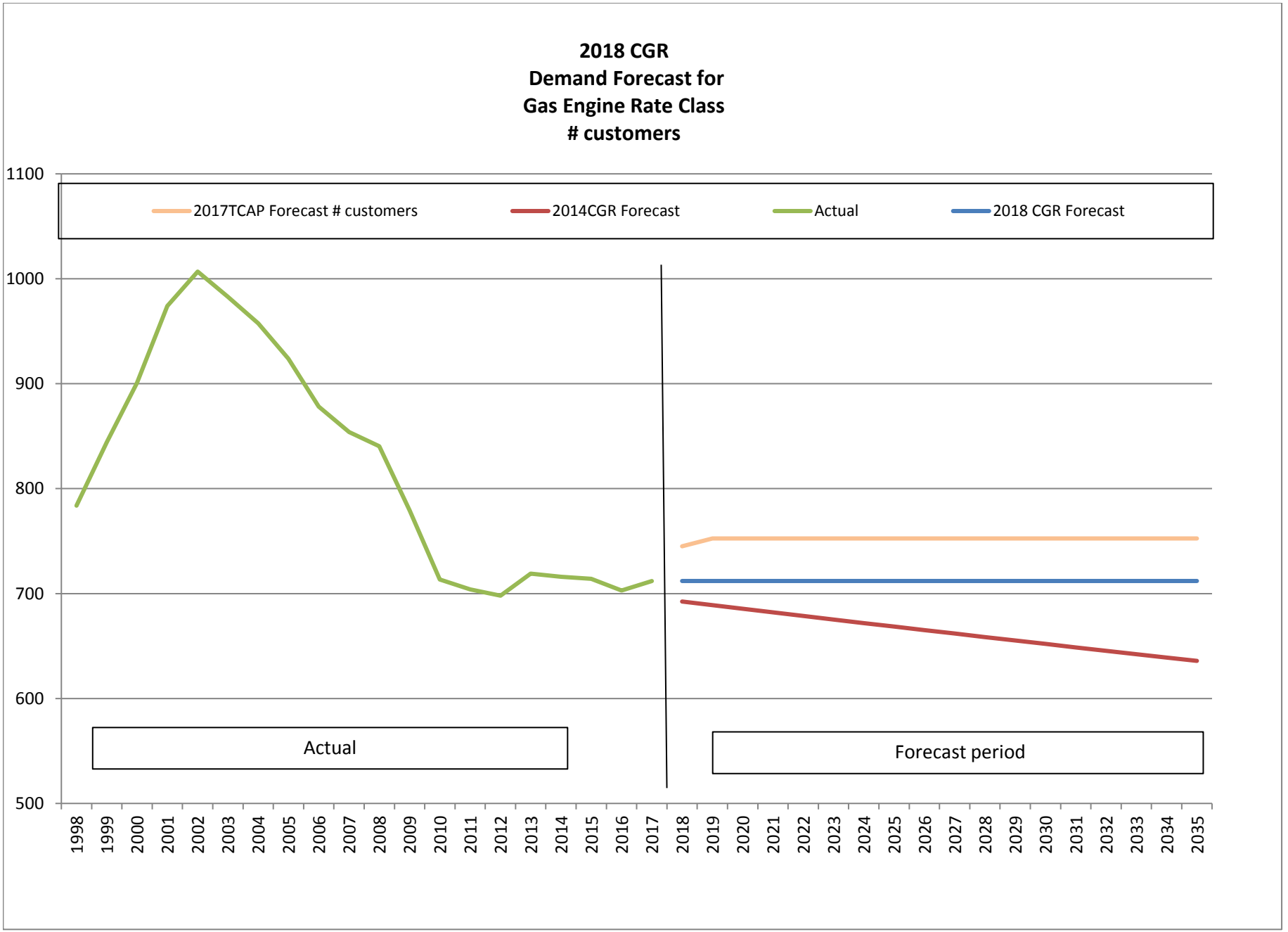
Meter For CGR2018 GEN 4/10/2018

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2017	718	716	715	713	714	714	714	713	715	713	713	711	714
2018	711	712	711	712	713	711	713	711	712	713	712	711	712
2019	711	712	711	712	713	711	713	711	712	713	712	711	712
2020	711	712	711	712	713	711	713	711	712	713	712	711	712
2021	711	712	711	712	713	711	713	711	712	713	712	711	712
2022	711	712	711	712	713	711	713	711	712	713	712	711	712
2023	711	712	711	712	713	711	713	711	712	713	712	711	712
2024	711	712	711	712	713	711	713	711	712	713	712	711	712
2025	711	712	711	712	713	711	713	711	712	713	712	711	712
2026	711	712	711	712	713	711	713	711	712	713	712	711	712
2027	711	712	711	712	713	711	713	711	712	713	712	711	712
2028	711	712	711	712	713	711	713	711	712	713	712	711	712
2029	711	712	711	712	713	711	713	711	712	713	712	711	712
2030	711	712	711	712	713	711	713	711	712	713	712	711	712
2031	711	712	711	712	713	711	713	711	712	713	712	711	712
2032	711	712	711	712	713	711	713	711	712	713	712	711	712
2033	711	712	711	712	713	711	713	711	712	713	712	711	712
2034	711	712	711	712	713	711	713	711	712	713	712	711	712
2035	711	712	711	712	713	711	713	711	712	713	712	711	712
2036	711	712	711	712	713	711	713	711	712	713	712	711	712
2037	711	712	711	712	713	711	713	711	712	713	712	711	712
2038	711	712	711	712	713	711	713	711	712	713	712	711	712
2039	711	712	711	712	713	711	713	711	712	713	712	711	712
2040	711	712	711	712	713	711	713	711	712	713	712	711	712

Mdth

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2017	75.65	55.49	69.38	110.53	134.06	196.65	237.67	261.22	233.12	149.06	167.52	115.30	1,806
2018	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2019	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2020	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2021	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2022	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2023	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2024	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2025	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2026	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2027	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2028	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2029	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2030	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2031	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2032	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2033	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2034	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2035	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2036	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2037	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2038	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2039	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230
2040	80.04	95.05	119.85	161.40	201.21	255.93	302.91	286.29	258.47	208.97	162.73	97.31	2,230

The gas engine forecast is calculated by using the average of the last 3 years (2017, 2016 and 2015) of usage per meter times the expected number of meters.
The formula is:
Gas Engine Demand Forecast = average use per meter * (forecasted meters)


2018 CGR
Demand Forecast for
Gas Engine Rate Class
customers
2017TCAP Forecast # customers
2014CGR Forecast
Actual
2018 CGR Forecast
1100
1000
900
800
700
600
500
Actual
Forecast period
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
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2016
2017
2018
2019
2020
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2022
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2024
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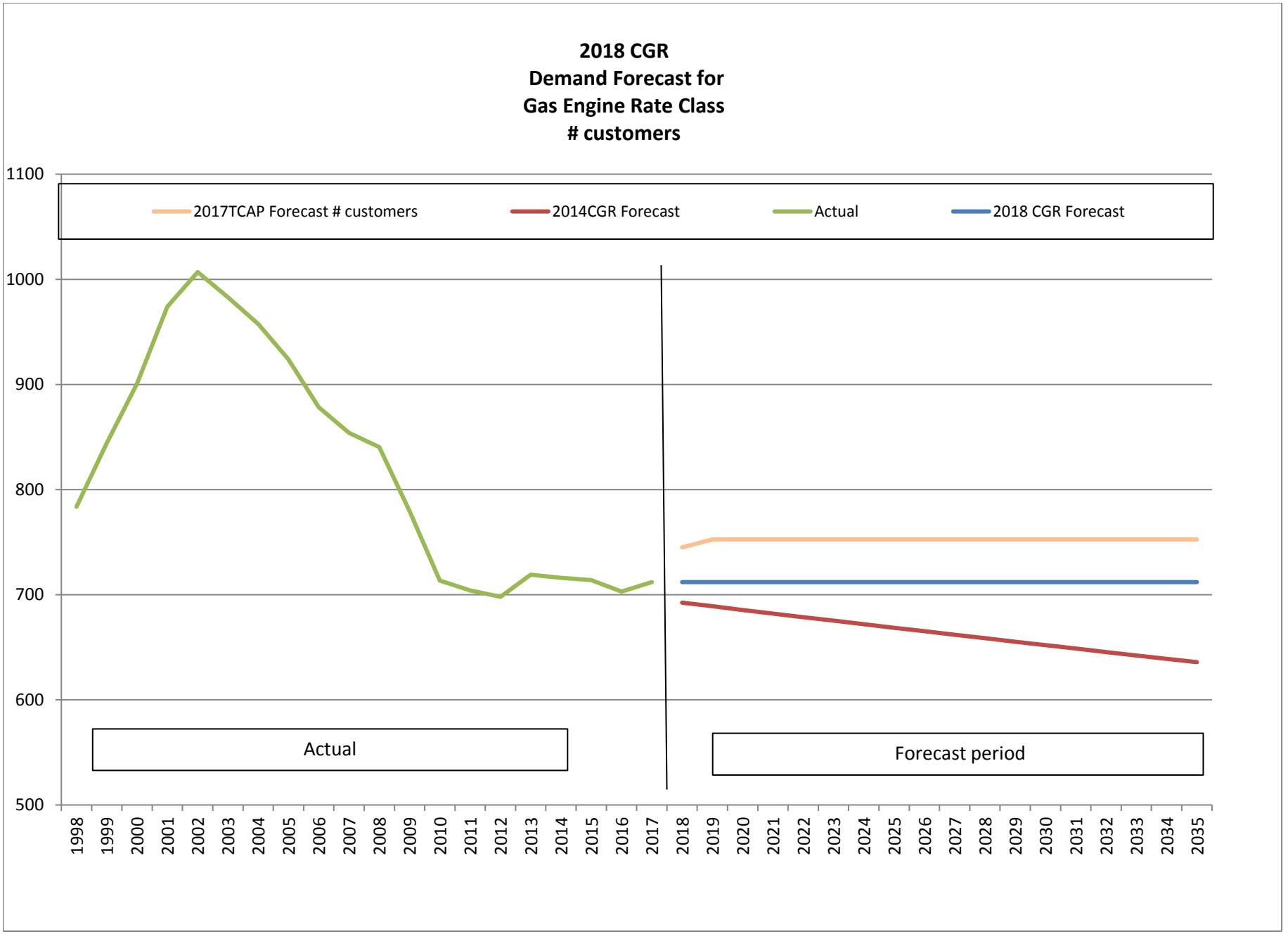
2031
2032
2033
2034
2035

Gas Air Conditioning Rate Class

2011 actual therms/ year	2012 actual therms/ year	2013 actual therms/ year	2014 actual therms/ year	2015 actual therms/ year	2016 Actual therms/ year	2017 Actual therms/ year	2018-2035 Forecast therms/ year
970,387	773,773	760,826	913,407	815,630	797,966	828,414	408,640

The Gas AC load forecast was based on 2017 usage for customers expected to retain the GAS AC rate.


2018 CGR
Demand Forecast for
Gas Engine Rate Class
customers
2017TCAP Forecast # customers
2014CGR Forecast
Actual
2018 CGR Forecast
1100
1000
900
800
700
600
500
Actual
Forecast period
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
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2034
2035

G10 Industrial DATA TABLES

G10 Industrial DATA TABLES

Southern California Gas Company
Industrial G10
The Year the Equipment Was Installed by Business Types

Business Type	Fire_ Tube_ Boiler	Water_ Tube_ Boiler	Space_ Heat	Water_ Heat	Dryer	Furnace_ Oven_ Kiln	AC	Engine	Other
Mining	2002	1980	1979	1980	1968	1978	.	1970	1976
Food	2004	1999	2002	1992	1992	2002	1965	1994	1983
Textile	1999	1998	1994	1982	1992	1982	.	.	1980
Wood_Paper	1997	1994	1995	1981	1981	2006	.	.	1975
Chemical	2005	1995	2002	1986	1985	1981	.	1999	1976
Petroleum	2006	1990	2002	1975	1981	1971	.	.	1977
Stone	2007	1983	1996	1982	1982	1982	1985	2014	1975
Primary_Metal	1993	1991	1987	1982	1978	1982	.	1996	1976
Fabricated_Metal	2002	1989	1986	1980	1984	1980	.	1984	1975
Transport	1993	1994	1996	1981	1987	1983	1973	2003	1976
Misc	1996	1995	1994	1981	1987	1978	1984	1999	1978

Southern California Gas Company
Industrial G10
Electric Price Forecasat (Cent/KWH)

(a) Average Price Forecast

Year	Chemical	Fab_Metal	Food	Mining	Petroleum	Prim_Metal	Stone	Textile	Transport	Wood_Paper	Misc
2017	13.64	13.56	13.95	13.24	13.73	12.75	14.16	13.54	14.15	14.18	14.98
2018	14.32	14.22	14.78	13.79	14.51	13.13	15.10	14.30	15.07	15.00	16.03
2019	14.96	14.86	15.42	14.43	15.14	13.77	15.73	14.93	15.71	15.64	16.68
2020	15.30	15.21	15.76	14.78	15.49	14.14	16.07	15.28	16.05	15.97	16.99
2021	15.72	15.63	16.16	15.22	15.89	14.61	16.45	15.70	16.43	16.37	17.34
2022	16.17	16.08	16.60	15.68	16.34	15.07	16.89	16.15	16.87	16.80	17.76
2023	15.94	15.86	16.34	15.49	16.11	14.93	16.61	15.93	16.59	16.52	17.40
2024	16.40	16.32	16.79	15.96	16.56	15.42	17.04	16.39	17.03	16.96	17.80
2025	16.95	16.88	17.33	16.53	17.11	16.00	17.58	16.94	17.56	17.50	18.32
2026	17.49	17.41	17.87	17.06	17.64	16.53	18.12	17.48	18.10	18.03	18.85
2027	17.85	17.78	18.22	17.43	18.00	16.91	18.47	17.84	18.45	18.37	19.18
2028	18.24	18.17	18.60	17.83	18.39	17.33	18.84	18.24	18.82	18.75	19.53
2029	18.79	18.73	19.16	18.39	18.95	17.89	19.39	18.79	19.38	19.30	20.08
2030	19.34	19.28	19.71	18.93	19.50	18.44	19.94	19.34	19.92	19.84	20.62
2031	19.74	19.68	20.11	19.34	19.90	18.84	20.35	19.75	20.33	20.25	21.02
2032	20.16	20.09	20.52	19.75	20.31	19.26	20.76	20.16	20.74	20.66	21.43
2033	20.57	20.51	20.95	20.17	20.73	19.67	21.18	20.58	21.16	21.08	21.85
2034	21.01	20.95	21.38	20.60	21.17	20.11	21.61	21.02	21.59	21.50	22.28
2035	21.45	21.39	21.81	21.05	21.61	20.56	22.05	21.46	22.03	21.94	22.70

(b) Marginal Price Forecast

Year	Chemical	Fab_Metal	Food	Mining	Petroleum	Prim_Metal	Stone	Textile	Transport	Wood_Paper	Misc
2017	10.80	10.83	10.97	10.67	10.86	10.49	11.04	10.70	11.00	11.06	11.35
2018	11.35	11.40	11.64	11.15	11.46	10.88	11.73	11.22	11.67	11.72	12.15
2019	11.86	11.91	12.14	11.66	11.96	11.39	12.23	11.72	12.18	12.22	12.66
2020	12.13	12.18	12.41	11.94	12.23	11.67	12.50	12.00	12.44	12.48	12.91
2021	12.46	12.50	12.72	12.28	12.56	12.03	12.81	12.33	12.75	12.79	13.20
2022	12.81	12.86	13.07	12.63	12.91	12.38	13.16	12.69	13.10	13.14	13.54
2023	12.63	12.67	12.87	12.46	12.72	12.23	12.95	12.52	12.90	12.93	13.30
2024	12.99	13.03	13.22	12.83	13.07	12.61	13.29	12.88	13.25	13.28	13.64
2025	13.42	13.46	13.65	13.26	13.51	13.05	13.72	13.31	13.67	13.71	14.06
2026	13.84	13.88	14.07	13.68	13.93	13.47	14.14	13.73	14.10	14.13	14.48
2027	14.13	14.17	14.35	13.97	14.21	13.76	14.42	14.02	14.38	14.41	14.75
2028	14.43	14.47	14.65	14.28	14.52	14.08	14.72	14.33	14.68	14.71	15.04
2029	14.87	14.91	15.09	14.72	14.95	14.52	15.16	14.77	15.11	15.15	15.48
2030	15.30	15.34	15.52	15.15	15.38	14.94	15.59	15.20	15.54	15.58	15.91
2031	15.62	15.66	15.84	15.47	15.70	15.26	15.91	15.52	15.86	15.90	16.23
2032	15.95	15.98	16.16	15.80	16.03	15.59	16.23	15.84	16.19	16.22	16.55
2033	16.28	16.31	16.50	16.12	16.36	15.91	16.57	16.17	16.52	16.55	16.89
2034	16.62	16.65	16.84	16.46	16.70	16.26	16.91	16.51	16.86	16.89	17.23
2035	16.96	17.00	17.18	16.81	17.04	16.61	17.25	16.86	17.21	17.24	17.57

Southern California Gas Company
Industrial G10
Gas Price Forecasat ($/Therm)

(a) Average Price Forecast

Year	Price Deflator	Chemical	Fabricated Metal	Food	Mining	Petroleum	Primary Metal	Stone	Textile	Transport	Wood Paper	Misc
2017	100.00	0.5974	0.5940	0.6112	0.5799	0.6014	0.5585	0.6205	0.5934	0.6200	0.6211	0.6565
2018	102.78	0.5826	0.5788	0.6016	0.5611	0.5903	0.5343	0.6143	0.5818	0.6134	0.6103	0.6523
2019	104.50	0.5911	0.5873	0.6095	0.5701	0.5985	0.5441	0.6218	0.5901	0.6210	0.6181	0.6591
2020	107.29	0.6149	0.6111	0.6332	0.5939	0.6223	0.5680	0.6456	0.6139	0.6447	0.6419	0.6827
2021	110.05	0.6438	0.6400	0.6616	0.6234	0.6509	0.5982	0.6736	0.6427	0.6727	0.6702	0.7100
2022	112.70	0.6863	0.6825	0.7045	0.6654	0.6936	0.6396	0.7168	0.6853	0.7160	0.7132	0.7539
2023	115.27	0.7715	0.7677	0.7908	0.7497	0.7794	0.7226	0.8037	0.7708	0.8028	0.7996	0.8421
2024	117.81	0.8455	0.8416	0.8654	0.8230	0.8537	0.7952	0.8786	0.8448	0.8777	0.8742	0.9179
2025	120.30	0.9161	0.9122	0.9366	0.8930	0.9246	0.8646	0.9501	0.9156	0.9492	0.9455	0.9902
2026	122.78	0.9790	0.9750	1.0004	0.9551	0.9879	0.9255	1.0144	0.9786	1.0134	1.0093	1.0556
2027	125.30	1.0463	1.0422	1.0682	1.0217	1.0555	0.9915	1.0826	1.0460	1.0816	1.0772	1.1246
2028	127.87	1.1265	1.1224	1.1491	1.1014	1.1360	1.0704	1.1638	1.1263	1.1627	1.1581	1.2066
2029	130.84	1.2141	1.2099	1.2376	1.1879	1.2241	1.1558	1.2528	1.2140	1.2517	1.2467	1.2969
2030	134.11	1.2865	1.2823	1.3108	1.2596	1.2969	1.2266	1.3265	1.2866	1.3254	1.3200	1.3716
2031	137.39	1.3497	1.3454	1.3748	1.3220	1.3605	1.2880	1.3909	1.3499	1.3897	1.3841	1.4371
2032	140.73	1.4121	1.4077	1.4377	1.3838	1.4231	1.3492	1.4541	1.4124	1.4529	1.4471	1.5011
2033	144.15	1.4713	1.4669	1.4978	1.4422	1.4827	1.4066	1.5146	1.4718	1.5134	1.5072	1.5627
2034	147.68	1.5530	1.5485	1.5803	1.5230	1.5649	1.4864	1.5976	1.5536	1.5964	1.5898	1.6468
2035	151.28	1.6225	1.6180	1.6503	1.5921	1.6346	1.5550	1.6678	1.6232	1.6665	1.6598	1.7176

(b) Marginal Price Forecasat

Year	Price Deflator	Chemical	Fabricated Metal	Food	Mining	Petroleum	Primary Metal	Stone	Textile	Transport	Wood Paper	Misc
2017	100.00	0.5593	0.5606	0.5681	0.5526	0.5622	0.5432	0.5715	0.5541	0.5697	0.5724	0.5879
2018	102.78	0.5355	0.5379	0.5491	0.5262	0.5406	0.5133	0.5534	0.5292	0.5506	0.5527	0.5734
2019	104.50	0.5452	0.5475	0.5584	0.5361	0.5501	0.5236	0.5625	0.5390	0.5598	0.5618	0.5819
2020	107.29	0.5691	0.5714	0.5822	0.5600	0.5740	0.5476	0.5864	0.5629	0.5837	0.5857	0.6057
2021	110.05	0.5992	0.6014	0.6119	0.5904	0.6039	0.5784	0.6159	0.5932	0.6133	0.6152	0.6346
2022	112.70	0.6406	0.6430	0.6537	0.6317	0.6456	0.6193	0.6579	0.6345	0.6552	0.6572	0.6771
2023	115.27	0.7238	0.7263	0.7377	0.7143	0.7290	0.7012	0.7420	0.7174	0.7392	0.7413	0.7623
2024	117.81	0.7965	0.7990	0.8108	0.7867	0.8018	0.7731	0.8153	0.7898	0.8123	0.8145	0.8363
2025	120.30	0.8660	0.8685	0.8807	0.8559	0.8715	0.8419	0.8853	0.8591	0.8823	0.8845	0.9069
2026	122.78	0.9271	0.9298	0.9424	0.9165	0.9328	0.9020	0.9473	0.9199	0.9441	0.9464	0.9698
2027	125.30	0.9931	0.9959	1.0089	0.9823	0.9990	0.9673	1.0139	0.9857	1.0106	1.0130	1.0371
2028	127.87	1.0721	1.0750	1.0884	1.0610	1.0782	1.0456	1.0935	1.0646	1.0901	1.0926	1.1173
2029	130.84	1.1577	1.1607	1.1746	1.1461	1.1640	1.1300	1.1800	1.1498	1.1765	1.1790	1.2048
2030	134.11	1.2285	1.2316	1.2460	1.2165	1.2351	1.1999	1.2516	1.2204	1.2480	1.2506	1.2773
2031	137.39	1.2901	1.2933	1.3082	1.2777	1.2969	1.2605	1.3139	1.2816	1.3102	1.3129	1.3404
2032	140.73	1.3513	1.3546	1.3698	1.3386	1.3582	1.3211	1.3756	1.3427	1.3718	1.3746	1.4028
2033	144.15	1.4088	1.4122	1.4279	1.3957	1.4160	1.3777	1.4340	1.3999	1.4300	1.4329	1.4620
2034	147.68	1.4888	1.4923	1.5085	1.4753	1.4962	1.4566	1.5147	1.4796	1.5107	1.5137	1.5437
2035	151.28	1.5575	1.5610	1.5775	1.5437	1.5650	1.5248	1.5838	1.5481	1.5797	1.5827	1.6132

Southern California Gas Company
Industrial G10
Historical Throughput and Customer Counts

Business Type	therms_ 2017	meters_ 2017	meters_ 2017_ ExCust	meters_ 2017_ NewCust	avgUse_ 2017_ ExCust	avgUse_ 2017_ NewCust	Price Elasticity	Employment Elasticity
Mining	3460102	231	229	2	15097	1400	0.000000	0.321451
Food	72574390	2894	2,858	36	25318	5994	-0.190795	1.242506
Textile	7775303	498	497	1	15638	3053	0.000000	0.033325
Wood_Paper	9705545	445	444	1	21856	1329	0.000000	0.508272
Chemical	20489473	1022	1,018	4	20083	11312	-0.080517	0.650067
Petroleum	13870210	136	135	1	100291	330957	-0.180563	0.084537
Stone	5226667	422	420	2	12438	1249	0.000000	0.416909
Prim_Metal	10684915	330	330	0	32379	0	0.000000	0.956685
Fab_Metal	25620869	2052	2,050	2	12461	37816	-0.137441	1.023881
Transport	14126278	1595	1,593	2	8867	196	0.000000	0.402505
Misc	36189691	6586	6,563	23	5502	3440	-0.108307	0.879307
Total	219,723,443	16,211						

Southern California Gas Company
Industrial G10
Average Use Per Meter

therm

Business Type	Water_ Boiler	Fire_ Boiler	Space_ Heat	Water_ Heat	Dryer	Furnace_ Oven_ Kiln	AC	Engine	Other	Total
Mining	0.00	6225.80	43.44	1922.69	76.05	0.56	0.00	2.75	4786.37	13057.66
Food	3180.78	10141.03	82.75	2847.86	5310.90	7.92	71.91	83.96	2503.74	24230.85
Textile	5027.39	6783.50	56.56	1340.65	7765.90	71.23	0.00	0.00	1098.82	22144.05
Wood_Paper	4463.96	11983.97	458.96	1285.89	1606.17	119.80	0.00	3.78	2324.39	22246.91
Chemical	1972.76	7552.98	2767.33	1673.42	2070.49	665.27	2.19	85.13	4219.74	21009.32
Petroleum	2197.09	20863.92	133.26	129.32	41681.87	8.61	0.00	9165.75	15693.36	89873.19
Stone	428.23	1589.00	45.91	474.03	3876.33	3293.73	0.59	0.02	1787.29	11495.13
Prim_Metal	1513.70	2386.00	313.35	1878.50	6092.33	16202.71	10.64	0.00	3538.66	31935.90
Fab_Metal	336.91	656.28	208.11	1452.36	3112.68	2689.72	0.05	7.80	2730.58	11194.48
Transport	488.08	1995.77	1128.58	1115.44	1053.17	659.96	0.00	196.93	1456.32	8094.24
Misc	230.00	1031.13	332.14	501.28	1535.53	375.48	0.01	17.60	1179.66	5202.83

Southern California Gas Company
Industrial G10
Use Per Meter for New Customers therm

Business Type	Fire_ Tube_ Boiler	Water_ Tube_ Boiler	Space_ Heat	Water_ Heat	Dryer	Furnace_ Oven_ Kiln	AC	Engine	Other	Total
Mining	0.00	2.24	0.23	23947.31	0.00	0.00	0.00	0.00	9314.20	33263.98
Food	3155.88	12674.65	38.57	1919.40	1967.47	0.00	0.00	0.00	1249.16	21005.14
Textile	1329.08	131.16	1.11	7181.12	1647.02	0.00	0.00	0.00	17.62	10307.11
Wood_Paper	0.00	30721.53	214.64	20.21	9238.90	0.00	0.00	0.00	0.00	40195.28
Chemical	5624.56	11816.67	3290.36	2592.56	3709.92	0.00	0.00	35.54	587.66	27657.26
Petroleum	3649.78	91492.09	145.82	0.00	26440.15	0.00	0.00	0.00	868.47	122596.30
Stone	0.00	0.00	198.09	0.00	1636.20	0.00	0.00	0.00	0.00	1834.29
Prim_Metal	0.00	18017.06	0.00	0.00	1290.93	39287.08	0.00	0.00	0.00	58595.07
Fab_Metal	0.00	317.56	14.86	42.94	6237.87	33.44	0.00	0.00	2118.72	8765.39
Transport	0.00	3204.72	1876.33	589.64	2009.99	3173.04	0.00	5922.60	0.00	16776.31
Misc	1325.47	1281.96	223.24	588.39	2609.70	138.67	0.00	10.79	2858.83	9037.05

Southern California Gas Company
Industrial G10
Electric UEC (Kwh/SqFt)

Business Type	Fire_ Tube_ Boiler	Water_ Tube_ Boiler	Space_ Heat	Water_ Heat	Dryer	Furnace_ Oven_ Kiln	AC	Engine	Other
Mining	12053557	117480	22540	4117	3349437	1388699	3261	2871579	0
Food	992080	234899	77958	15939	1062552	781260	24817	1163891	0
Textile	1428304	371125	20797	30369	3811277	1069238	74615	0	0
Wood_Paper	11051345	3626956	48301	2915	523062	985476	3282	0	0
Chemical	1169880	658201	34723	19440	26417	593554	1620	738	0
Petroleum	1527674	385215	15711	15192	13761553	60935	0	101154	0
Stone	4960873	985989	31975	22824	6850607	6237158	37820	0	0
Primary_Metal	174313	550730	55233	9317	25494	13916258	66288	0	0
Fabricated_Metal	605450	591011	55315	8658	57653	2084618	5763	0	0
Transportation	76358	44486	30560	6490	228869	392291	1456	7240	0
Miscellaneous	148060	104128	22745	4673	181266	1005453	8471	17618	0

Southern California Gas Company
Industrial G10
GAS UEC (Therm per SqFt.)

Business Type	Fire_ Tube_ Boiler	Water_ Tube_ Boiler	Space_ Heat	Water_ Heat	Dryer	Furnace_ Oven_ Kiln	AC	Engine	Other
Mining	0.0	2241270.1	252.0	5267.6	91252.7	671.9	0.0	113.8	6627.3
Food	111173.3	105370.7	954.4	4330.2	187396.8	2236.7	39768.2	13205.2	3384.0
Textile	97755.9	84794.4	490.2	4405.9	97073.5	28811.2	0.0	0.0	2469.0
Wood_Paper	8370448.2	5798601.6	3701.3	3131.2	78732.7	32091.3	0.0	567.0	3557.8
Chemical	205830.3	167162.0	13968.3	3956.0	84010.5	226745.1	1213.0	3552.9	6903.5
Petroleum	211873.9	619041.3	1095.3	797.2	1339770.6	2324.5	0.0	235688.8	27337.0
Stone	1361621.6	1403586.3	285.7	1376.6	501089.7	171147.3	48.5	1.8	3023.2
Primary_Metal	659478.1	366907.6	2067.2	4478.5	123876.9	329457.3	2862.7	0.0	5996.1
Fabricated_Metal	352859.2	114530.0	1645.4	3351.1	65001.9	216650.8	55.1	949.7	3834.3
Transportation	219677.7	209547.3	7747.4	3076.9	44487.1	83149.8	0.0	31017.5	1883.4
Miscellaneous	107096.3	63856.5	2149.8	1292.7	53625.4	55446.0	4.5	2639.9	1626.2

Southern California Gas Company
Industrial G10
Gas Market Shares

Business Type	Fire_ Tube_ Boiler	Water_ Tube_ Boiler	Space_ Heat	Water_ Heat	Dryer	Furnace_ Oven_ Kiln	AC	Engine	Other
Chemical	0.00000	0.27778	0.23611	0.50000	0.02778	0.01389	0.00000	0.02778	0.72222
Fabricated_Metal	0.06358	0.21387	0.14451	0.77374	0.23617	0.01073	0.00248	0.00908	0.73988
Food	0.19780	0.30769	0.16484	0.42857	0.57143	0.02747	0.00000	0.00000	0.44505
Mining	0.05333	0.20667	0.20000	0.53333	0.22667	0.05333	0.00000	0.01333	0.65333
Miscllaneous	0.06846	0.32274	0.27139	0.57946	0.20538	0.02934	0.00245	0.03423	0.61125
Petroleum	0.07407	0.24074	0.16667	0.22222	0.25926	0.03704	0.00000	0.05556	0.57407
Primary_Metal	0.03145	0.11321	0.22013	0.47170	0.25786	0.32075	0.01887	0.01258	0.59119
Stone	0.03279	0.09290	0.20765	0.55191	0.32787	0.49180	0.00546	0.01093	0.59016
Textile	0.01364	0.08186	0.17326	0.57026	0.31924	0.12415	0.00136	0.00955	0.71214
Transportation	0.01587	0.06803	0.19955	0.49660	0.19728	0.07937	0.00000	0.00907	0.77324
Wood_Paper	0.01534	0.11534	0.21164	0.53122	0.23862	0.06772	0.00159	0.00952	0.72540

Southern California Gas Company
Industrial G10
Saturation Rate

Business Type	Fire_ Tube_ Boiler	Water_ Tube_ Boiler	Space_ Heat	Water_ Heat	Dryer	Furnace_ Oven_ Kiln	AC	Engine	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

Southern California Gas Company
Industrial G10
UEC, Equipment Cost and Efficiency Shares

Where Fuel = 1 (gas) and = 2 (electric), and
Efficiency =1 (stock), =2 (standard), =3 (high) and =4 (premium)

Business Type	End Use	Fuel	Efficiency	EQcost
Mining	Fire_Tube_Boiler	1	1	3,907,010
Mining	Fire_Tube_Boiler	1	2	4,297,711
Mining	Fire_Tube_Boiler	1	3	4,688,412
Mining	Fire_Tube_Boiler	2	1	3,125,608
Mining	Fire_Tube_Boiler	2	2	3,438,169
Mining	Fire_Tube_Boiler	2	3	3,750,729
Mining	Water_Tube_Boiler	1	1	38,080
Mining	Water_Tube_Boiler	1	2	41,888
Mining	Water_Tube_Boiler	1	3	45,696
Mining	Water_Tube_Boiler	2	1	30,464
Mining	Water_Tube_Boiler	2	2	33,510
Mining	Water_Tube_Boiler	2	3	36,557
Mining	Space_Heat	1	1	7,306
Mining	Space_Heat	1	2	8,037
Mining	Space_Heat	1	3	8,767
Mining	Space_Heat	2	1	5,845
Mining	Space_Heat	2	2	6,429
Mining	Space_Heat	2	3	7,014
Mining	Water_Heat	1	1	1,868
Mining	Water_Heat	1	2	2,055
Mining	Water_Heat	1	3	2,242
Mining	Water_Heat	2	1	1,494
Mining	Water_Heat	2	2	1,644
Mining	Water_Heat	2	3	1,793
Mining	Dryer	1	1	1,085,678
Mining	Dryer	1	2	1,194,246
Mining	Dryer	1	3	1,302,814
Mining	Dryer	2	1	868,543
Mining	Dryer	2	2	955,397
Mining	Dryer	2	3	1,042,251
Mining	Furnace_Oven_Kiln	1	1	450,129
Mining	Furnace_Oven_Kiln	1	2	495,142
Mining	Furnace_Oven_Kiln	1	3	540,155
Mining	Furnace_Oven_Kiln	2	1	360,104
Mining	Furnace_Oven_Kiln	2	2	396,114
Mining	Furnace_Oven_Kiln	2	3	432,124
Mining	AC	1	1	1,057
Mining	AC	1	2	1,163
Mining	AC	1	3	1,268
Mining	AC	2	1	846
Mining	AC	2	2	930
Mining	AC	2	3	1,015
Mining	Engine	1	1	930,786
Mining	Engine	1	2	1,023,865
Mining	Engine	1	3	1,116,944
Mining	Engine	2	1	744,629
Mining	Engine	2	2	819,092
Mining	Engine	2	3	893,555
Mining	Other	1	1	-
Mining	Other	1	2	-
Mining	Other	1	3	-
Mining	Other	2	1	-
Mining	Other	2	2	-
Mining	Other	2	3	-
Food	Fire_Tube_Boiler	1	1	303,093
Food	Fire_Tube_Boiler	1	2	333,402
Food	Fire_Tube_Boiler	1	3	363,711
Food	Fire_Tube_Boiler	2	1	242,474
Food	Fire_Tube_Boiler	2	2	266,722

Food	Fire_Tube_Boiler	2	3	290,969
Food	Water_Tube_Boiler	1	1	71,765
Food	Water_Tube_Boiler	1	2	78,941
Food	Water_Tube_Boiler	1	3	86,117
Food	Water_Tube_Boiler	2	1	57,412
Food	Water_Tube_Boiler	2	2	63,153
Food	Water_Tube_Boiler	2	3	68,894
Food	Space_Heat	1	1	23,817
Food	Space_Heat	1	2	26,199
Food	Space_Heat	1	3	28,580
Food	Space_Heat	2	1	19,054
Food	Space_Heat	2	2	20,959
Food	Space_Heat	2	3	22,864
Food	Water_Heat	1	1	6,817
Food	Water_Heat	1	2	7,499
Food	Water_Heat	1	3	8,181
Food	Water_Heat	2	1	5,454
Food	Water_Heat	2	2	5,999
Food	Water_Heat	2	3	6,545
Food	Dryer	1	1	324,623
Food	Dryer	1	2	357,085
Food	Dryer	1	3	389,547
Food	Dryer	2	1	259,698
Food	Dryer	2	2	285,668
Food	Dryer	2	3	311,638
Food	Furnace_Oven_Kiln	1	1	238,684
Food	Furnace_Oven_Kiln	1	2	262,553
Food	Furnace_Oven_Kiln	1	3	286,421
Food	Furnace_Oven_Kiln	2	1	190,948
Food	Furnace_Oven_Kiln	2	2	210,042
Food	Furnace_Oven_Kiln	2	3	229,137
Food	AC	1	1	7,582
Food	AC	1	2	8,340
Food	AC	1	3	9,098
Food	AC	2	1	6,065
Food	AC	2	2	6,672
Food	AC	2	3	7,279
Food	Engine	1	1	355,583
Food	Engine	1	2	391,141
Food	Engine	1	3	426,700
Food	Engine	2	1	284,466
Food	Engine	2	2	312,913
Food	Engine	2	3	341,360
Food	Other	1	1	-
Food	Other	1	2	-
Food	Other	1	3	-
Food	Other	2	1	-
Food	Other	2	2	-
Food	Other	2	3	-
Textile	Fire_Tube_Boiler	1	1	440,682
Textile	Fire_Tube_Boiler	1	2	484,750
Textile	Fire_Tube_Boiler	1	3	528,818
Textile	Fire_Tube_Boiler	2	1	352,546
Textile	Fire_Tube_Boiler	2	2	387,800
Textile	Fire_Tube_Boiler	2	3	423,055
Textile	Water_Tube_Boiler	1	1	114,505
Textile	Water_Tube_Boiler	1	2	125,956
Textile	Water_Tube_Boiler	1	3	137,406
Textile	Water_Tube_Boiler	2	1	91,604
Textile	Water_Tube_Boiler	2	2	100,765
Textile	Water_Tube_Boiler	2	3	109,925
Textile	Space_Heat	1	1	6,417
Textile	Space_Heat	1	2	7,058
Textile	Space_Heat	1	3	7,700
Textile	Space_Heat	2	1	5,133
Textile	Space_Heat	2	2	5,647
Textile	Space_Heat	2	3	6,160
Textile	Water_Heat	1	1	13,118
Textile	Water_Heat	1	2	14,430
Textile	Water_Heat	1	3	15,742
Textile	Water_Heat	2	1	10,494

Textile	Water_Heat	2	2	11,544
Textile	Water_Heat	2	3	12,593
Textile	Dryer	1	1	1,175,913
Textile	Dryer	1	2	1,293,505
Textile	Dryer	1	3	1,411,096
Textile	Dryer	2	1	940,731
Textile	Dryer	2	2	1,034,804
Textile	Dryer	2	3	1,128,877
Textile	Furnace_Oven_Kiln	1	1	329,898
Textile	Furnace_Oven_Kiln	1	2	362,887
Textile	Furnace_Oven_Kiln	1	3	395,877
Textile	Furnace_Oven_Kiln	2	1	263,918
Textile	Furnace_Oven_Kiln	2	2	290,310
Textile	Furnace_Oven_Kiln	2	3	316,702
Textile	AC	1	1	23,021
Textile	AC	1	2	25,323
Textile	AC	1	3	27,626
Textile	AC	2	1	18,417
Textile	AC	2	2	20,259
Textile	AC	2	3	22,100
Textile	Engine	1	1	-
Textile	Engine	1	2	-
Textile	Engine	1	3	-
Textile	Engine	2	1	-
Textile	Engine	2	2	-
Textile	Engine	2	3	-
Textile	Other	1	1	-
Textile	Other	1	2	-
Textile	Other	1	3	-
Textile	Other	2	1	-
Textile	Other	2	2	-
Textile	Other	2	3	-
Wood_Paper	Fire_Tube_Boiler	1	1	3,531,505
Wood_Paper	Fire_Tube_Boiler	1	2	3,884,655
Wood_Paper	Fire_Tube_Boiler	1	3	4,237,806
Wood_Paper	Fire_Tube_Boiler	2	1	2,825,204
Wood_Paper	Fire_Tube_Boiler	2	2	3,107,724
Wood_Paper	Fire_Tube_Boiler	2	3	3,390,245
Wood_Paper	Water_Tube_Boiler	1	1	1,159,009
Wood_Paper	Water_Tube_Boiler	1	2	1,274,910
Wood_Paper	Water_Tube_Boiler	1	3	1,390,811
Wood_Paper	Water_Tube_Boiler	2	1	927,207
Wood_Paper	Water_Tube_Boiler	2	2	1,019,928
Wood_Paper	Water_Tube_Boiler	2	3	1,112,649
Wood_Paper	Space_Heat	1	1	15,435
Wood_Paper	Space_Heat	1	2	16,978
Wood_Paper	Space_Heat	1	3	18,522
Wood_Paper	Space_Heat	2	1	12,348
Wood_Paper	Space_Heat	2	2	13,583
Wood_Paper	Space_Heat	2	3	14,817
Wood_Paper	Water_Heat	1	1	1,304
Wood_Paper	Water_Heat	1	2	1,435
Wood_Paper	Water_Heat	1	3	1,565
Wood_Paper	Water_Heat	2	1	1,043
Wood_Paper	Water_Heat	2	2	1,148
Wood_Paper	Water_Heat	2	3	1,252
Wood_Paper	Dryer	1	1	167,147
Wood_Paper	Dryer	1	2	183,861
Wood_Paper	Dryer	1	3	200,576
Wood_Paper	Dryer	2	1	133,717
Wood_Paper	Dryer	2	2	147,089
Wood_Paper	Dryer	2	3	160,461
Wood_Paper	Furnace_Oven_Kiln	1	1	314,913
Wood_Paper	Furnace_Oven_Kiln	1	2	346,404
Wood_Paper	Furnace_Oven_Kiln	1	3	377,896
Wood_Paper	Furnace_Oven_Kiln	2	1	251,931
Wood_Paper	Furnace_Oven_Kiln	2	2	277,124
Wood_Paper	Furnace_Oven_Kiln	2	3	302,317
Wood_Paper	AC	1	1	1,049
Wood_Paper	AC	1	2	1,154
Wood_Paper	AC	1	3	1,258

Wood_Paper	AC	2	1	839
Wood_Paper	AC	2	2	923
Wood_Paper	AC	2	3	1,007
Wood_Paper	Engine	1	1	-
Wood_Paper	Engine	1	2	-
Wood_Paper	Engine	1	3	-
Wood_Paper	Engine	2	1	-
Wood_Paper	Engine	2	2	-
Wood_Paper	Engine	2	3	-
Wood_Paper	Other	1	1	-
Wood_Paper	Other	1	2	-
Wood_Paper	Other	1	3	-
Wood_Paper	Other	2	1	-
Wood_Paper	Other	2	2	-
Wood_Paper	Other	2	3	-
Chemical	Fire_Tube_Boiler	1	1	374,525
Chemical	Fire_Tube_Boiler	1	2	411,977
Chemical	Fire_Tube_Boiler	1	3	449,430
Chemical	Fire_Tube_Boiler	2	1	299,620
Chemical	Fire_Tube_Boiler	2	2	329,582
Chemical	Fire_Tube_Boiler	2	3	359,544
Chemical	Water_Tube_Boiler	1	1	210,716
Chemical	Water_Tube_Boiler	1	2	231,788
Chemical	Water_Tube_Boiler	1	3	252,859
Chemical	Water_Tube_Boiler	2	1	168,573
Chemical	Water_Tube_Boiler	2	2	185,430
Chemical	Water_Tube_Boiler	2	3	202,287
Chemical	Space_Heat	1	1	11,116
Chemical	Space_Heat	1	2	12,228
Chemical	Space_Heat	1	3	13,339
Chemical	Space_Heat	2	1	8,893
Chemical	Space_Heat	2	2	9,782
Chemical	Space_Heat	2	3	10,672
Chemical	Water_Heat	1	1	8,713
Chemical	Water_Heat	1	2	9,584
Chemical	Water_Heat	1	3	10,456
Chemical	Water_Heat	2	1	6,970
Chemical	Water_Heat	2	2	7,668
Chemical	Water_Heat	2	3	8,365
Chemical	Dryer	1	1	8,457
Chemical	Dryer	1	2	9,303
Chemical	Dryer	1	3	10,148
Chemical	Dryer	2	1	6,766
Chemical	Dryer	2	2	7,442
Chemical	Dryer	2	3	8,119
Chemical	Furnace_Oven_Kiln	1	1	190,020
Chemical	Furnace_Oven_Kiln	1	2	209,022
Chemical	Furnace_Oven_Kiln	1	3	228,024
Chemical	Furnace_Oven_Kiln	2	1	152,016
Chemical	Furnace_Oven_Kiln	2	2	167,218
Chemical	Furnace_Oven_Kiln	2	3	182,419
Chemical	AC	1	1	519
Chemical	AC	1	2	571
Chemical	AC	1	3	622
Chemical	AC	2	1	415
Chemical	AC	2	2	456
Chemical	AC	2	3	498
Chemical	Engine	1	1	236
Chemical	Engine	1	2	260
Chemical	Engine	1	3	284
Chemical	Engine	2	1	189
Chemical	Engine	2	2	208
Chemical	Engine	2	3	227
Chemical	Other	1	1	-
Chemical	Other	1	2	-
Chemical	Other	1	3	-
Chemical	Other	2	1	-
Chemical	Other	2	2	-
Chemical	Other	2	3	-
Petroleum	Fire_Tube_Boiler	1	1	461,658
Petroleum	Fire_Tube_Boiler	1	2	507,824

Petroleum	Fire_Tube_Boiler	1	3	553,990
Petroleum	Fire_Tube_Boiler	2	1	369,326
Petroleum	Fire_Tube_Boiler	2	2	406,259
Petroleum	Fire_Tube_Boiler	2	3	443,192
Petroleum	Water_Tube_Boiler	1	1	116,411
Petroleum	Water_Tube_Boiler	1	2	128,052
Petroleum	Water_Tube_Boiler	1	3	139,693
Petroleum	Water_Tube_Boiler	2	1	93,129
Petroleum	Water_Tube_Boiler	2	2	102,442
Petroleum	Water_Tube_Boiler	2	3	111,754
Petroleum	Space_Heat	1	1	4,748
Petroleum	Space_Heat	1	2	5,222
Petroleum	Space_Heat	1	3	5,697
Petroleum	Space_Heat	2	1	3,798
Petroleum	Space_Heat	2	2	4,178
Petroleum	Space_Heat	2	3	4,558
Petroleum	Water_Heat	1	1	6,427
Petroleum	Water_Heat	1	2	7,070
Petroleum	Water_Heat	1	3	7,713
Petroleum	Water_Heat	2	1	5,142
Petroleum	Water_Heat	2	2	5,656
Petroleum	Water_Heat	2	3	6,170
Petroleum	Dryer	1	1	4,158,697
Petroleum	Dryer	1	2	4,574,567
Petroleum	Dryer	1	3	4,990,436
Petroleum	Dryer	2	1	3,326,957
Petroleum	Dryer	2	2	3,659,653
Petroleum	Dryer	2	3	3,992,349
Petroleum	Furnace_Oven_Kiln	1	1	18,414
Petroleum	Furnace_Oven_Kiln	1	2	20,256
Petroleum	Furnace_Oven_Kiln	1	3	22,097
Petroleum	Furnace_Oven_Kiln	2	1	14,731
Petroleum	Furnace_Oven_Kiln	2	2	16,205
Petroleum	Furnace_Oven_Kiln	2	3	17,678
Petroleum	AC	1	1	-
Petroleum	AC	1	2	-
Petroleum	AC	1	3	-
Petroleum	AC	2	1	-
Petroleum	AC	2	2	-
Petroleum	AC	2	3	-
Petroleum	Engine	1	1	30,569
Petroleum	Engine	1	2	33,625
Petroleum	Engine	1	3	36,682
Petroleum	Engine	2	1	24,455
Petroleum	Engine	2	2	26,900
Petroleum	Engine	2	3	29,346
Petroleum	Other	1	1	-
Petroleum	Other	1	2	-
Petroleum	Other	1	3	-
Petroleum	Other	2	1	-
Petroleum	Other	2	2	-
Petroleum	Other	2	3	-
Stone	Fire_Tube_Boiler	1	1	1,591,073
Stone	Fire_Tube_Boiler	1	2	1,750,181
Stone	Fire_Tube_Boiler	1	3	1,909,288
Stone	Fire_Tube_Boiler	2	1	1,272,859
Stone	Fire_Tube_Boiler	2	2	1,400,145
Stone	Fire_Tube_Boiler	2	3	1,527,431
Stone	Water_Tube_Boiler	1	1	316,231
Stone	Water_Tube_Boiler	1	2	347,854
Stone	Water_Tube_Boiler	1	3	379,477
Stone	Water_Tube_Boiler	2	1	252,985
Stone	Water_Tube_Boiler	2	2	278,283
Stone	Water_Tube_Boiler	2	3	303,582
Stone	Space_Heat	1	1	10,255
Stone	Space_Heat	1	2	11,281
Stone	Space_Heat	1	3	12,306
Stone	Space_Heat	2	1	8,204
Stone	Space_Heat	2	2	9,024
Stone	Space_Heat	2	3	9,845
Stone	Water_Heat	1	1	10,249

Stone	Water_Heat	1	2	11,273
Stone	Water_Heat	1	3	12,298
Stone	Water_Heat	2	1	8,199
Stone	Water_Heat	2	2	9,019
Stone	Water_Heat	2	3	9,839
Stone	Dryer	1	1	2,197,157
Stone	Dryer	1	2	2,416,873
Stone	Dryer	1	3	2,636,589
Stone	Dryer	2	1	1,757,726
Stone	Dryer	2	2	1,933,498
Stone	Dryer	2	3	2,109,271
Stone	Furnace_Oven_Kiln	1	1	2,000,409
Stone	Furnace_Oven_Kiln	1	2	2,200,450
Stone	Furnace_Oven_Kiln	1	3	2,400,491
Stone	Furnace_Oven_Kiln	2	1	1,600,327
Stone	Furnace_Oven_Kiln	2	2	1,760,360
Stone	Furnace_Oven_Kiln	2	3	1,920,393
Stone	AC	1	1	12,130
Stone	AC	1	2	13,343
Stone	AC	1	3	14,556
Stone	AC	2	1	9,704
Stone	AC	2	2	10,674
Stone	AC	2	3	11,645
Stone	Engine	1	1	-
Stone	Engine	1	2	-
Stone	Engine	1	3	-
Stone	Engine	2	1	-
Stone	Engine	2	2	-
Stone	Engine	2	3	-
Stone	Other	1	1	-
Stone	Other	1	2	-
Stone	Other	1	3	-
Stone	Other	2	1	-
Stone	Other	2	2	-
Stone	Other	2	3	-
Prim_Metal	Fire_Tube_Boiler	1	1	54,853
Prim_Metal	Fire_Tube_Boiler	1	2	60,338
Prim_Metal	Fire_Tube_Boiler	1	3	65,823
Prim_Metal	Fire_Tube_Boiler	2	1	43,882
Prim_Metal	Fire_Tube_Boiler	2	2	48,270
Prim_Metal	Fire_Tube_Boiler	2	3	52,658
Prim_Metal	Water_Tube_Boiler	1	1	173,303
Prim_Metal	Water_Tube_Boiler	1	2	190,633
Prim_Metal	Water_Tube_Boiler	1	3	207,963
Prim_Metal	Water_Tube_Boiler	2	1	138,642
Prim_Metal	Water_Tube_Boiler	2	2	152,506
Prim_Metal	Water_Tube_Boiler	2	3	166,371
Prim_Metal	Space_Heat	1	1	17,381
Prim_Metal	Space_Heat	1	2	19,119
Prim_Metal	Space_Heat	1	3	20,857
Prim_Metal	Space_Heat	2	1	13,905
Prim_Metal	Space_Heat	2	2	15,295
Prim_Metal	Space_Heat	2	3	16,685
Prim_Metal	Water_Heat	1	1	4,105
Prim_Metal	Water_Heat	1	2	4,515
Prim_Metal	Water_Heat	1	3	4,926
Prim_Metal	Water_Heat	2	1	3,284
Prim_Metal	Water_Heat	2	2	3,612
Prim_Metal	Water_Heat	2	3	3,941
Prim_Metal	Dryer	1	1	8,022
Prim_Metal	Dryer	1	2	8,825
Prim_Metal	Dryer	1	3	9,627
Prim_Metal	Dryer	2	1	6,418
Prim_Metal	Dryer	2	2	7,060
Prim_Metal	Dryer	2	3	7,701
Prim_Metal	Furnace_Oven_Kiln	1	1	4,379,149
Prim_Metal	Furnace_Oven_Kiln	1	2	4,817,064
Prim_Metal	Furnace_Oven_Kiln	1	3	5,254,978
Prim_Metal	Furnace_Oven_Kiln	2	1	3,503,319
Prim_Metal	Furnace_Oven_Kiln	2	2	3,853,651
Prim_Metal	Furnace_Oven_Kiln	2	3	4,203,983

Prim_Metal	AC	1	1	20,859
Prim_Metal	AC	1	2	22,945
Prim_Metal	AC	1	3	25,031
Prim_Metal	AC	2	1	16,687
Prim_Metal	AC	2	2	18,356
Prim_Metal	AC	2	3	20,025
Prim_Metal	Engine	1	1	-
Prim_Metal	Engine	1	2	-
Prim_Metal	Engine	1	3	-
Prim_Metal	Engine	2	1	-
Prim_Metal	Engine	2	2	-
Prim_Metal	Engine	2	3	-
Prim_Metal	Other	1	1	-
Prim_Metal	Other	1	2	-
Prim_Metal	Other	1	3	-
Prim_Metal	Other	2	1	-
Prim_Metal	Other	2	2	-
Prim_Metal	Other	2	3	-
Fab_Metal	Fire_Tube_Boiler	1	1	199,496
Fab_Metal	Fire_Tube_Boiler	1	2	219,446
Fab_Metal	Fire_Tube_Boiler	1	3	239,395
Fab_Metal	Fire_Tube_Boiler	2	1	159,597
Fab_Metal	Fire_Tube_Boiler	2	2	175,557
Fab_Metal	Fire_Tube_Boiler	2	3	191,516
Fab_Metal	Water_Tube_Boiler	1	1	194,739
Fab_Metal	Water_Tube_Boiler	1	2	214,212
Fab_Metal	Water_Tube_Boiler	1	3	233,686
Fab_Metal	Water_Tube_Boiler	2	1	155,791
Fab_Metal	Water_Tube_Boiler	2	2	171,370
Fab_Metal	Water_Tube_Boiler	2	3	186,949
Fab_Metal	Space_Heat	1	1	18,226
Fab_Metal	Space_Heat	1	2	20,049
Fab_Metal	Space_Heat	1	3	21,872
Fab_Metal	Space_Heat	2	1	14,581
Fab_Metal	Space_Heat	2	2	16,039
Fab_Metal	Space_Heat	2	3	17,497
Fab_Metal	Water_Heat	1	1	3,994
Fab_Metal	Water_Heat	1	2	4,393
Fab_Metal	Water_Heat	1	3	4,793
Fab_Metal	Water_Heat	2	1	3,195
Fab_Metal	Water_Heat	2	2	3,515
Fab_Metal	Water_Heat	2	3	3,834
Fab_Metal	Dryer	1	1	18,997
Fab_Metal	Dryer	1	2	20,896
Fab_Metal	Dryer	1	3	22,796
Fab_Metal	Dryer	2	1	15,197
Fab_Metal	Dryer	2	2	16,717
Fab_Metal	Dryer	2	3	18,237
Fab_Metal	Furnace_Oven_Kiln	1	1	686,883
Fab_Metal	Furnace_Oven_Kiln	1	2	755,571
Fab_Metal	Furnace_Oven_Kiln	1	3	824,260
Fab_Metal	Furnace_Oven_Kiln	2	1	549,507
Fab_Metal	Furnace_Oven_Kiln	2	2	604,457
Fab_Metal	Furnace_Oven_Kiln	2	3	659,408
Fab_Metal	AC	1	1	1,899
Fab_Metal	AC	1	2	2,089
Fab_Metal	AC	1	3	2,279
Fab_Metal	AC	2	1	1,519
Fab_Metal	AC	2	2	1,671
Fab_Metal	AC	2	3	1,823
Fab_Metal	Engine	1	1	-
Fab_Metal	Engine	1	2	-
Fab_Metal	Engine	1	3	-
Fab_Metal	Engine	2	1	-
Fab_Metal	Engine	2	2	-
Fab_Metal	Engine	2	3	-
Fab_Metal	Other	1	1	-
Fab_Metal	Other	1	2	-
Fab_Metal	Other	1	3	-
Fab_Metal	Other	2	1	-
Fab_Metal	Other	2	2	-

Fab_Metal	Other	2	3	-
Transport	Fire_Tube_Boiler	1	1	27,156
Transport	Fire_Tube_Boiler	1	2	29,871
Transport	Fire_Tube_Boiler	1	3	32,587
Transport	Fire_Tube_Boiler	2	1	21,724
Transport	Fire_Tube_Boiler	2	2	23,897
Transport	Fire_Tube_Boiler	2	3	26,069
Transport	Water_Tube_Boiler	1	1	15,821
Transport	Water_Tube_Boiler	1	2	17,403
Transport	Water_Tube_Boiler	1	3	18,985
Transport	Water_Tube_Boiler	2	1	12,657
Transport	Water_Tube_Boiler	2	2	13,922
Transport	Water_Tube_Boiler	2	3	15,188
Transport	Space_Heat	1	1	10,868
Transport	Space_Heat	1	2	11,955
Transport	Space_Heat	1	3	13,042
Transport	Space_Heat	2	1	8,694
Transport	Space_Heat	2	2	9,564
Transport	Space_Heat	2	3	10,433
Transport	Water_Heat	1	1	3,231
Transport	Water_Heat	1	2	3,554
Transport	Water_Heat	1	3	3,877
Transport	Water_Heat	2	1	2,585
Transport	Water_Heat	2	2	2,843
Transport	Water_Heat	2	3	3,102
Transport	Dryer	1	1	81,394
Transport	Dryer	1	2	89,533
Transport	Dryer	1	3	97,673
Transport	Dryer	2	1	65,115
Transport	Dryer	2	2	71,627
Transport	Dryer	2	3	78,138
Transport	Furnace_Oven_Kiln	1	1	139,512
Transport	Furnace_Oven_Kiln	1	2	153,464
Transport	Furnace_Oven_Kiln	1	3	167,415
Transport	Furnace_Oven_Kiln	2	1	111,610
Transport	Furnace_Oven_Kiln	2	2	122,771
Transport	Furnace_Oven_Kiln	2	3	133,932
Transport	AC	1	1	518
Transport	AC	1	2	570
Transport	AC	1	3	621
Transport	AC	2	1	414
Transport	AC	2	2	456
Transport	AC	2	3	497
Transport	Engine	1	1	2,575
Transport	Engine	1	2	2,832
Transport	Engine	1	3	3,090
Transport	Engine	2	1	2,060
Transport	Engine	2	2	2,266
Transport	Engine	2	3	2,472
Transport	Other	1	1	-
Transport	Other	1	2	-
Transport	Other	1	3	-
Transport	Other	2	1	-
Transport	Other	2	2	-
Transport	Other	2	3	-
Misc	Fire_Tube_Boiler	1	1	50,324
Misc	Fire_Tube_Boiler	1	2	55,356
Misc	Fire_Tube_Boiler	1	3	60,388
Misc	Fire_Tube_Boiler	2	1	40,259
Misc	Fire_Tube_Boiler	2	2	44,285
Misc	Fire_Tube_Boiler	2	3	48,311
Misc	Water_Tube_Boiler	1	1	35,392
Misc	Water_Tube_Boiler	1	2	38,931
Misc	Water_Tube_Boiler	1	3	42,470
Misc	Water_Tube_Boiler	2	1	28,313
Misc	Water_Tube_Boiler	2	2	31,145
Misc	Water_Tube_Boiler	2	3	33,976
Misc	Space_Heat	1	1	7,731
Misc	Space_Heat	1	2	8,504
Misc	Space_Heat	1	3	9,277
Misc	Space_Heat	2	1	6,185

Misc	Space_Heat	2	2	6,803
Misc	Space_Heat	2	3	7,422
Misc	Water_Heat	1	1	2,224
Misc	Water_Heat	1	2	2,446
Misc	Water_Heat	1	3	2,669
Misc	Water_Heat	2	1	1,779
Misc	Water_Heat	2	2	1,957
Misc	Water_Heat	2	3	2,135
Misc	Dryer	1	1	61,610
Misc	Dryer	1	2	67,771
Misc	Dryer	1	3	73,932
Misc	Dryer	2	1	49,288
Misc	Dryer	2	2	54,217
Misc	Dryer	2	3	59,145
Misc	Furnace_Oven_Kiln	1	1	341,739
Misc	Furnace_Oven_Kiln	1	2	375,913
Misc	Furnace_Oven_Kiln	1	3	410,087
Misc	Furnace_Oven_Kiln	2	1	273,391
Misc	Furnace_Oven_Kiln	2	2	300,731
Misc	Furnace_Oven_Kiln	2	3	328,070
Misc	AC	1	1	2,879
Misc	AC	1	2	3,167
Misc	AC	1	3	3,455
Misc	AC	2	1	2,303
Misc	AC	2	2	2,534
Misc	AC	2	3	2,764
Misc	Engine	1	1	5,988
Misc	Engine	1	2	6,587
Misc	Engine	1	3	7,186
Misc	Engine	2	1	4,790
Misc	Engine	2	2	5,270
Misc	Engine	2	3	5,749
Misc	Other	1	1	-
Misc	Other	1	2	-
Misc	Other	1	3	-
Misc	Other	2	1	-
Misc	Other	2	2	-
Misc	Other	2	3	-

Southern California Gas Company
Industrial G10
Employment Forecast (in thousands)

YEAR	Mining	Food	Textile	Wood_Paper	Chemical	Petroleum	Stone	Primary_Metal	Fabricated_Metal	Transportation	Miscellaneous	Total
2017	16.1635	129.0636	9.0808	30.6771	50.7492	8.0165	18.1570	11.0987	86.1073	75.9911	299.9837	735.0885
2018	16.6153	130.6648	8.8856	31.0161	51.0104	7.9920	18.6887	11.2117	87.5823	76.1322	302.1372	741.9362
2019	17.2060	132.7147	8.6834	31.5821	51.1966	7.9618	19.1065	11.2872	89.2285	75.4447	305.2977	749.7093
2020	17.4238	134.6093	8.4449	32.1708	51.0426	7.9238	19.3095	11.2859	90.7388	74.6563	305.9301	753.5357
2021	17.6121	135.9931	8.2002	32.7095	50.6828	7.8018	19.4859	11.0731	91.2949	73.9030	305.2132	753.9697
2022	17.9344	137.4453	7.9529	33.1590	50.1418	7.6227	19.6103	10.8372	92.0872	72.5249	304.2996	753.6152
2023	18.0708	138.7979	7.7043	33.7060	49.4854	7.4314	19.5929	10.6260	92.9201	70.1257	303.1287	751.5892
2024	18.1013	140.1412	7.4693	34.2292	48.7821	7.2261	19.5228	10.4595	93.9272	67.6919	302.4777	750.0283
2025	17.9931	141.0514	7.3607	34.6570	48.2606	7.0321	19.4881	10.3260	94.6058	65.8245	301.2659	747.8653
2026	17.7153	141.7667	7.3601	35.0286	48.0139	6.8588	19.4324	10.2055	95.1852	64.9610	299.3579	745.8853
2027	17.4759	142.4042	7.3291	35.3600	47.8350	6.6948	19.4259	9.9992	95.3955	64.6270	297.3847	743.9314
2028	17.3046	142.8921	7.2772	35.7090	47.6934	6.5386	19.4216	9.7435	95.3345	64.3976	295.0709	741.3829
2029	17.1215	143.3227	7.2048	35.9742	47.4805	6.3787	19.4147	9.5163	95.5527	64.1283	292.7255	738.8199
2030	16.9866	143.5254	7.1018	36.2038	47.1884	6.2226	19.4089	9.2919	95.6175	63.5516	290.4462	735.5446
2031	16.8478	143.7970	6.9672	36.1867	46.8685	6.0920	19.3544	9.0785	95.6000	62.9454	288.7676	732.5052
2032	16.7256	143.9130	6.8330	35.7139	46.5301	5.9518	19.2193	8.8800	95.6270	62.4422	287.5542	729.3900
2033	16.5761	143.8822	6.6957	35.3227	46.2183	5.8168	19.1504	8.6757	95.4177	62.2709	286.2276	726.2540
2034	16.4348	143.7207	6.5558	35.8541	45.9418	5.6907	19.2685	8.4644	94.9751	62.2685	284.8703	724.0445
2035	16.3321	143.5361	6.4305	36.5194	45.7055	5.5728	19.3970	8.2667	94.6963	62.3053	283.8433	722.6049

Southern California Gas Company
Industrial G10
Core Industrial Demand Forecast (Mdth)
Average Temperature

Avg Year	Model Output G10-Ind	EE/DSM	AB980	City of Vernon	AMI	C2NC Migration	Final
2017	21,972.3	0.0	0.0	0.0	0.0	0.0	21,972.3
2018	22,291.9	257.0	0.0	79.1	1.3	517.1	21,437.5
2019	22,535.4	502.6	0.0	158.2	2.4	517.1	21,355.2
2020	22,675.6	778.9	0.1	237.2	2.4	517.1	21,140.0
2021	22,683.7	1,085.9	0.1	316.3	2.4	517.1	20,762.0
2022	22,625.7	1,387.8	0.1	395.4	2.4	517.1	20,323.1
2023	22,319.7	1,710.1	0.1	395.4	2.3	517.1	19,694.8
2024	22,054.0	2,027.3	0.1	395.4	2.3	517.1	19,111.9
2025	21,769.3	2,339.4	0.2	395.4	2.3	517.1	18,515.2
2026	21,508.2	2,610.6	0.2	395.4	2.3	517.1	17,983.0
2027	21,212.3	2,861.3	0.2	395.4	2.2	517.1	17,436.3
2028	20,853.1	3,112.0	0.2	395.4	2.2	517.1	16,826.5
2029	20,489.4	3,357.6	0.2	395.4	2.2	517.1	16,217.3
2030	20,178.8	3,608.3	0.3	395.4	2.1	517.1	15,656.0
2031	19,904.6	3,735.4	0.3	395.4	2.1	517.1	15,254.8
2032	19,630.0	3,873.5	0.3	395.4	2.1	517.1	14,842.1
2033	19,365.6	3,867.3	0.3	395.4	2.0	517.1	14,584.1
2034	19,048.5	3,872.4	0.3	395.4	2.0	517.1	14,261.9
2035	18,781.6	3,846.8	0.4	395.4	2.0	517.1	14,020.7

Southern California Gas Company
Industrial G10
Core Industrial Demand Forecast (Mdth)
Cold Temperature

Cold YEAR	Model Output G10-Ind	EE/DSM	AB980	City of Vernon	AMI	C2NC Migration	Final
2017	22,508.24	0.0	0.0	0.0	0.0	0.0	22,508.2
2018	22,835.60	257.0	0.0	79.1	1.3	517.1	21,981.1
2019	23,085.02	502.6	0.0	158.2	2.4	517.1	21,904.7
2020	23,228.67	778.9	0.1	237.2	2.4	517.1	21,693.0
2021	23,236.93	1,085.9	0.1	316.3	2.4	517.1	21,315.2
2022	23,177.52	1,387.8	0.1	395.4	2.4	517.1	20,874.9
2023	22,864.06	1,710.1	0.1	395.4	2.4	517.1	20,239.1
2024	22,591.89	2,027.3	0.1	395.4	2.4	517.1	19,649.8
2025	22,300.21	2,339.4	0.2	395.4	2.3	517.1	19,046.0
2026	22,032.78	2,610.6	0.2	395.4	2.3	517.1	18,507.5
2027	21,729.61	2,861.3	0.2	395.4	2.3	517.1	17,953.6
2028	21,361.65	3,112.0	0.2	395.4	2.2	517.1	17,335.0
2029	20,989.14	3,357.6	0.2	395.4	2.2	517.1	16,717.0
2030	20,670.90	3,608.3	0.3	395.4	2.2	517.1	16,148.1
2031	20,390.04	3,735.4	0.3	395.4	2.1	517.1	15,740.2
2032	20,108.72	3,873.5	0.3	395.4	2.1	517.1	15,320.8
2033	19,837.90	3,867.3	0.3	395.4	2.1	517.1	15,056.3
2034	19,513.07	3,872.4	0.3	395.4	2.1	517.1	14,726.4
2035	19,239.70	3,846.8	0.4	395.4	2.0	517.1	14,478.7

Southern California Gas Company
Industrial G10
Core Industrial Demand Forecast (Mdth)
Hot Temperature

Hot

YEAR	Model Output G10-Ind	EE/DSM	AB980	City of Vernon	AMI	C2NC Migration	Final
2017	21,436.4	0.0	0.0	0.0	0.0	0.0	21,436.4
2018	21,748.2	257.0	0.0	79.1	1.2	517.1	20,893.8
2019	21,985.8	502.6	0.0	158.2	2.3	517.1	20,805.6
2020	22,122.6	778.9	0.1	237.2	2.3	517.1	20,587.0
2021	22,130.4	1,085.9	0.1	316.3	2.3	517.1	20,208.8
2022	22,073.9	1,387.8	0.1	395.4	2.3	517.1	19,771.3
2023	21,775.3	1,710.1	0.1	395.4	2.3	517.1	19,150.5
2024	21,516.1	2,027.3	0.1	395.4	2.3	517.1	18,574.1
2025	21,238.3	2,339.4	0.2	395.4	2.2	517.1	17,984.3
2026	20,983.6	2,610.6	0.2	395.4	2.2	517.1	17,458.4
2027	20,694.9	2,861.3	0.2	395.4	2.2	517.1	16,919.0
2028	20,344.5	3,112.0	0.2	395.4	2.1	517.1	16,317.9
2029	19,989.7	3,357.6	0.2	395.4	2.1	517.1	15,717.6
2030	19,686.6	3,608.3	0.3	395.4	2.1	517.1	15,163.9
2031	19,419.1	3,735.4	0.3	395.4	2.0	517.1	14,769.4
2032	19,151.2	3,873.5	0.3	395.4	2.0	517.1	14,363.4
2033	18,893.3	3,867.3	0.3	395.4	2.0	517.1	14,111.8
2034	18,583.9	3,872.4	0.3	395.4	2.0	517.1	13,797.4
2035	18,323.6	3,846.8	0.4	395.4	1.9	517.1	13,562.6

Southern California Gas Company
Industrial G10
Core Industrial Demand Forecast (Mdth)
Base Temperature

Base YEAR	Model Output G10-Ind	EE/DSM	AB980	City of Vernon	AMI	C2NC Migration	Final
2017	19,390.7	0.0	0.0	0.0	0.0	0.0	19,390.7
2018	19,672.7	257.0	0.0	79.1	1.1	517.1	18,818.4
2019	19,887.5	502.6	0.0	158.2	2.1	517.1	18,707.6
2020	20,011.3	778.9	0.1	237.2	2.1	517.1	18,476.0
2021	20,018.4	1,085.9	0.1	316.3	2.1	517.1	18,097.0
2022	19,967.2	1,387.8	0.1	395.4	2.1	517.1	17,664.9
2023	19,697.2	1,710.1	0.1	395.4	2.1	517.1	17,072.6
2024	19,462.7	2,027.3	0.1	395.4	2.0	517.1	16,520.9
2025	19,211.4	2,339.4	0.2	395.4	2.0	517.1	15,957.6
2026	18,981.1	2,610.6	0.2	395.4	2.0	517.1	15,456.1
2027	18,719.9	2,861.3	0.2	395.4	2.0	517.1	14,944.2
2028	18,402.9	3,112.0	0.2	395.4	1.9	517.1	14,376.6
2029	18,082.0	3,357.6	0.2	395.4	1.9	517.1	13,810.1
2030	17,807.8	3,608.3	0.3	395.4	1.9	517.1	13,285.3
2031	17,565.8	3,735.4	0.3	395.4	1.8	517.1	12,916.3
2032	17,323.5	3,873.5	0.3	395.4	1.8	517.1	12,535.9
2033	17,090.2	3,867.3	0.3	395.4	1.8	517.1	12,308.9
2034	16,810.3	3,872.4	0.3	395.4	1.8	517.1	12,024.0
2035	16,574.8	3,846.8	0.4	395.4	1.7	517.1	11,814.1

2018 CALIFORNIA GAS REPORT

NONCORE COMMERCIAL AND INDUSTRIAL

Noncore Commercial and Industrial End Use Model

Introduction

The purpose of these workpapers is to document the methodology used to forecast demand for SoCalGas' noncore commercial and industrial markets. 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 from output from the EUForecaster and reduced by CPUC-authorized energy efficiency goal.

Data Sources

A. Historical Billing Data

Monthly historical gas consumption for the commercial and industrial markets was obtained from SoCalGas' billing records for 2017. The recorded usage was then further disaggregated into the 14 commercial or 11 industrial business sectors; however, the customer counts were often quite low for specific business types, especially for the noncore commercial segment. Historical data and model forecast results are provided only on an aggregated basis—for noncore commercial and noncore industrial (non-refinery) segments.

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 of retail electricity prices were developed from the California Energy Commission's staff report entitled *California Energy Demand*

2018-2030 Revised Baseline Forecast, February 2018, number CEC-200-2018-002-CMF. Retail electricity price forecasts for the SCE industrial customer classes were based on the MID case assumptions for the SCE planning area (see EXCEL files posted at web-link: http://www.energy.ca.gov/2017_energypolicy/documents/2017-12-15_workshop/2017-12-15_middemandcase_forecst.php of the CEC's web-site.). The electricity price forecast from this source ended in year 2030; it was extrapolated through 2035 applying the annual growth rate for 2030 relative to 2029 to the year 2031 prices and beyond. The resulting prices were used for 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 demand forecast models. The employment forecast through 2035 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 about 85% of the service area's total population and employment). The historical employment data used was derived from the California Employment Development Department (EDD) for the 12 counties served by SoCalGas. The monthly employment used in the model was generally by summing the weighted employment data over the commercial and industrial NAICS codes.

E. Post-Model Adjustment

Once the EuForecaster end-use model forecast was generated, post-model adjustments were made to account for effects the model is not designed to simulate. Energy savings goals that were authorized by the CPUC in decision D.04-09-060 and expected load leaving SoCalGas' retail service for service by the City of Vernon were subtracted from the model forecast. The gas load for these customers essentially transfers from retail to wholesale service. Migration of customers between noncore and core service has been observed to the extent that the net-migration is from core to noncore. An outlook for this net load migration, split between commercial and industrial sectors was developed and results in a *subtraction* from the respective core sector and a corresponding *addition* to the respective noncore sector.

Noncore Commercial Demand Forecast
Forecast by Sectors from End-Use Model (MDth)

Year	Agriculture	College	Construc-tion	Govern-ment	Health	Laundry	Lodging	Misc	Office	Restaurant	Retail	School	TCU	Warehouse	Grand Total
2017	2,627.3	1,793.7	115.2	2,126.6	6,852.3	940.2	975.5	0.0	113.7	28.8	95.7	0.0	1,678.6	922.6	18,270.2
2018	2,659.2	1,802.7	118.1	2,137.0	6,963.4	950.8	992.4	0.0	115.0	29.0	96.2	0.0	1,706.0	933.1	18,503.1
2019	2,660.8	1,799.5	119.8	2,130.7	6,987.4	942.2	991.2	0.0	116.3	28.9	95.7	0.0	1,705.9	936.6	18,515.0
2020	2,667.0	1,803.0	123.3	2,140.6	7,013.9	936.5	991.4	0.0	117.5	28.9	95.6	0.0	1,705.2	939.9	18,562.8
2021	2,665.6	1,805.6	126.2	2,134.5	7,033.1	931.3	990.1	0.0	117.7	28.8	95.1	0.0	1,702.6	940.0	18,570.6
2022	2,659.5	1,806.2	127.8	2,133.0	7,046.5	925.7	987.6	0.0	117.9	28.6	94.3	0.0	1,693.7	939.0	18,559.9
2023	2,643.7	1,800.6	128.0	2,123.6	7,036.2	917.4	981.7	0.0	117.8	28.2	93.1	0.0	1,675.8	935.0	18,481.2
2024	2,628.2	1,797.0	127.9	2,116.8	7,026.8	909.6	976.4	0.0	117.8	27.9	92.0	0.0	1,659.2	931.5	18,411.2
2025	2,611.3	1,794.3	128.0	2,111.0	7,015.0	902.4	969.7	0.0	117.5	27.7	91.1	0.0	1,645.7	927.6	18,341.2
2026	2,596.5	1,793.6	128.1	2,107.3	7,014.4	897.0	963.8	0.0	117.2	27.5	90.3	0.0	1,633.5	923.7	18,293.0
2027	2,581.6	1,791.7	128.2	2,102.3	7,017.2	891.6	959.2	0.0	116.9	27.3	89.8	0.0	1,617.5	919.2	18,242.6
2028	2,565.1	1,787.2	128.1	2,094.5	7,021.5	885.9	954.5	0.0	116.5	27.2	89.3	0.0	1,599.0	911.0	18,179.6
2029	2,549.7	1,780.8	128.1	2,085.0	7,032.4	880.8	950.4	0.0	116.0	27.1	88.8	0.0	1,584.6	904.2	18,127.8
2030	2,539.5	1,776.1	128.5	2,087.4	7,056.1	877.4	947.4	0.0	115.9	27.1	88.6	0.0	1,575.5	898.7	18,118.3
2031	2,533.4	1,773.6	129.4	2,074.0	7,082.1	874.5	946.9	0.0	116.0	27.1	88.5	0.0	1,568.8	894.4	18,108.7
2032	2,528.3	1,772.5	130.2	2,070.6	7,112.7	872.2	946.1	0.0	116.1	27.1	88.4	0.0	1,563.6	889.6	18,117.4
2033	2,524.8	1,773.0	131.1	2,068.8	7,145.3	870.6	946.5	0.0	116.2	27.1	88.5	0.0	1,558.2	885.8	18,135.9
2034	2,516.6	1,771.7	132.3	2,064.8	7,163.6	867.4	944.5	0.0	116.3	27.1	88.3	0.0	1,550.0	880.1	18,122.7
2035	2,509.5	1,771.7	133.8	2,062.3	7,180.7	864.9	944.4	0.0	116.3	27.1	88.2	0.0	1,543.3	875.8	18,118.1

Noncore Industrial Demand Forecast
Forecast by Sectors from End-Use Model (MDth)

Year	Chemical	Fab_Metal	Food	Mining	Misc	Petroleum	Prim_Metal	Stone	Textile	Transport	Wood_Paper	Grand Total
2017	3,224.8	4,772.9	18,719.0	1,706.3	1,880.6	2,891.3	6,490.4	4,513.5	2,299.1	1,425.4	3,335.4	51,258.7
2018	3,259.0	4,848.9	18,978.8	1,742.6	1,902.6	2,911.6	6,574.4	4,612.5	2,295.7	1,438.6	3,380.5	51,945.4
2019	3,240.0	4,855.3	18,974.1	1,757.8	1,897.2	2,884.2	6,545.2	4,624.6	2,254.7	1,421.7	3,382.7	51,837.5
2020	3,227.8	4,882.4	19,055.2	1,764.1	1,894.4	2,871.0	6,529.3	4,636.5	2,221.6	1,411.4	3,403.7	51,897.4
2021	3,205.7	4,879.4	19,079.1	1,766.7	1,885.4	2,840.3	6,449.0	4,639.5	2,185.1	1,399.8	3,417.9	51,747.9
2022	3,173.8	4,875.2	19,078.8	1,772.9	1,873.0	2,796.1	6,353.5	4,629.4	2,145.2	1,380.7	3,422.3	51,501.0
2023	3,121.3	4,845.6	18,967.1	1,760.2	1,849.5	2,734.8	6,230.4	4,577.4	2,093.5	1,345.5	3,412.0	50,937.3
2024	3,072.6	4,827.2	18,881.6	1,745.1	1,830.3	2,675.9	6,129.4	4,526.6	2,047.2	1,312.5	3,405.2	50,453.6
2025	3,031.6	4,803.7	18,780.7	1,724.9	1,811.0	2,621.5	6,042.2	4,483.2	2,017.0	1,285.4	3,396.1	49,997.2
2026	3,004.3	4,786.6	18,702.2	1,700.2	1,793.4	2,575.9	5,970.4	4,446.4	2,002.9	1,269.4	3,390.6	49,642.5
2027	2,976.6	4,756.7	18,603.6	1,676.1	1,774.2	2,530.1	5,872.5	4,411.5	1,983.8	1,256.8	3,380.2	49,222.1
2028	2,945.6	4,713.2	18,467.5	1,652.7	1,751.5	2,482.1	5,754.0	4,370.0	1,959.5	1,243.2	3,365.3	48,704.7
2029	2,913.4	4,677.7	18,332.3	1,629.4	1,729.3	2,434.5	5,645.4	4,329.5	1,933.7	1,229.6	3,347.1	48,202.1
2030	2,886.4	4,649.7	18,227.2	1,612.5	1,711.7	2,394.1	5,552.3	4,300.0	1,909.5	1,216.7	3,335.5	47,795.7
2031	2,863.4	4,626.9	18,154.8	1,598.0	1,698.5	2,361.7	5,471.2	4,272.4	1,885.2	1,205.6	3,317.9	47,455.6
2032	2,840.6	4,606.2	18,077.2	1,584.8	1,687.1	2,328.7	5,395.7	4,237.5	1,861.5	1,195.7	3,280.2	47,095.2
2033	2,821.0	4,583.8	18,005.5	1,571.8	1,676.8	2,298.6	5,323.7	4,213.3	1,839.2	1,189.5	3,249.2	46,772.3
2034	2,795.3	4,544.9	17,881.3	1,555.2	1,662.2	2,264.2	5,237.1	4,197.7	1,812.1	1,181.5	3,252.0	46,383.4
2035	2,775.2	4,516.7	17,783.6	1,542.8	1,651.1	2,234.8	5,162.6	4,189.9	1,789.5	1,175.8	3,265.8	46,087.9

Noncore Commercial Demand Forecast

Sum of total Usage year	Total from EUForeaster (Therms)
2017	182,701,551
2018	185,030,615
2019	185,149,918
2020	185,628,244
2021	185,706,002
2022	185,599,173
2023	184,811,880
2024	184,112,095
2025	183,411,514
2026	182,929,815
2027	182,425,577
2028	181,796,326
2029	181,278,196
2030	181,182,589
2031	181,087,158
2032	181,174,321
2033	181,358,869
2034	181,227,246
2035	181,180,793

Noncore Commercial Demand Forecast
Forecast by Sectors from End-Use Model (MDth)

Year	Total
2017	18,270
2018	18,503
2019	18,515
2020	18,563
2021	18,571
2022	18,560
2023	18,481
2024	18,411
2025	18,341
2026	18,293
2027	18,243
2028	18,180
2029	18,128
2030	18,118
2031	18,109
2032	18,117
2033	18,136
2034	18,123
2035	18,118

Noncore Industrial Demand Forecast

Sum of totalUsage year	Total from EUForeaster (Therms)
2017	512,586,890
2018	519,453,898
2019	518,374,899
2020	518,974,346
2021	517,478,827
2022	515,009,908
2023	509,372,611
2024	504,535,586
2025	499,972,100
2026	496,424,632
2027	492,221,066
2028	487,046,721
2029	482,020,753
2030	477,957,152
2031	474,556,013
2032	470,952,251
2033	467,723,043
2034	463,834,000
2035	460,878,792

Noncore Industrial Demand Forecast
Forecast by Sectors from End-Use Model (MDth)

Year	Total
2017	51,259
2018	51,945
2019	51,837
2020	51,897
2021	51,748
2022	51,501
2023	50,937
2024	50,454
2025	49,997
2026	49,642
2027	49,222
2028	48,705
2029	48,202
2030	47,796
2031	47,456
2032	47,095
2033	46,772
2034	46,383
2035	46,088

Noncore Commercial Monthly Demand Forecast (MDth)

Load per HDD: 14,901 Therm/HDD

	Commercial Average Year					Commercial Cold Year					
Date	End-Use Fcst @AvgYr HDD	DSM	Vernon	Migr: g10-- > g30	AvgYr Adj (MDth)	Cold Yr less Avg Yr HDD Load Incr.	End-Use Fcst @ColdYr HDD	DSM	Vernon	Migr: g10-- > g30	ColdYr Adj (MDth)
Jan-17	1,862	0	0	0	1,862	56	1,945	0	0	0	1,945
Feb-17	1,674	0	0	0	1,674	48	1,744	0	0	0	1,744
Mar-17	1,700	0	0	0	1,700	36	1,753	0	0	0	1,753
Apr-17	1,545	0	0	0	1,545	26	1,583	0	0	0	1,583
May-17	1,404	0	0	0	1,404	10	1,419	0	0	0	1,419
Jun-17	1,248	0	0	0	1,248	2	1,251	0	0	0	1,251
Jul-17	1,200	0	0	0	1,200	0	1,201	0	0	0	1,201
Aug-17	1,283	0	0	0	1,283	0	1,283	0	0	0	1,283
Sep-17	1,498	0	0	0	1,498	1	1,500	0	0	0	1,500
Oct-17	1,417	0	0	0	1,417	7	1,427	0	0	0	1,427
Nov-17	1,548	0	0	0	1,548	28	1,590	0	0	0	1,590
Dec-17	1,892	0	0	0	1,892	60	1,981	0	0	0	1,981
Jan-18	1,886	6	0	30	1,909	56	1,968	6	0	30	1,992
Feb-18	1,695	5	0	27	1,716	48	1,766	5	0	27	1,787
Mar-18	1,722	5	0	27	1,743	36	1,775	5	0	27	1,797
Apr-18	1,565	5	0	25	1,584	26	1,603	5	0	25	1,623
May-18	1,422	4	0	22	1,440	10	1,437	4	0	22	1,455
Jun-18	1,264	4	0	20	1,280	2	1,267	4	0	20	1,283
Jul-18	1,215	4	0	19	1,231	0	1,216	4	0	19	1,231
Aug-18	1,299	4	0	20	1,315	0	1,299	4	0	20	1,316
Sep-18	1,517	5	0	24	1,536	1	1,519	5	0	24	1,538
Oct-18	1,435	4	0	23	1,453	7	1,446	4	0	23	1,464
Nov-18	1,568	5	0	25	1,587	28	1,610	5	0	25	1,630
Dec-18	1,916	6	0	30	1,940	60	2,005	6	0	30	2,029
Jan-19	1,887	12	0	30	1,905	56	1,970	12	0	30	1,988
Feb-19	1,696	10	0	27	1,712	48	1,767	10	0	27	1,783
Mar-19	1,723	11	0	27	1,739	36	1,776	11	0	27	1,793
Apr-19	1,566	10	0	25	1,581	26	1,604	10	0	25	1,619
May-19	1,423	9	0	22	1,436	10	1,438	9	0	22	1,452
Jun-19	1,264	8	0	20	1,277	2	1,268	8	0	20	1,280
Jul-19	1,216	7	0	19	1,228	0	1,217	7	0	19	1,228
Aug-19	1,300	8	0	20	1,312	0	1,300	8	0	20	1,313
Sep-19	1,518	9	0	24	1,533	1	1,520	9	0	24	1,534
Oct-19	1,436	9	0	23	1,450	7	1,446	9	0	23	1,460
Nov-19	1,569	10	0	25	1,584	28	1,611	10	0	25	1,626
Dec-19	1,917	12	0	30	1,936	60	2,006	12	0	30	2,025
Jan-20	1,892	18	0	30	1,903	56	1,974	18	0	30	1,986
Feb-20	1,700	16	0	27	1,711	48	1,771	16	0	27	1,782
Mar-20	1,727	16	0	27	1,738	36	1,780	16	0	27	1,791
Apr-20	1,570	15	0	25	1,579	26	1,608	15	0	25	1,618
May-20	1,426	13	0	22	1,435	10	1,442	13	0	22	1,451
Jun-20	1,268	12	0	20	1,276	2	1,271	12	0	20	1,279
Jul-20	1,219	12	0	19	1,227	0	1,220	12	0	19	1,228
Aug-20	1,303	12	0	20	1,311	0	1,304	12	0	20	1,312
Sep-20	1,522	14	0	24	1,532	1	1,524	14	0	24	1,533
Oct-20	1,440	14	0	23	1,449	7	1,450	14	0	23	1,459
Nov-20	1,573	15	0	25	1,583	28	1,615	15	0	25	1,625
Dec-20	1,922	18	0	30	1,934	60	2,011	18	0	30	2,023
Jan-21	1,892	25	0	30	1,897	56	1,975	25	0	30	1,980
Feb-21	1,701	22	0	27	1,705	48	1,772	22	0	27	1,776
Mar-21	1,728	23	0	27	1,732	36	1,781	23	0	27	1,785
Apr-21	1,570	21	0	25	1,574	26	1,609	21	0	25	1,613
May-21	1,427	19	0	22	1,431	10	1,442	19	0	22	1,446
Jun-21	1,268	17	0	20	1,271	2	1,272	17	0	20	1,275
Jul-21	1,220	16	0	19	1,223	0	1,220	16	0	19	1,224
Aug-21	1,304	17	0	20	1,307	0	1,304	17	0	20	1,307
Sep-21	1,523	20	0	24	1,527	1	1,524	20	0	24	1,528
Oct-21	1,441	19	0	23	1,444	7	1,451	19	0	23	1,454
Nov-21	1,573	21	0	25	1,577	28	1,616	21	0	25	1,620
Dec-21	1,923	25	0	30	1,928	60	2,012	25	0	30	2,017

Noncore Commercial Monthly Demand Forecast (MDth)

Load per HDD: 14,901 Therm/HDD

	Commercial Average Year					Commercial Cold Year					
Date	End-Use Fcst @AvgYr HDD	DSM	Vernon	Migr: g10-- > g30	AvgYr Adj (MDth)	Cold Yr less Avg Yr HDD Load Incr.	End-Use Fcst @ColdYr HDD	DSM	Vernon	Migr: g10-- > g30	ColdYr Adj (MDth)
Jan-22	1,891	32	0	30	1,889	56	1,974	32	0	30	1,972
Feb-22	1,700	29	0	27	1,698	48	1,771	29	0	27	1,769
Mar-22	1,727	29	0	27	1,725	36	1,780	29	0	27	1,778
Apr-22	1,569	26	0	25	1,568	26	1,608	26	0	25	1,606
May-22	1,426	24	0	22	1,425	10	1,441	24	0	22	1,440
Jun-22	1,268	21	0	20	1,266	2	1,271	21	0	20	1,270
Jul-22	1,219	21	0	19	1,218	0	1,220	21	0	19	1,218
Aug-22	1,303	22	0	20	1,301	0	1,303	22	0	20	1,302
Sep-22	1,522	26	0	24	1,520	1	1,523	26	0	24	1,522
Oct-22	1,440	24	0	23	1,438	7	1,450	24	0	23	1,448
Nov-22	1,573	26	0	25	1,571	28	1,615	26	0	25	1,613
Dec-22	1,922	32	0	30	1,920	60	2,011	32	0	30	2,009
Jan-23	1,883	39	0	30	1,874	56	1,966	39	0	30	1,957
Feb-23	1,693	35	0	27	1,684	48	1,764	35	0	27	1,755
Mar-23	1,720	36	0	27	1,711	36	1,773	36	0	27	1,764
Apr-23	1,563	33	0	25	1,555	26	1,601	33	0	25	1,593
May-23	1,420	30	0	22	1,413	10	1,435	30	0	22	1,428
Jun-23	1,262	26	0	20	1,256	2	1,266	26	0	20	1,259
Jul-23	1,214	25	0	19	1,208	0	1,215	25	0	19	1,208
Aug-23	1,297	27	0	20	1,291	0	1,298	27	0	20	1,291
Sep-23	1,516	32	0	24	1,508	1	1,517	32	0	24	1,509
Oct-23	1,434	30	0	23	1,426	7	1,444	30	0	23	1,437
Nov-23	1,566	33	0	25	1,558	28	1,608	33	0	25	1,600
Dec-23	1,914	40	0	30	1,904	60	2,003	40	0	30	1,993
Jan-24	1,876	47	0	30	1,859	56	1,959	47	0	30	1,942
Feb-24	1,687	42	0	27	1,671	48	1,757	42	0	27	1,742
Mar-24	1,713	42	0	27	1,698	36	1,766	42	0	27	1,751
Apr-24	1,557	39	0	25	1,543	26	1,595	39	0	25	1,581
May-24	1,415	35	0	22	1,402	10	1,430	35	0	22	1,417
Jun-24	1,257	31	0	20	1,246	2	1,261	31	0	20	1,250
Jul-24	1,209	30	0	19	1,198	0	1,210	30	0	19	1,199
Aug-24	1,292	32	0	20	1,281	0	1,293	32	0	20	1,281
Sep-24	1,510	37	0	24	1,496	1	1,511	37	0	24	1,498
Oct-24	1,428	35	0	23	1,415	7	1,438	35	0	23	1,426
Nov-24	1,560	39	0	25	1,546	28	1,602	39	0	25	1,588
Dec-24	1,906	47	0	30	1,889	60	1,996	47	0	30	1,978
Jan-25	1,869	54	0	30	1,845	56	1,952	54	0	30	1,928
Feb-25	1,680	48	0	27	1,659	48	1,751	48	0	27	1,729
Mar-25	1,707	49	0	27	1,685	36	1,760	49	0	27	1,738
Apr-25	1,551	45	0	25	1,531	26	1,589	45	0	25	1,569
May-25	1,409	40	0	22	1,391	10	1,425	40	0	22	1,407
Jun-25	1,253	36	0	20	1,237	2	1,256	36	0	20	1,240
Jul-25	1,205	35	0	19	1,189	0	1,205	35	0	19	1,190
Aug-25	1,288	37	0	20	1,271	0	1,288	37	0	20	1,272
Sep-25	1,504	43	0	24	1,485	1	1,506	43	0	24	1,486
Oct-25	1,423	41	0	23	1,404	7	1,433	41	0	23	1,415
Nov-25	1,554	45	0	25	1,534	28	1,596	45	0	25	1,576
Dec-25	1,899	55	0	30	1,875	60	1,988	55	0	30	1,964
Jan-26	1,864	60	0	30	1,834	56	1,947	60	0	30	1,917
Feb-26	1,676	54	0	27	1,649	48	1,747	54	0	27	1,719
Mar-26	1,702	55	0	27	1,675	36	1,755	55	0	27	1,728
Apr-26	1,547	50	0	25	1,522	26	1,585	50	0	25	1,560
May-26	1,406	45	0	22	1,383	10	1,421	45	0	22	1,398
Jun-26	1,249	40	0	20	1,229	2	1,253	40	0	20	1,233
Jul-26	1,202	39	0	19	1,182	0	1,202	39	0	19	1,183
Aug-26	1,284	41	0	20	1,263	0	1,285	41	0	20	1,264
Sep-26	1,500	48	0	24	1,476	1	1,502	48	0	24	1,477
Oct-26	1,419	46	0	23	1,396	7	1,429	46	0	23	1,406
Nov-26	1,550	50	0	25	1,525	28	1,592	50	0	25	1,567
Dec-26	1,894	61	0	30	1,863	60	1,983	61	0	30	1,953

Noncore Commercial Monthly Demand Forecast (MDth)

Load per HDD: 14,901 Therm/HDD

	Commercial Average Year					Commercial Cold Year					
Date	End-Use Fcst @AvgYr HDD	DSM	Vernon	Migr: g10--> g30	AvgYr Adj (MDth)	Cold Yr less Avg Yr HDD Load Incr.	End-Use Fcst @ColdYr HDD	DSM	Vernon	Migr: g10--> g30	ColdYr Adj (MDth)
Jan-27	1,859	66	0	30	1,823	56	1,942	66	0	30	1,906
Feb-27	1,671	59	0	27	1,639	48	1,742	59	0	27	1,710
Mar-27	1,698	60	0	27	1,665	36	1,751	60	0	27	1,718
Apr-27	1,543	54	0	25	1,513	26	1,581	54	0	25	1,551
May-27	1,402	50	0	22	1,375	10	1,417	50	0	22	1,390
Jun-27	1,246	44	0	20	1,222	2	1,250	44	0	20	1,225
Jul-27	1,198	42	0	19	1,175	0	1,199	42	0	19	1,176
Aug-27	1,281	45	0	20	1,256	0	1,281	45	0	20	1,256
Sep-27	1,496	53	0	24	1,467	1	1,497	53	0	24	1,468
Oct-27	1,415	50	0	23	1,388	7	1,425	50	0	23	1,398
Nov-27	1,546	55	0	25	1,516	28	1,588	55	0	25	1,558
Dec-27	1,889	67	0	30	1,852	60	1,978	67	0	30	1,941
Jan-28	1,853	71	0	30	1,811	56	1,935	71	0	30	1,894
Feb-28	1,665	64	0	27	1,628	48	1,736	64	0	27	1,699
Mar-28	1,692	65	0	27	1,653	36	1,745	65	0	27	1,707
Apr-28	1,537	59	0	25	1,503	26	1,576	59	0	25	1,541
May-28	1,397	54	0	22	1,365	10	1,412	54	0	22	1,381
Jun-28	1,242	48	0	20	1,214	2	1,245	48	0	20	1,217
Jul-28	1,194	46	0	19	1,167	0	1,195	46	0	19	1,168
Aug-28	1,276	49	0	20	1,247	0	1,277	49	0	20	1,248
Sep-28	1,491	57	0	24	1,457	1	1,492	57	0	24	1,459
Oct-28	1,410	54	0	23	1,378	7	1,420	54	0	23	1,389
Nov-28	1,540	59	0	25	1,506	28	1,583	59	0	25	1,548
Dec-28	1,883	73	0	30	1,840	60	1,972	73	0	30	1,929
Jan-29	1,847	77	0	30	1,800	56	1,930	77	0	30	1,883
Feb-29	1,661	69	0	27	1,618	48	1,731	69	0	27	1,689
Mar-29	1,687	70	0	27	1,644	36	1,740	70	0	27	1,697
Apr-29	1,533	64	0	25	1,494	26	1,571	64	0	25	1,532
May-29	1,393	58	0	22	1,357	10	1,408	58	0	22	1,373
Jun-29	1,238	52	0	20	1,206	2	1,242	52	0	20	1,210
Jul-29	1,191	50	0	19	1,160	0	1,191	50	0	19	1,161
Aug-29	1,273	53	0	20	1,240	0	1,273	53	0	20	1,240
Sep-29	1,487	62	0	24	1,448	1	1,488	62	0	24	1,450
Oct-29	1,406	59	0	23	1,370	7	1,416	59	0	23	1,380
Nov-29	1,536	64	0	25	1,496	28	1,578	64	0	25	1,539
Dec-29	1,877	78	0	30	1,829	60	1,966	78	0	30	1,918
Jan-30	1,846	83	0	30	1,793	56	1,929	83	0	30	1,876
Feb-30	1,660	74	0	27	1,612	48	1,731	74	0	27	1,683
Mar-30	1,686	76	0	27	1,637	36	1,739	76	0	27	1,691
Apr-30	1,532	69	0	25	1,488	26	1,570	69	0	25	1,526
May-30	1,392	62	0	22	1,352	10	1,408	62	0	22	1,367
Jun-30	1,237	56	0	20	1,202	2	1,241	56	0	20	1,205
Jul-30	1,190	53	0	19	1,156	0	1,191	53	0	19	1,156
Aug-30	1,272	57	0	20	1,235	0	1,272	57	0	20	1,236
Sep-30	1,486	67	0	24	1,443	1	1,487	67	0	24	1,444
Oct-30	1,405	63	0	23	1,365	7	1,416	63	0	23	1,375
Nov-30	1,535	69	0	25	1,491	28	1,577	69	0	25	1,533
Dec-30	1,876	84	0	30	1,822	60	1,965	84	0	30	1,911
Jan-31	1,845	85	0	30	1,790	56	1,928	85	0	30	1,873
Feb-31	1,659	77	0	27	1,609	48	1,730	77	0	27	1,680
Mar-31	1,685	78	0	27	1,634	36	1,738	78	0	27	1,687
Apr-31	1,531	71	0	25	1,485	26	1,570	71	0	25	1,523
May-31	1,392	64	0	22	1,350	10	1,407	64	0	22	1,365
Jun-31	1,237	57	0	20	1,200	2	1,240	57	0	20	1,203
Jul-31	1,189	55	0	19	1,154	0	1,190	55	0	19	1,154
Aug-31	1,271	59	0	20	1,233	0	1,272	59	0	20	1,234
Sep-31	1,485	69	0	24	1,440	1	1,486	69	0	24	1,442
Oct-31	1,405	65	0	23	1,362	7	1,415	65	0	23	1,373
Nov-31	1,534	71	0	25	1,488	28	1,577	71	0	25	1,531
Dec-31	1,875	87	0	30	1,819	60	1,964	87	0	30	1,908

Noncore Commercial Monthly Demand Forecast (MDth)

Load per HDD: 14,901 Therm/HDD

	Commercial Average Year					Commercial Cold Year					
Date	End-Use Fcst @AvgYr HDD	DSM	Vernon	Migr: g10-- > g30	AvgYr Adj (MDth)	Cold Yr less Avg Yr HDD Load Incr.	End-Use Fcst @ColdYr HDD	DSM	Vernon	Migr: g10-- > g30	ColdYr Adj (MDth)
Jan-32	1,846	88	0	30	1,788	56	1,929	88	0	30	1,871
Feb-32	1,660	79	0	27	1,607	48	1,730	79	0	27	1,678
Mar-32	1,686	80	0	27	1,633	36	1,739	80	0	27	1,686
Apr-32	1,532	73	0	25	1,484	26	1,570	73	0	25	1,522
May-32	1,392	66	0	22	1,348	10	1,407	66	0	22	1,363
Jun-32	1,237	59	0	20	1,198	2	1,241	59	0	20	1,202
Jul-32	1,190	57	0	19	1,152	0	1,191	57	0	19	1,153
Aug-32	1,272	61	0	20	1,232	0	1,272	61	0	20	1,232
Sep-32	1,486	71	0	24	1,439	1	1,487	71	0	24	1,440
Oct-32	1,405	67	0	23	1,361	7	1,416	67	0	23	1,371
Nov-32	1,535	73	0	25	1,487	28	1,577	73	0	25	1,529
Dec-32	1,876	89	0	30	1,817	60	1,965	89	0	30	1,906
Jan-33	1,848	88	0	30	1,790	56	1,931	88	0	30	1,873
Feb-33	1,661	79	0	27	1,609	48	1,732	79	0	27	1,680
Mar-33	1,688	80	0	27	1,634	36	1,741	80	0	27	1,688
Apr-33	1,534	73	0	25	1,485	26	1,572	73	0	25	1,524
May-33	1,394	66	0	22	1,350	10	1,409	66	0	22	1,365
Jun-33	1,239	59	0	20	1,200	2	1,242	59	0	20	1,203
Jul-33	1,191	57	0	19	1,154	0	1,192	57	0	19	1,154
Aug-33	1,273	61	0	20	1,233	0	1,274	61	0	20	1,234
Sep-33	1,487	71	0	24	1,440	1	1,489	71	0	24	1,442
Oct-33	1,407	67	0	23	1,363	7	1,417	67	0	23	1,373
Nov-33	1,537	73	0	25	1,488	28	1,579	73	0	25	1,531
Dec-33	1,878	89	0	30	1,819	60	1,967	89	0	30	1,908
Jan-34	1,847	88	0	30	1,789	56	1,930	88	0	30	1,871
Feb-34	1,660	79	0	27	1,608	48	1,731	79	0	27	1,679
Mar-34	1,686	80	0	27	1,633	36	1,739	80	0	27	1,686
Apr-34	1,533	73	0	25	1,484	26	1,571	73	0	25	1,522
May-34	1,393	66	0	22	1,349	10	1,408	66	0	22	1,364
Jun-34	1,238	59	0	20	1,199	2	1,241	59	0	20	1,202
Jul-34	1,190	57	0	19	1,153	0	1,191	57	0	19	1,153
Aug-34	1,272	61	0	20	1,232	0	1,273	61	0	20	1,233
Sep-34	1,486	71	0	24	1,439	1	1,488	71	0	24	1,441
Oct-34	1,406	67	0	23	1,361	7	1,416	67	0	23	1,372
Nov-34	1,535	73	0	25	1,487	28	1,578	73	0	25	1,529
Dec-34	1,877	89	0	30	1,817	60	1,966	89	0	30	1,906
Jan-35	1,846	87	0	30	1,789	56	1,929	87	0	30	1,871
Feb-35	1,660	79	0	27	1,608	48	1,730	79	0	27	1,679
Mar-35	1,686	80	0	27	1,633	36	1,739	80	0	27	1,686
Apr-35	1,532	72	0	25	1,484	26	1,570	72	0	25	1,522
May-35	1,392	66	0	22	1,349	10	1,408	66	0	22	1,364
Jun-35	1,237	59	0	20	1,199	2	1,241	59	0	20	1,202
Jul-35	1,190	56	0	19	1,153	0	1,191	56	0	19	1,154
Aug-35	1,272	60	0	20	1,232	0	1,272	60	0	20	1,233
Sep-35	1,486	70	0	24	1,439	1	1,487	70	0	24	1,441
Oct-35	1,405	67	0	23	1,361	7	1,416	67	0	23	1,372
Nov-35	1,535	73	0	25	1,487	28	1,577	73	0	25	1,529
Dec-35	1,876	89	0	30	1,817	60	1,965	89	0	30	1,907

Noncore Industrial Monthly Demand Forecast (MDth)

	Industrial - All Temperature Years				
Date	IndModel	DSM	Vernon	Migr: g10--> g30	Ind-All
Jan-17	4,127	0	0	0	4,127
Feb-17	3,793	0	0	0	3,793
Mar-17	4,110	0	0	0	4,110
Apr-17	4,238	0	0	0	4,238
May-17	4,282	0	0	0	4,282
Jun-17	4,148	0	0	0	4,148
Jul-17	4,757	0	0	0	4,757
Aug-17	4,978	0	0	0	4,978
Sep-17	4,631	0	0	0	4,631
Oct-17	4,314	0	0	0	4,314
Nov-17	3,949	0	0	0	3,949
Dec-17	3,931	0	0	0	3,931
Jan-18	4,182	29	3	42	4,191
Feb-18	3,844	27	3	38	3,852
Mar-18	4,165	29	3	41	4,174
Apr-18	4,295	30	4	43	4,304
May-18	4,340	30	4	43	4,349
Jun-18	4,203	29	4	42	4,212
Jul-18	4,821	34	4	48	4,831
Aug-18	5,045	35	4	50	5,055
Sep-18	4,693	33	4	47	4,703
Oct-18	4,372	31	4	44	4,381
Nov-18	4,002	28	3	40	4,010
Dec-18	3,984	28	3	40	3,993
Jan-19	4,174	57	7	42	4,151
Feb-19	3,836	53	6	38	3,815
Mar-19	4,157	57	7	41	4,134
Apr-19	4,286	59	7	43	4,263
May-19	4,331	60	7	43	4,307
Jun-19	4,195	58	7	42	4,172
Jul-19	4,811	66	8	48	4,785
Aug-19	5,034	69	8	50	5,007
Sep-19	4,683	64	8	47	4,657
Oct-19	4,363	60	7	44	4,339
Nov-19	3,993	55	7	40	3,972
Dec-19	3,976	55	7	40	3,954
Jan-20	4,179	89	10	42	4,121
Feb-20	3,840	82	10	38	3,787
Mar-20	4,161	89	10	41	4,104
Apr-20	4,291	91	11	43	4,232
May-20	4,336	92	11	43	4,276
Jun-20	4,200	89	11	42	4,142
Jul-20	4,816	102	12	48	4,750
Aug-20	5,040	107	13	50	4,970
Sep-20	4,688	100	12	47	4,624
Oct-20	4,368	93	11	44	4,307
Nov-20	3,998	85	10	40	3,943
Dec-20	3,980	85	10	40	3,925
Jan-21	4,167	124	14	42	4,070
Feb-21	3,829	114	13	38	3,741
Mar-21	4,149	123	14	41	4,054
Apr-21	4,279	127	14	43	4,180
May-21	4,323	129	15	43	4,223
Jun-21	4,187	125	14	42	4,091
Jul-21	4,803	143	16	48	4,692
Aug-21	5,026	149	17	50	4,909
Sep-21	4,675	139	16	47	4,567
Oct-21	4,355	130	15	44	4,254
Nov-21	3,986	119	13	40	3,894
Dec-21	3,969	118	13	40	3,877

Noncore Industrial Monthly Demand Forecast (MDth)

	Industrial - All Temperature Years				
Date	IndModel	DSM	Vernon	Migr: g10--> g30	Ind-All
Jan-22	4,147	158	17	42	4,013
Feb-22	3,811	146	16	38	3,688
Mar-22	4,130	158	17	41	3,996
Apr-22	4,258	163	18	43	4,120
May-22	4,303	164	18	43	4,163
Jun-22	4,167	159	18	42	4,033
Jul-22	4,780	183	20	48	4,625
Aug-22	5,002	191	21	50	4,840
Sep-22	4,652	178	20	47	4,502
Oct-22	4,334	166	18	44	4,194
Nov-22	3,967	152	17	40	3,839
Dec-22	3,950	151	17	40	3,822
Jan-23	4,101	195	17	42	3,930
Feb-23	3,769	179	16	38	3,612
Mar-23	4,084	194	17	41	3,914
Apr-23	4,212	200	18	43	4,036
May-23	4,256	202	18	43	4,078
Jun-23	4,122	196	18	42	3,950
Jul-23	4,727	225	20	48	4,530
Aug-23	4,947	235	21	50	4,741
Sep-23	4,602	219	20	47	4,410
Oct-23	4,287	204	18	44	4,108
Nov-23	3,924	187	17	40	3,760
Dec-23	3,907	186	17	40	3,744
Jan-24	4,062	231	17	42	3,855
Feb-24	3,733	213	16	38	3,543
Mar-24	4,046	230	17	41	3,839
Apr-24	4,172	238	18	43	3,959
May-24	4,215	240	18	43	4,000
Jun-24	4,083	233	18	42	3,875
Jul-24	4,682	267	20	48	4,444
Aug-24	4,900	279	21	50	4,650
Sep-24	4,558	260	20	47	4,325
Oct-24	4,246	242	18	44	4,030
Nov-24	3,887	221	17	40	3,688
Dec-24	3,870	220	17	40	3,672
Jan-25	4,026	267	17	42	3,783
Feb-25	3,700	245	16	38	3,477
Mar-25	4,009	266	17	41	3,767
Apr-25	4,134	274	18	43	3,885
May-25	4,177	277	18	43	3,925
Jun-25	4,046	268	18	42	3,802
Jul-25	4,640	308	20	48	4,360
Aug-25	4,856	322	21	50	4,563
Sep-25	4,517	300	20	47	4,244
Oct-25	4,208	279	18	44	3,954
Nov-25	3,852	255	17	40	3,619
Dec-25	3,835	254	17	40	3,603
Jan-26	3,997	298	17	42	3,723
Feb-26	3,673	274	16	38	3,422
Mar-26	3,981	297	17	41	3,708
Apr-26	4,104	306	18	43	3,823
May-26	4,147	309	18	43	3,863
Jun-26	4,017	299	18	42	3,742
Jul-26	4,607	343	20	48	4,292
Aug-26	4,821	359	21	50	4,491
Sep-26	4,485	334	20	47	4,177
Oct-26	4,178	311	18	44	3,892
Nov-26	3,824	285	17	40	3,562
Dec-26	3,808	284	17	40	3,547

Noncore Industrial Monthly Demand Forecast (MDth)

	Industrial - All Temperature Years				
Date	IndModel	DSM	Vernon	Migr: g10--> g30	Ind-All
Jan-27	3,963	327	17	42	3,661
Feb-27	3,642	300	16	38	3,364
Mar-27	3,947	325	17	41	3,646
Apr-27	4,070	335	18	43	3,759
May-27	4,112	339	18	43	3,799
Jun-27	3,983	328	18	42	3,679
Jul-27	4,568	376	20	48	4,220
Aug-27	4,780	394	21	50	4,416
Sep-27	4,447	366	20	47	4,107
Oct-27	4,142	341	18	44	3,826
Nov-27	3,792	312	17	40	3,503
Dec-27	3,775	311	17	40	3,487
Jan-28	3,922	355	17	42	3,591
Feb-28	3,604	326	16	38	3,300
Mar-28	3,905	354	17	41	3,576
Apr-28	4,027	365	18	43	3,687
May-28	4,069	368	18	43	3,726
Jun-28	3,941	357	18	42	3,609
Jul-28	4,520	409	20	48	4,139
Aug-28	4,730	428	21	50	4,331
Sep-28	4,400	398	20	47	4,029
Oct-28	4,099	371	18	44	3,753
Nov-28	3,752	340	17	40	3,435
Dec-28	3,736	338	17	40	3,420
Jan-29	3,881	383	17	42	3,522
Feb-29	3,567	352	16	38	3,237
Mar-29	3,865	382	17	41	3,508
Apr-29	3,985	393	18	43	3,617
May-29	4,027	398	18	43	3,655
Jun-29	3,901	385	18	42	3,540
Jul-29	4,474	442	20	48	4,060
Aug-29	4,681	462	21	50	4,248
Sep-29	4,354	430	20	47	3,952
Oct-29	4,057	400	18	44	3,681
Nov-29	3,713	367	17	40	3,370
Dec-29	3,697	365	17	40	3,355
Jan-30	3,848	412	17	42	3,461
Feb-30	3,537	378	16	38	3,181
Mar-30	3,832	410	17	41	3,446
Apr-30	3,952	423	18	43	3,554
May-30	3,993	427	18	43	3,591
Jun-30	3,868	414	18	42	3,478
Jul-30	4,436	475	20	48	3,989
Aug-30	4,642	497	21	50	4,174
Sep-30	4,318	462	20	47	3,883
Oct-30	4,022	430	18	44	3,617
Nov-30	3,682	394	17	40	3,311
Dec-30	3,666	392	17	40	3,297
Jan-31	3,821	428	17	42	3,417
Feb-31	3,512	393	16	38	3,141
Mar-31	3,805	426	17	41	3,403
Apr-31	3,924	439	18	43	3,509
May-31	3,965	444	18	43	3,546
Jun-31	3,840	430	18	42	3,434
Jul-31	4,404	493	20	48	3,939
Aug-31	4,609	516	21	50	4,122
Sep-31	4,287	480	20	47	3,834
Oct-31	3,994	447	18	44	3,572
Nov-31	3,656	409	17	40	3,270
Dec-31	3,640	407	17	40	3,255

Noncore Industrial Monthly Demand Forecast (MDth)

	Industrial - All Temperature Years				
Date	IndModel	DSM	Vernon	Migr: g10--> g30	Ind-All
Jan-32	3,792	455	17	42	3,362
Feb-32	3,485	418	16	38	3,089
Mar-32	3,776	453	17	41	3,348
Apr-32	3,894	467	18	43	3,452
May-32	3,935	472	18	43	3,488
Jun-32	3,811	457	18	42	3,378
Jul-32	4,371	524	20	48	3,875
Aug-32	4,574	548	21	50	4,055
Sep-32	4,254	510	20	47	3,772
Oct-32	3,963	475	18	44	3,514
Nov-32	3,628	435	17	40	3,216
Dec-32	3,612	433	17	40	3,202
Jan-33	3,766	454	17	42	3,336
Feb-33	3,461	417	16	38	3,066
Mar-33	3,750	452	17	41	3,322
Apr-33	3,867	466	18	43	3,426
May-33	3,908	471	18	43	3,462
Jun-33	3,785	456	18	42	3,353
Jul-33	4,341	523	20	48	3,846
Aug-33	4,542	547	21	50	4,024
Sep-33	4,225	509	20	47	3,743
Oct-33	3,936	474	18	44	3,487
Nov-33	3,603	434	17	40	3,192
Dec-33	3,587	432	17	40	3,178
Jan-34	3,735	454	17	42	3,304
Feb-34	3,432	418	16	38	3,037
Mar-34	3,719	453	17	41	3,291
Apr-34	3,835	467	18	43	3,393
May-34	3,875	472	18	43	3,429
Jun-34	3,753	457	18	42	3,321
Jul-34	4,305	524	20	48	3,809
Aug-34	4,505	548	21	50	3,986
Sep-34	4,190	510	20	47	3,707
Oct-34	3,904	475	18	44	3,454
Nov-34	3,573	435	17	40	3,161
Dec-34	3,558	433	17	40	3,148
Jan-35	3,711	452	17	42	3,283
Feb-35	3,410	415	16	38	3,018
Mar-35	3,696	450	17	41	3,270
Apr-35	3,811	464	18	43	3,372
May-35	3,850	468	18	43	3,407
Jun-35	3,729	454	18	42	3,300
Jul-35	4,277	520	20	48	3,785
Aug-35	4,476	545	21	50	3,960
Sep-35	4,163	507	20	47	3,684
Oct-35	3,879	472	18	44	3,432
Nov-35	3,550	432	17	40	3,141
Dec-35	3,535	430	17	40	3,128

EUForecaster (Noncore Commercial), Adj. to "Avg Yr HDD"

Yr-2016

Month	2016 Forecast	Pred G30-Com at 2016 Cgr Avg 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%**

EUForecaster (Noncore Industrial/Non-Refinery)

Month	"Fitted Monthly" Load (per BMW's Simple Regression Model) **(MDTh)**	Monthly Proportions of Annual Total Load **(%-of-Annual)**
1	4,219	8.05%
2	3,877	7.40%
3	4,201	8.02%
4	4,332	8.27%
5	4,377	8.35%
6	4,240	8.09%
7	4,863	9.28%
8	5,088	9.71%
9	4,733	9.03%
10	4,409	8.42%
11	4,036	7.70%
12	4,019	7.67%
	52,394	**100.00%**

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
2024	117.81	117.81	0.6808	0.6472	0.6553	0.6296
2025	120.30	120.30	0.7475	0.7132	0.7215	0.6952
2026	122.78	122.78	0.8038	0.7687	0.7771	0.7501
2027	125.30	125.30	0.8674	0.8315	0.8401	0.8125
2028	127.87	127.87	0.9439	0.9073	0.9160	0.8877
2029	130.84	130.84	1.0243	0.9867	0.9956	0.9666
2030	134.11	134.11	1.0922	1.0536	1.0627	1.0329
2031	137.39	137.39	1.1507	1.1112	1.1205	1.0899
2032	140.73	140.73	1.2091	1.1689	1.1783	1.1471
2033	144.15	144.15	1.2639	1.2227	1.2323	1.2003
2034	147.68	147.68	1.3405	1.2982	1.3080	1.2752
2035	151.28	151.28	1.4071	1.3641	1.3741	1.3407

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
2024	14.31	10.09	14.31	10.09
2025	14.75	10.39	14.75	10.39
2026	15.22	10.73	15.22	10.73
2027	15.60	10.99	15.60	10.99
2028	16.00	11.28	16.00	11.28
2029	16.43	11.58	16.43	11.58
2030	16.88	11.90	16.88	11.90
2031	17.26	12.16	17.26	12.16
2032	17.63	12.43	17.63	12.43
2033	18.02	12.70	18.02	12.70
2034	18.42	12.98	18.42	12.98
2035	18.82	13.27	18.82	13.27

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
2024	1.7615	1.7615	1.7615	1.7615
2025	1.8330	1.8330	1.8330	1.8330
2026	1.9009	1.9009	1.9009	1.9009
2027	1.9760	1.9760	1.9760	1.9760
2028	2.0696	2.0696	2.0696	2.0696
2029	2.1849	2.1849	2.1849	2.1849
2030	2.2796	2.2796	2.2796	2.2796
2031	2.3894	2.3894	2.3894	2.3894
2032	2.5130	2.5130	2.5130	2.5130
2033	2.6389	2.6389	2.6389	2.6389
2034	2.7638	2.7638	2.7638	2.7638
2035	2.9024	2.9024	2.9024	2.9024

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
2024	27.705	24.347	25.159	22.584	40.375	6.808	6.472	6.553	6.296	1.1781	5.779	5.494	5.563	5.344
2025	30.797	27.368	28.194	25.561	43.956	7.475	7.132	7.215	6.952	1.2030	6.214	5.929	5.998	5.779
2026	34.324	30.807	31.650	28.945	46.061	8.038	7.687	7.771	7.501	1.2278	6.547	6.261	6.329	6.109
2027	38.179	34.589	35.446	32.683	48.565	8.674	8.315	8.401	8.125	1.2530	6.923	6.636	6.705	6.484
2028	43.114	39.451	40.322	37.498	51.274	9.439	9.073	9.160	8.877	1.2787	7.382	7.095	7.163	6.942
2029	48.536	44.776	45.666	42.764	53.893	10.243	9.867	9.956	9.666	1.3084	7.829	7.541	7.609	7.387
2030	52.937	49.081	49.990	47.010	56.278	10.922	10.536	10.627	10.329	1.3411	8.144	7.856	7.924	7.702
2031	56.481	52.529	53.457	50.398	58.593	11.507	11.112	11.205	10.899	1.3739	8.376	8.088	8.155	7.933
2032	60.273	56.249	57.191	54.075	60.636	12.091	11.689	11.783	11.471	1.4073	8.592	8.306	8.373	8.151
2033	64.423	60.299	61.261	58.063	61.967	12.639	12.227	12.323	12.003	1.4415	8.768	8.482	8.549	8.327
2034	68.934	64.706	65.688	62.407	65.113	13.405	12.982	13.080	12.752	1.4768	9.077	8.791	8.857	8.635
2035	73.518	69.222	70.217	66.880	67.189	14.071	13.641	13.741	13.407	1.5128	9.301	9.017	9.083	8.862

Noncore C and I Weights for Tiers in Weighted Rate Calculations

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%

				("Cust Cnt")	G-30 C&I (Non-Refinery)		Annual
Obs	seg	service	_TYPE_	_FREQ_	Therms	Prop/Pct.	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
2024	3.25	$350	30.16	24.19	20.38	17.66	$0	15.22	15.22	0.68	14.10	14.10	-12.046	1.178	117.81	3.490	0.55
2025	3.32	$350	33.34	27.22	23.32	20.52	$0	18.04	18.04	0.68	16.92	16.92	-14.844	1.203	120.30	3.848	0.55
2026	3.39	$350	36.99	30.69	26.66	23.79	$0	21.23	21.23	0.69	20.08	20.08	-17.943	1.228	122.78	4.058	0.55
2027	3.46	$350	40.93	34.48	30.36	27.41	$0	24.81	24.81	0.69	23.65	23.65	-21.504	1.253	125.30	4.309	0.55
2028	3.53	$350	45.95	39.35	35.13	32.11	$0	29.46	29.46	0.69	28.30	28.30	-26.138	1.279	127.87	4.580	0.55
2029	3.61	$350	51.51	44.70	40.35	37.24	$0	34.52	34.52	0.70	33.33	33.33	-31.098	1.308	130.84	4.842	0.55
2030	3.70	$350	56.03	49.02	44.54	41.33	$0	38.56	38.56	0.70	37.36	37.36	-35.117	1.341	134.11	5.080	0.55
2031	3.79	$350	59.69	52.48	47.87	44.57	$0	41.74	41.74	0.71	40.53	40.53	-38.278	1.374	137.39	5.312	0.55
2032	3.88	$350	63.54	56.19	51.48	48.12	$0	45.24	45.24	0.71	44.02	44.02	-41.748	1.407	140.73	5.516	0.55
2033	3.98	$350	67.82	60.25	55.41	51.95	$0	49.01	49.01	0.72	47.79	47.79	-45.505	1.442	144.15	5.649	0.55
2034	4.07	$350	72.46	64.67	59.69	56.13	$0	53.14	53.14	0.72	51.90	51.90	-49.601	1.477	147.68	5.964	0.55
2035	4.17	$350	77.09	69.16	64.09	60.47	$0	57.42	57.42	0.72	56.18	56.18	-53.876	1.513	151.28	6.171	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)**

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
2024	1.88318	0.75825	0.98382	0.09846	0.53017	0.69991	0.23330	1.35263	0.14795	0.24583	0.67357	0.59716	0.54979	0.24974	9.00376
2025	1.89851	0.75085	0.97423	0.09785	0.53153	0.70681	0.23560	1.36421	0.14765	0.24431	0.67882	0.59406	0.55707	0.24919	9.03070
2026	1.90955	0.74616	0.96814	0.09742	0.53166	0.71365	0.23788	1.37700	0.14719	0.24325	0.68385	0.59050	0.56288	0.24846	9.05760
2027	1.92228	0.74547	0.96725	0.09707	0.53157	0.72020	0.24007	1.39257	0.14734	0.24236	0.68864	0.58449	0.56934	0.24793	9.09656
2028	1.93383	0.74649	0.96857	0.09687	0.52798	0.72602	0.24201	1.41154	0.14771	0.24188	0.69283	0.57764	0.57552	0.24757	9.13647
2029	1.94387	0.74911	0.97198	0.09675	0.52591	0.73006	0.24335	1.43290	0.14824	0.24157	0.69559	0.57373	0.58229	0.24734	9.18267
2030	1.96153	0.75249	0.97636	0.09675	0.52370	0.73316	0.24439	1.45529	0.14866	0.24156	0.70460	0.57210	0.59048	0.24739	9.24846
2031	1.98009	0.75828	0.98387	0.09665	0.52186	0.73666	0.24555	1.47590	0.14960	0.24133	0.70080	0.57109	0.60234	0.24776	9.31179
2032	1.99902	0.76314	0.99019	0.09665	0.51925	0.74104	0.24701	1.49805	0.15039	0.24132	0.70386	0.57102	0.61328	0.24827	9.38249
2033	2.01615	0.76910	0.99792	0.09673	0.51732	0.74605	0.24868	1.51956	0.15142	0.24153	0.70733	0.57022	0.62435	0.24883	9.45520
2034	2.03583	0.77405	1.00434	0.09675	0.51470	0.75193	0.25064	1.53981	0.15214	0.24156	0.71148	0.56909	0.63930	0.24922	9.53084
2035	2.05107	0.77965	1.01161	0.09672	0.51274	0.75737	0.25246	1.55670	0.15319	0.24149	0.71525	0.56784	0.65691	0.24935	9.60235

ScgNoncore_WP_02_Com_NCore_Source_Data - Saturations

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

ScgNoncore_WP_02_Com_NCore_Source_Data - Saturations

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

ScgNoncore_WP_02_Com_NCore_Source_Data - ComNCoreAvgEQAge

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

Year Equipment Installed

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

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	654639	0	-0.046000	0.474000	6,881,366
Warehouse + School + College	27,163,218	20	20	0	1358161	0	-0.046000	0.474000	10,064,926
Health	68,523,222	84	84	0	815753	0	-0.046000	0.474000	1,707,720
Lodging + Misc	9,754,545	17	17	0	573797	0	-0.046000	0.474000	14,736,871
Government	21,265,681	33	33	0	644415	0	-0.046000	0.474000	3,533,422
TCU	16,786,112	33	33	0	508670	0	-0.046000	0.474000	2,992,940
Construction + Agriculture	27,425,271	22	22	0	1246603	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%

ScgNoncore_WP_03_Ind_NCore_Source_Data - IndNonCoreEmpFcast

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
2024	18.10131	140.14121	7.46933	34.22918	48.78208	7.22611	19.52279	10.45946	93.92716	67.69194	302.47773	750.03
2025	17.99312	141.05138	7.36071	34.65700	48.26058	7.03213	19.48806	10.32603	94.60581	65.82452	301.26590	747.87
2026	17.71526	141.76674	7.36007	35.02856	48.01389	6.85881	19.43242	10.20546	95.18518	64.96098	299.35792	745.89
2027	17.47595	142.40418	7.32911	35.36004	47.83498	6.69475	19.42593	9.99922	95.39552	64.62703	297.38466	743.93
2028	17.30461	142.89212	7.27718	35.70896	47.69345	6.53865	19.42164	9.74345	95.33446	64.39755	295.07087	741.38
2029	17.12153	143.32270	7.20478	35.97424	47.48046	6.37870	19.41472	9.51630	95.55265	64.12830	292.72555	738.82
2030	16.98657	143.52537	7.10182	36.20383	47.18835	6.22261	19.40890	9.29188	95.61750	63.55158	290.44624	735.54
2031	16.84776	143.79705	6.96720	36.18672	46.86853	6.09200	19.35436	9.07855	95.60003	62.94544	288.76758	732.51
2032	16.72560	143.91300	6.83299	35.71386	46.53012	5.95177	19.21928	8.88001	95.62702	62.44221	287.55419	729.39
2033	16.57608	143.88218	6.69566	35.32270	46.21828	5.81684	19.15042	8.67569	95.41769	62.27087	286.22758	726.25
2034	16.43476	143.72069	6.55576	35.85406	45.94176	5.69071	19.26849	8.46445	94.97514	62.26847	284.87026	724.04
2035	16.33206	143.53609	6.43052	36.51935	45.70546	5.57284	19.39704	8.26672	94.69631	62.30527	283.84328	722.60

ScgNoncore_WP_03_Ind_NCore_Source_Data - IndNonCoreUsePerMeterAvg

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

ScgNoncore_WP_03_Ind_NCore_Source_Data - IndNonCoreSat

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

ScgNoncore_WP_03_Ind_NCore_Source_Data - IndNonCoreGasShare

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

ScgNoncore_WP_03_Ind_NCore_Source_Data - IndNonCoreGasUec

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

ScgNoncore_WP_03_Ind_NCore_Source_Data - IndNonCoreElecUec

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

ScgNoncore_WP_03_Ind_NCore_Source_Data - IndNonCoreAvgEQAge

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

ScgNoncore_WP_03_Ind_NCore_Source_Data - Historical_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 for noncore Industrial

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NATURAL GAS VEHICLES

SoCalGas G-NGV Forecast Description of forecast volumes and meters

Table 1 - SoCalGas Volume Forecast Growth						
Years	Volumes				G-NGV Meters	
	Compressed		Uncompressed			
	MM CCF		MM CCF			
2013	2.3		111.5			
2014	2.2		119.9			
2015	2.3		125.2			
2016	2.3		131.1			
2017	2.8		137.6	Historical value		
2018	3.1		145.0			
2019	3.4		152.9			
2020	3.7		161.1			
2021	4.1		169.8			
2022	4.4		179.0			
2023	4.8		188.6			
2024	5.3		198.8			
2025	5.7		209.5			
2026	6.3		220.8			
2027	6.9		232.8			
2028	7.5		245.3			
2029	8.2		258.6			
2030	9.0		272.5			
2031	9.8		287.2			
2032	10.7		302.7			
2033	11.7		319.1			
2034	12.8		336.3			
2035	14.0		354.5			

Table 2 - SoCalGas Monthly Volumes													
Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Compressed Volumes - Total (M decatherms)													
2017	21	19	23	21	25	24	24	27	26	28	27	28	292
2018	23	21	25	24	27	26	27	30	28	31	29	30	320
2019	25	23	27	26	30	28	29	33	31	34	32	33	351
2020	27	25	30	28	33	31	32	36	34	37	35	36	384
2021	29	27	33	31	36	34	35	39	37	41	39	40	420
2022	32	29	36	34	39	37	38	43	40	44	42	43	458
2023	35	32	39	37	42	40	42	46	44	48	46	47	500
2024	38	35	42	40	46	44	46	51	48	53	50	52	545
2025	41	38	46	44	51	48	50	55	53	58	55	57	595
2026	45	42	51	48	55	52	55	60	57	63	60	62	650
2027	49	46	55	52	60	57	60	66	63	69	66	68	710
2028	54	50	60	57	66	62	65	72	69	75	72	74	776
2029	58	54	66	63	72	68	71	79	75	82	78	81	848
2030	64	59	72	68	79	74	78	86	82	90	86	88	927
2031	70	65	79	75	86	81	85	94	90	98	94	97	1,014
2032	76	71	87	82	94	89	93	103	98	107	102	106	1,109
2033	83	78	95	89	103	97	102	113	108	117	112	116	1,213
2034	91	85	104	98	113	106	112	124	118	129	123	127	1,327
2035	99	93	113	107	124	116	122	135	129	141	134	139	1,452

2017	12	12	15	14	16	15	16	18	17	18	18	19	191
2018	13	13	17	15	18	16	18	20	19	20	20	20	210
2019	15	15	18	17	20	18	20	22	21	22	22	23	232
2020	16	16	20	19	22	20	22	24	23	25	24	25	256
2021	18	18	22	21	24	22	24	27	25	27	26	27	282
2022	20	20	25	23	27	24	27	29	28	30	29	30	312
2023	22	22	27	25	29	27	29	32	31	33	32	33	344
2024	24	24	30	28	33	30	32	36	34	37	35	37	379
2025	26	26	33	31	36	33	36	39	38	40	39	41	418
2026	29	29	37	34	40	36	39	44	41	45	43	45	461
2027	32	32	40	37	44	40	44	48	46	49	47	50	509
2028	36	35	44	41	48	44	48	53	51	54	52	55	562
2029	39	39	49	46	53	48	53	58	56	60	58	60	620
2030	43	43	54	50	59	53	59	64	61	66	64	67	684
2031	48	47	60	56	65	59	65	71	68	73	70	73	754
2032	53	52	66	61	71	65	71	78	75	81	78	81	832
2033	58	57	73	68	79	72	79	87	83	89	86	89	918
2034	64	63	80	75	87	79	87	96	91	98	94	99	1,013
2035	71	70	88	82	96	87	96	105	100	108	104	109	1,117

Compressed Volumes - Utility Use (M decatherms)													
2017	8	7	8	7	8	9	8	9	9	10	9	9	101
2018	9	7	8	8	9	9	9	10	9	11	10	10	110
2019	10	8	9	9	10	10	10	11	10	12	11	11	119
2020	11	9	10	9	11	11	10	12	11	12	12	11	128
2021	12	9	10	10	11	12	11	12	12	13	12	12	137
2022	12	10	11	11	12	13	12	13	12	14	13	13	146
2023	13	11	12	12	13	13	12	14	13	15	14	14	156
2024	14	11	12	12	14	14	13	15	14	16	15	15	166
2025	15	12	13	13	15	15	14	16	15	17	16	16	177
2026	16	13	14	14	16	16	15	17	16	18	17	17	189
2027	17	14	15	15	17	17	16	18	17	20	18	18	201
2028	18	15	16	16	18	18	17	19	18	21	19	19	214
2029	19	16	17	17	19	20	18	21	19	22	21	20	229
2030	20	17	18	18	20	21	19	22	21	24	22	22	244
2031	22	18	19	19	22	22	21	23	22	25	23	23	260
2032	23	19	21	20	23	24	22	25	23	27	25	25	277
2033	25	20	22	22	24	25	24	27	25	29	27	26	295
2034	26	21	24	23	26	27	25	28	27	31	28	28	315
2035	28	23	25	25	28	29	27	30	28	33	30	30	335

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Uncompressed Volumes - Total (M Decatherms)													
2017	1,111	1,052	1,220	1,129	1,227	1,172	1,163	1,270	1,218	1,308	1,205	1,169	14,244
2018	1,171	1,108	1,286	1,190	1,293	1,235	1,226	1,339	1,283	1,378	1,270	1,233	15,013
2019	1,234	1,168	1,355	1,254	1,363	1,302	1,292	1,411	1,353	1,453	1,339	1,299	15,823
2020	1,301	1,231	1,428	1,322	1,437	1,372	1,362	1,487	1,426	1,531	1,411	1,369	16,677
2021	1,371	1,298	1,505	1,393	1,514	1,446	1,436	1,567	1,503	1,614	1,487	1,443	17,577
2022	1,445	1,368	1,587	1,468	1,596	1,524	1,513	1,652	1,584	1,701	1,567	1,521	18,526
2023	1,523	1,441	1,672	1,548	1,682	1,607	1,595	1,741	1,669	1,793	1,652	1,603	19,526
2024	1,605	1,519	1,762	1,631	1,773	1,693	1,681	1,835	1,759	1,889	1,741	1,690	20,580
2025	1,692	1,601	1,858	1,719	1,869	1,785	1,772	1,934	1,854	1,991	1,835	1,781	21,691
2026	1,783	1,688	1,958	1,812	1,970	1,881	1,867	2,038	1,954	2,099	1,934	1,877	22,862
2027	1,880	1,779	2,063	1,910	2,076	1,983	1,968	2,148	2,060	2,212	2,039	1,978	24,096
2028	1,981	1,875	2,175	2,013	2,188	2,090	2,074	2,264	2,171	2,332	2,149	2,085	25,396
2029	2,088	1,976	2,292	2,122	2,306	2,203	2,186	2,387	2,288	2,457	2,265	2,197	26,767
2030	2,201	2,083	2,416	2,236	2,431	2,321	2,304	2,515	2,412	2,590	2,387	2,316	28,212
2031	2,320	2,195	2,546	2,357	2,562	2,447	2,429	2,651	2,542	2,730	2,516	2,441	29,734
2032	2,445	2,313	2,684	2,484	2,700	2,579	2,560	2,794	2,679	2,877	2,651	2,573	31,339
2033	2,577	2,438	2,829	2,618	2,846	2,718	2,698	2,945	2,823	3,032	2,795	2,712	33,031
2034	2,716	2,570	2,981	2,759	2,999	2,865	2,844	3,104	2,976	3,196	2,945	2,858	34,814
2035	2,862	2,709	3,142	2,908	3,161	3,019	2,997	3,272	3,137	3,369	3,104	3,012	36,693

Workpaper NGV-1 (3)

Uncompressed Volumes - Utility Procurement Customers (M Decatherms)													
2017	629	596	688	635	695	666	663	678	648	689	636	605	7,828
2018	663	628	725	670	733	702	699	715	682	726	670	637	8,250
2019	699	662	764	706	772	740	737	753	719	765	706	672	8,695
2020	737	697	805	744	814	780	777	794	758	807	745	708	9,165
2021	777	735	848	784	858	822	819	837	799	850	785	746	9,659
2022	819	775	894	826	904	866	863	882	842	896	827	786	10,181
2023	863	816	942	871	953	913	909	930	888	944	872	829	10,730
2024	909	860	993	918	1,004	962	958	980	936	995	919	873	11,309
2025	958	907	1,047	968	1,059	1,014	1,010	1,033	986	1,049	968	921	11,920
2026	1,010	956	1,103	1,020	1,116	1,069	1,065	1,089	1,039	1,106	1,021	970	12,563
2027	1,065	1,007	1,163	1,075	1,176	1,127	1,122	1,147	1,095	1,165	1,076	1,023	13,241
2028	1,122	1,062	1,226	1,133	1,239	1,187	1,183	1,209	1,154	1,228	1,134	1,078	13,956
2029	1,183	1,119	1,292	1,194	1,306	1,252	1,247	1,275	1,217	1,295	1,195	1,136	14,709
2030	1,247	1,179	1,362	1,258	1,377	1,319	1,314	1,343	1,282	1,365	1,260	1,197	15,503
2031	1,314	1,243	1,435	1,326	1,451	1,390	1,385	1,416	1,352	1,438	1,328	1,262	16,340
2032	1,385	1,310	1,513	1,398	1,529	1,465	1,460	1,492	1,425	1,516	1,399	1,330	17,222
2033	1,460	1,381	1,594	1,473	1,612	1,544	1,538	1,573	1,502	1,598	1,475	1,402	18,151
2034	1,538	1,455	1,680	1,553	1,699	1,628	1,621	1,658	1,583	1,684	1,554	1,477	19,131
2035	1,621	1,534	1,771	1,637	1,791	1,716	1,709	1,747	1,668	1,775	1,638	1,557	20,164

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Uncompressed Volumes - Customer Owned Gas (M Decatherms)													
2017	482	456	532	494	532	506	500	592	570	619	569	565	6,417
2018	508	481	561	520	561	533	527	624	601	652	600	595	6,763
2019	535	507	591	548	591	562	556	657	633	687	632	627	7,128
2020	564	534	623	578	623	593	585	693	667	724	666	661	7,513
2021	595	563	657	609	657	625	617	730	703	764	702	697	7,918
2022	627	593	692	642	692	658	650	770	741	805	740	735	8,346
2023	660	625	730	677	729	694	686	811	781	848	780	774	8,796
2024	696	659	769	713	769	731	723	855	824	894	822	816	9,271
2025	734	694	811	752	810	771	762	901	868	942	867	860	9,771
2026	773	732	854	792	854	812	803	950	915	993	913	907	10,299
2027	815	771	900	835	900	856	846	1,001	964	1,047	963	956	10,854
2028	859	813	949	880	949	902	892	1,055	1,016	1,103	1,015	1,007	11,440
2029	905	857	1,000	928	1,000	951	940	1,112	1,071	1,163	1,069	1,061	12,058
2030	954	903	1,054	978	1,054	1,002	990	1,172	1,129	1,225	1,127	1,119	12,709
2031	1,006	952	1,111	1,031	1,111	1,056	1,044	1,235	1,190	1,292	1,188	1,179	13,395
2032	1,060	1,003	1,171	1,086	1,171	1,113	1,100	1,302	1,254	1,361	1,252	1,243	14,118
2033	1,117	1,057	1,234	1,145	1,234	1,174	1,160	1,372	1,322	1,435	1,320	1,310	14,879
2034	1,178	1,114	1,301	1,207	1,300	1,237	1,222	1,446	1,393	1,512	1,391	1,381	15,683
2035	1,241	1,175	1,371	1,272	1,371	1,304	1,288	1,524	1,468	1,594	1,466	1,455	16,529

4. Source

Historical monthly throughput extracted from Data Warehouse.

Workpaper NGV-4

Unit Conversions for Uncompressed and compressed volumes

Table 1 - therms per CCF Unit Conversion Calculation			
Description	SoCalGas 2017 Volumes		
	therms	CCF	therms/CCF
Compressed	2,916,061	2,815,325	1.03578
Uncompressed	144,183,651	139,283,941	1.03518

1. Title - Forecasted Volume Growth Rates

2. Description - Uncompressed and compressed volume growth rates

3. Data

Table 1 - Historical Annual Growth Rates		
Historical Period	Uncompressed Annual Growth Rate	
	SoCalGas	SDG&E
5-Year (2013-2017)	5.40%	7.1%

Table 2 - Compressed Volumes - Public Use Annual Growth Rate		
Description	Units	Value
Price Elasticity of Demand	-	(0.43)
2017 Utility CNG Station Sales	GGEs	1,801,319
2017 Utility CNG Station Revenue	$ per year	$4,202,168
2017 Utility CNG Station Average Pump Price	$ per GGE	$2.33
Estimated Utility LCFS Credit	$ per GGE	($0.56)
Compressed Volumes - Public Use Annual Growth Rate	-	10.32%

Table 3 - Utility Fleet Forecast		
Description	SoCalGas	SDG&E
Current Fleet	1,005	89
Annual Fleet Addition	90	2
2018	1,005	89
2019	1,095	91
2020	1,185	93
2021	1,275	95
2022	1,365	97

4. Sources

Table 2 short run price elasticity of demand for diesel fuel taken from "The demand for road diesel in Canada" by Philippe Barla, et.al., published in Energy Economics Volume 43, May 2014, Pages 316-322, Table 2 public access CNG station revenue and sales taken from Altametrics database, Table 2 estimated LCFS credit is based on an assumed $140 per LCFS credit sale price and annual LCFS credit sales of ~7,400 LCFS credits, and Table 3 utility fleet information provided by Nicholas Soar (SoCalGas) and Clinton Marsh (SDG&E) on XXX via XXX

2018 CALIFORNIA GAS REPORT

ENERGY EFFICIENCY

Southern California Gas Company ENERGY EFFICIENCY NET SAVINGS

	Reported 2010 Therms	Reported 2011 Therms	Reported 2012 Therms	Reported 2013	Reported 2014	Reported 2015	Reported 2016	Reported 2017	Forecast 2018
SoCalGas EE Program TOTAL	**27,413,193**	**37,233,416**	**32,077,678**	**25,817,960**	**28,856,008**	**21,620,562**	**30,155,462**	**29,150,327**	50,227,346
PUC Goal	**28,000,000**	**30,000,000**	**32,000,000**	24,120,000	23,190,000	25,300,000	29,100,000	30,300,000	46,000,000
Difference	**(586,807)**	**7,233,416**	**77,678**	**1,697,960**	**5,666,008**	**(3,679,438)**	**1,055,462**	**(1,149,673)**	4,227,346

SoCalGas	2010 therms	2011 therms	2012 therms	2013 therms	2014 therms	2015 therms	2016 therms	2017 therms	2018 therms
Core Residential	9,072,268	12,564,473	8,445,190	8,173,595	7,371,223	7,037,522	14,912,118	17,830,064	28,542,275
Core Commercial	7,457,290	10,030,218	9,608,803	2,380,370	4,093,890	6,286,602	11,216,376	9,558,519	10,971,823
Core Industrial	2,268,570	3,051,276	2,923,078	2,803,233	2,457,183	1,928,820	1,236,543	1,125,795	2,569,917
NonCore Commercial	1,064,214	1,431,391	1,371,252	293,874	2,168,951	1,878,668	335,445	287,429	578,829
NonCore Industrial retail	2,483,166	3,339,913	3,199,588	4,184,881	6,592,493	2,495,191	1,562,769	226,097	3,642,195
NonCore Industrial refinery	5,067,684	6,816,146	6,529,768	7,982,006	6,172,268	1,993,759	892,212	122,423	3,922,307
Total	**27,413,193**	**37,233,416**	**32,077,678**	**25,817,960**	**28,856,008**	**21,620,562**	**30,155,462**	**29,150,327**	**50,227,346**

Proportionally scale it down or up to match PUC Goals for 2010 - 2014

ANNUAL NET SAVINGS	2010 Mdth	2011 Mdth	2012 Mdth	2013 Mdth	2014 Mdth	2015 Mdth	2016 Mdth	2017 Mdth	2018 Mdth
Core Residential	927	1,012	842	764	592	704	1,491	1,783	2,854
Core Commercial	762	808	959	222	329	629	1,122	956	1,097
Core Industrial	232	246	292	262	197	193	124	113	257
NonCore Commercial	109	115	137	27	174	188	34	29	58
NonCore Industrial retail	254	269	319	391	530	250	156	23	364
NonCore Industrial refinery	518	549	651	746	496	199	89	12	392
Total	**2,800**	**3,000**	**3,200**	**2,412**	**2,319**	**2,162**	**3,016**	**2,915**	**5,023**

Cumulative Savings Mdth	2012 Mdth	2013 Mdth	2014 Mdth	2015 Mdth	2016 Mdth	2017 Mdth	2018 Mdth
Core Residential							2,854
Core Commercial							1,097
Core Industrial							257
NonCore Commercial							58
NonCore Industrial regular							364
NonCore Industrial refinery							392
Total Load Impacts							**5,023**

MMCF factor: **1.0353**

Cumulative Savings MMCF	2012 mmcf	2013 mmcf	2014 mmcf	2015 mmcf	2016 mmcf	2017 mmcf	2018 mmcf
Core Residential	-		-	-	-	-	2,757
Core Commercial	-		-	-	-	-	1,060
Core Industrial	-		-	-	-	-	248
NonCore Commercial	-		-	-	-	-	56
NonCore Industrial regular	-		-	-	-	-	352
NonCore Industrial refinery	-		-	-	-	-	379
Total Cumulative Load	**-**		**-**	**-**	**-**	**-**	**4,851**

Forecast Year ====> 1

Life cycle is 15 years.

Southern California Gas Company ENERGY EFFICIENCY NET SAVI

	Forecast 2019	Forecast 2020	Forecast 2021	Forecast 2022	Forecast 2023	Forecast 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028
SoCalGas EE Program TOTAL										
PUC Goal	48,000,000	54,000,000	60,000,000	59,000,000	63,000,000	62,000,000	61,000,000	53,000,000	49,000,000	49,000,000
Difference										

SoCalGas
Core Residential
Core Commercial
Core Industrial
NonCore Commercial
NonCore Industrial retail
NonCore Industrial refinery
Total

Proportionally scale it down or up to match PU

ANNUAL NET SAVINGS	2019 Mdth	2020 Mdth	2021 Mdth	2022 Mdth	2023 Mdth	2024 Mdth	2025 Mdth	2026 Mdth	2027 Mdth	2028 Mdth
Core Residential	2,728	3,069	3,410	3,353	3,580	3,523	3,466	3,012	2,784	2,784
Core Commercial	1,049	1,180	1,311	1,289	1,376	1,354	1,333	1,158	1,070	1,070
Core Industrial	246	276	307	302	322	317	312	271	251	251
NonCore Commercial	55	62	69	68	73	71	70	61	56	56
NonCore Industrial retail	348	392	435	428	457	450	442	384	355	355
NonCore Industrial refinery	375	422	469	461	492	484	476	414	383	383
Total	**4,800**	**5,400**	**6,000**	**5,900**	**6,300**	**6,200**	**6,100**	**5,300**	**4,900**	**4,900**

Cumulative Savings Mdth	2019 Mdth	2020 Mdth	2021 Mdth	2022 Mdth	2023 Mdth	2024 Mdth	2025 Mdth	2026 Mdth	2027 Mdth	2028 Mdth
Core Residential	5,582	8,650	12,060	15,413	18,993	22,516	25,982	28,994	31,779	34,563
Core Commercial	2,146	3,325	4,636	5,925	7,301	8,655	9,988	11,146	12,216	13,286
Core Industrial	503	779	1,086	1,388	1,710	2,027	2,339	2,611	2,861	3,112
NonCore Commercial	113	175	245	313	385	457	527	588	644	701
NonCore Industrial regular	712	1,104	1,539	1,967	2,424	2,873	3,316	3,700	4,055	4,411
NonCore Industrial refinery	767	1,189	1,657	2,118	2,610	3,094	3,571	3,984	4,367	4,750
Total Load Impacts	**9,823**	**15,223**	**21,223**	**27,123**	**33,423**	**39,623**	**45,723**	**51,023**	**55,923**	**60,823**

Cumulative Savings MMCF	2019 mmcf	2020 mmcf	2021 mmcf	2022 mmcf	2023 mmcf	2024 mmcf	2025 mmcf	2026 mmcf	2027 mmcf	2028 mmcf
Core Residential	5,392	8,356	11,649	14,887	18,345	21,748	25,097	28,006	30,695	33,385
Core Commercial	2,073	3,212	4,478	5,723	7,052	8,360	9,647	10,766	11,799	12,833
Core Industrial	485	752	1,049	1,340	1,652	1,958	2,260	2,522	2,764	3,006
NonCore Commercial	109	169	236	302	372	441	509	568	622	677
NonCore Industrial regular	688	1,066	1,486	1,900	2,341	2,775	3,202	3,574	3,917	4,260
NonCore Industrial refinery	741	1,148	1,601	2,046	2,521	2,989	3,449	3,849	4,218	4,588
Total Cumulative Load	**9,488**	**14,704**	**20,499**	**26,198**	**32,283**	**38,272**	**44,164**	**49,283**	**54,016**	**58,749**

2 3 4 5 6 7 8 9 10 11

Life cycle is 15 years.

	Forecast 2033	Forecast 2034	Forecast 2035	Forecast 2036	Forecast 2037	Forecast 2038	Forecast 2039	Forecast 2040
SoCalGas EE Program TOTAL								
PUC Goal	49,000,000	49,000,000	49,000,000	49,000,000	49,000,000	49,000,000	49,000,000	49,000,000
Difference								

SoCalGas

Core Residential
Core Commercial
Core Industrial
NonCore Commercial
NonCore Industrial retail
NonCore Industrial refinery
Total

Proportionally scale it down or up to match PU(

ANNUAL NET SAVINGS	2033 Mdth	2034 Mdth	2035 Mdth	2036 Mdth	2037 Mdth	2038 Mdth	2039 Mdth	2040 Mdth
Core Residential	2,784	2,784	2,784	2,784	2,784	2,784	2,784	2,784
Core Commercial	1,070	1,070	1,070	1,070	1,070	1,070	1,070	1,070
Core Industrial	251	251	251	251	251	251	251	251
NonCore Commercial	56	56	56	56	56	56	56	56
NonCore Industrial retail	355	355	355	355	355	355	355	355
NonCore Industrial refinery	383	383	383	383	383	383	383	383
Total	**4,900**	**4,900**	**4,900**	**4,900**	**4,900**	**4,900**	**4,900**	**4,900**

Cumulative Savings Mdth	2033 Mdth	2034 Mdth	2035 Mdth	2036 Mdth	2037 Mdth	2038 Mdth	2039 Mdth	2040 Mdth
Core Residential	42,300	42,357	42,073	41,448	40,880	40,084	39,345	38,663
Core Commercial	15,442	15,464	15,354	15,114	14,896	14,590	14,306	14,044
Core Industrial	3,867	3,872	3,847	3,791	3,739	3,668	3,601	3,540
NonCore Commercial	862	863	857	845	833	817	802	788
NonCore Industrial regular	5,637	5,644	5,608	5,528	5,455	5,354	5,260	5,173
NonCore Industrial refinery	6,161	6,169	6,130	6,044	5,966	5,857	5,755	5,662
Total Load Impacts	**74,269**	**74,369**	**73,869**	**72,769**	**71,769**	**70,369**	**69,069**	**67,869**

Cumulative Savings MMCF	2033 mmcf	2034 mmcf	2035 mmcf	2036 mmcf	2037 mmcf	2038 mmcf	2039 mmcf	2040 mmcf
Core Residential	40,858	40,913	40,639	40,035	39,486	38,717	38,004	37,345
Core Commercial	14,915	14,936	14,831	14,599	14,388	14,092	13,818	13,565
Core Industrial	3,735	3,740	3,716	3,661	3,612	3,543	3,478	3,419
NonCore Commercial	833	834	828	816	805	789	775	761
NonCore Industrial regular	5,445	5,452	5,417	5,339	5,269	5,171	5,080	4,996
NonCore Industrial refinery	5,951	5,959	5,921	5,838	5,763	5,657	5,559	5,469
Total Cumulative Load	**71,737**	**71,834**	**71,351**	**70,288**	**69,322**	**67,970**	**66,714**	**65,555**

16 17 18 19 20 21 22 23

Life cycle is 15 years.

2018 CALIFORNIA GAS REPORT

EXCHANGE

The Master Exchange Agreement (MEA) was made and entered into on the 1st day of March 1990 by and between Pacific Gas and Electric Company (PG&E) and Southern California Gas Company (SoCalGAs). The MEA sets the terms and conditions of any delivery or redelivery of natural gas for standby or for ongoing deliveries. Each delivery point and each redelivery point is specified on the exchange tap information sheet and listed on the exchange tap information summary sheet.

For the purposes of the forecast, the monthly exchange volumes for SoCalGas deliveries to PG&E and PG&E deliveries to SoCalGas at various exchange taps were tracked. The last three years of historical exchange deliveries formed the basis for the exchange forecast. The exchange taps that were tracked are as follows:

SoCalGas to PGE	PGE to SoCalGas
Zone 1	**Zone 1**
Topock	Topock
	Needles
zone 2	**Zone 2**
Pisgah	Needles
EOR	**EOR**
Arco (Texaco Exploration 6'99)	EOR Redelivery
Rio Bravo	
Chevron	
Dexzel	
Oxy USA	
Zone 3	**Zone 3**
Bakersfield(stock & allen)	Baksfld(STOCK)
Fellows	Monolith
Maricopa	lamont
Taft (lincoln&ash)	Kettleman
Kern River Intertie/Bakersfield (L202) & Bakersfield (L7309)	Buttonwillow
Oxy USA #11	Bakersfld(palm & west)
Sullivan Road	Taft(lincoln&date)
Zone 4	**Zone 4**
Adelaida	Atascadero
Creston	lamont
Selma area	Templeton
Shandon	Arigo (part of San Joaquin)
Unocal Shandon	San Joaquin-Floral& sj
	Raisin City-tap 111
	Raisin City-tap 138
	Morrow bay
	Other Creston

SOURCE	DELCODE	YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
			0.16880411	0.119687	0.091203	0.066224	0.054049	0.048797	0.034334	0.042392	0.056646	0.061454	0.087114	0.169297	
EXCH	X	2018	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2019	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2020	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2021	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2022	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2023	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2024	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2025	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2026	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2027	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2028	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2029	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2030	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2031	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2032	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2033	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2034	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00
EXCH	X	2035	51.82	36.74	28.00	20.33	16.59	14.98	10.54	13.01	17.39	18.87	26.74	51.97	307.00

2018 CALIFORNIA GAS REPORT

ENHANCED OIL RECOVERY-STEAM

Enhanced Oil Recovery - Steam

2018 CALIFORNIA GAS REPORT WORKPAPERS

Actuals were recorded for 1995 through 2017. Forecasted demand for 2018 to 2035 assumes that EOR is going to maintain at 2017 levels. Forecasted break out by service levels (Medium Pressure Distribution - MPD, High Pressure Distribution - HPD, and Transmission Level Service - TLS) was determined by using service level distributions from 2017 actuals.

SoCalGas 2018 CGR Demand Forecast for EOR Market
2018 CGR Forecast Years = 2018 thru 2035

			Steaming		
		MPD	HPD	TLS	Total
Units	Year	0.8%	87.5%	11.7%	100.0%
Mdth/year	1995 actual	126	14,352	1,917	**16,395**
Mdth/year	1995 actual	105	11,941	1,595	**13,640**
Mdth/year	1996 actual	121	13,839	1,849	**15,810**
Mdth/year	1997 actual	88	10,034	1,341	**11,463**
Mdth/year	1999 actual	75	8,528	1,139	**9,742**
Mdth/year	2000 actual	102	11,663	1,558	**13,323**
Mdth/year	2001 actual	87	9,887	1,321	**11,294**
Mdth/year	2002 actual	116	13,211	1,765	**15,091**
Mdth/year	2003 actual	123	14,017	1,873	**16,013**
Mdth/year	2004 actual	102	11,648	1,556	**13,306**
Mdth/year	2005 actual	101	11,459	1,531	**13,091**
Mdth/year	2006 actual	114	12,979	1,734	**14,827**
Mdth/year	2007 actual	115	13,081	1,748	**14,943**
Mdth/year	2008 actual	116	13,191	1,762	**15,069**
Mdth/year	2009 actual	104	11,888	1,588	**13,580**
Mdth/year	2010 actual	82	9,315	1,244	**10,641**
Mdth/year	2011 actual	80	9,088	1,214	**10,382**
Mdth/year	2012 actual	89	10,165	1,358	**11,612**
Mdth/year	2013 actual	104	11,833	1,581	**13,518**
Mdth/year	2014 actual	130	14,804	1,978	**16,911**
Mdth/year	2015 actual	135	15,374	2,054	**17,562**
Mdth/year	2016 actual	121	13,833	1,848	**15,802**
Mdth/year	2017 actual	132	15,044	2,010	**17,185**
Mdth/year	2018 forecast	132	15,044	2,010	**17,185**
Mdth/year	2019 forecast	132	15,044	2,010	**17,185**
Mdth/year	2020 forecast	132	15,044	2,010	**17,185**
Mdth/year	2021 forecast	132	15,044	2,010	**17,185**
Mdth/year	2022 forecast	132	15,044	2,010	**17,185**
Mdth/year	2023 forecast	132	15,044	2,010	**17,185**
Mdth/year	2024 forecast	132	15,044	2,010	**17,185**
Mdth/year	2025 forecast	132	15,044	2,010	**17,185**
Mdth/year	2026 forecast	132	15,044	2,010	**17,185**
Mdth/year	2027 forecast	132	15,044	2,010	**17,185**
Mdth/year	2028 forecast	132	15,044	2,010	**17,185**
Mdth/year	2029 forecast	132	15,044	2,010	**17,185**
Mdth/year	2030 forecast	132	15,044	2,010	**17,185**
Mdth/year	2031 forecast	132	15,044	2,010	**17,185**
Mdth/year	2032 forecast	132	15,044	2,010	**17,185**
Mdth/year	2033 forecast	132	15,044	2,010	**17,185**
Mdth/year	2034 forecast	132	15,044	2,010	**17,185**
Mdth/year	2035 forecast	132	15,044	2,010	**17,185**

2018 CALIFORNIA GAS REPORT

REFINERIES

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 average 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	80.5%
Feb	78.6%
Mar	80.9%
Apr	78.5%
May	79.5%
Jun	81.1%
Jul	81.4%
Aug	79.0%
Sep	79.2%
Oct	81.6%
Nov	81.9%
Dec	83.1%

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 (2017-2035)

Month	Ref G30 %	#Days per month	Month #	Total Ref Mdth	Total Ref Mdth/Day	Ln(Mdth_D)	ln(G/P): Moving 2-Mo Avg	Burner_tip_Gas (G) $/dth	Propane (P) $/dth
Jan-17	80.46%	31	1	10,904.1	351.7	5.8629	-0.6724	4.1314	8.6277
Feb-17	78.56%	28	2	9,258.1	330.6	5.8010	-0.8158	3.5199	8.6715
Mar-17	80.92%	31	3	9,875.2	318.6	5.7638	-0.8362	3.4216	7.3467
Apr-17	78.53%	30	4	9,492.6	316.4	5.7571	-0.7164	3.5955	7.0182
May-17	79.52%	31	5	10,244.8	330.5	5.8005	-0.6559	3.6325	6.9088
Jun-17	81.09%	30	6	9,766.1	325.5	5.7855	-0.6170	3.5509	6.4051
Jul-17	81.37%	31	7	10,035.4	323.7	5.7799	-0.6274	3.5757	6.9416
Aug-17	79.02%	31	8	9,956.4	321.2	5.7720	-0.7308	3.6787	8.1241
Sep-17	79.16%	30	9	9,883.9	329.5	5.7975	-0.8846	3.5811	9.4599
Oct-17	81.64%	31	10	10,860.7	350.3	5.8589	-1.0214	3.5393	10.3139
Nov-17	81.85%	30	11	10,191.6	339.7	5.8281	-1.0824	3.6530	10.9161
Dec-17	83.06%	31	12	10,308.3	332.5	5.8067	-1.0688	3.8219	10.8504
Jan-18	80.46%	31	1	9,826.0	317.0	5.7588	-0.8826	3.8805	7.7683
Feb-18	78.56%	28	2	8,803.4	314.4	5.7507	-0.7893	3.2151	7.8555
Mar-18	80.92%	31	3	9,809.7	316.4	5.7571	-0.8635	3.1631	7.2703
Apr-18	78.53%	30	4	9,470.4	315.7	5.7547	-0.8357	2.9549	6.8409
May-18	79.52%	31	5	9,810.9	316.5	5.7573	-0.8649	2.9193	7.1085
Jun-18	81.09%	30	6	9,478.0	315.9	5.7555	-0.8450	3.0276	6.7350
Jul-18	81.37%	31	7	9,738.3	314.1	5.7498	-0.7795	3.2302	6.9093
Aug-18	79.02%	31	8	9,738.2	314.1	5.7498	-0.7794	3.3511	7.4384
Sep-18	79.16%	30	9	9,518.5	317.3	5.7598	-0.8940	3.1486	8.4530
Oct-18	81.64%	31	10	9,993.2	322.4	5.7757	-1.0767	3.0191	9.6482
Nov-18	81.85%	30	11	9,744.7	324.8	5.7833	-1.1642	3.0726	9.8660
Dec-18	83.06%	31	12	10,025.0	323.4	5.7789	-1.1133	3.6320	10.5445
Jan-19	80.46%	31	1	9,850.1	317.7	5.7612	-0.9108	4.2120	8.9575
Feb-19	78.56%	28	2	8,788.3	313.9	5.7490	-0.7696	4.1278	9.0471
Mar-19	80.92%	31	3	9,752.1	314.6	5.7512	-0.7957	3.7658	8.4458
Apr-19	78.53%	30	4	9,476.5	315.9	5.7554	-0.8432	3.3132	8.0044
May-19	79.52%	31	5	9,842.0	317.5	5.7604	-0.9013	3.2990	8.2795
Jun-19	81.09%	30	6	9,516.1	317.2	5.7595	-0.8911	3.3359	7.8956
Jul-19	81.37%	31	7	9,785.5	315.7	5.7547	-0.8351	3.5925	8.0748
Aug-19	79.02%	31	8	9,792.3	315.9	5.7554	-0.8431	3.5921	8.6185
Sep-19	79.16%	30	9	9,573.4	319.1	5.7655	-0.9602	3.4054	9.6612
Oct-19	81.64%	31	10	10,020.7	323.2	5.7784	-1.1083	3.3790	10.8894
Nov-19	81.85%	30	11	9,705.0	323.5	5.7792	-1.1172	3.8201	11.1133
Dec-19	83.06%	31	12	9,987.0	322.2	5.7751	-1.0696	4.0463	11.8106
Jan-20	80.46%	31	1	9,894.0	319.2	5.7657	-0.9620	4.2108	9.7973
Feb-20	78.56%	29	2	9,169.4	316.2	5.7563	-0.8543	4.1706	9.8959
Mar-20	80.92%	31	3	9,792.7	315.9	5.7554	-0.8436	4.0583	9.2338
Apr-20	78.53%	30	4	9,494.4	316.5	5.7573	-0.8649	3.5141	8.7478
May-20	79.52%	31	5	9,856.7	318.0	5.7619	-0.9185	3.5898	9.0507
Jun-20	81.09%	30	6	9,518.8	317.3	5.7598	-0.8944	3.6384	8.6281
Jul-20	81.37%	31	7	9,798.1	316.1	5.7560	-0.8499	3.8224	8.8253
Aug-20	79.02%	31	8	9,817.0	316.7	5.7579	-0.8721	3.8074	9.4240
Sep-20	79.16%	30	9	9,598.7	320.0	5.7682	-0.9906	3.6184	10.5721
Oct-20	81.64%	31	10	10,049.6	324.2	5.7813	-1.1414	3.5662	11.9245
Nov-20	81.85%	30	11	9,742.5	324.7	5.7831	-1.1615	3.9758	12.1711
Dec-20	83.06%	31	12	10,035.1	323.7	5.7799	-1.1249	4.1774	12.9388
Jan-21	80.46%	31	1	9,922.4	320.1	5.7686	-0.9949	4.4560	10.4102
Feb-21	78.56%	28	2	8,856.2	316.3	5.7567	-0.8581	4.4152	10.5140
Mar-21	80.92%	31	3	9,786.0	315.7	5.7547	-0.8357	4.3999	9.8176
Apr-21	78.53%	30	4	9,478.7	316.0	5.7556	-0.8459	3.8078	9.3064
May-21	79.52%	31	5	9,849.9	317.7	5.7612	-0.9105	3.8085	9.6250
Jun-21	81.09%	30	6	9,523.0	317.4	5.7603	-0.8995	3.8413	9.1805
Jul-21	81.37%	31	7	9,804.7	316.3	5.7566	-0.8576	4.0346	9.3879
Aug-21	79.02%	31	8	9,819.2	316.7	5.7581	-0.8747	4.0575	10.0176
Sep-21	79.16%	30	9	9,592.2	319.7	5.7675	-0.9828	3.8929	11.2252
Oct-21	81.64%	31	10	10,037.9	323.8	5.7801	-1.1280	3.8340	12.6476
Nov-21	81.85%	30	11	9,732.0	324.4	5.7820	-1.1492	4.2639	12.9068
Dec-21	83.06%	31	12	10,027.5	323.5	5.7791	-1.1161	4.4559	13.7143

Base Forecast of Refinery Gas Demand (2017-2035)

Month	Ref G30 %	#Days per month	Month #	Total Ref Mdth	Total Ref Mdth/Day	Ln(Mdth_D)	ln(G/P): Moving 2-Mo Avg	Burner_tip_Gas (G) $/dth	Propane (P) $/dth
Jan-22	80.46%	31	1	9,913.3	319.8	5.7677	-0.9844	4.8116	11.0875
Feb-22	78.56%	28	2	8,845.4	315.9	5.7554	-0.8441	4.7695	11.1961
Mar-22	80.92%	31	3	9,774.0	315.3	5.7535	-0.8215	4.7571	10.4671
Apr-22	78.53%	30	4	9,462.1	315.4	5.7539	-0.8257	4.1762	9.9319
May-22	79.52%	31	5	9,826.2	317.0	5.7588	-0.8829	4.1773	10.2654
Jun-22	81.09%	30	6	9,500.3	316.7	5.7579	-0.8720	4.2122	9.8000
Jul-22	81.37%	31	7	9,778.4	315.4	5.7539	-0.8267	4.4575	10.0172
Aug-22	79.02%	31	8	9,791.4	315.9	5.7553	-0.8420	4.4582	10.6765
Sep-22	79.16%	30	9	9,566.0	318.9	5.7648	-0.9513	4.2772	11.9407
Oct-22	81.64%	31	10	10,009.3	322.9	5.7773	-1.0952	4.2084	13.4298
Nov-22	81.85%	30	11	9,710.1	323.7	5.7797	-1.1233	4.6150	13.7012
Dec-22	83.06%	31	12	10,011.5	323.0	5.7775	-1.0978	4.8088	14.5466
Jan-23	80.46%	31	1	9,876.2	318.6	5.7639	-0.9413	5.4191	11.6698
Feb-23	78.56%	28	2	8,803.3	314.4	5.7507	-0.7891	5.2339	11.7829
Mar-23	80.92%	31	3	9,745.2	314.4	5.7505	-0.7876	5.1417	11.0237
Apr-23	78.53%	30	4	9,408.8	313.6	5.7482	-0.7607	4.9019	10.4664
May-23	79.52%	31	5	9,733.8	314.0	5.7494	-0.7742	4.9100	10.8137
Jun-23	81.09%	30	6	9,401.7	313.4	5.7474	-0.7520	5.0572	10.3291
Jul-23	81.37%	31	7	9,682.8	312.3	5.7441	-0.7138	5.1715	10.5553
Aug-23	79.02%	31	8	9,699.0	312.9	5.7458	-0.7330	5.3009	11.2418
Sep-23	79.16%	30	9	9,457.1	315.2	5.7533	-0.8196	5.1860	12.5582
Oct-23	81.64%	31	10	9,876.5	318.6	5.7639	-0.9416	5.2145	14.1089
Nov-23	81.85%	30	11	9,605.7	320.2	5.7689	-0.9989	5.2814	14.3916
Dec-23	83.06%	31	12	9,913.4	319.8	5.7677	-0.9845	5.8021	15.2720
Jan-24	80.46%	31	1	9,789.9	315.8	5.7551	-0.8403	6.0652	12.2247
Feb-24	78.56%	29	2	9,069.7	312.7	5.7454	-0.7284	5.7924	12.3415
Mar-24	80.92%	31	3	9,700.4	312.9	5.7459	-0.7347	5.6709	11.5574
Apr-24	78.53%	30	4	9,354.4	311.8	5.7424	-0.6940	5.5889	10.9819
May-24	79.52%	31	5	9,665.6	311.8	5.7423	-0.6933	5.5706	11.3406
Jun-24	81.09%	30	6	9,338.2	311.3	5.7407	-0.6740	5.7337	10.8401
Jul-24	81.37%	31	7	9,616.2	310.2	5.7372	-0.6344	5.8863	11.0737
Aug-24	79.02%	31	8	9,631.3	310.7	5.7388	-0.6524	6.0172	11.7826
Sep-24	79.16%	30	9	9,387.1	312.9	5.7459	-0.7341	5.9451	13.1422
Oct-24	81.64%	31	10	9,801.6	316.2	5.7563	-0.8540	5.9262	14.7437
Nov-24	81.85%	30	11	9,540.6	318.0	5.7621	-0.9207	5.9334	15.0356
Dec-24	83.06%	31	12	9,847.5	317.7	5.7610	-0.9077	6.5653	15.9448
Jan-25	80.46%	31	1	9,720.5	313.6	5.7480	-0.7585	6.8977	12.7991
Feb-25	78.56%	28	2	8,698.3	310.7	5.7387	-0.6512	6.5123	12.9189
Mar-25	80.92%	31	3	9,643.4	311.1	5.7400	-0.6669	6.3378	12.1144
Apr-25	78.53%	30	4	9,297.0	309.9	5.7362	-0.6232	6.3372	11.5238
May-25	79.52%	31	5	9,603.8	309.8	5.7359	-0.6196	6.2645	11.8918
Jun-25	81.09%	30	6	9,284.9	309.5	5.7349	-0.6082	6.4021	11.3783
Jul-25	81.37%	31	7	9,566.5	308.6	5.7320	-0.5748	6.5406	11.6180
Aug-25	79.02%	31	8	9,585.8	309.2	5.7340	-0.5979	6.6382	12.3455
Sep-25	79.16%	30	9	9,345.0	311.5	5.7414	-0.6825	6.5443	13.7406
Oct-25	81.64%	31	10	9,760.0	314.8	5.7521	-0.8051	6.4762	15.3840
Nov-25	81.85%	30	11	9,504.7	316.8	5.7583	-0.8773	6.4445	15.6835
Dec-25	83.06%	31	12	9,816.7	316.7	5.7579	-0.8717	7.0643	16.6165
Jan-26	80.46%	31	1	9,692.1	312.6	5.7451	-0.7248	7.4471	13.3393
Feb-26	78.56%	28	2	8,670.4	309.7	5.7355	-0.6143	7.0536	13.4621
Mar-26	80.92%	31	3	9,611.0	310.0	5.7367	-0.6281	6.8729	12.6373
Apr-26	78.53%	30	4	9,266.1	308.9	5.7329	-0.5849	6.8713	12.0319
May-26	79.52%	31	5	9,572.1	308.8	5.7326	-0.5815	6.7932	12.4092
Jun-26	81.09%	30	6	9,254.9	308.5	5.7317	-0.5710	6.9310	11.8828
Jul-26	81.37%	31	7	9,536.9	307.6	5.7289	-0.5391	7.0737	12.1284
Aug-26	79.02%	31	8	9,556.3	308.3	5.7310	-0.5625	7.1730	12.8742
Sep-26	79.16%	30	9	9,314.9	310.5	5.7382	-0.6453	7.0825	14.3044
Oct-26	81.64%	31	10	9,726.3	313.8	5.7486	-0.7653	7.0104	15.9890
Nov-26	81.85%	30	11	9,470.9	315.7	5.7548	-0.8364	6.9775	16.2961
Dec-26	83.06%	31	12	9,783.3	315.6	5.7544	-0.8325	7.6141	17.2525

Base Forecast of Refinery Gas Demand (2017-2035)

Month	Ref G30 %	#Days per month	Month #	Total Ref Mdth	Total Ref Mdth/Day	Ln(Mdth_D)	ln(G/P): Moving 2-Mo Avg	Burner_tip_Gas (G) $/dth	Propane (P) $/dth
Jan-27	80.46%	31	1	9,660.8	311.6	5.7418	-0.6875	8.0778	13.9556
Feb-27	78.56%	28	2	8,642.0	308.6	5.7322	-0.5765	7.6753	14.0813
Mar-27	80.92%	31	3	9,578.1	309.0	5.7332	-0.5887	7.4874	13.2370
Apr-27	78.53%	30	4	9,235.0	307.8	5.7296	-0.5463	7.4841	12.6172
May-27	79.52%	31	5	9,540.2	307.7	5.7293	-0.5431	7.3994	13.0035
Jun-27	81.09%	30	6	9,224.9	307.5	5.7285	-0.5336	7.5370	12.4645
Jul-27	81.37%	31	7	9,507.3	306.7	5.7258	-0.5034	7.6845	12.7160
Aug-27	79.02%	31	8	9,526.6	307.3	5.7279	-0.5267	7.7860	13.4795
Sep-27	79.16%	30	9	9,284.1	309.5	5.7349	-0.6073	7.6993	14.9436
Oct-27	81.64%	31	10	9,691.6	312.6	5.7450	-0.7242	7.6226	16.6681
Nov-27	81.85%	30	11	9,436.1	314.5	5.7511	-0.7940	7.5886	16.9825
Dec-27	83.06%	31	12	9,748.6	314.5	5.7509	-0.7916	8.2446	17.9615
Jan-28	80.46%	31	1	9,628.6	310.6	5.7385	-0.6491	8.8383	14.7337
Feb-28	78.56%	29	2	8,921.5	307.6	5.7289	-0.5390	8.4269	14.8629
Mar-28	80.92%	31	3	9,545.5	307.9	5.7298	-0.5495	8.2313	13.9956
Apr-28	78.53%	30	4	9,204.4	306.8	5.7262	-0.5081	8.2256	13.3589
May-28	79.52%	31	5	9,508.9	306.7	5.7260	-0.5053	8.1333	13.7557
Jun-28	81.09%	30	6	9,195.4	306.5	5.7253	-0.4968	8.2700	13.2021
Jul-28	81.37%	31	7	9,478.4	305.8	5.7228	-0.4683	8.4224	13.4604
Aug-28	79.02%	31	8	9,497.4	306.4	5.7248	-0.4914	8.5265	14.2447
Sep-28	79.16%	30	9	9,253.7	308.5	5.7316	-0.5695	8.4437	15.7487
Oct-28	81.64%	31	10	9,656.9	311.5	5.7414	-0.6829	8.3619	17.5203
Nov-28	81.85%	30	11	9,400.8	313.4	5.7474	-0.7509	8.3273	17.8432
Dec-28	83.06%	31	12	9,713.4	313.3	5.7473	-0.7501	9.0037	18.8489
Jan-29	80.46%	31	1	9,600.6	309.7	5.7356	-0.6157	9.6288	15.6397
Feb-29	78.56%	28	2	8,593.5	306.9	5.7266	-0.5118	9.2020	15.7742
Mar-29	80.92%	31	3	9,522.0	307.2	5.7274	-0.5211	8.9978	14.8711
Apr-29	78.53%	30	4	9,182.0	306.1	5.7238	-0.4801	8.9949	14.2081
May-29	79.52%	31	5	9,485.6	306.0	5.7235	-0.4770	8.8976	14.6212
Jun-29	81.09%	30	6	9,173.1	305.8	5.7228	-0.4689	9.0384	14.0447
Jul-29	81.37%	31	7	9,456.3	305.0	5.7205	-0.4415	9.1978	14.3138
Aug-29	79.02%	31	8	9,475.4	305.7	5.7225	-0.4647	9.3027	15.1305
Sep-29	79.16%	30	9	9,230.8	307.7	5.7291	-0.5410	9.2257	16.6966
Oct-29	81.64%	31	10	9,630.7	310.7	5.7387	-0.6517	9.1390	18.5414
Nov-29	81.85%	30	11	9,374.4	312.5	5.7445	-0.7186	9.0999	18.8777
Dec-29	83.06%	31	12	9,687.4	312.5	5.7446	-0.7193	9.8013	19.9250
Jan-30	80.46%	31	1	9,580.5	309.0	5.7335	-0.5916	10.2950	16.3872
Feb-30	78.56%	28	2	8,577.6	306.3	5.7247	-0.4905	9.8591	16.5260
Mar-30	80.92%	31	3	9,503.4	306.6	5.7254	-0.4987	9.6481	15.5938
Apr-30	78.53%	30	4	9,164.5	305.5	5.7219	-0.4581	9.6438	14.9095
May-30	79.52%	31	5	9,467.6	305.4	5.7216	-0.4553	9.5404	15.3359
Jun-30	81.09%	30	6	9,156.2	305.2	5.7210	-0.4477	9.6813	14.7409
Jul-30	81.37%	31	7	9,439.8	304.5	5.7187	-0.4214	9.8453	15.0186
Aug-30	79.02%	31	8	9,458.8	305.1	5.7207	-0.4446	9.9522	15.8616
Sep-30	79.16%	30	9	9,213.5	307.1	5.7272	-0.5195	9.8789	17.4781
Oct-30	81.64%	31	10	9,611.1	310.0	5.7367	-0.6282	9.7878	19.3823
Nov-30	81.85%	30	11	9,354.5	311.8	5.7424	-0.6942	9.7476	19.7295
Dec-30	83.06%	31	12	9,667.7	311.9	5.7426	-0.6958	10.4678	20.8105
Jan-31	80.46%	31	1	9,569.6	308.7	5.7324	-0.5784	10.8663	17.2337
Feb-31	78.56%	28	2	8,574.5	306.2	5.7243	-0.4863	10.4164	17.3780
Mar-31	80.92%	31	3	9,499.7	306.4	5.7250	-0.4941	10.1977	16.4091
Apr-31	78.53%	30	4	9,161.1	305.4	5.7215	-0.4538	10.1962	15.6980
May-31	79.52%	31	5	9,464.0	305.3	5.7213	-0.4508	10.0886	16.1411
Jun-31	81.09%	30	6	9,152.8	305.1	5.7206	-0.4435	10.2334	15.5227
Jul-31	81.37%	31	7	9,436.7	304.4	5.7184	-0.4176	10.4036	15.8113
Aug-31	79.02%	31	8	9,455.7	305.0	5.7204	-0.4407	10.5112	16.6874
Sep-31	79.16%	30	9	9,209.6	307.0	5.7268	-0.5146	10.4430	18.3674
Oct-31	81.64%	31	10	9,605.6	309.9	5.7361	-0.6217	10.3477	20.3463
Nov-31	81.85%	30	11	9,348.8	311.6	5.7418	-0.6871	10.3033	20.7070
Dec-31	83.06%	31	12	9,662.3	311.7	5.7420	-0.6894	11.0459	21.8305

Base Forecast of Refinery Gas Demand (2017-2035)

Month	Ref G30 %	#Days per month	Month #	Total Ref Mdth	Total Ref Mdth/Day	Ln(Mdth_D)	ln(G/P): Moving 2-Mo Avg	Burner_tip_Gas (G) $/dth	Propane (P) $/dth
Jan-32	80.46%	31	1	9,567.8	308.6	5.7322	-0.5763	11.4401	18.1823
Feb-32	78.56%	29	2	8,882.0	306.3	5.7245	-0.4879	10.9781	18.3329
Mar-32	80.92%	31	3	9,500.5	306.5	5.7251	-0.4952	10.7527	17.3222
Apr-32	78.53%	30	4	9,162.1	305.4	5.7216	-0.4552	10.7534	16.5803
May-32	79.52%	31	5	9,465.0	305.3	5.7214	-0.4520	10.6420	17.0427
Jun-32	81.09%	30	6	9,153.9	305.1	5.7207	-0.4449	10.7902	16.3976
Jul-32	81.37%	31	7	9,438.3	304.5	5.7185	-0.4195	10.9658	16.6986
Aug-32	79.02%	31	8	9,457.2	305.1	5.7205	-0.4426	11.0740	17.6125
Sep-32	79.16%	30	9	9,210.3	307.0	5.7269	-0.5154	11.0103	19.3650
Oct-32	81.64%	31	10	9,605.1	309.8	5.7361	-0.6211	10.9112	21.4293
Nov-32	81.85%	30	11	9,347.8	311.6	5.7417	-0.6859	10.8633	21.8057
Dec-32	83.06%	31	12	9,661.8	311.7	5.7420	-0.6888	11.6256	22.9776
Jan-33	80.46%	31	1	9,570.9	308.7	5.7325	-0.5800	11.9656	19.1582
Feb-33	78.56%	28	2	8,580.9	306.5	5.7251	-0.4949	11.4897	19.3148
Mar-33	80.92%	31	3	9,506.1	306.6	5.7257	-0.5019	11.2590	18.2630
Apr-33	78.53%	30	4	9,167.6	305.6	5.7222	-0.4620	11.2656	17.4909
May-33	79.52%	31	5	9,470.3	305.5	5.7219	-0.4586	11.1538	17.9720
Jun-33	81.09%	30	6	9,159.0	305.3	5.7213	-0.4513	11.3085	17.3006
Jul-33	81.37%	31	7	9,443.8	304.6	5.7191	-0.4262	11.4894	17.6140
Aug-33	79.02%	31	8	9,462.7	305.2	5.7211	-0.4493	11.5966	18.5651
Sep-33	79.16%	30	9	9,214.8	307.2	5.7274	-0.5211	11.5375	20.3891
Oct-33	81.64%	31	10	9,608.5	310.0	5.7364	-0.6251	11.4360	22.5376
Nov-33	81.85%	30	11	9,350.6	311.7	5.7420	-0.6894	11.3826	22.9292
Dec-33	83.06%	31	12	9,665.3	311.8	5.7423	-0.6929	12.1622	24.1489
Jan-34	80.46%	31	1	9,568.0	308.6	5.7322	-0.5766	12.7211	20.1408
Feb-34	78.56%	28	2	8,572.0	306.1	5.7241	-0.4829	12.2322	20.3032
Mar-34	80.92%	31	3	9,495.7	306.3	5.7246	-0.4893	11.9921	19.2126
Apr-34	78.53%	30	4	9,158.0	305.3	5.7212	-0.4500	11.9979	18.4120
May-34	79.52%	31	5	9,460.6	305.2	5.7209	-0.4467	11.8783	18.9109
Jun-34	81.09%	30	6	9,150.0	305.0	5.7203	-0.4399	12.0339	18.2147
Jul-34	81.37%	31	7	9,435.1	304.4	5.7182	-0.4156	12.2214	18.5396
Aug-34	79.02%	31	8	9,453.8	305.0	5.7202	-0.4385	12.3310	19.5258
Sep-34	79.16%	30	9	9,205.2	306.8	5.7263	-0.5091	12.2772	21.4171
Oct-34	81.64%	31	10	9,597.1	309.6	5.7352	-0.6115	12.1699	23.6449
Nov-34	81.85%	30	11	9,339.0	311.3	5.7408	-0.6750	12.1141	24.0510
Dec-34	83.06%	31	12	9,653.6	311.4	5.7411	-0.6791	12.9195	25.3157
Jan-35	80.46%	31	1	9,563.3	308.5	5.7317	-0.5709	13.3772	21.2272
Feb-35	78.56%	28	2	8,573.3	306.2	5.7242	-0.4847	12.8728	21.3961
Mar-35	80.92%	31	3	9,497.0	306.4	5.7247	-0.4909	12.6255	20.2620
Apr-35	78.53%	30	4	9,159.5	305.3	5.7214	-0.4519	12.6359	19.4295
May-35	79.52%	31	5	9,462.0	305.2	5.7210	-0.4484	12.5135	19.9483
Jun-35	81.09%	30	6	9,151.3	305.0	5.7205	-0.4416	12.6747	19.2244
Jul-35	81.37%	31	7	9,436.8	304.4	5.7184	-0.4177	12.8687	19.5622
Aug-35	79.02%	31	8	9,455.4	305.0	5.7204	-0.4404	12.9781	20.5877
Sep-35	79.16%	30	9	9,205.9	306.9	5.7264	-0.5100	12.9297	22.5543
Oct-35	81.64%	31	10	9,596.5	309.6	5.7352	-0.6108	12.8186	24.8709
Nov-35	81.85%	30	11	9,337.8	311.3	5.7406	-0.6736	12.7576	25.2931
Dec-35	83.06%	31	12	9,652.9	311.4	5.7410	-0.6781	13.5854	26.6082

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

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 above as the Base forecast of refinery gas demand. 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:

G-30 Refinery Gas Demand, Aug-2020 = (7,757.1) - (100.7) = (7,656.4 MDth).

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

C. Refinery Cogeneration Gas Demand

Gas used for cogeneration at refineries receives G-50 rate treatment does not have out-of-model adjustment. The G-50 gas demand forecast for cogeneration for August 2020 is:

G-50 Refinery Gas Demand, Aug-2020 = (2,059.9 MDth).

REFINERY GAS DEMAND FORECASTS

A. Annual Forecast Table

The first table below provides annual gas demand for the refinery segment. Recorded data are for year 2017, while forecasts cover years 2018-2035.

B. Monthly Forecast Tables

The additional four tables below provide monthly gas demand for the refinery segment. Recorded data are for year 2017, while forecasts cover years 2018-2035.

Annual Refinery Gas Demand: Recorded (2017)

Forecast (2018-2035) (MDth)

		Refinery Industrial (G-30) Gas Demand			Refinery Cogeneration (G-50) Gas Demand			
Year	Total Refinery (G30 + G50) (MDth)	Ref **G30**, Base Econ. Fcst	Accum. EE/DSM Scg Pgm Savings for **Refinery G-30**	Base Ref **G30,** *less* EE/DSM (MDth)	Cal. Days per Year	Ref **G50**, Base Econ. Fcst	Out-of-model Adj. for **Refinery G-50**	Base Ref **G50** *plus* Out-of-model Adj (MDth)
2017	**120,777**	97,187	0	97,187	365	23,590	0	23,590
2018	**115,564**	93,301	392	92,908	365	22,656	0	22,656
2019	**115,322**	93,405	767	92,638	365	22,684	0	22,684
2020	**115,578**	93,944	1,189	92,756	366	22,823	0	22,823
2021	**114,772**	93,679	1,657	92,022	365	22,751	0	22,751
2022	**114,070**	93,485	2,118	91,367	365	22,703	0	22,703
2023	**112,593**	92,691	2,610	90,081	365	22,513	0	22,513
2024	**111,648**	92,313	3,094	89,219	366	22,429	0	22,429
2025	**110,256**	91,584	3,571	88,013	365	22,243	0	22,243
2026	**109,471**	91,285	3,984	87,300	365	22,170	0	22,170
2027	**108,708**	90,979	4,367	86,612	365	22,096	0	22,096
2028	**108,255**	90,916	4,750	86,167	366	22,089	0	22,089
2029	**107,287**	90,445	5,125	85,320	365	21,967	0	21,967
2030	**106,688**	90,271	5,507	84,763	365	21,925	0	21,925
2031	**106,340**	90,226	5,801	84,426	365	21,914	0	21,914
2032	**106,281**	90,471	6,171	84,300	366	21,981	0	21,981
2033	**106,039**	90,274	6,161	84,113	365	21,926	0	21,926
2034	**105,919**	90,184	6,169	84,015	365	21,904	0	21,904
2035	**105,962**	90,187	6,130	84,056	365	21,905	0	21,905

Monthly Refinery Gas Demand: Recorded (2017)

Forecast (2018-2035) (MDth)

		Refinery Industrial (G-30) Gas Demand			Refinery Cogeneration (G-50) Gas Demand			
Month	Total Refinery (G30 + G50) (MDth)	Ref **G30**, Base Econ. Fcst	Accum. EE/DSM Scg Pgm Savings for **Refinery G-30**	Cal. Days per Year	Cal. Days per Month	Ref **G50**, Base Econ. Fcst	Out-of-model Adj. for **Refinery G-50**	Base Ref **G50** *plus* Out-of-model Adj (MDth)
Jan-17	**10,904**	8,773	0	8,773	31	2,131	0	2,131
Feb-17	**9,258**	7,273	0	7,273	28	1,985	0	1,985
Mar-17	**9,875**	7,991	0	7,991	31	1,884	0	1,884
Apr-17	**9,493**	7,455	0	7,455	30	2,038	0	2,038
May-17	**10,245**	8,147	0	8,147	31	2,098	0	2,098
Jun-17	**9,766**	7,919	0	7,919	30	1,847	0	1,847
Jul-17	**10,035**	8,166	0	8,166	31	1,870	0	1,870
Aug-17	**9,956**	7,867	0	7,867	31	2,089	0	2,089
Sep-17	**9,884**	7,824	0	7,824	30	2,059	0	2,059
Oct-17	**10,861**	8,867	0	8,867	31	1,994	0	1,994
Nov-17	**10,192**	8,342	0	8,342	30	1,850	0	1,850
Dec-17	**10,308**	8,562	0	8,562	31	1,746	0	1,746
Jan-18	**9,793**	7,906	33	7,873	31	1,920	0	1,920
Feb-18	**8,773**	6,916	30	6,886	28	1,888	0	1,888
Mar-18	**9,776**	7,938	33	7,905	31	1,872	0	1,872
Apr-18	**9,438**	7,437	32	7,405	30	2,033	0	2,033
May-18	**9,778**	7,802	33	7,769	31	2,009	0	2,009
Jun-18	**9,446**	7,685	32	7,653	30	1,792	0	1,792
Jul-18	**9,705**	7,924	33	7,891	31	1,814	0	1,814
Aug-18	**9,705**	7,695	33	7,661	31	2,043	0	2,043
Sep-18	**9,486**	7,535	32	7,503	30	1,983	0	1,983
Oct-18	**9,960**	8,159	33	8,125	31	1,834	0	1,834
Nov-18	**9,712**	7,976	32	7,944	30	1,768	0	1,768
Dec-18	**9,992**	8,327	33	8,294	31	1,698	0	1,698
Jan-19	**9,785**	7,925	65	7,860	31	1,925	0	1,925
Feb-19	**8,729**	6,904	59	6,845	28	1,884	0	1,884
Mar-19	**9,687**	7,891	65	7,826	31	1,861	0	1,861
Apr-19	**9,413**	7,442	63	7,379	30	2,034	0	2,034
May-19	**9,777**	7,827	65	7,762	31	2,015	0	2,015
Jun-19	**9,453**	7,716	63	7,653	30	1,800	0	1,800
Jul-19	**9,720**	7,962	65	7,897	31	1,823	0	1,823
Aug-19	**9,727**	7,738	65	7,672	31	2,055	0	2,055
Sep-19	**9,510**	7,579	63	7,516	30	1,995	0	1,995
Oct-19	**9,956**	8,181	65	8,116	31	1,839	0	1,839
Nov-19	**9,642**	7,944	63	7,881	30	1,761	0	1,761
Dec-19	**9,922**	8,296	65	8,230	31	1,691	0	1,691
Jan-20	**9,793**	7,961	101	7,860	31	1,933	0	1,933
Feb-20	**9,075**	7,203	94	7,109	29	1,966	0	1,966
Mar-20	**9,692**	7,924	101	7,824	31	1,868	0	1,868
Apr-20	**9,397**	7,456	97	7,359	30	2,038	0	2,038
May-20	**9,756**	7,838	101	7,738	31	2,018	0	2,018
Jun-20	**9,421**	7,719	97	7,621	30	1,800	0	1,800
Jul-20	**9,697**	7,973	101	7,872	31	1,825	0	1,825
Aug-20	**9,716**	7,757	101	7,656	31	2,060	0	2,060
Sep-20	**9,501**	7,599	97	7,501	30	2,000	0	2,000
Oct-20	**9,949**	8,205	101	8,104	31	1,845	0	1,845
Nov-20	**9,645**	7,974	97	7,877	30	1,768	0	1,768
Dec-20	**9,934**	8,336	101	8,235	31	1,700	0	1,700

Monthly Refinery Gas Demand: Recorded (2017)

Forecast (2018-2035) (MDth)

		Refinery Industrial (G-30) Gas Demand			Refinery Cogeneration (G-50) Gas Demand			
Month	Total Refinery (G30 + G50) (MDth)	Ref **G30**, Base Econ. Fcst	Accum. EE/DSM Scg Pgm Savings for **Refinery G-30**	Cal. Days per Year	Cal. Days per Month	Ref **G50**, Base Econ. Fcst	Out-of-model Adj. for **Refinery G-50**	Base Ref **G50** *plus* Out-of-model Adj (MDth)
Jan-21	**9,782**	7,984	141	7,843	31	1,939	0	1,939
Feb-21	**8,729**	6,957	127	6,830	28	1,899	0	1,899
Mar-21	**9,645**	7,919	141	7,778	31	1,867	0	1,867
Apr-21	**9,342**	7,444	136	7,308	30	2,035	0	2,035
May-21	**9,709**	7,833	141	7,692	31	2,017	0	2,017
Jun-21	**9,387**	7,722	136	7,586	30	1,801	0	1,801
Jul-21	**9,664**	7,978	141	7,837	31	1,827	0	1,827
Aug-21	**9,678**	7,759	141	7,618	31	2,060	0	2,060
Sep-21	**9,456**	7,594	136	7,457	30	1,999	0	1,999
Oct-21	**9,897**	8,195	141	8,055	31	1,843	0	1,843
Nov-21	**9,596**	7,966	136	7,830	30	1,766	0	1,766
Dec-21	**9,887**	8,329	141	8,188	31	1,698	0	1,698
Jan-22	**9,733**	7,976	180	7,796	31	1,937	0	1,937
Feb-22	**8,683**	6,949	162	6,786	28	1,897	0	1,897
Mar-22	**9,594**	7,909	180	7,729	31	1,865	0	1,865
Apr-22	**9,288**	7,431	174	7,257	30	2,031	0	2,031
May-22	**9,646**	7,814	180	7,634	31	2,012	0	2,012
Jun-22	**9,326**	7,704	174	7,530	30	1,797	0	1,797
Jul-22	**9,598**	7,957	180	7,777	31	1,822	0	1,822
Aug-22	**9,611**	7,737	180	7,557	31	2,055	0	2,055
Sep-22	**9,392**	7,573	174	7,399	30	1,993	0	1,993
Oct-22	**9,829**	8,172	180	7,992	31	1,837	0	1,837
Nov-22	**9,536**	7,948	174	7,774	30	1,762	0	1,762
Dec-22	**9,832**	8,316	180	8,136	31	1,696	0	1,696
Jan-23	**9,655**	7,946	222	7,725	31	1,930	0	1,930
Feb-23	**8,603**	6,916	200	6,715	28	1,888	0	1,888
Mar-23	**9,523**	7,886	222	7,664	31	1,859	0	1,859
Apr-23	**9,194**	7,389	215	7,174	30	2,020	0	2,020
May-23	**9,512**	7,741	222	7,519	31	1,993	0	1,993
Jun-23	**9,187**	7,624	215	7,409	30	1,778	0	1,778
Jul-23	**9,461**	7,879	222	7,657	31	1,804	0	1,804
Aug-23	**9,477**	7,664	222	7,442	31	2,035	0	2,035
Sep-23	**9,243**	7,487	215	7,272	30	1,971	0	1,971
Oct-23	**9,655**	8,064	222	7,842	31	1,813	0	1,813
Nov-23	**9,391**	7,862	215	7,648	30	1,743	0	1,743
Dec-23	**9,692**	8,234	222	8,013	31	1,679	0	1,679
Jan-24	**9,528**	7,877	262	7,615	31	1,913	0	1,913
Feb-24	**8,824**	7,125	245	6,880	29	1,945	0	1,945
Mar-24	**9,438**	7,850	262	7,588	31	1,851	0	1,851
Apr-24	**9,101**	7,346	254	7,093	30	2,008	0	2,008
May-24	**9,404**	7,687	262	7,424	31	1,979	0	1,979
Jun-24	**9,085**	7,572	254	7,319	30	1,766	0	1,766
Jul-24	**9,354**	7,825	262	7,563	31	1,792	0	1,792
Aug-24	**9,369**	7,610	262	7,348	31	2,021	0	2,021
Sep-24	**9,133**	7,431	254	7,177	30	1,956	0	1,956
Oct-24	**9,540**	8,002	262	7,740	31	1,799	0	1,799
Nov-24	**9,287**	7,809	254	7,555	30	1,731	0	1,731
Dec-24	**9,585**	8,180	262	7,918	31	1,668	0	1,668
Jan-25	**9,417**	7,821	303	7,518	31	1,899	0	1,899
Feb-25	**8,424**	6,833	274	6,559	28	1,865	0	1,865
Mar-25	**9,340**	7,803	303	7,500	31	1,840	0	1,840
Apr-25	**9,004**	7,301	293	7,008	30	1,996	0	1,996
May-25	**9,301**	7,637	303	7,334	31	1,966	0	1,966
Jun-25	**8,991**	7,529	293	7,235	30	1,756	0	1,756
Jul-25	**9,263**	7,784	303	7,481	31	1,782	0	1,782
Aug-25	**9,283**	7,574	303	7,271	31	2,011	0	2,011
Sep-25	**9,052**	7,398	293	7,104	30	1,947	0	1,947
Oct-25	**9,457**	7,968	303	7,665	31	1,792	0	1,792
Nov-25	**9,211**	7,780	293	7,486	30	1,725	0	1,725
Dec-25	**9,513**	8,154	303	7,851	31	1,663	0	1,663

Monthly Refinery Gas Demand: Recorded (2017)

Forecast (2018-2035) (MDth)

		Refinery Industrial (G-30) Gas Demand			Refinery Cogeneration (G-50) Gas Demand			
Month	Total Refinery (G30 + G50) (MDth)	Ref **G30**, Base Econ. Fcst	Accum. EE/DSM Scg Pgm Savings for **Refinery G-30**	Cal. Days per Year	Cal. Days per Month	Ref **G50**, Base Econ. Fcst	Out-of-model Adj. for **Refinery G-50**	Base Ref **G50** *plus* Out-of-model Adj (MDth)
Jan-26	**9,354**	7,798	338	7,460	31	1,894	0	1,894
Feb-26	**8,365**	6,811	306	6,506	28	1,859	0	1,859
Mar-26	**9,273**	7,777	338	7,439	31	1,834	0	1,834
Apr-26	**8,939**	7,277	327	6,949	30	1,989	0	1,989
May-26	**9,234**	7,612	338	7,274	31	1,960	0	1,960
Jun-26	**8,927**	7,505	327	7,177	30	1,750	0	1,750
Jul-26	**9,199**	7,760	338	7,422	31	1,777	0	1,777
Aug-26	**9,218**	7,551	338	7,213	31	2,005	0	2,005
Sep-26	**8,987**	7,374	327	7,046	30	1,941	0	1,941
Oct-26	**9,388**	7,941	338	7,602	31	1,785	0	1,785
Nov-26	**9,143**	7,752	327	7,425	30	1,719	0	1,719
Dec-26	**9,445**	8,126	338	7,788	31	1,657	0	1,657
Jan-27	**9,290**	7,773	371	7,402	31	1,888	0	1,888
Feb-27	**8,307**	6,789	335	6,454	28	1,853	0	1,853
Mar-27	**9,207**	7,751	371	7,380	31	1,828	0	1,828
Apr-27	**8,876**	7,252	359	6,893	30	1,983	0	1,983
May-27	**9,169**	7,587	371	7,216	31	1,953	0	1,953
Jun-27	**8,866**	7,480	359	7,121	30	1,745	0	1,745
Jul-27	**9,136**	7,736	371	7,365	31	1,771	0	1,771
Aug-27	**9,156**	7,528	371	7,157	31	1,999	0	1,999
Sep-27	**8,925**	7,350	359	6,991	30	1,934	0	1,934
Oct-27	**9,321**	7,913	371	7,542	31	1,779	0	1,779
Nov-27	**9,077**	7,724	359	7,365	30	1,712	0	1,712
Dec-27	**9,378**	8,098	371	7,727	31	1,651	0	1,651
Jan-28	**9,226**	7,747	402	7,345	31	1,881	0	1,881
Feb-28	**8,545**	7,008	376	6,632	29	1,913	0	1,913
Mar-28	**9,143**	7,724	402	7,322	31	1,821	0	1,821
Apr-28	**8,815**	7,228	389	6,839	30	1,976	0	1,976
May-28	**9,107**	7,562	402	7,160	31	1,947	0	1,947
Jun-28	**8,806**	7,456	389	7,067	30	1,739	0	1,739
Jul-28	**9,076**	7,712	402	7,310	31	1,766	0	1,766
Aug-28	**9,095**	7,505	402	7,102	31	1,993	0	1,993
Sep-28	**8,864**	7,326	389	6,936	30	1,928	0	1,928
Oct-28	**9,255**	7,884	402	7,482	31	1,773	0	1,773
Nov-28	**9,011**	7,695	389	7,305	30	1,706	0	1,706
Dec-28	**9,311**	8,068	402	7,666	31	1,645	0	1,645
Jan-29	**9,165**	7,725	435	7,289	31	1,876	0	1,876
Feb-29	**8,200**	6,751	393	6,358	28	1,843	0	1,843
Mar-29	**9,087**	7,705	435	7,270	31	1,817	0	1,817
Apr-29	**8,761**	7,211	421	6,790	30	1,971	0	1,971
May-29	**9,050**	7,543	435	7,108	31	1,942	0	1,942
Jun-29	**8,752**	7,438	421	7,017	30	1,735	0	1,735
Jul-29	**9,021**	7,695	435	7,259	31	1,762	0	1,762
Aug-29	**9,040**	7,487	435	7,052	31	1,988	0	1,988
Sep-29	**8,810**	7,307	421	6,886	30	1,923	0	1,923
Oct-29	**9,195**	7,863	435	7,428	31	1,768	0	1,768
Nov-29	**8,953**	7,673	421	7,252	30	1,701	0	1,701
Dec-29	**9,252**	8,047	435	7,612	31	1,641	0	1,641
Jan-30	**9,113**	7,708	468	7,241	31	1,872	0	1,872
Feb-30	**8,155**	6,738	422	6,316	28	1,839	0	1,839
Mar-30	**9,036**	7,690	468	7,222	31	1,813	0	1,813
Apr-30	**8,712**	7,197	453	6,744	30	1,968	0	1,968
May-30	**9,000**	7,529	468	7,061	31	1,939	0	1,939
Jun-30	**8,704**	7,425	453	6,972	30	1,732	0	1,732
Jul-30	**8,972**	7,681	468	7,213	31	1,759	0	1,759
Aug-30	**8,991**	7,474	468	7,006	31	1,985	0	1,985
Sep-30	**8,761**	7,294	453	6,841	30	1,920	0	1,920
Oct-30	**9,143**	7,847	468	7,379	31	1,764	0	1,764
Nov-30	**8,902**	7,657	453	7,204	30	1,698	0	1,698
Dec-30	**9,200**	8,030	468	7,563	31	1,637	0	1,637

Monthly Refinery Gas Demand: Recorded (2017)

Forecast (2018-2035) (MDth)

		Refinery Industrial (G-30) Gas Demand			Refinery Cogeneration (G-50) Gas Demand			
Month	Total Refinery (G30 + G50) (MDth)	Ref **G30**, Base Econ. Fcst	Accum. EE/DSM Scg Pgm Savings for **Refinery G-30**	Cal. Days per Year	Cal. Days per Month	Ref **G50**, Base Econ. Fcst	Out-of-model Adj. for **Refinery G-50**	Base Ref **G50** *plus* Out-of-model Adj (MDth)
Jan-31	**9,077**	7,700	493	7,207	31	1,870	0	1,870
Feb-31	**8,130**	6,736	445	6,291	28	1,839	0	1,839
Mar-31	**9,007**	7,687	493	7,194	31	1,813	0	1,813
Apr-31	**8,684**	7,194	477	6,718	30	1,967	0	1,967
May-31	**8,971**	7,526	493	7,034	31	1,938	0	1,938
Jun-31	**8,676**	7,422	477	6,945	30	1,731	0	1,731
Jul-31	**8,944**	7,679	493	7,186	31	1,758	0	1,758
Aug-31	**8,963**	7,472	493	6,979	31	1,984	0	1,984
Sep-31	**8,733**	7,291	477	6,814	30	1,919	0	1,919
Oct-31	**9,113**	7,842	493	7,350	31	1,763	0	1,763
Nov-31	**8,872**	7,652	477	7,175	30	1,697	0	1,697
Dec-31	**9,170**	8,026	493	7,533	31	1,636	0	1,636
Jan-32	**9,045**	7,698	523	7,176	31	1,870	0	1,870
Feb-32	**8,393**	6,977	489	6,488	29	1,905	0	1,905
Mar-32	**8,978**	7,688	523	7,165	31	1,813	0	1,813
Apr-32	**8,656**	7,195	506	6,689	30	1,967	0	1,967
May-32	**8,942**	7,527	523	7,004	31	1,938	0	1,938
Jun-32	**8,648**	7,423	506	6,917	30	1,731	0	1,731
Jul-32	**8,916**	7,680	523	7,157	31	1,758	0	1,758
Aug-32	**8,935**	7,473	523	6,950	31	1,984	0	1,984
Sep-32	**8,704**	7,291	506	6,785	30	1,919	0	1,919
Oct-32	**9,082**	7,842	523	7,319	31	1,763	0	1,763
Nov-32	**8,842**	7,651	506	7,146	30	1,696	0	1,696
Dec-32	**9,139**	8,025	523	7,503	31	1,636	0	1,636
Jan-33	**9,048**	7,701	523	7,177	31	1,870	0	1,870
Feb-33	**8,108**	6,741	473	6,268	28	1,840	0	1,840
Mar-33	**8,983**	7,692	523	7,169	31	1,814	0	1,814
Apr-33	**8,661**	7,199	506	6,693	30	1,968	0	1,968
May-33	**8,947**	7,531	523	7,008	31	1,939	0	1,939
Jun-33	**8,653**	7,427	506	6,920	30	1,732	0	1,732
Jul-33	**8,920**	7,684	523	7,161	31	1,759	0	1,759
Aug-33	**8,939**	7,477	523	6,954	31	1,986	0	1,986
Sep-33	**8,708**	7,295	506	6,788	30	1,920	0	1,920
Oct-33	**9,085**	7,845	523	7,321	31	1,764	0	1,764
Nov-33	**8,844**	7,654	506	7,147	30	1,697	0	1,697
Dec-33	**9,142**	8,028	523	7,505	31	1,637	0	1,637
Jan-34	**9,044**	7,698	524	7,174	31	1,870	0	1,870
Feb-34	**8,099**	6,734	473	6,261	28	1,838	0	1,838
Mar-34	**8,972**	7,684	524	7,160	31	1,812	0	1,812
Apr-34	**8,651**	7,192	507	6,685	30	1,966	0	1,966
May-34	**8,937**	7,523	524	7,000	31	1,937	0	1,937
Jun-34	**8,643**	7,420	507	6,913	30	1,730	0	1,730
Jul-34	**8,911**	7,677	524	7,153	31	1,758	0	1,758
Aug-34	**8,930**	7,470	524	6,946	31	1,984	0	1,984
Sep-34	**8,698**	7,287	507	6,780	30	1,918	0	1,918
Oct-34	**9,073**	7,835	524	7,311	31	1,762	0	1,762
Nov-34	**8,832**	7,644	507	7,137	30	1,695	0	1,695
Dec-34	**9,130**	8,019	524	7,495	31	1,635	0	1,635
Jan-35	**9,043**	7,695	521	7,174	31	1,869	0	1,869
Feb-35	**8,103**	6,735	470	6,265	28	1,838	0	1,838
Mar-35	**8,976**	7,685	521	7,164	31	1,812	0	1,812
Apr-35	**8,656**	7,193	504	6,689	30	1,966	0	1,966
May-35	**8,941**	7,525	521	7,004	31	1,937	0	1,937
Jun-35	**8,647**	7,421	504	6,917	30	1,731	0	1,731
Jul-35	**8,916**	7,679	521	7,158	31	1,758	0	1,758
Aug-35	**8,935**	7,471	521	6,951	31	1,984	0	1,984
Sep-35	**8,702**	7,288	504	6,784	30	1,918	0	1,918
Oct-35	**9,076**	7,835	521	7,314	31	1,762	0	1,762
Nov-35	**8,834**	7,643	504	7,139	30	1,695	0	1,695
Dec-35	**9,132**	8,018	521	7,497	31	1,635	0	1,635

2018 CALIFORNIA GAS REPORT

ELECTRIC GENERATION

2018 CALIFORNIA GAS REPORT

NON-COGENERATION EG

SDG&E/SoCalGas

Jeff Huang

The electric generation forecast is based on an analysis of the plant's operation in the western electric market using the Market Analytics model from ABB Enterprise Software. Market Analytics has been used by SoCalGas in previous applications before the Commission. This workpapers include both the input assumptions and results.

Workpapers List

California Energy Demand Forecast
California Energy Commission's (CEC's) California Energy Demand Forecast, 2018 – 2030 Revised Forecast, dated January 2018. SoCalGas selected the Mid Energy Demand scenario with Mid Additional Achievable Energy Efficiency (AAEE) and mid Additional Achievable Photovoltaic (AAPV) scenario.

See Schedule 1 - 3 for the summary of peak and energy data.

Renewable Power Supply Assumptions
The base case assumes that California achieves its Renewable Portfolio Standard (RPS) goal of 33% by 2020, and 50% by 2030. For summary of RPS, see Schedule 4.

Energy Storage Assumption
See Schedule 5.

Green House Gas (GHG) Compliance Costs
See Schedule 6.

Once Through Cooling (OTC) Compliance Schedule
See Schedule 7.

Annual Gas Demand Throughput Forecasts
See Schedule 8 and Schedule 9.

Peak Day Forecasts
See Schedule 10 and Schedule 11.

Schedule 1: Form 1.5a - Statewide
California Energy Demand Forecast 2018 - 2030, Mid Demand Baseline Case, Mid AAEE and AAPV Savings
Total Energy to Serve Load by Agency and Balancing Authority (GWh)

Balancing Authority/ Load Pocket	Agency	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Average Annual Growth 2016 - 2030
	CCSF	1,039	1,036	1,025	1,015	1,017	1,015	1,018	1,016	1,014	1,015	1,014	1,013	1,013	1,012	1,012	-0.19%
	NCPA - Greater Bay Area	1,416	1,412	1,389	1,369	1,365	1,357	1,353	1,344	1,335	1,330	1,322	1,316	1,308	1,303	1,297	-0.62%
	Other NP15 LSEs - Bay Area	22	22	22	22	21	22	22	21	21	21	22	22	21	21	21	-0.33%
	PG&E Service Area - Greater Bay Area	35,794	35,768	35,264	34,851	34,848	34,740	34,756	34,641	34,491	34,454	34,328	34,222	34,095	33,992	33,902	-0.39%
	Silicon Valley Power	3,619	3,610	3,565	3,526	3,528	3,520	3,523	3,513	3,500	3,502	3,494	3,491	3,488	3,487	3,487	-0.26%
Greater Bay Area Subtotal		41,890	41,848	41,264	40,783	40,778	40,654	40,671	40,536	40,361	40,321	40,180	40,064	39,925	39,816	39,719	-0.38%
	CDWR-N	602	556	556	556	556	556	556	556	556	556	556	556	556	556	556	-0.57%
	NCPA - Non Bay Area	989	987	976	968	970	970	974	973	971	972	972	972	971	972	972	-0.12%
	Other NP15 LSEs - Non Bay Area	249	249	247	244	246	247	248	249	250	250	251	252	252	253	254	0.14%
	PG&E Service Area - Non Bay Area	46,915	46,880	46,221	45,680	45,675	45,533	45,554	45,403	45,208	45,158	44,994	44,855	44,687	44,554	44,436	-0.39%
	WAPA	1,397	1,385	1,397	1,410	1,422	1,437	1,453	1,469	1,482	1,495	1,507	1,520	1,536	1,551	1,565	0.81%
Total North of Path 15		92,042	91,904	90,660	89,641	89,647	89,397	89,457	89,186	88,828	88,752	88,460	88,219	87,928	87,702	87,502	-0.36%
	CDWR-ZP26	1,164	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	-0.57%
	PG&E Service Area - ZP26	9,766	9,758	9,621	9,508	9,508	9,478	9,482	9,451	9,411	9,400	9,366	9,337	9,302	9,275	9,249	-0.39%
Total Zone Path 26		10,930	10,833	10,696	10,583	10,583	10,553	10,557	10,526	10,486	10,475	10,441	10,412	10,377	10,350	10,324	-0.41%
Total Valley		61,082	60,890	60,093	59,441	59,452	59,296	59,342	59,176	58,952	58,906	58,721	58,567	58,380	58,236	58,107	-0.36%
Total North of Path 26		102,972	102,737	101,357	100,224	100,230	99,950	100,013	99,712	99,314	99,227	98,901	98,631	98,305	98,052	97,826	-0.37%
	Merced	489	490	486	483	480	477	475	471	467	463	459	455	453	450	445	-0.67%
	Turlock Irrigation District	2,191	2,195	2,171	2,157	2,137	2,120	2,107	2,083	2,060	2,037	2,016	1,996	1,981	1,960	1,939	-0.87%
Total Turlock Irrigation District Control Area		2,680	2,685	2,657	2,640	2,617	2,597	2,582	2,554	2,527	2,500	2,475	2,451	2,434	2,410	2,384	-0.83%
	City of Shasta Lake	210	209	208	208	207	206	205	203	201	200	199	198	197	196	197	-0.47%
	Modesto Irrigation District	2,650	2,626	2,621	2,614	2,601	2,587	2,577	2,555	2,533	2,512	2,493	2,478	2,471	2,466	2,460	-0.53%
	Redding	794	787	785	782	779	775	773	767	763	758	754	751	750	751	750	-0.40%
	Roseville	1,250	1,239	1,232	1,225	1,215	1,205	1,196	1,182	1,169	1,158	1,147	1,138	1,132	1,127	1,122	-0.77%
	SMUD	11,156	11,177	11,170	11,187	11,205	11,221	11,246	11,236	11,234	11,240	11,238	11,252	11,292	11,346	11,394	0.15%
	WAPA (BANC)	397	398	404	409	414	421	428	433	439	446	452	458	463	468	471	1.23%
Total BANC Control Area		16,457	16,436	16,420	16,426	16,421	16,414	16,425	16,376	16,339	16,315	16,283	16,274	16,305	16,353	16,394	-0.03%
	Anaheim	2,649	2,620	2,582	2,563	2,556	2,550	2,551	2,554	2,544	2,534	2,519	2,510	2,501	2,494	2,486	-0.45%
	MWD	199	197	196	197	199	201	203	206	208	210	211	212	214	215	216	0.59%
	Other SP15 LSEs - LA Basin	1,529	1,513	1,496	1,490	1,491	1,492	1,497	1,504	1,502	1,501	1,499	1,498	1,498	1,498	1,498	-0.15%
	Pasadena	1,231	1,218	1,194	1,178	1,169	1,161	1,155	1,151	1,141	1,133	1,122	1,114	1,107	1,100	1,094	-0.84%
	Riverside	2,477	2,450	2,409	2,386	2,373	2,362	2,360	2,360	2,349	2,339	2,326	2,316	2,309	2,304	2,297	-0.54%
	SCE Service Area - LA Basin	71,107	70,465	69,500	69,117	69,017	68,918	68,987	69,147	68,870	68,559	68,140	67,755	67,377	66,991	66,622	-0.46%
	Vernon	1,192	1,180	1,167	1,163	1,165	1,359	1,363	1,370	1,371	1,371	1,370	1,370	1,370	1,371	1,372	1.01%
LA Basin Subtotal		80,384	79,642	78,543	78,094	77,969	78,044	78,115	78,292	77,986	77,646	77,187	76,774	76,375	75,972	75,585	-0.44%
	CDWR-S	5,363	5,141	5,141	5,141	5,141	5,141	5,141	5,141	5,141	5,141	5,141	5,141	5,141	5,141	5,141	-0.30%
	SCE Service Area - Big Creek Ventura	15,560	15,419	15,208	15,124	15,102	15,080	15,095	15,130	15,070	15,002	14,911	14,827	14,743	14,659	14,578	-0.46%
Big Creek/Ventura Subtotal		20,923	20,560	20,349	20,265	20,243	20,221	20,236	20,271	20,211	20,143	20,052	19,968	19,884	19,800	19,719	-0.42%
	MWD	2,010	1,990	1,982	1,990	2,007	2,028	2,052	2,084	2,102	2,119	2,132	2,147	2,161	2,175	2,188	0.61%
	Other SP15 LSEs - Out of LA Basin	100	99	97	98	98	98	99	99	99	99	99	99	99	99	99	-0.09%
	SCE Service Area - Out of LA Basin	3,943	3,907	3,854	3,833	3,827	3,822	3,825	3,834	3,819	3,801	3,778	3,757	3,736	3,714	3,694	-0.47%
Total SCE TAC Area		107,360	106,198	104,825	104,280	104,144	104,213	104,327	104,581	104,217	103,809	103,248	102,745	102,255	101,761	101,284	-0.42%
SDG&E Service Area		20,526	19,921	19,732	19,642	19,582	19,525	19,716	19,725	19,737	19,714	19,630	19,512	19,393	19,259	19,117	-0.51%
Valley Electric Association		11	11	11	11	12	12	12	12	13	13	13	13	13	14	14	1.74%
Total South of Path 26		127,897	126,130	124,568	123,933	123,739	123,750	124,055	124,318	123,967	123,535	122,891	122,270	121,661	121,033	120,415	-0.43%
	Burbank	1,114	1,115	1,115	1,116	1,120	1,125	1,140	1,146	1,151	1,162	1,166	1,173	1,185	1,200	1,218	0.64%
	Glendale	1,134	1,134	1,136	1,138	1,144	1,150	1,167	1,175	1,183	1,198	1,207	1,218	1,235	1,255	1,278	0.86%
	LADWP	26,663	26,118	25,990	26,286	26,652	27,059	27,499	27,744	28,108	28,355	28,781	29,077	29,387	29,665	29,943	0.83%

Schedule 1: Form 1.5a - Statewide
California Energy Demand Forecast 2018 - 2030, Mid Demand Baseline Case, Mid AAEE and AAPV Savings
Total Energy to Serve Load by Agency and Balancing Authority (GWh)

Total LADWP Control Area	28,911	28,367	28,241	28,540	28,915	29,334	29,806	30,065	30,443	30,715	31,155	31,469	31,808	32,120	32,439	0.83%
Imperial Irrigation District Control Area	3,819	3,842	3,863	3,860	3,876	3,873	3,886	3,881	3,875	3,876	3,869	3,862	3,859	3,851	3,839	0.04%
Total CAISO	230,869	228,867	225,925	224,158	223,968	223,700	224,069	224,029	223,280	222,763	221,792	220,900	219,966	219,085	218,241	-0.40%
Total Statewide	282,736	280,196	277,106	275,624	275,797	275,919	276,768	276,906	276,465	276,168	275,574	274,957	274,372	273,819	273,296	-0.24%

Table developed based on actual 2016 data.

Schedule 2: Form 1.5b - Statewide
California Energy Demand Forecast 2018 - 2030, Mid Demand Baseline Case, Mid AAEE and AAPV Savings
1 in 2 Net Electricity Peak Demand by Agency and Balancing Authority (MW)

Balancing Authority/ Load Pocket	Agency	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Average Annual Growth 2017 - 2030
	CCSF	206	204	204	204	206	206	208	207	210	210	211	211	212	213	0.28%
	NCPA - Greater Bay Area	281	278	275	274	275	275	276	274	276	276	274	273	274	275	-0.16%
	Other NP15 LSEs - Bay Area	4	4	4	4	5	5	5	5	5	5	4	4	4	4	0.78%
	PG&E Service Area - Greater Bay Area	7,089	7,023	6,983	7,001	7,050	7,088	7,149	7,116	7,215	7,245	7,252	7,237	7,283	7,343	0.27%
	Silicon Valley Power	718	713	708	708	712	713	719	714	723	725	725	724	728	734	0.17%
Greater Bay Area Subtotal		8,298	8,222	8,174	8,191	8,247	8,287	8,358	8,316	8,428	8,461	8,467	8,450	8,501	8,570	0.25%
	CDWR-N	98	98	98	98	98	98	98	98	98	98	98	98	98	98	0.00%
	NCPA - Non Bay Area	196	195	194	195	196	198	199	198	201	201	202	202	203	205	0.34%
	Other NP15 LSEs - Non Bay Area	49	49	49	49	50	50	51	51	52	52	52	52	52	53	0.62%
	PG&E Service Area - Non Bay Area	9,341	9,255	9,202	9,226	9,291	9,341	9,420	9,377	9,507	9,548	9,557	9,537	9,597	9,676	0.27%
	WAPA	275	279	283	285	290	294	298	300	306	310	313	316	321	326	1.31%
Total North of Path 15		18,257	18,097	18,000	18,044	18,172	18,268	18,424	18,340	18,592	18,670	18,689	18,654	18,773	18,928	0.28%
	CDWR-ZP26	117	117	117	117	117	117	117	117	117	117	117	117	117	117	0.00%
	PG&E Service Area - ZP26	1,993	1,976	1,965	1,970	1,984	1,995	2,011	2,001	2,029	2,038	2,040	2,035	2,048	2,065	0.27%
Total Zone Path 26		2,110	2,093	2,082	2,087	2,101	2,112	2,128	2,118	2,146	2,155	2,157	2,152	2,165	2,182	0.26%
Total Valley		12,069	11,968	11,909	11,939	12,026	12,093	12,194	12,142	12,310	12,364	12,379	12,356	12,437	12,540	0.29%
Total North of Path 26		20,367	20,190	20,082	20,130	20,273	20,380	20,552	20,458	20,738	20,825	20,846	20,806	20,938	21,110	0.28%
	Merced	120	120	121	121	119	119	117	116	114	114	113	112	111	110	-0.69%
	Turlock Irrigation District	538	538	540	536	530	527	519	513	506	500	494	489	483	477	-0.92%
Total Turlock Irrigation District Control Area		658	659	661	657	649	646	636	628	620	614	607	600	594	587	-0.88%
	City of Shasta Lake	56	57	56	57	56	56	55	54	53	53	53	52	51	51	-0.66%
	Modesto Irrigation District	708	709	710	707	701	698	689	680	671	663	657	651	644	638	-0.80%
	Redding	212	212	213	212	211	209	207	204	202	200	199	198	196	194	-0.67%
	Roseville	334	334	333	331	327	324	319	314	309	304	301	297	293	289	-1.11%
	SMUD	3,040	3,048	3,060	3,057	3,046	3,043	3,030	3,015	3,001	2,991	2,986	2,977	2,974	2,970	-0.18%
	WAPA (BANC)	107	109	110	111	113	114	116	117	119	121	122	123	125	125	1.18%
Total BANC Control Area		4,457	4,469	4,483	4,475	4,453	4,444	4,415	4,384	4,355	4,333	4,318	4,298	4,284	4,267	-0.33%
	Anaheim	575	565	559	556	553	552	548	542	537	530	530	524	531	540	-0.48%
	MWD	20	20	20	20	20	20	21	21	21	21	21	21	21	21	0.34%
	Other SP15 LSEs - LA Basin	332	327	325	325	323	324	324	322	320	318	318	316	320	324	-0.19%
	Pasadena	267	262	257	254	252	250	247	242	238	234	234	230	234	239	-0.85%
	Riverside	538	527	521	516	513	510	507	500	494	488	489	483	491	500	-0.57%
	SCE Service Area - LA Basin	16,297	16,074	15,993	15,901	15,882	15,883	15,841	15,757	15,645	15,514	15,421	15,239	15,219	15,240	-0.51%
	Vernon	259	255	254	253	277	278	278	276	275	274	275	273	276	279	0.57%
LA Basin Subtotal		18,288	18,031	17,930	17,825	17,821	17,817	17,766	17,660	17,530	17,380	17,288	17,086	17,091	17,141	-0.50%
	CDWR-S	160	160	160	160	160	160	160	160	160	160	160	160	160	160	0.00%
	SCE Service Area - Big Creek Ventura	3,740	3,692	3,670	3,641	3,628	3,618	3,597	3,572	3,539	3,505	3,479	3,433	3,423	3,423	-0.68%
Big Creek/Ventura Subtotal		3,900	3,852	3,830	3,801	3,788	3,778	3,757	3,732	3,699	3,665	3,639	3,593	3,583	3,583	-0.65%
	MWD	196	195	196	196	198	200	202	204	205	206	208	208	210	211	0.57%
	Other SP15 LSEs - Out of LA Basin	22	21	22	22	21	21	21	22	21	21	21	21	21	21	-0.32%
	SCE Service Area - Out of LA Basin	867	855	851	846	845	845	843	839	833	826	821	811	810	812	-0.50%
Total SCE TAC Area		23,272	22,953	22,828	22,690	22,674	22,662	22,589	22,456	22,288	22,098	21,977	21,719	21,716	21,768	-0.51%
SDG&E Service Area		4,155	4,078	4,038	4,010	4,038	4,110	4,138	4,164	4,180	4,194	4,210	4,217	4,206	4,207	0.09%
Valley Electric Association		125	126	128	130	131	133	135	136	138	139	141	142	144	145	1.15%
Total South of Path 26		27,552	27,157	26,995	26,830	26,843	26,905	26,863	26,755	26,607	26,430	26,329	26,078	26,065	26,120	-0.41%
	Burbank	306	306	307	305	303	302	301	300	297	294	292	291	290	289	-0.43%

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Schedule 2: Form 1.5b - Statewide
California Energy Demand Forecast 2018 - 2030, Mid Demand Baseline Case, Mid AAEE and AAPV Savings
1 in 2 Net Electricity Peak Demand by Agency and Balancing Authority (MW)

Glendale	311	312	312	312	310	310	308	308	307	306	304	305	305	307	-0.09%
LADWP	5,995	5,908	5,886	5,841	5,775	5,736	5,663	5,602	5,526	5,458	5,381	5,298	5,245	5,173	-1.13%
Total LADWP Control Area	6,612	6,525	6,505	6,458	6,388	6,348	6,272	6,210	6,130	6,058	5,977	5,894	5,839	5,769	-1.04%
Imperial Irrigation District Control Area	1,065	1,075	1,082	1,080	1,074	1,071	1,064	1,057	1,050	1,042	1,036	1,027	1,021	1,011	-0.40%
Total CAISO Noncoincident Peak	47,920	47,347	47,077	46,961	47,116	47,284	47,414	47,214	47,345	47,255	47,175	46,883	47,003	47,230	-0.11%
Total CAISO Coincident Peak	46,243	45,690	45,429	45,317	45,467	45,629	45,755	45,561	45,688	45,601	45,524	45,243	45,358	45,577	-0.11%
Total Statewide Noncoincident Peak	60,712	60,074	59,807	59,631	59,680	59,794	59,802	59,494	59,500	59,302	59,113	58,703	58,741	58,864	-0.24%
Total Statewide Coincident Peak	58,587	57,971	57,714	57,544	57,591	57,701	57,709	57,411	57,417	57,227	57,044	56,649	56,685	56,804	-0.24%

Table developed based on actual 2017 load data.
Incorporates peak shift for the PG&E, SCE, and SDG&E TAC areas.

Schedule 3: Form 1.1c - Statewide
California Energy Demand Forecast 2018 - 2030, Mid Demand Baseline Case, Mid AAEE and AAPV Savings
Electricity Deliveries to End Users by Agency (GWh)

Planning Area	Agency	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Average Annual Growth 2016 - 2030
PGE	Calaveras Public Power Agency	33	33	33	33	33	33	34	34	34	35	35	35	35	36	36	0.6%
	City of Alameda	360	359	354	351	352	352	352	352	352	352	352	352	353	352	353	-0.1%
	City of Biggs	16	16	16	16	16	16	15	15	15	16	16	16	16	16	16	-0.2%
	City of Gridley	33	33	33	32	32	32	32	32	32	32	32	32	33	32	32	-0.2%
	City of Healdsburg	73	73	72	70	70	70	70	69	69	69	69	69	69	69	69	-0.4%
	City of Lodi	411	410	405	402	402	402	402	401	399	400	398	398	397	397	396	-0.3%
	City of Lompoc	125	124	123	122	122	122	123	123	123	122	122	122	122	122	122	-0.2%
	City of Palo Alto	885	883	868	854	849	841	837	830	822	817	810	804	798	793	788	-0.8%
	City of San Francisco	949	947	936	927	929	928	930	929	927	927	926	926	926	926	926	-0.2%
	City of Ukiah	103	103	102	101	101	101	101	100	100	99	99	99	98	97	97	-0.4%
	Department of Water Resources (North)	1,701	1,572	1,572	1,572	1,572	1,572	1,572	1,572	1,572	1,572	1,572	1,572	1,572	1,572	1,572	-0.6%
	Island Energy/Pittsburg	20	20	20	20	19	20	20	20	19	19	20	20	20	19	19	-0.3%
	Lassen Municipal Utility District	152	151	150	149	148	149	149	149	149	149	149	149	150	149	149	-0.1%
	Pacific Gas and Electric Company (Bundled)	70,430	62,936	50,747	39,974	40,124	40,030	40,112	40,010	39,851	39,855	39,735	39,636	39,500	39,401	39,320	-4.1%
	Pacific Gas and Electric Company (Direct Access)	9,520	9,520	9,520	9,520	9,520	9,520	9,520	9,520	9,520	9,520	9,520	9,520	9,520	9,520	9,520	0.0%
	Pacific Gas and Electric Company (Marin Clean Energy CCA)	1,966	2,841	5,160	5,069	5,061	5,037	5,031	5,006	4,977	4,964	4,938	4,916	4,892	4,872	4,854	6.7%
	Pacific Gas and Electric Company (Sonoma Clean Power CCA)	2,108	2,313	2,665	2,617	2,613	2,601	2,598	2,585	2,570	2,564	2,550	2,539	2,526	2,516	2,507	1.2%
	Pacific Gas and Electric Company (Clean Power San Francisco Clean CCA)	176	524	610	599	599	596	595	592	589	587	584	581	579	577	574	8.8%
	Pacific Gas and Electric Company (Peninsula Clean Energy Authority CCA)	146	2,645	3,804	3,737	3,731	3,713	3,710	3,691	3,669	3,660	3,641	3,625	3,607	3,592	3,579	25.7%
	Pacific Gas and Electric Company (Silicon Valley Clean Energy CCA)	-	3,325	3,713	3,646	3,640	3,624	3,620	3,602	3,581	3,571	3,553	3,537	3,520	3,505	3,492	–
	Pacific Gas and Electric Company (Redwood Coast Energy Authority CCA)	-	188	663	651	650	647	646	643	639	638	634	631	628	626	623	–
	Pacific Gas and Electric Company (Pioneer Community Energy CCA)	-	-	1,144	1,124	1,122	1,116	1,115	1,109	1,103	1,100	1,095	1,090	1,084	1,079	1,075	–
	Pacific Gas and Electric Company (Monterrey Bay Community Power Authority CCA)	-	-	2,370	3,500	3,473	3,456	3,452	3,435	3,415	3,406	3,389	3,374	3,357	3,343	3,331	–
	Pacific Gas and Electric Company (East Bay Community Energy CCA)	-	-	1,415	6,447	6,396	6,367	6,359	6,327	6,290	6,274	6,242	6,214	6,183	6,158	6,136	–
	Pacific Gas and Electric Company (Valley Clean Energy Alliance CCA)	-	-	456	762	756	753	752	748	744	742	738	735	731	728	726	–
	Pacific Gas and Electric Company (San Jose City CCA)	-	-	843	4,498	4,462	4,441	4,437	4,414	4,389	4,377	4,354	4,335	4,314	4,296	4,280	–
	Plumas-Sierra Rural Electric Cooperation	142	142	142	141	143	144	146	147	149	150	151	153	154	155	156	0.7%
	Port of Oakland	48	48	48	46	47	47	47	47	47	47	47	47	47	47	46	-0.3%
	Port of Stockton	20	20	20	20	20	20	20	21	21	21	21	21	22	22	22	0.7%
	Silicon Valley Power	3,306	3,297	3,256	3,221	3,223	3,216	3,220	3,210	3,199	3,201	3,195	3,193	3,190	3,189	3,190	-0.3%
	Tuolumne County Public Power Agency	23	23	23	23	23	23	24	24	24	24	24	25	25	25	25	0.6%
	WAPA (CAISO)	1,305	1,294	1,305	1,317	1,328	1,342	1,357	1,372	1,385	1,397	1,408	1,420	1,435	1,450	1,463	0.8%
PGE Total		94,051	93,840	92,588	91,561	91,576	91,329	91,399	91,129	90,774	90,708	90,420	90,184	89,903	89,683	89,494	-0.4%
SCE	Anza Electric Cooperative, Inc.	53	53	52	53	53	54	54	55	56	56	56	57	57	58	58	0.6%
	Azusa Light & Water	266	263	259	257	257	256	257	257	256	256	254	253	252	252	251	-0.4%
	Bear Valley Electric Service	129	128	127	128	129	130	132	134	135	136	137	138	139	140	141	0.6%
	City of Anaheim	2,484	2,457	2,422	2,404	2,398	2,392	2,393	2,396	2,386	2,377	2,364	2,355	2,347	2,340	2,333	-0.4%
	City of Banning	134	133	131	131	131	131	131	132	131	131	131	131	131	131	131	-0.2%
	City of Cerritos	75	75	74	75	75	76	77	78	79	80	80	81	81	82	82	0.6%
	City of Colton	371	367	361	358	357	356	355	355	354	353	350	349	349	348	348	-0.5%
	City of Corona	137	136	134	134	134	135	135	136	137	137	137	137	137	137	137	0.0%
	City of Pasadena	1,154	1,142	1,119	1,106	1,097	1,089	1,084	1,080	1,071	1,062	1,053	1,046	1,039	1,033	1,026	-0.8%
	City of Rancho Cucamonga	77	76	75	75	75	75	75	75	74	74	74	74	74	73	73	-0.3%
	City of Riverside	2,323	2,298	2,259	2,237	2,226	2,216	2,214	2,214	2,204	2,194	2,182	2,173	2,166	2,162	2,157	-0.5%
	City of Vernon	1,118	1,106	1,095	1,091	1,092	1,275	1,279	1,285	1,285	1,286	1,285	1,285	1,286	1,286	1,287	1.0%
	Department of Water Resources (South)	5,167	4,953	4,953	4,953	4,953	4,953	4,953	4,953	4,953	4,953	4,953	4,953	4,953	4,953	4,953	-0.3%
	Metropolitan Water District	2,071	2,051	2,043	2,051	2,069	2,090	2,115	2,148	2,166	2,184	2,198	2,213	2,228	2,242	2,256	0.6%
	Moreno Valley Utilities	192	190	187	187	187	187	187	187	187	186	187	186	185	186	186	-0.2%
	Southern California Edison Company (Bundled)	73,260	72,331	69,216	68,771	68,567	68,353	68,305	68,328	67,923	67,481	66,937	66,426	65,925	65,421	64,936	-0.9%
	Southern California Edison Company (Direct Access)	10,929	10,806	10,451	10,499	10,599	10,713	10,852	11,026	11,129	11,226	11,302	11,385	11,465	11,541	11,618	0.4%
	Southern California Edison Company (Lancaster Energy Clean CCA)	640	633	623	620	617	615	614	614	610	605	600	595	591	586	581	-0.7%
	Southern California Edison Company (Apple Valley Choice Energy CCA)	-	221	215	213	212	212	211	212	210	209	207	205	203	202	200	–
	Southern California Edison Company (Pico Rivera Innovative Municipal Energy CCA)	-	77	75	75	74	74	74	74	74	74	72	72	71	71	70	–
	Southern California Edison Company (Los Angeles Community Choice Energy CCA)	-	-	2,340	2,291	2,283	2,275	2,271	2,270	2,256	2,240	2,221	2,203	2,186	2,168	2,151	–
	Victorville Municipal	93	93	91	92	91	92	92	93	93	93	93	93	93	93	93	0.0%
SCE Total		100,673	99,587	98,302	97,801	97,678	97,749	97,860	98,104	97,770	97,394	96,873	96,411	95,959	95,505	95,070	-0.4%
SDGE	San Diego Gas and Electric Company (Bundled)	15,653	15,188	15,016	14,916	14,834	14,751	14,861	14,870	14,883	14,864	14,787	14,680	14,571	14,448	14,318	-0.6%
	San Diego Gas and Electric Company (Direct Access)	3,516	3,416	3,414	3,432	3,459	3,490	3,562	3,562	3,562	3,562	3,562	3,562	3,562	3,562	3,562	0.1%

Schedule 3: Form 1.1c - Statewide
California Energy Demand Forecast 2018 - 2030, Mid Demand Baseline Case, Mid AAEE and AAPV Savings
Electricity Deliveries to End Users by Agency (GWh)

SDGE Total		19,169	18,604	18,430	18,348	18,293	18,241	18,423	18,432	18,445	18,426	18,349	18,242	18,133	18,010	17,880	-0.5%
Northern Ca	City of Redding	745	738	736	735	731	727	725	720	716	711	708	704	704	704	704	-0.4%
	City of Roseville	1,173	1,162	1,156	1,150	1,140	1,130	1,122	1,110	1,097	1,086	1,077	1,068	1,064	1,059	1,053	-0.8%
	City of Shasta Lake	197	196	196	195	194	193	192	191	190	188	187	186	185	185	184	-0.5%
	Merced Irrigation District	460	461	456	454	451	448	447	442	439	435	432	428	426	422	419	-0.7%
	Modesto Irrigation District	2,487	2,464	2,459	2,453	2,440	2,428	2,419	2,398	2,377	2,358	2,340	2,326	2,320	2,315	2,309	-0.5%
	Sacramento Municipal Utility District	10,485	10,506	10,500	10,517	10,535	10,551	10,575	10,567	10,565	10,573	10,571	10,585	10,625	10,677	10,724	0.2%
	Turlock Irrigation District	2,059	2,063	2,041	2,027	2,010	1,994	1,981	1,959	1,937	1,916	1,897	1,878	1,863	1,845	1,825	-0.9%
	WAPA (BANC)	381	382	388	393	399	405	411	417	422	428	435	440	445	450	454	1.3%
Northern California Non-CAISO Total		17,987	17,972	17,932	17,925	17,900	17,876	17,872	17,804	17,744	17,696	17,646	17,615	17,631	17,657	17,672	-0.1%
LADWP	Los Angeles Department of Water and Power	23,495	22,987	22,459	22,282	22,189	22,118	22,088	21,822	21,676	21,425	21,338	21,154	21,001	20,835	20,647	-0.9%
BUGL	City of Burbank	1,047	1,048	1,048	1,049	1,053	1,057	1,072	1,078	1,082	1,093	1,097	1,104	1,115	1,129	1,145	0.6%
	City of Glendale	1,066	1,066	1,068	1,070	1,075	1,081	1,097	1,105	1,113	1,127	1,135	1,146	1,162	1,181	1,203	0.9%
BUGL Total		2,113	2,115	2,116	2,119	2,128	2,138	2,169	2,184	2,196	2,220	2,232	2,250	2,277	2,310	2,348	0.8%
IID	Imperial Irrigation District	3,386	3,406	3,426	3,423	3,437	3,436	3,448	3,444	3,439	3,440	3,435	3,428	3,426	3,419	3,409	0.0%
VEA	Valley Electric Association, Inc.	10	10	11	11	11	11	11	12	12	12	12	12	13	13	13	1.9%
OTHER	Kirkwood Meadows Public Utility District	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	0.0%
	Lathrop Irrigation District	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0.0%
	Liberty Utilities	558	557	555	554	560	565	572	578	583	588	593	598	602	606	610	0.6%
	City of Needles	36	36	36	36	36	36	37	37	38	38	38	38	39	39	39	0.6%
	PacifiCorp	740	739	736	735	743	749	758	767	774	780	786	793	798	804	809	0.6%
	Surprise Valley Electrification Corporation	102	102	102	102	103	104	105	106	107	108	109	110	111	111	112	0.7%
	Truckee-Donner Public Utility District	163	163	162	162	164	165	167	169	171	172	174	175	176	177	179	0.7%
OTHER Total		1,610	1,608	1,602	1,600	1,617	1,630	1,650	1,668	1,684	1,697	1,711	1,725	1,737	1,748	1,760	0.6%
Statewide Total		262,494	260,129	256,866	255,070	254,828	254,529	254,920	254,599	253,740	253,018	252,016	251,020	250,079	249,179	248,293	-0.4%
Total Pumping Load		8,939	8,576	8,567	8,575	8,593	8,614	8,640	8,672	8,691	8,709	8,723	8,738	8,753	8,767	8,781	-0.1%
Total Statewide Retail Deliveries excluding pumping		253,555	251,553	248,299	246,495	246,235	245,915	246,280	245,927	245,049	244,309	243,293	242,282	241,326	240,412	239,512	-0.4%

This table includes retail sales and other deliveries only measured at the customer level. Losses and consumption served by self-generation are excluded. Table developed based on actual 2016 data.

Table includes sales from entities outside of California control area. Thus, total sales in row 85 are higher than state totals given in Form 1.1b.

Pacific Gas and Electric Company (Direct Access) includes BART.

Schedule 4
Statewide Total Renewable Generation by Year (GWh)

Year	Biogas & Biomass	Geothermal	Hydro (Small)	Solar PV/Thermal	Wind	Out-of-State	Total	RPS
2018	5,896	11,582	4,781	21,769	14,283	18,662	76,973	31%
2019	5,915	11,582	4,781	23,122	14,817	18,662	78,879	32%
2020	5,939	11,582	4,781	24,811	15,483	18,662	81,257	33%
2021	5,981	11,582	4,781	27,792	16,658	18,662	85,456	35%
2022	6,025	11,582	4,781	30,942	17,901	18,662	89,892	37%
2023	6,067	11,582	4,781	33,906	19,070	18,662	94,067	38%
2024	6,106	11,582	4,781	36,712	20,176	18,662	98,020	40%
2025	6,144	11,582	4,781	39,393	21,234	18,662	101,795	42%
2026	6,181	11,582	4,781	41,971	22,250	18,662	105,427	43%
2027	6,217	11,582	4,781	44,528	23,258	18,662	109,027	45%
2028	6,252	11,582	4,781	47,078	24,264	18,662	112,619	47%
2029	6,288	11,582	4,781	49,620	25,267	18,662	116,199	48%
2030	6,324	11,582	4,781	52,145	26,263	18,662	119,756	50%

Note: The annual renewable generation assumption is roughly based on the Energy Almanac data and CEC RPS goals.
CEC RPS goals: 25% by 2016, 33% by 2020, 40% by 2024, 45% by 2027, and 50% by 2030.
http://www.energy.ca.gov/renewables/tracking_progress/documents/renewable.pdf

Schedule 5
Energy Storage (MW)

Year	SDG&E	SCE	PG&E	Total
2018	90	150	150	390
2019	90	200	200	490
2020	140	300	300	740
2021	140	350	350	840
2022	140	450	450	1040
2023	190	500	500	1190
2024	190	600	550	1340
2025	190	600	550	1340
2026	190	600	550	1340
2027	190	600	550	1340
2028	190	600	550	1340
2029	190	600	550	1340
2030	190	600	550	1340

Schedule 6

GHG Compliance Cost

Year	Nominal $/Ton
2018	$ 15.31
2019	$ 15.85
2020	$ 16.38
2021	$ 18.95
2022	$ 22.91
2023	$ 25.88
2024	$ 29.54
2025	$ 34.45
2026	$ 38.88
2027	$ 44.68
2028	$ 52.37
2029	$ 59.37
2030	$ 65.25

Note: Based on California Carbon Allowance Price Forecast, ICIS (October 2017).

Schedule 7
OTC Schedule

Plants	Existing Capacity (MW)	SWRCB Approved Compliance Dates	Updated Compliance Dates	2018 CGR Compliance Dates
Humboldt Bay (1,2)	163	12/31/2010	9/30/2010	Offline
South Bay	708	12/31/2011	12/31/2010	Offline
Potrero (3)	206	10/1/2011	2/28/2011	Offline
Huntington Beach (3,4)	452	12/31/2020	11/1/2012	Offline
Contra Costa (6,7)	674	12/31/2017	4/30/2013	Offline
Haynes (5,6)	535	12/31/2013	6/1/2013	Offline
San Onofre (2,3)	2,246	12/31/2022	6/7/2013	Offline
El Segundo (3)	335	12/31/2015	7/27/2013	Offline
Morro Bay (3,4)	650	12/31/2015	2/5/2014	Offline
El Segundo (4)	335	12/31/2015	12/31/2015	Offline
Scattergood (3)	450	12/31/2015	12/31/2015	Offline
Pittsburg (5,6,7)	1,307	12/31/2017	12/31/2016	Offline
Moss Landing (6,7)	1,510	12/31/2020	12/31/2016	Offline
Encina (1)	104	12/31/2017	3/1/2017	Offline
Encina (2)	104	12/31/2017	1/31/2018	1/31/2018
Mandalay (1,2)	430	12/31/2020	2/6/2018	2/6/2018
Encina (3)	110	12/31/2017	10/1/2018	10/1/2018
Ormond Beach (1,2)	1,516	12/31/2020	10/1/2018	10/1/2018
Encina (4,5)	628	12/31/2017	12/31/2018	12/31/2018
Redondo (7)	493	12/31/2020	10/1/2019	10/1/2019
Huntington Beach (1)	226	12/31/2020	12/31/2019	12/31/2019
Alamitos (1,2,6)	848	12/31/2020	12/31/2019	12/31/2019
Moss Landing (1,2)	1,020	12/31/2020	12/31/2020	12/31/2020
Huntington Beach (2)	226	12/31/2020	12/31/2020	12/31/2020
Redondo (5,6,8)	850	12/31/2020	12/31/2020	12/31/2020
Alamitos (3,4,5)	1,163	12/31/2020	12/31/2020	12/31/2020
Diablo Canyon (1)	1,120	12/31/2024	11/2/2024	11/2/2024
Scattergood (1,2)	367	12/31/2024	12/31/2024	12/31/2024
Diablo Canyon (2)	1,120	12/31/2024	8/26/2025	8/26/2025
Haynes (1,2)	444	12/31/2029	12/31/2025	12/31/2025
Haynes (8)	575	12/31/2029	12/31/2028	12/31/2028
Harbor (5)	229	12/31/2029	12/31/2029	12/31/2029

Based on CEC Tracking Progress updated April 2018.

Schedule 8
Annual Base Case EG Throughput (BCF)
EG Including Large Cogen

Year	SDG&E	SoCalGas	Total
2018	46	214	260
2019	44	206	250
2020	42	205	248
2021	42	201	243
2022	41	200	241
2023	40	198	238
2024	40	197	236
2025	39	195	235
2026	39	194	233
2027	39	192	231
2028	39	190	229
2029	38	189	227
2030	38	187	225
2031	38	187	225
2032	38	187	225
2033	38	187	225
2034	38	187	225
2035	38	187	225

Schedule 9
Annual Dry Hydro EG Throughput (BCF)
EG Including Large Cogen

Year	SDG&E	SoCalGas	Total
2018	46	214	260
2019	50	232	282
2020	48	230	278
2021	48	233	281
2022	47	221	269
2023	45	213	258
2024	44	214	259
2025	44	212	257
2026	43	210	254
2027	43	208	251
2028	42	206	248
2029	41	204	245
2030	40	202	242
2031	40	202	242
2032	40	202	242
2033	40	202	242
2034	40	202	242
2035	40	202	242

Schedule 10

Base Case Winter Coincidental Peak Day Demand (MMCFD)

EG (Including Large Cogen)

Year	SDG&E	SoCalGas	Total
2018	174	607	781
2019	191	594	785
2020	165	678	843
2021	149	692	841
2022	154	673	827
2023	127	654	781
2024	150	644	794
2025	147	639	786
2026	146	633	779
2027	145	628	772
2028	143	622	765
2029	142	616	758
2030	141	611	751
2031	141	611	751
2032	141	611	751
2033	141	611	751
2034	141	611	751
2035	141	611	751

Note: In addition to the OTC retirement schedule, these plants are also retiring.
Etiwanda Power Plant will be shutdown by June 1, 2018.
Ellwood Power Plant will be shutdown by October 1, 2018.

Schedule 11

Dry Hydro Summer Coincidental Peak Day Demand (MMCFD)

EG (Including Large Cogen)

Year	SDG&E	SoCalGas	Total
2018	281	1,283	1,565
2019	299	1,459	1,758
2020	281	1,434	1,715
2021	287	1,187	1,474
2022	232	1,187	1,419
2023	242	1,103	1,345
2024	226	1,154	1,379
2025	227	1,120	1,347
2026	228	1,112	1,340
2027	228	1,104	1,332
2028	228	1,096	1,325
2029	228	1,089	1,317
2030	229	1,081	1,310
2031	229	1,081	1,310
2032	229	1,081	1,310
2033	229	1,081	1,310
2034	229	1,081	1,310
2035	229	1,081	1,310

Note: In addition to the OTC retirement schedule, these plants are also retiring.
Etiwanda Power Plant will be shutdown by June 1, 2018.
Ellwood Power Plant will be shutdown by October 1, 2018.

2018 CALIFORNIA GAS REPORT

INDUSTRIAL/COMMERCIAL COGENERATION < 20MW

Small Cogeneration (Capacity < 20 Mw)
Gas Demand

INTRODUCTION

The gas demand forecast for small cogeneration (capacity < 20 Mw) is based 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.

BASE 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,
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 2018 is as follows:

LN[SmCoGen_MDth/yr] = 8.11941 + LN(316.32) x (0.32373)
+ LN[(3.9648 ¢/Kwh)/(12.2817 ¢/Kwh)] x (-0.24418)

LN[SmCoGen_MDth/yr] = 10.25913

(EXP[10.25913]) = 28,542 MDth/yr

The table below shows the base 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 87.60 Thm/Yr per Kw
2018	28,542	316	10.259	5.757	-1.131	0.32	12.28	3.96
2019	28,229	321	10.248	5.773	-1.064	0.34	12.76	4.40
2020	28,195	326	10.247	5.786	-1.042	0.35	13.15	4.64
2021	28,084	328	10.243	5.793	-1.016	0.36	13.53	4.90
2022	27,756	330	10.231	5.799	-0.961	0.38	13.87	5.31
2023	26,874	331	10.199	5.803	-0.823	0.44	13.90	6.11
2024	26,392	332	10.181	5.807	-0.744	0.48	14.31	6.80
2025	26,004	333	10.166	5.809	-0.680	0.51	14.75	7.47
2026	25,750	334	10.156	5.812	-0.636	0.53	15.22	8.05
2027	25,456	335	10.145	5.815	-0.584	0.56	15.60	8.70
2028	25,119	337	10.131	5.819	-0.525	0.59	16.00	9.47
2029	24,804	338	10.119	5.824	-0.467	0.63	16.43	10.30
2030	24,628	340	10.112	5.830	-0.430	0.65	16.88	10.99
2031	24,490	342	10.106	5.836	-0.399	0.67	17.26	11.58
2032	24,372	345	10.101	5.843	-0.370	0.69	17.63	12.18
2033	24,289	347	10.098	5.849	-0.347	0.71	18.02	12.74
2034	24,124	350	10.091	5.857	-0.310	0.73	18.42	13.51
2035	24,019	352	10.087	5.863	-0.283	0.75	18.82	14.19

NONCORE SELF-GENERATION INCENTIVE PROGRAM (G-50, SGIP LOAD)

SoCalGas administers a program funded by the State of California to encourage customers to install small capacity electric generation equipment to generate electricity for the customer's own use (not for re-sale in to the electric transmission & distribution grid). The table below shows the expected annual gas demand for the noncore (G-50) part of the SGIP:

Noncore SGIP Annual Forecast of Gas Demand

Year	G50 SGIP (Mdth)
2018	5.6
2019	11.2
2020	16.8
2021	22.4
2022	28.0
2023	33.6
2024	39.2
2025	44.8
2026	50.4
2027	56.0
2028	61.6
2029	67.2
2030	72.8
2031	78.4
2032	84.0
2033	89.6
2034	95.2
2035	100.8

MONTHLY PATTERN FOR TOTAL SMALL COGEN LOAD

This total 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 2018 example above together with the monthly percentages of annual total load in the table above, the August 2018 small cogeneration (G-50) gas demand is calculated as:

SmCoGen_G-50 = (28,542 MDth/yr, base forecast
+ 5.6 MDth/yr, from G-50 SGIP)
x (9.0604%, monthly % of annual)
= 2,587 MDth

The tables below provide the small cogeneration annual and monthly gas demand forecasts. Recorded data are for year 2017, while forecasts cover years from 2018 through 2035.

**Annual Small CoGen (C&I) Gas Demand:
Recorded (2017) and
Forecast (2018-2035) (MDth)**

Date	Small Cogen (C&I) (G-50) Gas Demand (MDth)
2017	27,561
2018	28,548
2019	28,240
2020	28,212
2021	28,106
2022	27,784
2023	26,907
2024	26,432
2025	26,049
2026	25,801
2027	25,512
2028	25,180
2029	24,871
2030	24,700
2031	24,569
2032	24,456
2033	24,378
2034	24,220
2035	24,120

**Monthly Small CoGen (C&I) Gas Demand:
Recorded (2017) and
Forecast (2018-2035) (MDth)**

Year	Month	Small Cogen (C&I) (G-50) Gas Demand (MDth)
2017	Jan-17	2,265
2017	Feb-17	1,961
2017	Mar-17	2,126
2017	Apr-17	2,186
2017	May-17	2,289
2017	Jun-17	2,341
2017	Jul-17	2,494
2017	Aug-17	2,497
2017	Sep-17	2,365
2017	Oct-17	2,360
2017	Nov-17	2,323
2017	Dec-17	2,354
2018	Jan-18	2,346
2018	Feb-18	2,031
2018	Mar-18	2,202
2018	Apr-18	2,264
2018	May-18	2,371
2018	Jun-18	2,424
2018	Jul-18	2,583
2018	Aug-18	2,587
2018	Sep-18	2,450
2018	Oct-18	2,444
2018	Nov-18	2,406
2018	Dec-18	2,438
2019	Jan-19	2,321
2019	Feb-19	2,009
2019	Mar-19	2,179
2019	Apr-19	2,239
2019	May-19	2,346
2019	Jun-19	2,398
2019	Jul-19	2,555
2019	Aug-19	2,559
2019	Sep-19	2,424
2019	Oct-19	2,418
2019	Nov-19	2,380
2019	Dec-19	2,412
2020	Jan-20	2,318
2020	Feb-20	2,007
2020	Mar-20	2,177
2020	Apr-20	2,237
2020	May-20	2,343
2020	Jun-20	2,396
2020	Jul-20	2,553
2020	Aug-20	2,556
2020	Sep-20	2,421
2020	Oct-20	2,416
2020	Nov-20	2,378
2020	Dec-20	2,409

**Monthly Small CoGen (C&I) Gas Demand:
Recorded (2017) and
Forecast (2018-2035) (MDth)**

Year	Month	Small Cogen (C&I) (G-50) Gas Demand (MDth)
2021	Jan-21	2,310
2021	Feb-21	2,000
2021	Mar-21	2,168
2021	Apr-21	2,229
2021	May-21	2,335
2021	Jun-21	2,387
2021	Jul-21	2,543
2021	Aug-21	2,547
2021	Sep-21	2,412
2021	Oct-21	2,407
2021	Nov-21	2,369
2021	Dec-21	2,400
2022	Jan-22	2,283
2022	Feb-22	1,977
2022	Mar-22	2,144
2022	Apr-22	2,203
2022	May-22	2,308
2022	Jun-22	2,360
2022	Jul-22	2,514
2022	Aug-22	2,517
2022	Sep-22	2,385
2022	Oct-22	2,379
2022	Nov-22	2,342
2022	Dec-22	2,373
2023	Jan-23	2,211
2023	Feb-23	1,915
2023	Mar-23	2,076
2023	Apr-23	2,134
2023	May-23	2,235
2023	Jun-23	2,285
2023	Jul-23	2,435
2023	Aug-23	2,438
2023	Sep-23	2,309
2023	Oct-23	2,304
2023	Nov-23	2,268
2023	Dec-23	2,298
2024	Jan-24	2,172
2024	Feb-24	1,881
2024	Mar-24	2,039
2024	Apr-24	2,096
2024	May-24	2,196
2024	Jun-24	2,245
2024	Jul-24	2,392
2024	Aug-24	2,395
2024	Sep-24	2,269
2024	Oct-24	2,263
2024	Nov-24	2,228
2024	Dec-24	2,257
2025	Jan-25	2,141
2025	Feb-25	1,854
2025	Mar-25	2,010
2025	Apr-25	2,066
2025	May-25	2,164
2025	Jun-25	2,212
2025	Jul-25	2,357
2025	Aug-25	2,360
2025	Sep-25	2,236
2025	Oct-25	2,231
2025	Nov-25	2,196
2025	Dec-25	2,225

**Monthly Small CoGen (C&I) Gas Demand:
Recorded (2017) and
Forecast (2018-2035) (MDth)**

Year	Month	Small Cogen (C&I) (G-50) Gas Demand (MDth)
2026	Jan-26	2,120
2026	Feb-26	1,836
2026	Mar-26	1,990
2026	Apr-26	2,046
2026	May-26	2,143
2026	Jun-26	2,191
2026	Jul-26	2,334
2026	Aug-26	2,338
2026	Sep-26	2,214
2026	Oct-26	2,209
2026	Nov-26	2,175
2026	Dec-26	2,204
2027	Jan-27	2,096
2027	Feb-27	1,815
2027	Mar-27	1,968
2027	Apr-27	2,023
2027	May-27	2,119
2027	Jun-27	2,167
2027	Jul-27	2,308
2027	Aug-27	2,311
2027	Sep-27	2,190
2027	Oct-27	2,185
2027	Nov-27	2,150
2027	Dec-27	2,179
2028	Jan-28	2,069
2028	Feb-28	1,792
2028	Mar-28	1,943
2028	Apr-28	1,997
2028	May-28	2,092
2028	Jun-28	2,139
2028	Jul-28	2,278
2028	Aug-28	2,281
2028	Sep-28	2,161
2028	Oct-28	2,156
2028	Nov-28	2,122
2028	Dec-28	2,151
2029	Jan-29	2,044
2029	Feb-29	1,770
2029	Mar-29	1,919
2029	Apr-29	1,972
2029	May-29	2,066
2029	Jun-29	2,112
2029	Jul-29	2,250
2029	Aug-29	2,253
2029	Sep-29	2,135
2029	Oct-29	2,130
2029	Nov-29	2,096
2029	Dec-29	2,124
2030	Jan-30	2,030
2030	Feb-30	1,758
2030	Mar-30	1,906
2030	Apr-30	1,959
2030	May-30	2,052
2030	Jun-30	2,098
2030	Jul-30	2,235
2030	Aug-30	2,238
2030	Sep-30	2,120
2030	Oct-30	2,115
2030	Nov-30	2,082
2030	Dec-30	2,110

**Monthly Small CoGen (C&I) Gas Demand:
Recorded (2017) and
Forecast (2018-2035) (MDth)**

Year	Month	Small Cogen (C&I) (G-50) Gas Demand (MDth)
2031	Jan-31	2,019
2031	Feb-31	1,748
2031	Mar-31	1,895
2031	Apr-31	1,948
2031	May-31	2,041
2031	Jun-31	2,087
2031	Jul-31	2,223
2031	Aug-31	2,226
2031	Sep-31	2,109
2031	Oct-31	2,104
2031	Nov-31	2,071
2031	Dec-31	2,098
2032	Jan-32	2,010
2032	Feb-32	1,740
2032	Mar-32	1,887
2032	Apr-32	1,939
2032	May-32	2,031
2032	Jun-32	2,077
2032	Jul-32	2,213
2032	Aug-32	2,216
2032	Sep-32	2,099
2032	Oct-32	2,094
2032	Nov-32	2,061
2032	Dec-32	2,089
2033	Jan-33	2,003
2033	Feb-33	1,735
2033	Mar-33	1,881
2033	Apr-33	1,933
2033	May-33	2,025
2033	Jun-33	2,070
2033	Jul-33	2,206
2033	Aug-33	2,209
2033	Sep-33	2,092
2033	Oct-33	2,087
2033	Nov-33	2,055
2033	Dec-33	2,082
2034	Jan-34	1,990
2034	Feb-34	1,723
2034	Mar-34	1,869
2034	Apr-34	1,921
2034	May-34	2,012
2034	Jun-34	2,057
2034	Jul-34	2,191
2034	Aug-34	2,194
2034	Sep-34	2,079
2034	Oct-34	2,074
2034	Nov-34	2,041
2034	Dec-34	2,069
2035	Jan-35	1,982
2035	Feb-35	1,716
2035	Mar-35	1,861
2035	Apr-35	1,913
2035	May-35	2,004
2035	Jun-35	2,048
2035	Jul-35	2,182
2035	Aug-35	2,185
2035	Sep-35	2,070
2035	Oct-35	2,065
2035	Nov-35	2,033
2035	Dec-35	2,060

2018 CALIFORNIA GAS REPORT

INDUSTRIAL/COMMERCIAL COGENERATION > 20MW

Please refer to the Non-Cogeneration EG section of the workpapers for the description of the details concerning Industrial/Commercial Cogen.

2018 CALIFORNIA GAS REPORT

ENHANED OIL RECOVERY-RELATED COGENERATION

Enhanced Oil Recovery - Cogeneration

2018 CALIFORNIA GAS REPORT WORKPAPERS

Actuals were recorded for 1995 through 2017. Forecasted demand for 2018 to 2035 assumes that EOR is going to maintain at 2017 levels. Forecasted break out by service levels (Medium Pressure Distribution - MPD, High Pressure Distribution - HPD, and Transmission Level Service - TLS) was determined by using service level distributions from 2017 actuals.

In 2017, recorded gas deliveries to the EOR-related cogeneration market decreased by 35% from 2016 mainly due to changes in operations for some of the existing EOR-related cogeneration customers. EOR-related cogeneration demand is forecasted to remain steady going forward.

SoCalGas 2018 CGR Demand Forecast for EOR Market
2018 CGR Forecast Years = 2018 thru 2035

Units	Year	MPD 0.0%	Cogen HPD 0.0%	TLS 100.0%	Total 100.0%
Mdth/year	1995 actual	0	0	37,244	**37,244**
Mdth/year	1995 actual	0	0	46,577	**46,577**
Mdth/year	1996 actual	0	0	45,188	**45,188**
Mdth/year	1997 actual	0	0	42,009	**42,009**
Mdth/year	1999 actual	0	0	33,446	**33,446**
Mdth/year	2000 actual	0	0	27,957	**27,957**
Mdth/year	2001 actual	0	0	15,588	**15,588**
Mdth/year	2002 actual	0	0	24,532	**24,532**
Mdth/year	2003 actual	0	0	18,844	**18,844**
Mdth/year	2004 actual	0	0	15,821	**15,821**
Mdth/year	2005 actual	0	0	15,753	**15,753**
Mdth/year	2006 actual	0	0	18,056	**18,056**
Mdth/year	2007 actual	0	0	24,240	**24,240**
Mdth/year	2008 actual	0	0	22,050	**22,050**
Mdth/year	2009 actual	0	0	7,857	**7,857**
Mdth/year	2010 actual	0	0	4,574	**4,574**
Mdth/year	2011 actual	0	0	4,179	**4,179**
Mdth/year	2012 actual	0	0	8,168	**8,168**
Mdth/year	2013 actual	0	0	8,877	**8,877**
Mdth/year	2014 actual	0	0	6,246	**6,246**
Mdth/year	2015 actual	0	0	3,907	**3,907**
Mdth/year	2016 actual	0	0	5,734	**5,734**
Mdth/year	2017 actual	0	0	3,709	**3,709**
Mdth/year	2018 forecast	0	0	3,709	**3,709**
Mdth/year	2019 forecast	0	0	3,709	**3,709**
Mdth/year	2020 forecast	0	0	3,709	**3,709**
Mdth/year	2021 forecast	0	0	3,709	**3,709**
Mdth/year	2022 forecast	0	0	3,709	**3,709**
Mdth/year	2023 forecast	0	0	3,709	**3,709**
Mdth/year	2024 forecast	0	0	3,709	**3,709**
Mdth/year	2025 forecast	0	0	3,709	**3,709**
Mdth/year	2026 forecast	0	0	3,709	**3,709**
Mdth/year	2027 forecast	0	0	3,709	**3,709**
Mdth/year	2028 forecast	0	0	3,709	**3,709**
Mdth/year	2029 forecast	0	0	3,709	**3,709**
Mdth/year	2030 forecast	0	0	3,709	**3,709**
Mdth/year	2031 forecast	0	0	3,709	**3,709**
Mdth/year	2032 forecast	0	0	3,709	**3,709**
Mdth/year	2033 forecast	0	0	3,709	**3,709**
Mdth/year	2034 forecast	0	0	3,709	**3,709**
Mdth/year	2035 forecast	0	0	3,709	**3,709**
Mdth/year	2036 forecast				

2018 CALIFORNIA GAS REPORT

REFINERY RELATED COGENERATION

Refinery Related Cogeneration
Gas Demand

Please see the discussion under “Refineries” section above for refinery-related cogeneration gas demand.

2018 CALIFORNIA GAS REPORT

WHOLESALE AND INTERNATIONAL REQUIREMENTS

San Diego Gas and Electric Company

The detail of SDG&E's forecast is published in the 2018 California Gas Report Workpapers for San Diego Gas and Electric. Please refer to the SDG&E redacted workpapers.

2018 CALIFORNIA GAS REPORT

LONG BEACH GAS AND OIL DEPARTMENT

The workpapers for Long Beach Oil and Gas have been redacted in this version.

2018 CALIFORNIA GAS REPORT

SOUTHWEST GAS CORPORATION

The workpapers for Southwest Gas have been redacted in this version.

2018 CALIFORNIA GAS REPORT

CITY OF VERNON

The workpapers for the City of Vernon have been redacted in this version.

2018 CALIFORNIA GAS REPORT

MEXICALI

The workpapers for ECOGAS have been redacted in this version.

2018 CALIFORNIA GAS REPORT

CORE PEAK DAY FORECAST

SoCalGas Heating Degree Day (HDD) Weather Designs
(Calendar Based)

	Cold		Average	Hot	
	1-in-35 exceedance	1-in-10 exceedance		1-in-10 exceedance	1-in-35 exceedance
January	323.3	304.1	267.8	231.4	212.2
February	276.4	259.9	228.9	197.8	181.4
March	207.5	195.1	171.8	148.5	136.1
April	149.1	140.3	123.5	106.8	97.9
May	59.7	56.1	49.4	42.7	39.2
June	14.5	13.6	12.0	10.4	9.5
July	2.6	2.4	2.1	1.9	1.7
August	2.2	2.1	1.8	1.6	1.5
September	5.6	5.2	4.6	4.0	3.6
October	40.0	37.6	33.1	28.6	26.3
November	165.5	155.6	137.1	118.5	108.6
December	347.6	326.9	287.9	248.8	228.1
	1594.0	1499.0	**1320.0**	1141.0	1046.0

Notes:

1/ 20-Yr-Avg (Jan1998-Dec2017)

2/ Daily system wide temperature based on six-zone average using customer counts by zone for December 2017.

2018-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-2" Likelihood Cold Day Temperature

No.	"CGR_B"	CLASS	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	2035
1		RESIDEN	2032.9	2025.7	2010.5	1992.4	1975.6	1953.1	1918.8	1890.7	1864.3	1749.3	1720.3
2		Com G10	442.9	440.0	437.1	433.1	427.5	420.4	411.1	402.5	394.2	364.3	363.3
2		GAC 2/	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2		GEN 2/	3.7	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
3		Ind G10	76.2	74.9	74.8	74.3	73.2	71.9	69.9	68.1	66.2	57.0	51.5
4		NGV 2/	38.3	40.4	42.6	45.0	47.4	50.0	52.8	55.7	58.8	76.9	100.7
	Total:	MDth/day	2594.2	2584.2	2568.3	2548.0	2526.9	2498.7	2455.8	2420.2	2386.7	2250.6	2239.0
		MMcf/day 4/	2508.2	2498.5	2483.2	2463.5	2443.2	2415.9	2374.4	2340.0	2307.6	2176.0	2164.8
		Days per Mo	31	31	31	31	31	31	31	31	31	31	31
	Pk-Day Temp. (deg-F) =		**45.5**	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5
	Hdd: December--ColdYr =		347.6	347.6	347.6	347.6	347.6	347.6	347.6	347.6	347.6	347.6	347.6
	"Wkday/Wkend" Factor-Res:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	"Wkday/Wkend" Factor-NonRes:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2018-CGR Res and C&I Calculations

Notes:

1/ =("Avg-Dec" / 31 days) + {[("Cold-Dec" - "Avg-Dec") / ("Cold-Dec-Hdd" - "Avg-Dec-Hdd")]
* [(65 degF - 45.5 degF) - (Avg-Dec-Hdd / 31 days)]}

2/ "Non-temperature" sensitive market segment.

3/ "Weekday/Weekend" Factor applies to the "raw" estimate.

4/ Dth/Mcf= 1.0343

2018-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-10" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	2035
1	RESIDEN	2332.3	2325.9	2310.3	2291.4	2274.2	2250.4	2213.0	2182.9	2154.6	2030.8	1999.8
2	Com G10	489.4	486.5	483.6	479.7	474.0	466.9	457.6	449.0	440.7	410.8	409.8
2	GAC 2/	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2	GEN 2/	3.7	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
3	Ind G10	80.6	79.3	79.2	78.7	77.7	76.4	74.3	72.4	70.5	61.0	55.2
4	NGV 2/	38.3	40.4	42.6	45.0	47.4	50.0	52.8	55.7	58.8	76.9	100.7
Total:	MDth/day	2944.5	2935.3	2919.0	2897.9	2876.5	2846.9	2800.9	2763.2	2727.8	2582.6	2568.7
	MMcf/day 4/	2846.9	2838.1	2822.3	2801.9	2781.2	2752.6	2708.1	2671.7	2637.4	2497.1	2483.6
	Days per Mo	31	31	31	31	31	31	31	31	31	31	31
Pk-Day Temp. (deg-F) =		**42.0**	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
Hdd: December--ColdYr =		347.6	347.6	347.6	347.6	347.6	347.6	347.6	347.6	347.6	347.6	347.6
"Wkday/Wkend" Factor-Res:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
"Wkday/Wkend" Factor-NonRes:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2018-CGR Res and C&I Calculations

Notes:

1/ =("Avg-Dec" / 31 days) + {[("Cold-Dec" - "Avg-Dec") / ("Cold-Dec-Hdd" - "Avg-Dec-Hdd")]
* [(65 degF - 42.0 degF) - (Avg-Dec-Hdd / 31 days)]}

2/ "Non-temperature" sensitive market segment.

3/ "Weekday/Weekend" Factor applies to the "raw" estimate.

4/ Dth/Mcf= 1.0343

2018-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-35" Likelihood Cold Day Temperature

No.	"CGR_B"	CLASS	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	2035
1		RESIDEN	2477.8	2471.8	2455.9	2436.6	2419.2	2394.7	2356.0	2324.8	2295.6	2167.6	2135.6
2		Com G10	512.0	509.1	506.2	502.2	496.6	489.5	480.2	471.6	463.3	433.4	432.4
2		GAC 2/	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2		GEN 2/	3.7	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
3		Ind G10	82.7	81.4	81.4	80.9	79.8	78.5	76.4	74.5	72.5	62.9	56.9
4		NGV 2/	38.3	40.4	42.6	45.0	47.4	50.0	52.8	55.7	58.8	76.9	100.7
			======	======	======	======	======	======	======	======	======	======	======
	Total:	MDth/day	3114.6	3105.9	3089.4	3067.9	3046.3	3016.0	2968.6	2929.8	2893.4	2743.9	2728.9
		MMcf/day 4/	3011.4	3003.0	2987.0	2966.3	2945.4	2916.1	2870.2	2832.8	2797.6	2653.0	2638.5
		Days per Mo	31	31	31	31	31	31	31	31	31	31	31
	Pk-Day Temp. (deg-F) =		**40.3**	40.3	40.3	40.3	40.3	40.3	40.3	40.3	40.3	40.3	40.3
	Hdd: December--ColdYr =		347.6	347.6	347.6	347.6	347.6	347.6	347.6	347.6	347.6	347.6	347.6
	"Wkday/Wkend" Factor-Res:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	"Wkday/Wkend" Factor-NonRes:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2018-CGR Res and C&I Calculations

Notes:

1/ =("Avg-Dec" / 31 days) + {[("Cold-Dec" - "Avg-Dec") / ("Cold-Dec-Hdd" - "Avg-Dec-Hdd")]
* [(65 degF - 40.3 degF) - (Avg-Dec-Hdd / 31 days)]}

2/ "Non-temperature" sensitive market segment.

3/ "Weekday/Weekend" Factor applies to the "raw" estimate.

4/ Dth/Mcf = 1.0343

2018-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
Temp=December, Cold Year

No.	"CGR_CLASS	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	2035
1	Residen	41037.1	40757.2	40322.7	39816.5	39328.1	38727.1	37882.5	37166.9	36487.9	33561.8	32815.1
2	Com G10	10314.9	10224.8	10137.2	10013.8	9838.1	9618.6	9329.6	9063.5	8806.7	7878.1	7848.6
2	GAC	5.8	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
2	GEN	115.3	97.3	97.3	97.3	97.3	97.3	97.3	97.3	97.3	97.3	97.3
3	Ind G10	2045.5	1999.0	1993.0	1974.7	1941.3	1902.2	1844.8	1791.6	1737.1	1475.2	1323.8
4	NGV	1187.9	1253.0	1321.6	1394.1	1470.5	1551.3	1636.5	1726.5	1821.5	2382.6	3121.1
		54707	54334	53875	53299	52678	51899	50793	49848	48953	45398	45208
	Mdth/Hdd	100.1	100.3	100.2	100.0	99.9	99.5	98.6	98.0	97.4	94.9	94.2

2018-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
Temp=December, Average Year

No.	"CGR_CLASS	2017	2018	2019	2020	2021	2022	2023	2024	2025	2030	2035
1	Residen	35924.6	35631.2	35204.9	34712.0	34230.7	33652.4	32858.8	32179.1	31532.3	28755.1	28043.4
2	Com G10	9520.9	9430.8	9343.2	9219.8	9044.0	8824.6	8535.6	8269.5	8012.7	7084.1	7054.6
2	GAC	5.8	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
2	GEN	115.3	97.3	97.3	97.3	97.3	97.3	97.3	97.3	97.3	97.3	97.3
3	Ind G10	1971.7	1924.1	1917.3	1898.5	1865.1	1826.2	1769.8	1717.5	1664.0	1407.4	1260.7
4	NGV	1187.9	1253.0	1321.6	1394.1	1470.5	1551.3	1636.5	1726.5	1821.5	2382.6	3121.1
		48726	48339	47887	47324	46710	45954	44901	43993	43130	39729	39580

2018 CALIFORNIA GAS REPORT

SUPPORTING DATA

2018 CALIFORNIA GAS REPORT

WEATHER

HEATING DEGREE DAYS – AVERAGE AND "COLD" YEAR DESIGNS AND WINTER PEAK DAY DESIGN TEMPERATURES

Weather for SoCalGas: Heating Degree Days – Average and Cold Year Designs; and Winter Peak Day Design Temperatures

July 2018

Weather for SoCalGas: Heating Degree Days – Average and Cold Year Designs; and Winter Peak Day Design Temperatures

August 2018

I. Overview

Southern California Gas Company's service area extends from Fresno County to the Mexican border. To quantify the overall temperature experienced within this region, SoCalGas aggregates daily temperature recordings from fifteen U.S. Weather Bureau weather stations first into six temperature zones and then into one system average heating degree-day ("HDD") figure. The table below lists weather station locations by temperature zones.

Table 1

Weather Stations by Temperature Zones and Weights

Temperature Zone	Weight	Station (After 10/31/2002)	Station (Before 11/1/2002)
1. High mountain	0.0058	Big Bear Lake	Lake Arrowhead
2. Low desert	0.0385	Palm Springs	Palm Springs
		El Centro	Brawley
3. Coastal	0.1854	Los Angeles Airport	Los Angeles Airport
		Newport Beach	Newport Beach Harbor
		Santa Barbara Airport	Santa Barbara Airport
4. High desert	0.0716	Bakersfield	Bakersfield Airport
		Lancaster Airport	Palmdale
		Fresno	Visalia
5. Interior valleys	0.3831	Burbank	Burbank
		Pasadena	Pasadena
		Ontario	Pomona Cal Poly
		Rialto	Redlands
6. Basin	0.3156	Los Angeles Civic Center	Los Angeles Civic Center/ Downtown-USC
		Santa Ana	Santa Ana

SoCalGas uses 65° Fahrenheit to calculate the number of HDDs. One heating degree day is accumulated for each degree that the daily average is below 65° Fahrenheit. To arrive at the HDD figure for each temperature zone, SoCalGas uses the simple average of the weather station HDDs in that temperature zone. To arrive at the system average HDDs figure for its entire service area, SoCalGas weights the HDD figure for each zone using the proportion of gas customers within each temperature zone based on calendar year 2017 customer counts. These weights have been used in calculating the data shown from January 1998 to December 2017.

Daily weather temperatures are from the National Climatic Data Center or from preliminary data that SoCalGas captures each day and posts on its internal Company web-site at the URL: http://utilinet.sempra.com/departments/massmarkets/weather/default.htm for various individual weather stations as well as for its system average values of HDD. Annual HDDs for the entire service area from 1998 to 2017 are listed in Table 2, below.

Table 2

Calendar Month Heating Degree-Days (Jan. 1998 through Dec. 2017)

	Month												Total
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	"Cal-Year"
1998	269	282	187	185	87	21	0	0	5	43	167	322	1568
1999	265	246	284	235	78	39	1	2	5	8	128	246	1537
2000	247	243	210	81	26	5	2	1	3	64	248	242	1372
2001	379	338	195	208	26	6	4	3	3	21	146	359	1688
2002	334	202	226	149	79	11	2	4	8	77	92	315	1499
2003	141	233	166	180	74	17	1	1	3	16	200	306	1338
2004	292	301	86	85	18	8	3	2	4	73	227	292	1391
2005	287	208	176	116	35	11	4	1	9	44	99	235	1225
2006	272	201	338	163	29	3	0	1	5	36	104	279	1431
2007	347	215	125	117	50	16	1	1	12	37	126	353	1400
2008	347	263	149	124	76	8	1	0	2	23	75	334	1402
2009	196	259	194	134	19	16	3	4	1	44	117	320	1307
2010	254	220	174	164	72	14	8	9	14	42	203	268	1442
2011	251	307	212	105	80	27	3	3	6	40	207	350	1591
2012	224	236	222	118	38	11	6	1	1	16	111	300	1284
2013	330	264	126	66	17	4	1	2	2	44	103	257	1216
2014	142	148	90	76	20	4	0	1	1	5	66	223	776
2015	180	94	64	67	69	5	1	0	1	4	162	316	963
2016	281	111	114	54	46	8	1	1	3	14	111	268	1012
2017	319	208	99	44	50	6	1	0	4	12	50	174	967
20-Yr-Avg (Jan1998-Dec2017)													
Avg.	267.9	229.0	171.9	123.6	49.5	12.0	2.2	1.9	4.6	33.2	137.1	288.0	1320.5
St.Dev.	66.7	61.2	68.5	53.4	25.1	9.0	2.1	2.1	3.6	21.8	55.9	48.8	236.4
Min.	141.0	94.0	64.0	44.0	17.0	3.0	0.0	0.0	1.0	4.0	50.0	174.0	776.0
Max.	379.0	338.0	338.0	235.0	87.0	39.0	8.0	9.0	14.0	77.0	248.0	359.0	1688.0

II. Calculations to Define Our Average-Temperature Year

The simple average of the 20-year period (January 1998 through December 2017) was used to represent the Average Year total and the individual monthly values for HDD. In this CGR, the standard deviation has been calculated using an approach that compensates for the annual HDD values for the years 2014-2017 in SoCalGas' service territory being dramatically lower than in any preceding year going back to 1950. A regression with a time trend and a dummy variable for the years 2014-2017 has been used to estimate a shift in the level of annual HDD that occurred beginning in 2014. A dummy variable takes the value one for some observations to indicate the presence of an effect or membership in a group and zero for the remaining observations. Estimating the effect of the dummy variable gives an estimate of that effect or the impact of membership in that group. A dummy variable is used here to estimate the average effect on annual HDD of a given year having membership in the group of years 2014-2017. The dataset is SoCalGas system-wide annual HDD for the years 1998-2017. The regression equation is:

$$HDD_t = \alpha + \beta * t + \beta_{2014-2017} * D_{2014-2017} + \varepsilon$$

where $D_{2014-2017}$ is a dummy variable for the years 2014-2017 and $\beta_{2014-201}$ is the corresponding dummy coefficient. This regression equation estimates average HDD over the period 1998-2017 controlling for time trends in HDD and the warm weather regime of years 2014-2017. It's important to note that p-value for the estimate of $\beta_{2014-201}$ is 0.11% indicating an extremely low probability that membership in the group of years 2014-2017 had no effect on annual HDDs. Please see table 3 below for the full regression output.

Table 3

Dummy Regression for Calculation of Heating Degree-Day Standard Deviation

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.877127127
R Square	0.769351997
Adjusted R Squa	0.742216937
Standard Error	120.0395315
Observations	20

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	817095.635	408547.8175	28.35269274	3.84656E-06
Residual	17	244961.315	14409.48912		
Total	19	1062056.95			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	26248.60272	12961.00191	2.025198584	0.058843735
Regime Dummy	-364.8759058	93.16452578	-3.916468235	0.001111279
YEAR	-12.38115942	6.462711128	-1.915784131	0.072366763

The dummy variable's estimated effect, $\beta_{2014-2017}$, is subtracted from the actual annual HDD data for years 2014-2017 to adjust the data to remove the level shift. The standard deviation has been calculated using this adjusted dataset. This standard deviation has been used to design the two Cold Years based on a "1-in-10" and "1-in-35" chance, ***c***, that the respective annual "Cold Year" $\boldsymbol{hdd_c}$ value would be exceeded.

A probability model for the annual HDD is based on a t-Distribution with N-1 degrees of freedom, where, N is the number of years of HDD data we use, μ is the average of the last 20 years of HDD, and S_{20} is the average of the standard deviations of the 20 most recent 20 year periods:

$U = (HDD_y - \mu)/S_{20}$, has a t-Distribution with N-1 degrees of freedom.

III. Calculating the Cold-Temperature Year Weather Designs

Cold Year HDD Weather Designs

For SoCalGas, cold-temperature-year HDD weather designs are developed with a 1-in-35 annual chance of occurrence. In terms of probabilities this can be expressed as the following for a "1-in-35" cold-year HDD value in equation 1 and a "1-in-10" cold-year HDD value in equation 2, with Annual HDD as the random variable:

(1) Prob { Annual HDD > "1-in-35" Cold-Yr HDD } = 1/35 = 0.0286

(2) Prob { Annual HDD > "1-in-10" Cold-Yr HDD } = 1/10 = 0.1000

An area of 0.0286 under one tail of the T-Distribution translates to 2.025 standard deviations *above* an average-year based on a t-statistic with 19 degrees of freedom. Using the standard deviation calculated as described earlier, 135.1 HDD, these equations yield values of about 1,594 HDD for a "1-in-35" cold year and 1,499 as the number of HDDs for a "1-in-10" cold year (an area of 0.1000 under one tail of the T-Distribution translates to 1.328 standard deviations *above* an average-year based on a t-statistic with 19 degrees of freedom). For example, the "1-in-35" cold-year HDD is calculated as follows:

(3) Cold-year HDD = 1,594 which equals approximately
1,320 average-year HDDs + 2.025 * 135.1

Table 4 shows monthly HDD figures for "1-in-35" cold year, "1-in-10" cold year and, average year temperature designs. The monthly average-temperature-year HDDs are calculated from weighted monthly HDDs from 1998 to 2017, as

shown as the bottom of Table 2, above. For example, the average-year December value of 288.0 HDD equals the simple average of the 20 December HDD figures from 1998 to 2017. SoCalGas calculates the cold--temperature-year monthly HDD values using the same distribution of average-year HDDs. For example, since 21.8 percent of average-temperature-year HDDs occurred in December, the estimated number of HDDs during December for a cold-year is equal to 1,594 HDDs multiplied by 21.8 percent, or 347.6 HDDs.

Table 4

Calendar Month Heating Degree-Day Designs

	Cold		Average	Hot	
	1-in-35 Design	1-in-10 Design		1-in-10 Design	1-in-35 Design
January	323.3	304.1	267.8	231.4	212.2
February	276.4	259.9	228.9	197.8	181.4
March	207.5	195.1	171.8	148.5	136.1
April	149.1	140.3	123.5	106.8	97.9
May	59.7	56.1	49.4	42.7	39.2
June	14.5	13.6	12.0	10.4	9.5
July	2.6	2.4	2.1	1.9	1.7
August	2.2	2.1	1.8	1.6	1.5
September	5.6	5.2	4.6	4.0	3.6
October	40.0	37.6	33.1	28.6	26.3
November	165.5	155.6	137.1	118.5	108.6
December	347.6	326.9	287.9	248.8	228.1
	1594	1499	1320	1141	1046

IV. Calculating the Peak-Day Design Temperature

SoCalGas' 1-in-35 Peak-Day design temperature of 40.3 degrees Fahrenheit, denoted "Deg-F," is determined from a statistical analysis of observed annual minimum daily system average temperatures constructed from daily temperature recordings from the fifteen U.S. Weather Bureau weather stations discussed above. Since we have a time series of daily data by year, the following notation will be used for the remainder of this discussion:

(1) $AVG_{y,d}$ = system avg value of temperature for calendar year "y" and day "d".

The calendar year, y, can range from 1950 through 2017, while the day, d, can range from 1 to 365, for non-leap years, or from 1 to 366 for leap years. The "upper" value for the day, d, thus depends on the calendar year, y, and will be denoted by n(y)=365, or 366, respectively, when y is a non-leap year or a leap year.

For each calendar year, we calculate the following statistic from our series of daily system average temperatures defined in equation (1) above:

$$(2) \quad \text{MinAVG}_y = \min_{d=1}^{n(y)}\{ \text{AVG}_{y,d} \}, \text{ for y=1950, 1951, …, 2017.}$$

(The notation used in equation 2 means “For a particular year, y, list all the daily values of system average temperature for that year, then pick the smallest one.”)

The resulting minimum annual temperatures are shown in Tables 5.1 and 5.2, below. Note that most of the minimum temperatures occur in the months of December or January; however, for some calendar years the minimums occurred in other months (the minimum for 2006 was observed in March).

The statistical methods we use to analyze this data employ software developed to fit three generic probability models: the Generalized Extreme Value (GEV) model, the Double-Exponential or GUMBEL (EV1) model and a 2-Parameter Students’ T-Distribution (T-Dist) model. [The GEV and EV1 models have the same mathematical specification as those implemented in a DOS-based executable-only computer code that was developed by Richard L. Lehman and described in a paper published in the Proceedings of the Eighth Conference on Applied Climatology, January 17-22, 1993, Anaheim, California, pp. 270-273, by the American Meteorological Society, Boston, MA., with the title “Two Software Products for Extreme Value Analysis: System Overviews of ANYEX and DDEX.” At the time he wrote the paper, Dr. Lehman was with the Climate Analysis Center, National Weather Service/NOAA in Washington, D.C., zip code 20233.] The Statistical Analysis Software (SAS) procedure for nonlinear statistical model estimation (PROC MODEL) was used to do the calculations. Further, the calculation procedures were implemented to fit the probability models to observed *maxima* of data, like heating degrees. By recognizing that:

$$- \text{MinAVG}_y = - \min_{d=1}^{n(y)}\{\text{AVG}_{y,d}\} = \max_{d=1}^{n(y)}\{ -\text{AVG}_{y,d}\}, \text{ for y=1950, …, 2017;}$$

this same software, when applied to the *negative* of the minimum temperature data, yields appropriate probability model estimation results.

The calculations done to fit any one of the three probability models chooses the parameter values that provide the “best fit” of the parametric probability model’s calculated cumulative distribution function (CDF) to the empirical cumulative distribution function (ECDF). Note that the ECDF is constructed based on the variable “$-\text{MinAVG}_y$” (which is a *maximum* over a set of *negative* temperatures) with values of the variable MinAVG_y that are the same as shown in Tables 5.1 and 5.2, below.

In Tables 6.1 and 6.2, the data for $-\text{MinAVG}_y$ are shown after they have been sorted from “lowest” to “highest” value. The ascending *ordinal* value is shown in the column labeled “RANK” and the empirical cumulative distribution function is calculated and shown in the next column. The formula used to calculate this function is:

$$\text{ECDF} = (\text{RANK} – \alpha)/[\text{MaxRANK} + (1 – 2\,\alpha)],$$

where the parameter "α" (shown as *alpha* in Table 6.1 and Table 6.2) is a "small" positive value (usually less than ½) that is used to bound the ECDF away from 0 and 1.

Of the three probability models considered (GEV, EV1, and T_Dist) the results obtained for the T_Dist model were selected since the fit to the ECDF was better than that of either the GEV model or the EV1 model. (Although convergence to stable parameter estimates is occasionally a problem with fitting a GEV model to the ECDF, the T_Dist model had no problems with convergence of the iterative procedure to estimate parameters.)

The T_Dist model used here is a three-parameter probability model where the varable $z = (-\text{MinAVG}_y - \gamma) / \theta$, for each year, y, is presumed to follow a T_Dist with location parameter, γ, and scale parameter, θ, and a third parameter, v, that represents the number of degrees of freedom. For a given number of years of data, N, then v=N-2.

The following mathematical expression specifies the T_Dist model we fit to the data for "$-\text{MinAVG}_y$ " shown in Table 6.1 and Table 6.2, below.

(3) $\text{ECDF}(-\text{MinAVG}_y) = \text{Prob}\{ -T < -\text{MinAVG}_y \} = \text{T\_Dist}\{z; \gamma, \theta, v=N-2\}$,

where "T_Dist{ . }" is the cumulative probability distribution function for Student's T-Distribution[1], and

(4) $z = (-\text{MinAVG}_y - \gamma) / \theta$, for each year, y, and

the parameters "γ" and "θ" are estimated for this model for given degrees of freedom v=N-2. The estimated values for γ and θ are shown in Table 6.2 along with the fitted values of the model CDF (the column: "Fitted" Model CDF).

Now, to calculate a *peak-day design temperature*, TPDD_δ, with a specified likelihood, δ, that a value less than TPDD_δ would be observed, we use the equation below:

(5) $\delta = \text{Prob}\{ T \leq \text{TPDD}_\delta \}$, which is equivalent to

(6) $\delta = \text{Prob}\{ [(-T - \gamma) / \theta] \geq [(-\text{TPDD}_\delta - \gamma) / \theta] \}, = \text{Prob}\{ [(-T - \gamma) / \theta] \geq [z_\delta] \}$,

where $z_\delta = [(-\text{TPDD}_\delta - \gamma) / \theta]$. In terms of our probability model,

(7) $\delta = 1 - \text{T\_Dist}\{ z_\delta; \gamma, \theta, v=N-2\}$,

which yields the following equation for z_δ,

(7') $z_\delta = \{ \text{TINV\_Dist}\{ (1-\delta); \gamma, \theta, v=N-2\}$, where "TINV_Dist{ . }" is the inverse function of the T_Dist{ . } function[2]. The implied equation for TPDD_δ is:

---

[1] A common mathematical expression for Student's T-Distribution is provided at http://en.wikipedia.org/wiki/Student%27s_t-distribution; with a probability density function

$$f(t) = \frac{\Gamma\left(\frac{\nu+1}{2}\right)}{\sqrt{\nu\pi}\,\Gamma\left(\frac{\nu}{2}\right)}\left(1+\frac{t^2}{\nu}\right)^{-\frac{\nu+1}{2}},$$

such that $\text{T\_Dist}\{z; \gamma, \theta, v=N-2\} = \int f(t)\,dt$, from $t=-\infty$ to $t=z$. Also, the notation Γ(.) is known in mathematics as the GAMMA function; see http://www.wikipedia.org/wiki/Gamma_function for a description. Also, see *Statistical Theory*, 3rd Ed., B.W. Lindgren, MacMillian Pub. Inc, 1976, pp. 336-337.

(8) $TPDD_{\delta} = - [\gamma + (z_{\delta})(\theta)]$.

To calculate the minimum daily (system average) temperature to define our extreme weather event, we specify that this COLDEST-Day be one where the temperature would be lower with a "1-in-35" likelihood. This criterion translates into two equations to be solved based on equations (7) and (8) above:

(9) solve for "z_{δ}" from equation (7') above with (1-δ) = (1 - 1/35) = 1 - 0.0286,

(10) solve for "$TPDD_{\delta}$" from $TPDD_{\delta} = - [\gamma + (z_{\delta})(\theta)]$.

The value of z_{δ} = 1.938 and $TPDD_{\delta} = - [\gamma + (z_{\delta})(\theta)]$ = 40.3 degrees Fahrenheit, with values for "v=N-2"; along with "γ" and "θ" in Tables 6.1 & 6.2, below.

SoCalGas' 1-in-10 peak-day design temperature of 42.0 degrees Fahrenheit, is calculated in a methodologically similar way as for the 40.3 degree peak day temperature. The criteria specified in equation (9) above for a "1-in-35" likelihood would be replaced by a "1-in-10" likelihood.

(9') solve for "z_{δ}" from equation (7') above with (1-δ) = (1 - 1/10) = 1 - 0.1000,

which yields a "z_{δ}" value of z_{δ} = 1.295 and, $TPDD_{\delta} = - [\gamma + (z_{\delta})(\theta)]$ = 42.0 with values for "v=N-2"; along with "γ" and "θ" in Tables 6.1 and 6.2, below.

A plot of the cumulative distribution function for $MinAVG_y$ based on "v=N-2", the fitted model parameters, "γ" and "θ" with values in Tables 6.1 and 6.2, below, is shown in Figure 1.

[2] Computer software packages such as SAS and EXCEL have implemented statistical and mathematical functions to readily calculate values for T_Dist{ . } and TINV_Dist{ . } as defined above.

Table 5.1

YEAR	MINAVG	Month(MinAvg)
1950	40.8634	Jan
1951	44.5730	Dec
1952	43.0734	Jan
1953	45.6758	Feb
1954	45.6884	Dec
1955	45.8342	Dec
1956	44.9053	Feb
1957	39.4961	Jan
1958	46.2669	Nov
1959	48.2571	Feb
1960	42.3300	Jan
1961	47.2153	Dec
1962	43.4200	Jan
1963	42.5981	Jan
1964	45.2353	Nov
1965	44.7995	Jan
1966	46.7088	Jan
1967	40.7616	Dec
1968	40.6340	Dec
1969	44.8417	Jan
1970	46.8281	Dec
1971	42.9888	Jan
1972	41.4200	Dec
1973	45.0642	Jan
1974	42.9862	Jan
1975	44.6346	Jan
1976	44.8440	Jan
1977	48.3449	Jan
1978	41.6562	Dec
1979	41.3803	Jan
1980	50.3474	Jan
1981	49.3422	Jan
1982	45.3450	Jan
1983	48.6797	Jan
1984	46.9101	Dec
1985	45.1244	Feb
1986	48.5959	Feb
1987	43.4583	Dec
1988	43.2855	Dec
1989	40.6087	Feb
1990	39.0053	Dec
1991	48.6689	Mar
1992	47.3482	Dec
1993	46.1072	Jan
1994	47.1497	Nov

Table 5.2

YEAR	MINAVG	Month(MinAvg)
1995	49.8387	Dec
1996	44.9460	Feb
1997	48.3524	Jan
1998	43.6350	Dec
1999	49.0089	Jan
2000	48.7903	Mar
2001	47.1587	Feb
2002	45.8195	Jan
2003	47.0887	Dec
2004	48.2140	Nov
2005	47.2790	Jan
2006	45.7926	Mar
2007	41.5310	Jan
2008	45.8173	Dec
2009	45.2622	Dec
2010	44.7088	Dec
2011	46.7556	Feb
2012	46.7788	Dec
2013	43.9135	Jan
2014	48.0734	Dec
2015	45.6143	Jan
2016	46.7328	Dec
2017	47.5690	Jan

Table 6.1

alpha= 0.375

YEAR	Month(- MinAvg)	Days/Yr	**-MinAvg**	Rank	Empirical CDF	Fitted Model CDF
1980	Jan	366	-50.3474	1	0.0145	-2.232
1995	Dec	365	-49.8387	2	0.0290	-1.929
1981	Jan	365	-49.3422	3	0.0435	-1.738
1999	Jan	365	-49.0089	4	0.0580	-1.593
2000	Mar	366	-48.7903	5	0.0725	-1.475
1983	Jan	365	-48.6797	6	0.0870	-1.375
1991	Mar	365	-48.6689	7	0.1014	-1.286
1986	Feb	365	-48.5959	8	0.1159	-1.207
1997	Jan	365	-48.3524	9	0.1304	-1.134
1977	Jan	365	-48.3449	10	0.1449	-1.067
1959	Feb	365	-48.2571	11	0.1594	-1.004
2004	Nov	366	-48.2140	12	0.1739	-0.946
2014	Dec	365	-48.0734	13	0.1884	-0.890
2017	Jan	365	-47.5690	14	0.2029	-0.837
1992	Dec	366	-47.3482	15	0.2174	-0.786
2005	Jan	365	-47.2790	16	0.2319	-0.737
1961	Dec	365	-47.2153	17	0.2464	-0.690
2001	Feb	365	-47.1587	18	0.2609	-0.644
1994	Nov	365	-47.1497	19	0.2754	-0.600
2003	Dec	365	-47.0887	20	0.2899	-0.557
1984	Dec	366	-46.9101	21	0.3043	-0.514
1970	Dec	365	-46.8281	22	0.3188	-0.473
2012	Dec	366	-46.7788	23	0.3333	-0.433
2011	Feb	365	-46.7556	24	0.3478	-0.393
2016	Dec	366	-46.7328	25	0.3623	-0.354
1966	Jan	365	-46.7088	26	0.3768	-0.315
1958	Nov	365	-46.2669	27	0.3913	-0.277
1993	Jan	365	-46.1072	28	0.4058	-0.239
1955	Dec	365	-45.8342	29	0.4203	-0.202
2002	Jan	365	-45.8195	30	0.4348	-0.165
2008	Dec	366	-45.8173	31	0.4493	-0.128
2006	Mar	365	-45.7926	32	0.4638	-0.091
1954	Dec	365	-45.6884	33	0.4783	-0.055
1953	Feb	365	-45.6758	34	0.4928	-0.018
2015	Jan	365	-45.6143	35	0.5072	0.018
1982	Jan	365	-45.3450	36	0.5217	0.055
2009	Dec	365	-45.2622	37	0.5362	0.091
1964	Nov	366	-45.2353	38	0.5507	0.128
1985	Feb	365	-45.1244	39	0.5652	0.165
1973	Jan	365	-45.0642	40	0.5797	0.202
1996	Feb	366	-44.9460	41	0.5942	0.239
1956	Feb	366	-44.9053	42	0.6087	0.277
1976	Jan	366	-44.8440	43	0.6232	0.315
1969	Jan	365	-44.8417	44	0.6377	0.354
1965	Jan	365	-44.7995	45	0.6522	0.393

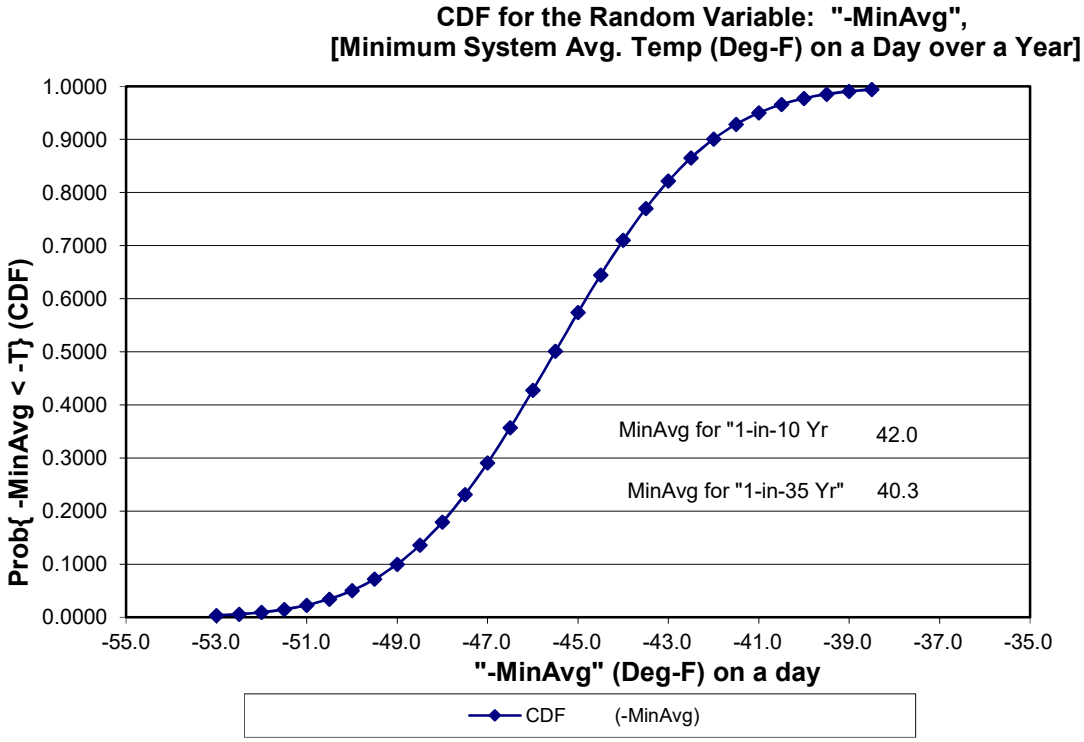
Table 6.2

alpha= 0.375

YEAR	Month(- MinAvg)	Days/Yr	**-MinAvg**	Rank	Empirical CDF	Fitted Model CDF
2010	Dec	365	-44.7088	46	0.6667	0.433
1975	Jan	365	-44.6346	47	0.6812	0.473
1951	Dec	365	-44.5730	48	0.6957	0.514
2013	Jan	365	-43.9135	49	0.7101	0.557
1998	Dec	365	-43.6350	50	0.7246	0.600
1987	Dec	365	-43.4583	51	0.7391	0.644
1962	Jan	365	-43.4200	52	0.7536	0.690
1988	Dec	366	-43.2855	53	0.7681	0.737
1952	Jan	366	-43.0734	54	0.7826	0.786
1971	Jan	365	-42.9888	55	0.7971	0.837
1974	Jan	365	-42.9862	56	0.8116	0.890
1963	Jan	365	-42.5981	57	0.8261	0.946
1960	Jan	366	-42.3300	58	0.8406	1.004
1978	Dec	365	-41.6562	59	0.8551	1.067
2007	Jan	365	-41.5310	60	0.8696	1.134
1972	Dec	366	-41.4200	61	0.8841	1.207
1979	Jan	365	-41.3803	62	0.8986	1.286
1950	Jan	365	-40.8634	63	0.9130	1.375
1967	Dec	365	-40.7616	64	0.9275	1.475
1968	Dec	366	-40.6340	65	0.9420	1.593
1989	Feb	365	-40.6087	66	0.9565	1.738
1957	Jan	365	-39.4961	67	0.9710	1.929
1990	Dec	365	-39.0053	68	0.9855	2.232

"Gamma" (Fitted) =	**-45.51**
"Theta" (Fitted) =	**2.70**
Deg. Freedom=	**66**

Figure 1


CDF for the Random Variable: "-MinAvg",
[Minimum System Avg. Temp (Deg-F) on a Day over a Year]
Prob{ -MinAvg < -T} (CDF)
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
-55.0
-53.0
-51.0
-49.0
-47.0
-45.0
-43.0
-41.0
-39.0
-37.0
-35.0
"-MinAvg" (Deg-F) on a day
MinAvg for "1-in-10 Yr 42.0
MinAvg for "1-in-35 Yr" 40.3
CDF (-MinAvg)

V. Estimating the Uncertainty in the Peak-Day Design Temperature

The calculated peak-day design temperatures in section IV above also have a statistical uncertainty associated with them. The estimated measures of uncertainty recommended for our use are calculated from the fitted model for the probability distribution and are believed to be reasonable, although rough, approximations.

The basic approach used the estimated parameters for the probability distribution (see the results provided in Tables 6.1 and 6.2, above) to calculate the fitted temperatures as a function of the empirical CDF listed in Tables 6.1 and 6.2, above. These fitted temperatures are then compared with the observed temperatures by calculating the difference = "observed" – "fitted" values. The full set of differences are then separated into the lower third (L), the middle third (M) and the upper third (U) of the distribution. Finally, values of the root-mean-square error (RMSE) of the differences in each third of the distribution are calculated, along with the RMSE for the entire set of differences overall. The data in Tables 7.1 and 7.2, below, show the temperature data and the resulting RMSE values.

The formula below is used to calculate the RMSE for a specified set of "N" data differences:

$$\text{RMSE} = \text{SQRT}\left\{ \left(\sum_{i=1, \ldots, N} e[\,i\,]^{2} \right) / (N-2) \right\},$$

where e[i] = *observed* less *fitted* value of temperature, T[i]. The number of estimated paramters (3 for the GEV model, 2 for the T-Dist and EV1 models) is subtracted from the respective number of data differences, N, in the denominator of the RMSE expression.

Since both the "1-in-35" and "1-in-10" peak-day temperature values are in the lower third quantile of the fitted distribution, the calculated standard error for these estimates is 0.5 Deg-F.

Table 7.1

Quantile: (Lower, Middle, Upper 3rd's)	Observed $T_{[i]}$ Temp. Ranked	Fitted Value of $T_{[i]}$	Residual $e_{[i]}$: Obs'd. less Fitted Value of $T_{[i]}$	Square of $e_{[i]}$:
U	50.3474	52.0385	-1.6911	2.859685
U	49.8387	50.9561	-1.1174	1.248662
U	49.3422	50.3582	-1.0160	1.032201
U	49.0089	49.9286	-0.9196	0.845695
U	48.7903	49.5866	-0.7963	0.634079
U	48.6797	49.2990	-0.6193	0.383540
U	48.6689	49.0484	-0.3795	0.144011
U	48.5959	48.8249	-0.2290	0.052433
U	48.3524	48.6219	-0.2694	0.072603
U	48.3449	48.4350	-0.0902	0.008129
U	48.2571	48.2612	-0.0041	0.000017
U	48.2140	48.0981	0.1159	0.013427
U	48.0734	47.9440	0.1293	0.016731
U	47.5690	47.7975	-0.2284	0.052175
U	47.3482	47.6574	-0.3092	0.095602
U	47.2790	47.5229	-0.2439	0.059470
U	47.2153	47.3933	-0.1780	0.031677
U	47.1587	47.2679	-0.1092	0.011933
U	47.1497	47.1462	0.0035	0.000012
U	47.0887	47.0279	0.0608	0.003700
U	46.9101	46.9124	-0.0023	0.000005
U	46.8281	46.7994	0.0287	0.000822
U	46.7788	46.6887	0.0901	0.008123
M	46.7556	46.5799	0.1757	0.030861
M	46.7328	46.4729	0.2599	0.067539
M	46.7088	46.3675	0.3414	0.116539
M	46.2669	46.2633	0.0037	0.000013
M	46.1072	46.1602	-0.0530	0.002814
M	45.8342	46.0582	-0.2240	0.050173
M	45.8195	45.9569	-0.1373	0.018862
M	45.8173	45.8562	-0.0389	0.001516
M	45.7926	45.7561	0.0366	0.001337
M	45.6884	45.6562	0.0322	0.001036
M	45.6758	45.5566	0.1191	0.014193
M	45.6143	45.4571	0.1572	0.024727
M	45.3450	45.3575	-0.0125	0.000155
M	45.2622	45.2577	0.0046	0.000021
M	45.2353	45.1575	0.0778	0.006048
M	45.1244	45.0569	0.0675	0.004559
M	45.0642	44.9556	0.1087	0.011811
M	44.9460	44.8535	0.0926	0.008567
M	44.9053	44.7504	0.1548	0.023966
M	44.8440	44.6463	0.1978	0.039106
M	44.8417	44.5408	0.3009	0.090559
M	44.7995	44.4338	0.3657	0.133757

Table 7.2

Quantile: (Lower, Middle, Upper 3rd's)	Observed $T_{[i]}$ Temp. Ranked	Fitted Value of $T_{[i]}$	Residual $e_{[i]}$: Obs'd. less Fitted Value of $T_{[i]}$	Square of $e_{[i]}$:
L	44.7088	44.3250	0.3837	0.147254
L	44.6346	44.2143	0.4202	0.176600
L	44.5730	44.1014	0.4716	0.222419
L	43.9135	43.9859	-0.0723	0.005234
L	43.6350	43.8675	-0.2325	0.054068
L	43.4583	43.7458	-0.2875	0.082665
L	43.4200	43.6204	-0.2004	0.040172
L	43.2855	43.4908	-0.2054	0.042173
L	43.0734	43.3563	-0.2830	0.080085
L	42.9888	43.2163	-0.2275	0.051736
L	42.9862	43.0697	-0.0835	0.006972
L	42.5981	42.9156	-0.3175	0.100776
L	42.3300	42.7525	-0.4225	0.178531
L	41.6562	42.5787	-0.9225	0.851040
L	41.5310	42.3918	-0.8608	0.741056
L	41.4200	42.1889	-0.7688	0.591100
L	41.3803	41.9653	-0.5850	0.342207
L	40.8634	41.7148	-0.8513	0.724757
L	40.7616	41.4271	-0.6655	0.442919
L	40.6340	41.0852	-0.4512	0.203574
L	40.6087	40.6555	-0.0468	0.002193
L	39.4961	40.0576	-0.5615	0.315316
L	39.0053	38.9753	0.0300	0.000900

Overall RMSE ($e_{[i]}$):	**0.45**	**°F**
Upper 3rd RMSE ($e_{[i]}$):	**0.60**	**°F**
Middle 3rd RMSE ($e_{[i]}$):	**0.18**	**°F**
Lower 3rd RMSE ($e_{[i]}$):	**0.51**	**°F**

VI. The Relationship between Annual Likelihoods for Peak-Day Temperatures and "Expected Return Time"

The event whose probability distribution we've modeled is the likelihood that the minimum daily temperature over a calendar year is less than a specified value. And, in particular, we've used this probability model to infer the value of a temperature, our *peak-day design temperature* ($TPDD_{\delta}$), that corresponds to a pre-defined likelihood, δ, that the observed minimum temperature is less than or equal to this design temperature.

(1) δ = Prob{ Minimum Daily Temperature over the Year < $TPDD_{\delta}$ }.

For some applications, it is useful to think of how this specified likelihood (or "risk level" δ) relates to the expected number of years until this Peak-Day event would first occur. This expected number of years is what is meant by the *return period*. The results stated below are found in the book: ***Statistics of Extremes***, E.J. Gumbel, Columbia University Press, 1958, on pages 21-25.

(2) E[#Yrs for Peak-Day Event to Occur] = 1 / δ,

1 / Prob{ Minimum Daily Temperature over the Year < $TPDD_{\delta}$ }.

For our peak-day design temperature (40.3°F) associated with a 1-in-35 annual likelihood, the return period is 35 years (δ=1/35). For the 42.0°F peak-day design temperature, the return period is 10 years (δ=1/10). Occasionally, a less precise terminology is used. For example, the 40.3°F peak-day design temperature may be referred to as a "1-in-35 year cold day"; and the 42.0°F peak-day design temperature may be referred to as a "1-in-10 year cold day."

The probability model for the *return period*, as a random variable, is a geometric (discrete) distribution with positive integer values for the *return period*. The parameter δ = Prob{ Minimum Daily Temperature over the Year < $TPDD_{\delta}$ }.

(3) Prob{ *return period* = r } = $(1 - \delta)^{(r-1)} \delta$, for r = 1, 2, 3, . . .

The expected value of the *return period* is already given in (2) above; the variance of the *return period* is:

(4) Var[*return period*] = $\left(E[\text{ return period }]\right)^2 \times \left(1 - (1 / E[\text{ return period }])\right)$,

(4') Var[*return period*] = $\left(E[\text{ return period }]\right) \times \left(E[\text{ return period }] - 1\right)$.

Equations (4) and (4') indicate that the standard deviation (square root of the variance) of the *return period* is nearly equal to its expected value. Thus, there is substantial variability about the expected value—a *return period* is not very precise.

2018 CALIFORNIA GAS REPORT

GAS PRICE FORECAST
JULY 2018

The Gas Company

A Sempra Energy utility™

2018 CGR Gas Price Forecasts Current $/MMBtu

Consistent with the prior CGR practices, the 2018 CGR gas price forecast was developed using a combination of market prices and fundamental forecasts. Gas futures prices from S&P Global (Platts') were used to generate the SoCalGas border prices through December 2022. The forecast for 2023 and 2024 reflect a blending of market and fundamental prices, with declining weights for market prices over the two year period. For 2025 and beyond, the gas price forecast is a blend of market price fundamentals. Fundamentals were generated as an average of the forecast developed by the CEC and various independent consultants.

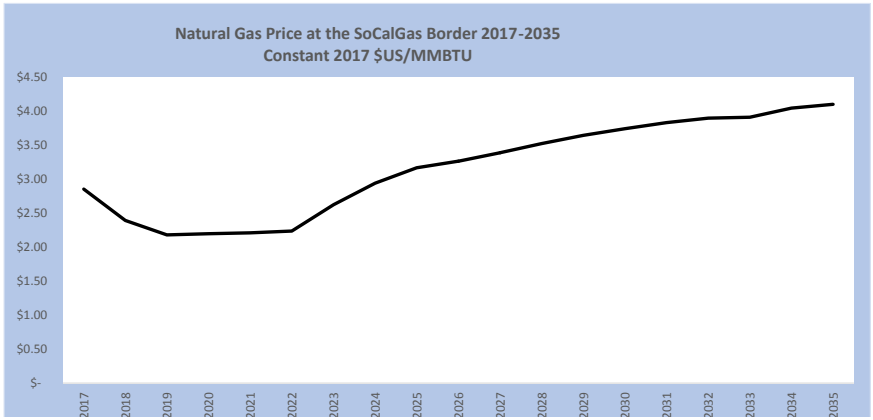
Historical Recorded Prices Reported Through February 2018.

SoCal Border

Futures through 2022; Splice 2023-2024; Fundamentals' Blend 2025-2035

Current $/MMbtu

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Nominal (Average) Price	Real (Average) Price (2017 Constant $)
2011	**4.35**	**4.17**	**3.91**	**4.23**	**4.24**	**4.55**	**4.42**	**4.17**	**4.14**	**3.53**	**3.5**	**3.48**	4.06	
2012	$ 2.92	$ 2.74	$ 2.30	$ 2.22	$ 2.46	$ 2.59	$ 2.91	$ 2.96	$ 3.07	$ 3.53	$ 3.66	$ 3.52	$ 2.91	
2013	$ 3.53	$ 3.52	$ 3.86	$ 4.11	$ 4.03	$ 3.82	$ 3.76	$ 3.55	$ 3.73	$ 3.75	$ 3.69	$ 4.62	$ 3.83	$ 4.16
2014	$ 4.64	$ 6.57	$ 4.98	$ 4.66	$ 4.64	$ 4.72	$ 4.34	$ 4.13	$ 4.09	$ 3.82	$ 4.16	$ 3.49	$ 4.52	$ 4.82
2015	$ 2.96	$ 2.62	$ 2.55	$ 2.42	$ 2.72	$ 2.75	$ 2.91	$ 2.85	$ 2.69	$ 2.39	$ 2.18	$ 2.22	$ 2.61	$ 2.75
2016	$ 2.36	$ 1.85	$ 1.58	$ 1.77	$ 1.80	$ 2.49	$ 2.83	$ 2.80	$ 2.81	$ 2.75	$ 2.33	$ 3.57	$ 2.41	$ 2.46
2017	$ 3.34	$ 2.72	$ 2.62	$ 2.81	$ 2.85	$ 2.76	$ 2.79	$ 2.90	$ 2.80	$ 2.75	$ 2.86	$ 3.02	$ 2.85	$ 2.85
2018	$ 3.11	$ 2.45	$ 2.39	$ 2.19	$ 2.15	$ 2.26	$ 2.46	$ 2.58	$ 2.38	$ 2.25	$ 2.30	$ 2.85	$ 2.45	$ 2.39
2019	$ 2.84	$ 2.76	$ 2.39	$ 1.95	$ 1.93	$ 1.96	$ 2.22	$ 2.22	$ 2.04	$ 2.00	$ 2.44	$ 2.67	$ 2.28	$ 2.18
2020	$ 2.73	$ 2.69	$ 2.57	$ 2.04	$ 2.11	$ 2.15	$ 2.34	$ 2.33	$ 2.14	$ 2.08	$ 2.49	$ 2.69	$ 2.36	$ 2.20
2021	$ 2.79	$ 2.75	$ 2.73	$ 2.15	$ 2.14	$ 2.17	$ 2.36	$ 2.39	$ 2.23	$ 2.16	$ 2.59	$ 2.78	$ 2.44	$ 2.21
2022	$ 2.86	$ 2.83	$ 2.81	$ 2.23	$ 2.23	$ 2.26	$ 2.51	$ 2.51	$ 2.33	$ 2.26	$ 2.66	$ 2.85	$ 2.53	$ 2.24
2023	$ 3.24	$ 3.06	$ 2.96	$ 2.73	$ 2.73	$ 2.88	$ 2.99	$ 3.13	$ 3.01	$ 3.03	$ 3.10	$ 3.62	$ 3.04	$ 2.62
2024	$ 3.66	$ 3.40	$ 3.27	$ 3.19	$ 3.17	$ 3.33	$ 3.48	$ 3.62	$ 3.55	$ 3.52	$ 3.53	$ 4.16	$ 3.49	$ 2.94
2025	$ 4.21	$ 3.83	$ 3.65	$ 3.65	$ 3.58	$ 3.71	$ 3.85	$ 3.95	$ 3.86	$ 3.78	$ 3.75	$ 4.37	$ 3.85	$ 3.17
2026	$ 4.43	$ 4.04	$ 3.85	$ 3.86	$ 3.78	$ 3.91	$ 4.05	$ 4.16	$ 4.07	$ 3.99	$ 3.96	$ 4.59	$ 4.06	$ 3.26
2027	$ 4.70	$ 4.30	$ 4.10	$ 4.11	$ 4.02	$ 4.15	$ 4.30	$ 4.41	$ 4.32	$ 4.24	$ 4.20	$ 4.85	$ 4.31	$ 3.39
2028	$ 4.98	$ 4.58	$ 4.38	$ 4.38	$ 4.28	$ 4.41	$ 4.56	$ 4.68	$ 4.59	$ 4.50	$ 4.47	$ 5.14	$ 4.58	$ 3.52
2029	$ 5.26	$ 4.84	$ 4.63	$ 4.63	$ 4.53	$ 4.67	$ 4.83	$ 4.94	$ 4.86	$ 4.77	$ 4.73	$ 5.42	$ 4.84	$ 3.64
2030	$ 5.51	$ 5.08	$ 4.86	$ 4.87	$ 4.76	$ 4.90	$ 5.06	$ 5.18	$ 5.10	$ 5.00	$ 4.96	$ 5.68	$ 5.08	$ 3.74
2031	$ 5.76	$ 5.31	$ 5.09	$ 5.09	$ 4.98	$ 5.12	$ 5.29	$ 5.41	$ 5.34	$ 5.23	$ 5.19	$ 5.93	$ 5.31	$ 3.83
2032	$ 5.97	$ 5.52	$ 5.28	$ 5.29	$ 5.18	$ 5.32	$ 5.49	$ 5.61	$ 5.55	$ 5.44	$ 5.39	$ 6.15	$ 5.52	$ 3.90
2033	$ 6.11	$ 5.64	$ 5.40	$ 5.42	$ 5.30	$ 5.45	$ 5.63	$ 5.75	$ 5.69	$ 5.58	$ 5.52	$ 6.30	$ 5.65	$ 3.91
2034	$ 6.44	$ 5.96	$ 5.71	$ 5.73	$ 5.60	$ 5.75	$ 5.94	$ 6.06	$ 6.01	$ 5.89	$ 5.83	$ 6.63	$ 5.96	$ 4.04
2035	$ 6.66	$ 6.17	$ 5.91	$ 5.93	$ 5.80	$ 5.96	$ 6.15	$ 6.27	$ 6.22	$ 6.10	$ 6.04	$ 6.86	$ 6.17	$ 4.10



San Juan Basin

Historical Recorded Prices Reported Through February 2018.
Futures through 2022; Splice 2023-2024; Fundamentals' Blend 2025-2035

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	NOMINAL Average
2012	$ 2.64	$ 2.48	$ 2.05	$ 1.84	$ 2.24	$ 2.31	$ 2.74	$ 2.74	$ 2.73	$ 3.27	$ 3.35	$ 3.25	$ 2.64
2013	$ 3.34	$ 3.26	$ 3.67	$ 3.94	$ 3.86	$ 3.66	$ 3.50	$ 3.31	$ 3.51	$ 3.54	$ 3.50	$ 4.43	$ 3.63
2014	$ 4.52	$ 6.49	$ 4.72	$ 4.46	$ 4.38	$ 4.48	$ 4.01	$ 3.85	$ 3.83	$ 3.64	$ 4.00	$ 3.32	$ 4.31
2015	$ 2.87	$ 2.52	$ 2.46	$ 2.31	$ 2.58	$ 2.59	$ 2.73	$ 2.67	$ 2.54	$ 2.22	$ 2.02	$ 1.98	$ 2.46
2016	$ 2.25	$ 1.78	$ 1.51	$ 1.70	$ 1.72	$ 2.36	$ 2.59	$ 2.60	$ 2.71	$ 2.64	$ 2.24	$ 3.46	$ 2.30
2017	$ 3.19	$ 2.59	$ 2.52	$ 2.70	$ 2.75	$ 2.59	$ 2.64	$ 2.60	$ 2.57	$ 2.43	$ 2.56	$ 2.52	$ 2.64
2018	$ 2.95	$ 2.20	$ 2.36	$ 2.47	$ 2.51	$ 2.57	$ 2.61	$ 2.65	$ 2.54	$ 2.50	$ 2.58	$ 2.85	$ 2.56
2019	$ 3.03	$ 2.85	$ 2.73	$ 2.40	$ 2.37	$ 2.42	$ 2.45	$ 2.48	$ 2.38	$ 2.36	$ 2.46	$ 2.74	$ 2.56
2020	$ 2.96	$ 2.80	$ 2.67	$ 2.37	$ 2.36	$ 2.41	$ 2.43	$ 2.46	$ 2.37	$ 2.34	$ 2.44	$ 2.74	$ 2.53
2021	$ 2.97	$ 2.81	$ 2.71	$ 2.43	$ 2.42	$ 2.47	$ 2.49	$ 2.53	$ 2.44	$ 2.41	$ 2.52	$ 2.80	$ 2.58
2022	$ 3.01	$ 2.85	$ 2.76	$ 2.48	$ 2.47	$ 2.52	$ 2.54	$ 2.59	$ 2.50	$ 2.47	$ 2.58	$ 2.87	$ 2.64
2023	$ 3.11	$ 2.96	$ 2.88	$ 2.64	$ 2.64	$ 2.73	$ 2.80	$ 2.88	$ 2.85	$ 2.82	$ 2.90	$ 3.31	$ 2.88
2024	$ 3.53	$ 3.29	$ 3.18	$ 3.10	$ 3.08	$ 3.18	$ 3.29	$ 3.37	$ 3.38	$ 3.31	$ 3.33	$ 3.85	$ 3.33
2025	$ 4.08	$ 3.73	$ 3.56	$ 3.56	$ 3.49	$ 3.56	$ 3.65	$ 3.70	$ 3.69	$ 3.57	$ 3.55	$ 4.06	$ 3.68
2026	$ 4.30	$ 3.94	$ 3.77	$ 3.77	$ 3.69	$ 3.76	$ 3.86	$ 3.91	$ 3.91	$ 3.77	$ 3.76	$ 4.28	$ 3.89
2027	$ 4.57	$ 4.20	$ 4.02	$ 4.02	$ 3.93	$ 4.00	$ 4.10	$ 4.16	$ 4.16	$ 4.02	$ 4.01	$ 4.55	$ 4.14
2028	$ 4.85	$ 4.48	$ 4.29	$ 4.29	$ 4.19	$ 4.26	$ 4.37	$ 4.43	$ 4.43	$ 4.29	$ 4.27	$ 4.83	$ 4.42
2029	$ 5.13	$ 4.74	$ 4.54	$ 4.54	$ 4.44	$ 4.52	$ 4.63	$ 4.69	$ 4.70	$ 4.55	$ 4.53	$ 5.12	$ 4.68
2030	$ 5.38	$ 4.98	$ 4.78	$ 4.78	$ 4.67	$ 4.75	$ 4.86	$ 4.93	$ 4.94	$ 4.79	$ 4.77	$ 5.37	$ 4.92
2031	$ 5.63	$ 5.21	$ 5.00	$ 5.00	$ 4.89	$ 4.97	$ 5.10	$ 5.16	$ 5.17	$ 5.02	$ 4.99	$ 5.62	$ 5.15
2032	$ 5.84	$ 5.41	$ 5.20	$ 5.20	$ 5.09	$ 5.17	$ 5.30	$ 5.36	$ 5.38	$ 5.22	$ 5.19	$ 5.84	$ 5.35
2033	$ 5.98	$ 5.54	$ 5.32	$ 5.33	$ 5.21	$ 5.30	$ 5.44	$ 5.50	$ 5.52	$ 5.36	$ 5.33	$ 5.99	$ 5.48
2034	$ 6.31	$ 5.86	$ 5.63	$ 5.64	$ 5.51	$ 5.60	$ 5.75	$ 5.81	$ 5.84	$ 5.67	$ 5.64	$ 6.33	$ 5.80
2035	$ 6.53	$ 6.06	$ 5.82	$ 5.84	$ 5.71	$ 5.81	$ 5.95	$ 6.02	$ 6.05	$ 5.88	$ 5.84	$ 6.55	$ 6.01

AECO

Historical Recorded Prices Reported Through February 2018.
Futures through 2022; Splice 2023-2024; Fundamentals' Blend 2025-2035

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	NOMINAL Average
2012	$ 2.47	$ 2.17	$ 1.82	$ 1.66	$ 2.05	$ 1.90	$ 2.30	$ 2.23	$ 2.37	$ 3.10	$ 3.36	$ 3.20	$ 2.39
2013	$ 3.07	$ 3.04	$ 3.38	$ 3.61	$ 3.54	$ 3.25	$ 2.73	$ 2.33	$ 2.02	$ 3.13	$ 3.26	$ 3.65	$ 3.08
2014	$ 4.03	$ 6.75	$ 5.06	$ 4.52	$ 4.37	$ 4.48	$ 3.92	$ 3.77	$ 3.78	$ 3.51	$ 3.72	$ 3.08	$ 4.25
2015	$ 2.63	$ 2.59	$ 2.58	$ 2.43	$ 2.69	$ 2.45	$ 2.70	$ 2.80	$ 2.75	$ 2.48	$ 2.40	$ 2.16	$ 2.56
2016	$ 2.26	$ 1.72	$ 1.29	$ 1.02	$ 1.18	$ 1.74	$ 2.27	$ 1.94	$ 2.50	$ 2.92	$ 2.58	$ 3.28	$ 2.06
2017	$ 2.79	$ 2.42	$ 2.48	$ 2.67	$ 2.85	$ 2.44	$ 1.71	$ 1.68	$ 1.04	$ 0.77	$ 2.17	$ 1.93	$ 2.08
2018	$ 2.00	$ 1.98	$ 2.23	$ 2.12	$ 2.29	$ 2.19	$ 1.98	$ 1.86	$ 1.67	$ 1.81	$ 2.56	$ 2.46	$ 2.09
2019	$ 2.83	$ 2.74	$ 2.60	$ 2.05	$ 2.15	$ 2.04	$ 1.82	$ 1.69	$ 1.51	$ 1.67	$ 2.43	$ 2.36	$ 2.16
2020	$ 2.76	$ 2.69	$ 2.54	$ 2.01	$ 2.14	$ 2.02	$ 1.81	$ 1.67	$ 1.50	$ 1.65	$ 2.42	$ 2.36	$ 2.13
2021	$ 2.78	$ 2.70	$ 2.58	$ 2.08	$ 2.20	$ 2.09	$ 1.87	$ 1.74	$ 1.57	$ 1.72	$ 2.49	$ 2.42	$ 2.19
2022	$ 2.82	$ 2.74	$ 2.63	$ 2.12	$ 2.25	$ 2.13	$ 1.91	$ 1.80	$ 1.63	$ 1.78	$ 2.56	$ 2.49	$ 2.24
2023	$ 2.92	$ 2.84	$ 2.75	$ 2.28	$ 2.42	$ 2.34	$ 2.17	$ 2.09	$ 1.98	$ 2.13	$ 2.88	$ 2.93	$ 2.48
2024	$ 3.34	$ 3.18	$ 3.05	$ 2.75	$ 2.86	$ 2.79	$ 2.66	$ 2.58	$ 2.51	$ 2.62	$ 3.31	$ 3.47	$ 2.93
2025	$ 3.88	$ 3.61	$ 3.43	$ 3.21	$ 3.27	$ 3.17	$ 3.03	$ 2.91	$ 2.82	$ 2.88	$ 3.53	$ 3.68	$ 3.28
2026	$ 4.10	$ 3.83	$ 3.64	$ 3.42	$ 3.47	$ 3.38	$ 3.23	$ 3.12	$ 3.04	$ 3.08	$ 3.74	$ 3.90	$ 3.50
2027	$ 4.37	$ 4.08	$ 3.89	$ 3.66	$ 3.71	$ 3.62	$ 3.48	$ 3.37	$ 3.29	$ 3.33	$ 3.98	$ 4.16	$ 3.75
2028	$ 4.66	$ 4.36	$ 4.16	$ 3.93	$ 3.97	$ 3.88	$ 3.74	$ 3.64	$ 3.56	$ 3.60	$ 4.25	$ 4.45	$ 4.02
2029	$ 4.93	$ 4.62	$ 4.41	$ 4.19	$ 4.22	$ 4.13	$ 4.01	$ 3.90	$ 3.83	$ 3.86	$ 4.51	$ 4.73	$ 4.28
2030	$ 5.19	$ 4.87	$ 4.65	$ 4.42	$ 4.45	$ 4.36	$ 4.24	$ 4.14	$ 4.07	$ 4.10	$ 4.74	$ 4.99	$ 4.52
2031	$ 5.43	$ 5.10	$ 4.87	$ 4.65	$ 4.67	$ 4.59	$ 4.47	$ 4.37	$ 4.30	$ 4.33	$ 4.97	$ 5.24	$ 4.75
2032	$ 5.65	$ 5.30	$ 5.07	$ 4.85	$ 4.87	$ 4.78	$ 4.67	$ 4.57	$ 4.51	$ 4.53	$ 5.17	$ 5.46	$ 4.95
2033	$ 5.79	$ 5.43	$ 5.19	$ 4.97	$ 4.99	$ 4.92	$ 4.81	$ 4.71	$ 4.65	$ 4.67	$ 5.30	$ 5.61	$ 5.09
2034	$ 6.12	$ 5.75	$ 5.50	$ 5.28	$ 5.29	$ 5.22	$ 5.12	$ 5.02	$ 4.97	$ 4.98	$ 5.61	$ 5.94	$ 5.40
2035	$ 6.34	$ 5.95	$ 5.69	$ 5.48	$ 5.49	$ 5.42	$ 5.33	$ 5.23	$ 5.18	$ 5.19	$ 5.82	$ 6.17	$ 5.61

Permian Basin

Historical Recorded Prices Reported Through February 2018.
Futures through 2022; Splice 2023-2024; Fundamentals' Blend 2025-2035

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	NOMINAL Average
2012	$ 2.63	$ 2.48	$ 2.06	$ 1.88	$ 2.32	$ 2.38	$ 2.81	$ 2.79	$ 2.75	$ 3.27	$ 3.36	$ 3.26	$ 2.66
2013	$ 3.32	$ 3.25	$ 3.66	$ 3.98	$ 3.88	$ 3.66	$ 3.51	$ 3.32	$ 3.52	$ 3.53	$ 3.50	$ 4.36	$ 3.63
2014	$ 4.44	$ 6.50	$ 4.65	$ 4.46	$ 4.37	$ 4.47	$ 3.96	$ 3.81	$ 3.82	$ 3.63	$ 3.97	$ 3.26	$ 4.28
2015	$ 2.83	$ 2.51	$ 2.47	$ 2.31	$ 2.57	$ 2.58	$ 2.72	$ 2.67	$ 2.53	$ 2.22	$ 1.98	$ 1.92	$ 2.44
2016	$ 2.20	$ 1.77	$ 1.52	$ 1.70	$ 1.71	$ 2.35	$ 2.59	$ 2.58	$ 2.70	$ 2.64	$ 2.20	$ 3.39	$ 2.28
2017	$ 3.13	$ 2.56	$ 2.50	$ 2.69	$ 2.73	$ 2.60	$ 2.59	$ 2.58	$ 2.57	$ 2.43	$ 2.50	$ 2.40	$ 2.61
2018	$ 2.93	$ 2.08	$ 2.36	$ 2.47	$ 2.49	$ 2.57	$ 2.58	$ 2.63	$ 2.53	$ 2.50	$ 2.53	$ 2.75	$ 2.53
2019	$ 2.97	$ 2.84	$ 2.72	$ 2.40	$ 2.35	$ 2.42	$ 2.42	$ 2.46	$ 2.38	$ 2.36	$ 2.41	$ 2.65	$ 2.53
2020	$ 2.90	$ 2.78	$ 2.67	$ 2.36	$ 2.34	$ 2.41	$ 2.41	$ 2.44	$ 2.36	$ 2.34	$ 2.39	$ 2.65	$ 2.50
2021	$ 2.92	$ 2.79	$ 2.71	$ 2.43	$ 2.41	$ 2.47	$ 2.47	$ 2.51	$ 2.43	$ 2.41	$ 2.47	$ 2.71	$ 2.56
2022	$ 2.96	$ 2.83	$ 2.75	$ 2.47	$ 2.45	$ 2.52	$ 2.51	$ 2.57	$ 2.49	$ 2.47	$ 2.53	$ 2.78	$ 2.61
2023	$ 3.06	$ 2.94	$ 2.87	$ 2.63	$ 2.63	$ 2.73	$ 2.77	$ 2.86	$ 2.84	$ 2.82	$ 2.85	$ 3.22	$ 2.85
2024	$ 3.48	$ 3.27	$ 3.18	$ 3.10	$ 3.07	$ 3.18	$ 3.26	$ 3.35	$ 3.38	$ 3.31	$ 3.28	$ 3.76	$ 3.30
2025	$ 4.02	$ 3.71	$ 3.56	$ 3.56	$ 3.47	$ 3.56	$ 3.63	$ 3.68	$ 3.69	$ 3.57	$ 3.50	$ 3.97	$ 3.66
2026	$ 4.24	$ 3.92	$ 3.76	$ 3.77	$ 3.67	$ 3.76	$ 3.83	$ 3.89	$ 3.90	$ 3.77	$ 3.71	$ 4.19	$ 3.87
2027	$ 4.51	$ 4.18	$ 4.01	$ 4.01	$ 3.92	$ 4.00	$ 4.08	$ 4.14	$ 4.15	$ 4.02	$ 3.96	$ 4.45	$ 4.12
2028	$ 4.80	$ 4.46	$ 4.29	$ 4.28	$ 4.18	$ 4.26	$ 4.34	$ 4.41	$ 4.42	$ 4.29	$ 4.22	$ 4.74	$ 4.39
2029	$ 5.07	$ 4.72	$ 4.54	$ 4.54	$ 4.43	$ 4.52	$ 4.61	$ 4.67	$ 4.69	$ 4.55	$ 4.48	$ 5.02	$ 4.65
2030	$ 5.33	$ 4.96	$ 4.77	$ 4.77	$ 4.66	$ 4.75	$ 4.84	$ 4.91	$ 4.93	$ 4.79	$ 4.72	$ 5.28	$ 4.89
2031	$ 5.57	$ 5.19	$ 5.00	$ 5.00	$ 4.88	$ 4.97	$ 5.07	$ 5.14	$ 5.17	$ 5.02	$ 4.94	$ 5.53	$ 5.12
2032	$ 5.79	$ 5.40	$ 5.19	$ 5.20	$ 5.07	$ 5.17	$ 5.27	$ 5.34	$ 5.38	$ 5.22	$ 5.14	$ 5.75	$ 5.33
2033	$ 5.93	$ 5.52	$ 5.31	$ 5.32	$ 5.20	$ 5.30	$ 5.41	$ 5.48	$ 5.52	$ 5.36	$ 5.28	$ 5.90	$ 5.46
2034	$ 6.26	$ 5.84	$ 5.62	$ 5.63	$ 5.50	$ 5.60	$ 5.72	$ 5.79	$ 5.84	$ 5.67	$ 5.59	$ 6.23	$ 5.77
2035	$ 6.48	$ 6.04	$ 5.82	$ 5.83	$ 5.70	$ 5.81	$ 5.93	$ 6.00	$ 6.05	$ 5.88	$ 5.79	$ 6.46	$ 5.98

Kern Delivered

Historical Recorded Prices Reported Through February 2018.
Futures through 2022; Splice 2023-2024; Fundamentals' Blend 2025-2035

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	NOMINAL Average
2012	$ 2.90	$ 2.74	$ 2.30	$ 2.21	$ 2.44	$ 2.60	$ 2.87	$ 2.95	$ 3.07	$ 3.55	$ 3.65	$ 3.52	$ 2.90
2013	$ 3.53	$ 3.48	$ 3.86	$ 4.09	$ 4.00	$ 3.78	$ 3.71	$ 3.52	$ 3.69	$ 3.75	$ 3.69	$ 4.73	$ 3.82
2014	$ 4.50	$ 7.00	$ 4.87	$ 4.49	$ 4.39	$ 4.48	$ 3.98	$ 3.80	$ 3.79	$ 3.61	$ 4.03	$ 3.35	$ 4.36
2015	$ 2.82	$ 2.50	$ 2.43	$ 2.29	$ 2.60	$ 2.57	$ 2.69	$ 2.63	$ 2.55	$ 2.21	$ 2.10	$ 2.10	$ 2.46
2016	$ 2.24	$ 1.76	$ 1.51	$ 1.69	$ 1.73	$ 2.32	$ 2.57	$ 2.59	$ 2.70	$ 2.67	$ 2.24	$ 3.48	$ 2.29
2017	$ 3.24	$ 2.61	$ 2.54	$ 2.73	$ 2.78	$ 2.59	$ 2.62	$ 2.61	$ 2.60	$ 2.56	$ 2.71	$ 2.58	$ 2.68
2018	$ 2.98	$ 2.31	$ 2.37	$ 2.48	$ 2.53	$ 2.55	$ 2.59	$ 2.65	$ 2.55	$ 2.58	$ 2.66	$ 2.89	$ 2.59
2019	$ 3.05	$ 2.86	$ 2.74	$ 2.41	$ 2.39	$ 2.40	$ 2.43	$ 2.48	$ 2.39	$ 2.44	$ 2.53	$ 2.78	$ 2.57
2020	$ 2.98	$ 2.80	$ 2.68	$ 2.38	$ 2.38	$ 2.39	$ 2.41	$ 2.46	$ 2.38	$ 2.42	$ 2.52	$ 2.78	$ 2.55
2021	$ 2.99	$ 2.81	$ 2.72	$ 2.44	$ 2.44	$ 2.45	$ 2.47	$ 2.53	$ 2.45	$ 2.49	$ 2.59	$ 2.84	$ 2.60
2022	$ 3.03	$ 2.85	$ 2.77	$ 2.49	$ 2.49	$ 2.50	$ 2.52	$ 2.59	$ 2.51	$ 2.55	$ 2.66	$ 2.91	$ 2.65
2023	$ 3.13	$ 2.96	$ 2.89	$ 2.65	$ 2.66	$ 2.71	$ 2.78	$ 2.88	$ 2.86	$ 2.90	$ 2.98	$ 3.35	$ 2.89
2024	$ 3.55	$ 3.29	$ 3.19	$ 3.11	$ 3.10	$ 3.16	$ 3.27	$ 3.37	$ 3.39	$ 3.39	$ 3.41	$ 3.89	$ 3.34
2025	$ 4.10	$ 3.73	$ 3.57	$ 3.57	$ 3.51	$ 3.54	$ 3.63	$ 3.70	$ 3.70	$ 3.65	$ 3.63	$ 4.10	$ 3.70
2026	$ 4.32	$ 3.94	$ 3.78	$ 3.78	$ 3.71	$ 3.74	$ 3.84	$ 3.91	$ 3.92	$ 3.85	$ 3.84	$ 4.32	$ 3.91
2027	$ 4.59	$ 4.20	$ 4.03	$ 4.03	$ 3.95	$ 3.98	$ 4.08	$ 4.16	$ 4.17	$ 4.10	$ 4.08	$ 4.59	$ 4.16
2028	$ 4.87	$ 4.48	$ 4.30	$ 4.30	$ 4.21	$ 4.24	$ 4.35	$ 4.43	$ 4.44	$ 4.37	$ 4.35	$ 4.87	$ 4.43
2029	$ 5.15	$ 4.74	$ 4.55	$ 4.55	$ 4.46	$ 4.50	$ 4.61	$ 4.69	$ 4.71	$ 4.63	$ 4.61	$ 5.16	$ 4.70
2030	$ 5.40	$ 4.98	$ 4.79	$ 4.79	$ 4.69	$ 4.73	$ 4.84	$ 4.93	$ 4.95	$ 4.87	$ 4.84	$ 5.41	$ 4.93
2031	$ 5.65	$ 5.21	$ 5.01	$ 5.01	$ 4.91	$ 4.95	$ 5.08	$ 5.16	$ 5.18	$ 5.10	$ 5.07	$ 5.66	$ 5.17
2032	$ 5.86	$ 5.42	$ 5.21	$ 5.21	$ 5.11	$ 5.15	$ 5.28	$ 5.36	$ 5.39	$ 5.30	$ 5.27	$ 5.88	$ 5.37
2033	$ 6.00	$ 5.54	$ 5.33	$ 5.34	$ 5.23	$ 5.28	$ 5.42	$ 5.50	$ 5.53	$ 5.44	$ 5.40	$ 6.03	$ 5.50
2034	$ 6.33	$ 5.86	$ 5.64	$ 5.65	$ 5.53	$ 5.58	$ 5.73	$ 5.81	$ 5.85	$ 5.75	$ 5.71	$ 6.37	$ 5.82

2035	$ 6.55	$ 6.06	$ 5.83	$ 5.85	$ 5.73	$ 5.79	$ 5.93	$ 6.02	$ 6.06	$ 5.96	$ 5.92	$ 6.59	$ 6.03	

Historical Recorded Prices Reported Through February 2018.

Malin **Futures through 2022; Splice 2023-2024; Fundamentals' Blend 2025-2035**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	NOMINAL Average
2012	$ 2.80	$ 2.60	$ 2.15	$ 1.93	$ 2.29	$ 2.28	$ 2.75	$ 2.76	$ 2.77	$ 3.40	$ 3.55	$ 3.43	$ 2.72
2013	$ 3.45	$ 3.40	$ 3.77	$ 4.00	$ 3.92	$ 3.68	$ 3.52	$ 3.36	$ 3.53	$ 3.71	$ 3.60	$ 4.54	$ 3.71
2014	$ 4.50	$ 6.91	$ 4.91	$ 4.55	$ 4.45	$ 4.55	$ 4.06	$ 3.87	$ 3.88	$ 3.67	$ 4.08	$ 3.40	$ 4.40
2015	$ 2.85	$ 2.53	$ 2.47	$ 2.33	$ 2.65	$ 2.63	$ 2.75	$ 2.70	$ 2.61	$ 2.27	$ 2.20	$ 2.19	$ 2.51
2016	$ 2.30	$ 1.80	$ 1.57	$ 1.72	$ 1.77	$ 2.38	$ 2.61	$ 2.66	$ 2.74	$ 2.72	$ 2.27	$ 3.50	$ 2.34
2017	$ 3.29	$ 2.65	$ 2.59	$ 2.79	$ 2.84	$ 2.63	$ 2.66	$ 2.68	$ 2.68	$ 2.61	$ 2.75	$ 2.64	$ 2.73
2018	$ 2.78	$ 2.36	$ 2.43	$ 2.53	$ 2.58	$ 2.60	$ 2.63	$ 2.72	$ 2.61	$ 2.63	$ 2.69	$ 2.93	$ 2.62
2019	$ 3.10	$ 2.90	$ 2.79	$ 2.46	$ 2.44	$ 2.45	$ 2.47	$ 2.55	$ 2.45	$ 2.49	$ 2.57	$ 2.82	$ 2.62
2020	$ 3.03	$ 2.84	$ 2.74	$ 2.42	$ 2.43	$ 2.44	$ 2.45	$ 2.53	$ 2.44	$ 2.47	$ 2.55	$ 2.82	$ 2.60
2021	$ 3.05	$ 2.85	$ 2.78	$ 2.49	$ 2.49	$ 2.50	$ 2.51	$ 2.60	$ 2.51	$ 2.54	$ 2.63	$ 2.88	$ 2.65
2022	$ 3.09	$ 2.89	$ 2.82	$ 2.53	$ 2.54	$ 2.55	$ 2.56	$ 2.66	$ 2.57	$ 2.60	$ 2.69	$ 2.95	$ 2.70
2023	$ 3.19	$ 3.00	$ 2.94	$ 2.69	$ 2.71	$ 2.76	$ 2.82	$ 2.95	$ 2.92	$ 2.95	$ 3.01	$ 3.39	$ 2.94
2024	$ 3.61	$ 3.33	$ 3.25	$ 3.16	$ 3.15	$ 3.21	$ 3.31	$ 3.44	$ 3.45	$ 3.44	$ 3.44	$ 3.93	$ 3.39
2025	$ 4.15	$ 3.77	$ 3.63	$ 3.62	$ 3.56	$ 3.59	$ 3.67	$ 3.77	$ 3.76	$ 3.70	$ 3.66	$ 4.14	$ 3.75
2026	$ 4.37	$ 3.98	$ 3.83	$ 3.83	$ 3.76	$ 3.79	$ 3.88	$ 3.98	$ 3.98	$ 3.90	$ 3.87	$ 4.36	$ 3.96
2027	$ 4.64	$ 4.24	$ 4.08	$ 4.07	$ 4.00	$ 4.03	$ 4.12	$ 4.23	$ 4.23	$ 4.15	$ 4.12	$ 4.63	$ 4.21
2028	$ 4.93	$ 4.52	$ 4.36	$ 4.34	$ 4.26	$ 4.29	$ 4.39	$ 4.50	$ 4.50	$ 4.42	$ 4.38	$ 4.91	$ 4.48
2029	$ 5.20	$ 4.78	$ 4.61	$ 4.60	$ 4.51	$ 4.55	$ 4.65	$ 4.76	$ 4.77	$ 4.68	$ 4.64	$ 5.20	$ 4.75
2030	$ 5.46	$ 5.02	$ 4.84	$ 4.83	$ 4.74	$ 4.78	$ 4.88	$ 5.00	$ 5.01	$ 4.92	$ 4.88	$ 5.45	$ 4.98
2031	$ 5.70	$ 5.25	$ 5.07	$ 5.06	$ 4.96	$ 5.00	$ 5.12	$ 5.23	$ 5.24	$ 5.15	$ 5.10	$ 5.70	$ 5.22
2032	$ 5.92	$ 5.46	$ 5.26	$ 5.26	$ 5.16	$ 5.20	$ 5.32	$ 5.43	$ 5.45	$ 5.35	$ 5.30	$ 5.92	$ 5.42
2033	$ 6.06	$ 5.58	$ 5.38	$ 5.38	$ 5.28	$ 5.33	$ 5.46	$ 5.57	$ 5.59	$ 5.49	$ 5.44	$ 6.07	$ 5.55
2034	$ 6.39	$ 5.90	$ 5.69	$ 5.69	$ 5.58	$ 5.63	$ 5.77	$ 5.88	$ 5.91	$ 5.80	$ 5.75	$ 6.41	$ 5.87
2035	$ 6.61	$ 6.10	$ 5.89	$ 5.89	$ 5.78	$ 5.84	$ 5.97	$ 6.09	$ 6.12	$ 6.01	$ 5.95	$ 6.63	$ 6.07

PGE Citigate

Updated March 15, 2018

PG&E G-EG Rates, 2015 GT&S Rate Case

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	NOMINAL Average
2012	$ 3.11	$ 2.92	$ 2.52	$ 2.38	$ 2.74	$ 2.77	$ 3.01	$ 3.03	$ 3.30	$ 3.95	$ 3.83	$ 3.76	$ 3.11
2013	$ 3.67	$ 3.63	$ 4.04	$ 4.19	$ 4.15	$ 3.92	$ 3.82	$ 3.71	$ 3.99	$ 3.98	$ 3.85	$ 4.65	$ 3.97
2014	$ 4.65	$ 6.83	$ 5.23	$ 5.09	$ 5.04	$ 5.11	$ 4.70	$ 4.49	$ 4.43	$ 4.29	$ 4.50	$ 3.82	$ 4.85
2015	$ 3.24	$ 2.95	$ 2.93	$ 2.86	$ 3.19	$ 3.08	$ 3.19	$ 3.17	$ 3.10	$ 2.87	$ 2.69	$ 2.55	$ 2.99
2016	$ 2.60	$ 2.09	$ 1.90	$ 1.95	$ 1.94	$ 2.62	$ 2.98	$ 3.20	$ 3.36	$ 3.25	$ 2.82	$ 3.76	$ 2.71
2017	$ 3.62	$ 3.26	$ 3.14	$ 3.31	$ 3.38	$ 3.12	$ 3.23	$ 3.27	$ 3.29	$ 3.13	$ 3.12	$ 2.92	$ 3.23
2018	$ 2.96	$ 2.70	$ 2.87	$ 2.90	$ 2.93	$ 2.97	$ 3.10	$ 3.28	$ 3.22	$ 3.15	$ 3.15	$ 3.20	$ 3.03
2019	$ 3.42	$ 3.35	$ 3.23	$ 2.83	$ 2.79	$ 2.82	$ 2.94	$ 3.12	$ 3.07	$ 3.02	$ 3.03	$ 3.09	$ 3.06
2020	$ 3.35	$ 3.29	$ 3.18	$ 2.80	$ 2.78	$ 2.80	$ 2.92	$ 3.10	$ 3.05	$ 3.00	$ 3.01	$ 3.09	$ 3.03
2021	$ 3.36	$ 3.30	$ 3.22	$ 2.86	$ 2.85	$ 2.87	$ 2.98	$ 3.17	$ 3.12	$ 3.07	$ 3.09	$ 3.15	$ 3.09
2022	$ 3.40	$ 3.34	$ 3.26	$ 2.91	$ 2.89	$ 2.91	$ 3.03	$ 3.22	$ 3.18	$ 3.13	$ 3.15	$ 3.22	$ 3.14
2023	$ 3.50	$ 3.45	$ 3.38	$ 3.07	$ 3.07	$ 3.12	$ 3.29	$ 3.51	$ 3.53	$ 3.47	$ 3.47	$ 3.72	$ 3.38
2024	$ 3.92	$ 3.78	$ 3.69	$ 3.53	$ 3.51	$ 3.57	$ 3.78	$ 4.01	$ 4.07	$ 3.96	$ 3.90	$ 4.26	$ 3.83
2025	$ 4.47	$ 4.22	$ 4.07	$ 3.99	$ 3.91	$ 3.95	$ 4.14	$ 4.34	$ 4.38	$ 4.22	$ 4.12	$ 4.47	$ 4.19
2026	$ 4.69	$ 4.43	$ 4.27	$ 4.20	$ 4.11	$ 4.16	$ 4.35	$ 4.55	$ 4.59	$ 4.43	$ 4.33	$ 4.70	$ 4.40
2027	$ 4.96	$ 4.69	$ 4.52	$ 4.45	$ 4.36	$ 4.40	$ 4.59	$ 4.79	$ 4.84	$ 4.68	$ 4.58	$ 4.96	$ 4.65
2028	$ 5.24	$ 4.97	$ 4.80	$ 4.72	$ 4.62	$ 4.66	$ 4.86	$ 5.06	$ 5.11	$ 4.94	$ 4.84	$ 5.25	$ 4.92
2029	$ 5.52	$ 5.23	$ 5.05	$ 4.97	$ 4.87	$ 4.91	$ 5.12	$ 5.32	$ 5.38	$ 5.21	$ 5.10	$ 5.53	$ 5.18
2030	$ 5.77	$ 5.47	$ 5.28	$ 5.21	$ 5.10	$ 5.14	$ 5.35	$ 5.56	$ 5.62	$ 5.44	$ 5.34	$ 5.78	$ 5.42
2031	$ 6.02	$ 5.70	$ 5.51	$ 5.43	$ 5.32	$ 5.37	$ 5.59	$ 5.79	$ 5.86	$ 5.67	$ 5.56	$ 6.03	$ 5.65
2032	$ 6.23	$ 5.91	$ 5.70	$ 5.63	$ 5.51	$ 5.56	$ 5.79	$ 6.00	$ 6.07	$ 5.88	$ 5.76	$ 6.26	$ 5.86

2033	$ 6.37	$ 6.03	$ 5.82	$ 5.76	$ 5.64	$ 5.70	$ 5.93	$ 6.13	$ 6.21	$ 6.02	$ 5.90	$ 6.40	$ 5.99
2034	$ 6.70	$ 6.35	$ 6.13	$ 6.07	$ 5.94	$ 6.00	$ 6.24	$ 6.44	$ 6.53	$ 6.33	$ 6.21	$ 6.74	$ 6.31
2035	$ 6.92	$ 6.55	$ 6.33	$ 6.27	$ 6.14	$ 6.20	$ 6.44	$ 6.65	$ 6.74	$ 6.54	$ 6.41	$ 6.97	$ 6.51

NYMEX through 2022; Splice 2023-2024; Blend 2025-2035

Henry Hub **Updated March 15, 2018** Recorded Historical values reported through February 2018.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	NOMINAL Average
2012	$2.6829	$2.5241	$2.1800	$1.9413	$2.4326	$2.4257	$2.9345	$2.8465	$2.8263	$3.3155	$3.5177	$3.3445	$ 2.75
2013	$3.3429	$3.3004	$3.8029	$4.1617	$4.0377	$3.8423	$3.6239	$3.4174	$3.6047	$3.6697	$3.6250	$4.2245	$ 3.72
2014	$4.5977	$5.8746	$4.7700	$4.6117	$4.5574	$4.5653	$4.0432	$3.8661	$3.8993	$3.7839	$4.0723	$3.3965	$ 4.34
2015	$2.9916	$2.8232	$2.7929	$2.5840	$2.8287	$2.7533	$2.8206	$2.7626	$2.6473	$2.3258	$2.0717	$1.8648	$ 2.61
2016	$2.2700	$1.9679	$1.6900	$1.8900	$1.8900	$2.5200	$2.7800	$2.7800	$2.9600	$2.9300	$2.4700	$3.5700	$ 2.48
2017	$3.3200	$2.8300	$2.8400	$3.0700	$3.1300	$2.9300	$2.9600	$2.8700	$2.9500	$2.8700	$2.9700	$2.7600	$ 2.96
2018	$3.7100	$2.6600	$2.6100	$2.7500	$2.7800	$2.8200	$2.8600	$2.8700	$2.8500	$2.8600	$2.9000	$3.0200	$ 2.89
2019	$3.1020	$3.0690	$2.9780	$2.6820	$2.6430	$2.6710	$2.7020	$2.7080	$2.6970	$2.7250	$2.7770	$2.9160	$ 2.81
2020	$3.0340	$3.0150	$2.9230	$2.6480	$2.6310	$2.6570	$2.6850	$2.6870	$2.6800	$2.7080	$2.7640	$2.9150	$ 2.78
2021	$3.0470	$3.0240	$2.9640	$2.7140	$2.6970	$2.7200	$2.7450	$2.7550	$2.7500	$2.7760	$2.8360	$2.9780	$ 2.83
2022	$3.0880	$3.0650	$3.0070	$2.7570	$2.7400	$2.7650	$2.7920	$2.8100	$2.8110	$2.8370	$2.9040	$3.0470	$ 2.89
2023	$3.1853	$3.1732	$3.1267	$2.9195	$2.9194	$2.9768	$3.0501	$3.1020	$3.1616	$3.1823	$3.2235	$3.4854	$ 3.13
2024	$3.6082	$3.5087	$3.4328	$3.3835	$3.3570	$3.4300	$3.5417	$3.5952	$3.6976	$3.6707	$3.6522	$4.0252	$ 3.58
2025	$4.1518	$3.9398	$3.8107	$3.8431	$3.7620	$3.8095	$3.9070	$3.9274	$4.0081	$3.9317	$3.8743	$4.2351	$ 3.93
2026	$4.3749	$4.1549	$4.0195	$4.0510	$3.9645	$4.0120	$4.1138	$4.1360	$4.2200	$4.1396	$4.0810	$4.4585	$ 4.14
2027	$4.6406	$4.4116	$4.2689	$4.2989	$4.2056	$4.2528	$4.3594	$4.3840	$4.4718	$4.3865	$4.3268	$4.7237	$ 4.39
2028	$4.9283	$4.6907	$4.5400	$4.5677	$4.4669	$4.5131	$4.6245	$4.6519	$4.7436	$4.6531	$4.5927	$5.0098	$ 4.67
2029	$5.2044	$4.9515	$4.7921	$4.8228	$4.7170	$4.7672	$4.8855	$4.9139	$5.0113	$4.9157	$4.8509	$5.2929	$ 4.93
2030	$5.4573	$5.1956	$5.0291	$5.0587	$4.9465	$4.9967	$5.1196	$5.1503	$5.2514	$5.1512	$5.0851	$5.5458	$ 5.17
2031	$5.7012	$5.4257	$5.2513	$5.2838	$5.1674	$5.2213	$5.3505	$5.3820	$5.4882	$5.3835	$5.3133	$5.7963	$ 5.40
2032	$5.9166	$5.6290	$5.4477	$5.4827	$5.3625	$5.4196	$5.5541	$5.5864	$5.6972	$5.5885	$5.5148	$6.0173	$ 5.60
2033	$6.0552	$5.7539	$5.5671	$5.6082	$5.4874	$5.5509	$5.6907	$5.7222	$5.8376	$5.7262	$5.6469	$6.1668	$ 5.73
2034	$6.3885	$6.0744	$5.8780	$5.9185	$5.7899	$5.8541	$6.0005	$6.0346	$6.1552	$6.0378	$5.9562	$6.5017	$ 6.05
2035	$6.6064	$6.2770	$6.0731	$6.1184	$5.9869	$6.0566	$6.2093	$6.2436	$6.3696	$6.2482	$6.1613	$6.7290	$ 6.26

Historical Recorded Prices Reported Through February 2018.

Opal **Futures through 2022; Splice 2023-2024; Fundamentals' Blend 2025-2035**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	NOMINAL Average
2012	$ 2.68	$ 2.53	$ 2.06	$ 1.88	$ 2.26	$ 2.27	$ 2.72	$ 2.75	$ 2.74	$ 3.35	$ 3.50	$ 3.35	$ 2.67
2013	$ 3.38	$ 3.32	$ 3.72	$ 3.96	$ 3.86	$ 3.62	$ 3.46	$ 3.29	$ 3.47	$ 3.61	$ 3.53	$ 4.54	$ 3.65
2014	$ 4.51	$ 7.02	$ 4.90	$ 4.49	$ 4.39	$ 4.48	$ 3.98	$ 3.80	$ 3.79	$ 3.61	$ 4.04	$ 3.36	$ 4.36
2015	$ 2.82	$ 2.51	$ 2.43	$ 2.30	$ 2.60	$ 2.57	$ 2.70	$ 2.64	$ 2.55	$ 2.21	$ 2.11	$ 2.11	$ 2.46
2016	$ 2.25	$ 1.76	$ 1.51	$ 1.70	$ 1.72	$ 2.32	$ 2.58	$ 2.60	$ 2.70	$ 2.68	$ 2.24	$ 3.48	$ 2.30
2017	$ 3.25	$ 2.61	$ 2.55	$ 2.74	$ 2.78	$ 2.59	$ 2.62	$ 2.61	$ 2.62	$ 2.57	$ 2.71	$ 2.59	$ 2.69
2018	$ 2.98	$ 2.32	$ 2.38	$ 2.49	$ 2.52	$ 2.55	$ 2.59	$ 2.65	$ 2.56	$ 2.59	$ 2.66	$ 2.89	$ 2.60
2019	$ 3.06	$ 2.86	$ 2.74	$ 2.42	$ 2.38	$ 2.40	$ 2.43	$ 2.49	$ 2.40	$ 2.45	$ 2.53	$ 2.79	$ 2.58
2020	$ 2.99	$ 2.80	$ 2.69	$ 2.39	$ 2.37	$ 2.39	$ 2.42	$ 2.47	$ 2.39	$ 2.43	$ 2.52	$ 2.79	$ 2.55
2021	$ 3.00	$ 2.81	$ 2.73	$ 2.45	$ 2.44	$ 2.45	$ 2.48	$ 2.54	$ 2.46	$ 2.50	$ 2.59	$ 2.85	$ 2.61
2022	$ 3.04	$ 2.85	$ 2.77	$ 2.50	$ 2.48	$ 2.50	$ 2.52	$ 2.59	$ 2.52	$ 2.56	$ 2.66	$ 2.92	$ 2.66
2023	$ 3.14	$ 2.96	$ 2.89	$ 2.66	$ 2.66	$ 2.71	$ 2.78	$ 2.88	$ 2.87	$ 2.91	$ 2.98	$ 3.36	$ 2.90
2024	$ 3.56	$ 3.29	$ 3.20	$ 3.12	$ 3.10	$ 3.16	$ 3.27	$ 3.38	$ 3.40	$ 3.40	$ 3.41	$ 3.90	$ 3.35
2025	$ 4.11	$ 3.73	$ 3.58	$ 3.58	$ 3.50	$ 3.54	$ 3.64	$ 3.71	$ 3.71	$ 3.66	$ 3.63	$ 4.11	$ 3.71
2026	$ 4.33	$ 3.94	$ 3.78	$ 3.79	$ 3.70	$ 3.74	$ 3.84	$ 3.92	$ 3.93	$ 3.86	$ 3.84	$ 4.33	$ 3.92
2027	$ 4.60	$ 4.20	$ 4.03	$ 4.04	$ 3.95	$ 3.98	$ 4.09	$ 4.16	$ 4.18	$ 4.11	$ 4.08	$ 4.59	$ 4.17
2028	$ 4.88	$ 4.48	$ 4.31	$ 4.31	$ 4.21	$ 4.24	$ 4.35	$ 4.43	$ 4.45	$ 4.38	$ 4.35	$ 4.88	$ 4.44
2029	$ 5.16	$ 4.74	$ 4.56	$ 4.56	$ 4.46	$ 4.50	$ 4.62	$ 4.69	$ 4.72	$ 4.64	$ 4.61	$ 5.16	$ 4.70
2030	$ 5.41	$ 4.98	$ 4.79	$ 4.80	$ 4.69	$ 4.73	$ 4.85	$ 4.93	$ 4.96	$ 4.88	$ 4.84	$ 5.42	$ 4.94
2031	$ 5.66	$ 5.21	$ 5.02	$ 5.02	$ 4.91	$ 4.95	$ 5.08	$ 5.16	$ 5.19	$ 5.11	$ 5.07	$ 5.67	$ 5.17
2032	$ 5.87	$ 5.42	$ 5.21	$ 5.22	$ 5.10	$ 5.15	$ 5.28	$ 5.37	$ 5.40	$ 5.31	$ 5.27	$ 5.89	$ 5.37

2033	$ 6.01	$ 5.54	$ 5.33	$ 5.35	$ 5.23	$ 5.28	$ 5.42	$ 5.50	$ 5.54	$ 5.45	$ 5.40	$ 6.04	$ 5.51
2034	$ 6.34	$ 5.86	$ 5.64	$ 5.66	$ 5.53	$ 5.58	$ 5.73	$ 5.81	$ 5.86	$ 5.76	$ 5.71	$ 6.37	$ 5.82
2035	$ 6.56	$ 6.06	$ 5.84	$ 5.86	$ 5.73	$ 5.79	$ 5.94	$ 6.02	$ 6.07	$ 5.97	$ 5.92	$ 6.60	$ 6.03

Historical Recorded Prices Reported Through February 2018.
Sumas **Futures through 2022; Splice 2023-2024; Fundamentals' Blend 2025-2035**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
2012	$ 2.91	$ 2.60	$ 2.14	$ 1.85	$ 2.21	$ 2.16	$ 2.56	$ 2.61	$ 2.63	$ 3.39	$ 3.65	$ 3.48	$ 2.68
2013	$ 3.62	$ 3.44	$ 3.81	$ 3.94	$ 3.85	$ 3.58	$ 3.37	$ 3.05	$ 3.22	$ 3.73	$ 3.93	$ 5.32	$ 3.74
2014	$ 4.53	$ 7.14	$ 4.93	$ 4.42	$ 4.31	$ 4.35	$ 3.92	$ 3.76	$ 3.76	$ 3.50	$ 3.97	$ 3.34	$ 4.33
2015	$ 2.76	$ 2.31	$ 2.19	$ 2.16	$ 2.39	$ 2.26	$ 2.26	$ 2.44	$ 2.50	$ 2.16	$ 2.16	$ 2.13	$ 2.31
2016	$ 2.27	$ 1.65	$ 1.39	$ 1.31	$ 1.35	$ 1.94	$ 2.31	$ 2.51	$ 2.65	$ 2.58	$ 2.14	$ 3.85	$ 2.16
2017	$ 3.51	$ 2.57	$ 2.41	$ 2.60	$ 2.54	$ 2.33	$ 2.29	$ 2.55	$ 2.58	$ 2.54	$ 2.68	$ 2.80	$ 2.62
2018	$ 2.69	$ 2.24	$ 2.25	$ 2.23	$ 2.22	$ 2.23	$ 2.29	$ 2.58	$ 2.51	$ 2.52	$ 2.59	$ 3.18	$ 2.46
2019	$ 3.20	$ 2.78	$ 2.61	$ 2.16	$ 2.08	$ 2.08	$ 2.13	$ 2.41	$ 2.36	$ 2.39	$ 2.47	$ 3.08	$ 2.48
2020	$ 3.13	$ 2.73	$ 2.56	$ 2.12	$ 2.07	$ 2.07	$ 2.12	$ 2.39	$ 2.34	$ 2.37	$ 2.45	$ 3.08	$ 2.45
2021	$ 3.14	$ 2.74	$ 2.60	$ 2.19	$ 2.13	$ 2.13	$ 2.18	$ 2.46	$ 2.41	$ 2.44	$ 2.53	$ 3.14	$ 2.51
2022	$ 3.19	$ 2.78	$ 2.64	$ 2.23	$ 2.18	$ 2.18	$ 2.22	$ 2.52	$ 2.47	$ 2.50	$ 2.59	$ 3.21	$ 2.56
2023	$ 3.28	$ 2.89	$ 2.76	$ 2.39	$ 2.35	$ 2.39	$ 2.48	$ 2.81	$ 2.82	$ 2.84	$ 2.91	$ 3.65	$ 2.80
2024	$ 3.71	$ 3.22	$ 3.07	$ 2.86	$ 2.79	$ 2.84	$ 2.97	$ 3.30	$ 3.36	$ 3.33	$ 3.34	$ 4.19	$ 3.25
2025	$ 4.25	$ 3.65	$ 3.45	$ 3.32	$ 3.20	$ 3.22	$ 3.34	$ 3.63	$ 3.67	$ 3.59	$ 3.56	$ 4.40	$ 3.61
2026	$ 4.47	$ 3.87	$ 3.65	$ 3.53	$ 3.40	$ 3.42	$ 3.54	$ 3.84	$ 3.88	$ 3.80	$ 3.77	$ 4.62	$ 3.82
2027	$ 4.74	$ 4.12	$ 3.90	$ 3.77	$ 3.64	$ 3.66	$ 3.79	$ 4.09	$ 4.13	$ 4.05	$ 4.02	$ 4.88	$ 4.07
2028	$ 5.03	$ 4.40	$ 4.18	$ 4.04	$ 3.90	$ 3.92	$ 4.05	$ 4.36	$ 4.40	$ 4.31	$ 4.28	$ 5.17	$ 4.34
2029	$ 5.30	$ 4.66	$ 4.43	$ 4.30	$ 4.15	$ 4.18	$ 4.32	$ 4.62	$ 4.67	$ 4.58	$ 4.54	$ 5.45	$ 4.60
2030	$ 5.55	$ 4.91	$ 4.66	$ 4.53	$ 4.38	$ 4.41	$ 4.55	$ 4.86	$ 4.91	$ 4.81	$ 4.78	$ 5.71	$ 4.84
2031	$ 5.80	$ 5.14	$ 4.89	$ 4.76	$ 4.60	$ 4.63	$ 4.78	$ 5.09	$ 5.15	$ 5.04	$ 5.00	$ 5.96	$ 5.07
2032	$ 6.01	$ 5.34	$ 5.08	$ 4.96	$ 4.80	$ 4.83	$ 4.98	$ 5.29	$ 5.36	$ 5.25	$ 5.20	$ 6.18	$ 5.27
2033	$ 6.15	$ 5.47	$ 5.20	$ 5.08	$ 4.92	$ 4.96	$ 5.12	$ 5.43	$ 5.50	$ 5.39	$ 5.34	$ 6.33	$ 5.41
2034	$ 6.49	$ 5.79	$ 5.51	$ 5.39	$ 5.22	$ 5.26	$ 5.43	$ 5.74	$ 5.82	$ 5.70	$ 5.65	$ 6.66	$ 5.72
2035	$ 6.70	$ 5.99	$ 5.71	$ 5.59	$ 5.42	$ 5.47	$ 5.64	$ 5.95	$ 6.03	$ 5.91	$ 5.85	$ 6.89	$ 5.93

Historical Recorded Prices Reported Through February 2018.
Stanfield **Futures through 2022; Splice 2023-2024; Fundamentals' Blend 2025-2035**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	$ 2.79	$ 2.57	$ 2.12	$ 1.87	$ 2.23	$ 2.18	$ 2.59	$ 2.63	$ 2.70	$ 3.37	$ 3.54	$ 3.42
2013	$ 3.46	$ 3.38	$ 3.74	$ 3.94	$ 3.83	$ 3.59	$ 3.41	$ 3.25	$ 3.39	$ 3.66	$ 3.59	$ 4.56
2014	$ 2.53	$ 2.51	$ 3.09	$ 3.95	$ 3.53	$ 3.73	$ 3.77	$ 3.80	$ 4.29	$ 4.34	$ 4.48	$ 4.41
2015	$ 5.83	$ 5.95	$ 4.37	$ 4.16	$ 3.66	$ 3.42	$ 3.37	$ 3.34	$ 3.45	$ 3.77	$ 3.93	$ 3.86
2016	$ 2.27	$ 1.73	$ 1.43	$ 1.54	$ 1.64	$ 2.22	$ 2.49	$ 2.57	$ 2.66	$ 2.59	$ 2.19	$ 3.49
2017	$ 3.28	$ 2.59	$ 2.46	$ 2.63	$ 2.68	$ 2.43	$ 2.48	$ 2.56	$ 2.57	$ 2.54	$ 2.68	$ 2.62
2018	$ 2.72	$ 2.26	$ 2.29	$ 2.36	$ 2.43	$ 2.42	$ 2.48	$ 2.61	$ 2.51	$ 2.53	$ 2.62	$ 2.91
2019	$ 3.08	$ 2.83	$ 2.66	$ 2.29	$ 2.29	$ 2.27	$ 2.32	$ 2.45	$ 2.36	$ 2.39	$ 2.49	$ 2.81
2020	$ 3.01	$ 2.78	$ 2.60	$ 2.25	$ 2.28	$ 2.26	$ 2.30	$ 2.43	$ 2.34	$ 2.37	$ 2.48	$ 2.81
2021	$ 3.03	$ 2.79	$ 2.64	$ 2.32	$ 2.35	$ 2.32	$ 2.36	$ 2.50	$ 2.41	$ 2.44	$ 2.55	$ 2.87
2022	$ 3.07	$ 2.83	$ 2.69	$ 2.36	$ 2.39	$ 2.37	$ 2.41	$ 2.55	$ 2.47	$ 2.50	$ 2.62	$ 2.94
2023	$ 3.17	$ 2.93	$ 2.81	$ 2.52	$ 2.57	$ 2.58	$ 2.67	$ 2.84	$ 2.82	$ 2.85	$ 2.94	$ 3.38
2024	$ 3.59	$ 3.27	$ 3.11	$ 2.99	$ 3.01	$ 3.03	$ 3.16	$ 3.34	$ 3.36	$ 3.34	$ 3.37	$ 3.92
2025	$ 4.13	$ 3.70	$ 3.49	$ 3.45	$ 3.41	$ 3.41	$ 3.52	$ 3.67	$ 3.67	$ 3.60	$ 3.59	$ 4.13
2026	$ 4.35	$ 3.92	$ 3.70	$ 3.66	$ 3.61	$ 3.61	$ 3.73	$ 3.88	$ 3.88	$ 3.80	$ 3.80	$ 4.35
2027	$ 4.62	$ 4.17	$ 3.95	$ 3.90	$ 3.86	$ 3.85	$ 3.97	$ 4.12	$ 4.13	$ 4.05	$ 4.04	$ 4.61
2028	$ 4.91	$ 4.45	$ 4.22	$ 4.17	$ 4.12	$ 4.11	$ 4.24	$ 4.39	$ 4.40	$ 4.32	$ 4.31	$ 4.90
2029	$ 5.18	$ 4.71	$ 4.47	$ 4.43	$ 4.37	$ 4.37	$ 4.50	$ 4.65	$ 4.67	$ 4.58	$ 4.57	$ 5.18
2030	$ 5.44	$ 4.96	$ 4.71	$ 4.66	$ 4.60	$ 4.60	$ 4.73	$ 4.89	$ 4.91	$ 4.82	$ 4.80	$ 5.44
2031	$ 5.68	$ 5.19	$ 4.93	$ 4.89	$ 4.82	$ 4.82	$ 4.97	$ 5.12	$ 5.15	$ 5.05	$ 5.03	$ 5.69
2032	$ 5.90	$ 5.39	$ 5.13	$ 5.09	$ 5.01	$ 5.02	$ 5.17	$ 5.33	$ 5.36	$ 5.25	$ 5.23	$ 5.91
2033	$ 6.04	$ 5.51	$ 5.25	$ 5.21	$ 5.14	$ 5.15	$ 5.31	$ 5.46	$ 5.50	$ 5.39	$ 5.36	$ 6.06
2034	$ 6.37	$ 5.84	$ 5.56	$ 5.52	$ 5.44	$ 5.45	$ 5.62	$ 5.77	$ 5.82	$ 5.70	$ 5.67	$ 6.39
2035	$ 6.59	$ 6.04	$ 5.75	$ 5.72	$ 5.64	$ 5.66	$ 5.82	$ 5.98	$ 6.03	$ 5.91	$ 5.88	$ 6.62

2018 CALIFORNIA GAS REPORT

SERVICE AREA ECONOMIC FORECAST

SOUTHERN CALIFORNIA GAS COMPANY SERVICE AREA ECONOMIC FORECAST

(based on Global Insight's February 2018 Regional Forecast)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
EMPLOYMENT (1000's)												
Total	8,162.3	8,366.3	8,564.2	8,799.4	9,012.7	9,152.9	9,279.7	9,429.0	9,556.4	9,622.6	9,675.3	9,718.7
Agriculture	228.3	235.9	237.4	240.8	240.3	239.5	243.1	245.9	247.9	248.8	249.3	249.8
Total Non-farm	7,934.0	8,130.4	8,326.8	8,558.6	8,772.5	8,913.4	9,036.7	9,183.1	9,308.5	9,373.8	9,425.9	9,468.9
Mining	22.7	22.6	23.1	20.7	16.9	16.2	16.6	17.2	17.4	17.6	17.9	18.1
Construction	301.9	325.7	345.7	371.5	390.5	419.6	439.6	458.7	489.6	516.2	533.7	543.2
Manufacturing	722.1	723.9	725.3	728.1	724.6	718.9	725.3	732.5	736.1	736.4	735.7	733.5
Transportation, Information, Utilities	500.7	515.0	524.8	546.9	580.7	583.6	598.3	605.0	607.0	608.5	606.4	601.9
Trade	1,374.5	1,407.6	1,443.1	1,476.7	1,499.9	1,509.9	1,520.2	1,531.8	1,539.2	1,537.5	1,529.7	1,521.9
Retail	939.9	956.3	978.2	997.9	1,010.2	1,011.5	1,015.0	1,017.3	1,019.2	1,014.9	1,004.6	994.1
Wholesale (including warehousing)	434.6	451.3	464.9	478.9	489.7	498.5	505.2	514.5	520.0	522.6	525.1	527.8
Restaurants	622.8	656.7	693.9	726.4	758.2	779.5	782.3	784.1	785.5	782.2	774.3	766.2
Finance, Insurance & Real Estate	419.4	425.5	424.6	431.9	438.6	443.2	451.0	457.3	461.1	460.3	459.2	459.4
Services	2,548.3	2,630.1	2,704.6	2,783.7	2,858.5	2,919.6	2,978.2	3,059.9	3,117.2	3,150.3	3,190.4	3,232.3
Accomodation	121.4	125.4	129.3	133.4	137.2	140.5	144.4	145.7	146.4	146.9	147.3	147.7
Personal & Laundry Services	84.7	88.3	92.0	94.2	96.5	102.0	103.2	102.2	101.1	100.3	99.7	99.1
Professional & Business Services	1,086.8	1,125.7	1,147.6	1,169.2	1,187.7	1,200.4	1,219.9	1,280.1	1,324.6	1,345.2	1,371.6	1,399.2
Health & Social Services	1,037.6	1,065.5	1,099.8	1,143.1	1,185.8	1,222.1	1,253.0	1,276.7	1,292.5	1,307.5	1,323.0	1,338.9
Misc. Services	217.9	225.1	235.9	243.8	251.3	254.7	257.7	255.1	252.5	250.5	248.8	247.5
Government & Education	1,421.7	1,423.3	1,441.7	1,472.7	1,504.6	1,522.8	1,525.1	1,536.6	1,555.4	1,564.8	1,578.7	1,592.4
OTHER INDICATORS												
Southern California Consumer Inflation*	2.0%	1.1%	1.3%	0.9%	1.9%	2.8%	2.8%	1.7%	2.7%	2.6%	2.4%	2.3%
Inflation--US Gross Domestic Product**	1.8%	1.6%	1.8%	1.1%	1.3%	1.8%	2.3%	2.4%	2.6%	2.6%	2.5%	2.5%

* Consumer Price Index for Greater Los Angeles area (Los Angeles and Orange Counties)

** Chained Price Index--US GDP, from Global Insight's February 2018 Long-Term Forecast of the U.S. Economy.

SOUTHERN CALIFORNIA GAS COMPANY SERVICE AREA ECONOMIC FORECAST

(based on Global Insight's February 2018 Regional Forecast)

	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
EMPLOYMENT (1000's)												
Total	9,753.8	9,778.6	9,803.5	9,840.5	9,877.9	9,921.5	9,984.0	10,044.3	10,111.9	10,181.5	10,254.9	10,325.0
Agriculture	249.7	249.2	248.5	247.9	247.6	247.3	247.4	247.8	248.3	248.8	249.2	249.3
Total Non-farm	9,504.0	9,529.4	9,555.0	9,592.6	9,630.3	9,674.2	9,736.6	9,796.5	9,863.6	9,932.6	10,005.7	10,075.6
Mining	18.1	18.0	17.7	17.5	17.3	17.1	17.0	16.8	16.7	16.6	16.4	16.3
Construction	549.8	557.1	562.9	569.3	575.5	582.3	590.5	602.3	613.3	624.4	639.3	656.9
Manufacturing	731.9	729.9	728.2	726.5	724.1	721.7	718.6	715.7	712.7	709.7	707.6	706.3
Transportation, Information, Utilities	597.2	594.1	590.5	584.5	577.6	573.7	572.1	571.1	571.0	570.2	569.1	567.8
Trade	1,514.0	1,505.8	1,499.8	1,498.8	1,496.6	1,497.9	1,500.1	1,505.7	1,509.4	1,515.2	1,519.0	1,524.3
Retail	983.8	974.2	968.1	967.3	968.6	972.0	976.4	983.9	990.2	997.9	1,004.3	1,011.6
Wholesale (including warehousing)	530.2	531.5	531.7	531.6	528.0	525.9	523.7	521.9	519.2	517.3	514.7	512.7
Restaurants	758.3	750.9	746.2	745.5	746.5	749.1	752.5	758.3	763.1	769.1	774.0	779.7
Finance, Insurance & Real Estate	459.0	456.2	452.9	449.2	447.5	446.8	447.9	447.7	447.5	448.0	449.5	450.7
Services	3,269.0	3,296.4	3,321.5	3,352.4	3,384.3	3,416.6	3,455.9	3,495.9	3,537.9	3,577.4	3,616.6	3,648.4
Accomodation	147.9	147.7	147.2	147.3	147.7	148.2	148.7	149.6	150.4	151.4	152.1	153.2
Personal & Laundry Services	98.5	97.8	97.4	97.1	96.9	96.7	96.7	96.7	96.6	96.7	96.7	96.7
Professional & Business Services	1,424.2	1,442.3	1,456.7	1,473.1	1,486.3	1,497.1	1,513.7	1,532.4	1,551.5	1,568.1	1,586.4	1,600.3
Health & Social Services	1,352.6	1,364.2	1,377.0	1,392.6	1,411.5	1,432.9	1,455.3	1,475.9	1,498.0	1,519.6	1,539.8	1,556.7
Misc. Services	245.8	244.3	243.3	242.4	241.9	241.6	241.6	241.3	241.3	241.5	241.6	241.5
Government & Education	1,606.8	1,621.2	1,635.4	1,648.9	1,660.9	1,669.0	1,682.2	1,683.0	1,691.9	1,702.1	1,714.1	1,725.1
OTHER INDICATORS												
Southern California Consumer Inflation*	2.2%	2.1%	2.1%	2.1%	2.1%	2.3%	2.5%	2.4%	2.4%	2.4%	2.4%	2.4%
Inflation--US Gross Domestic Product**	2.5%	2.4%	2.3%	2.3%	2.2%	2.2%	2.2%	2.1%	2.1%	2.1%	2.1%	2.1%

* Consumer Price Index for Greater Los Angeles area (Los Angeles and Orange Counties)

** Chained Price Index--US GDP, from Global Insight's February 2018 Long-Term Forecast of the U.S. Economy.