2020 CALIFORNIA GAS REPORT REDACTED (PUBLIC) VERSION

Prepared By:

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2020 CALIFORNIA GAS REPORT

HISTORICAL DATA

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND SENDOUT - MMCF/DAY
RECORDED YEARS 2015 TO 2019

Line	CAPACITY AVAILABLE		2015	2016	2017	2018	2019
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		122	89	84	104	97
	Out-of-State Gas						
11	Other Out-of-State		2,397	2,342	2,434	2,246	2,305
12	Total Out-of-State Gas		2,397	2,342	2,434	2,246	2,305
13	TOTAL SUPPLY TAKEN		2,519	2,431	2,518	2,350	2,402
14	Net Underground Storage Withdrawal		40	80	(14)	(8)	7
15	TOTAL THROUGHPUT (1)(2)		2,559	2,511	2,504	2,342	2,409
	DELIVERIES BY END-USE						
16	Core	Residential	548	557	565	569	645
17		Commercial	207	213	214	217	226
18		Industrial	58	55	55	57	61
19		NGV	35	36	38	40	41
20		Subtotal	848	861	872	883	973
21	Noncore	Commercial	52	57	56	59	58
22		Industrial	362	391	389	389	357
23		EOR Steaming	46	39	39	38	51
24		Electric Generation	795	740	713	615	589
25		Subtotal	1,255	1,228	1,198	1,102	1,055
26	Wholesale/International		428	390	401	333	342
27	Co. Use & LUAF		28	31	33	25	39
28	SYSTEM TOTAL-THROUGHPUT (1)(2)		2,559	2,511	2,504	2,342	2,409
	TRANSPORTATION AND EXCHANGE						
29	Core	All End Uses	52	56	62	71	74
30	Noncore	Commercial/Industrial	414	449	446	448	415
31		EOR Steaming	46	39	39	38	51
32		Electric Generation	795	740	713	622	589
33		Subtotal-Retail	1,307	1,284	1,260	1,181	1,129
34	Wholesale/International		428	390	401	333	342
35	TOTAL TRANSPORTATION & EXCHANGE		1,735	1,674	1,660	1,513	1,471
36	CURTAILMENT (3)						
37	REFUSAL						
38		Total BTU Factor (Dth/Mcf)	1.0353	1.0345	1.0343	1.0319	1.0336

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 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.

2020 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS AVERAGE TEMPERATURE YEAR-SUMMARY

The Gas Company

A Sempra Energy utility™

TABLE 1-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2020 THRU 2024

AVERAGE TEMPERATURE YEAR

LINE			2020	2021	2022	2023	2024	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/]		990	990	990	1,250	1,250	5
6	Total Out-of-State Gas		2,965	2,965	2,965	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,175	3,175	3,175	3,435	3,435	7
	GAS SUPPLY TAKEN							
8	California Source Gas [5/]		63	63	63	63	63	8
9	Out-of-State		2,399	2,384	2,394	2,358	2,286	9
10	TOTAL SUPPLY TAKEN		2,462	2,447	2,457	2,421	2,349	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,462	2,447	2,457	2,421	2,349	12
	REQUIREMENTS FORECAST BY END-USE [7/]							
13	CORE [8/]	Residential	629	624	614	605	596	13
14		Commercial	209	208	213	210	206	14
15		Industrial	54	52	52	51	50	15
16		NGV	42	43	43	44	45	16
17		Subtotal-CORE	934	926	922	911	896	17
18	NONCORE	Commercial	51	51	51	52	51	18
19		Industrial	391	386	389	391	393	19
20		EOR Steaming	32	32	32	32	32	20
21		Electric Generation (EG)	669	667	679	657	611	21
22		Subtotal-NONCORE	1,143	1,136	1,152	1,132	1,088	22
23	WHOLESALE &	Core	187	188	188	188	187	23
24	INTERNATIONAL	Noncore Excl. EG	53	53	53	54	54	24
25		Electric Generation (EG)	113	113	112	106	94	25
26		Subtotal-WHOLESALE & INTL.	353	353	353	347	335	26
27		Co. Use & LUAF	31	31	31	31	30	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,462	2,447	2,457	2,421	2,349	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	70	70	71	71	70	29
30	NONCORE	Commercial/Industrial	442	437	441	443	444	30
31		EOR Steaming	32	32	32	32	32	31
32		Electric Generation (EG)	669	667	679	657	611	32
33		Subtotal-RETAIL	1,213	1,206	1,222	1,203	1,158	33
34	WHOLESALE & INTERNATIONAL	All End Uses	353	353	353	347	335	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,566	1,560	1,575	1,550	1,493	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.

6/ Excludes own-source gas supply of 1.1 1.1 1.1 1.1 1.1
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: 894 885 880 868 854

TABLE 2-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2025 THRU 2035

AVERAGE TEMPERATURE YEAR

LINE			2025	2026	2027	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/]		1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN							
8	California Source Gas [5/]		63	63	63	63	63	8
9	Out-of-State		2,279	2,254	2,198	2,069	2,040	9
10	TOTAL SUPPLY TAKEN		2,342	2,317	2,261	2,132	2,103	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,342	2,317	2,261	2,132	2,103	12
	REQUIREMENTS FORECAST BY END-USE [7/]							
13	CORE [8/]	Residential	589	580	572	547	543	13
14		Commercial	201	196	192	182	171	14
15		Industrial	49	48	47	44	39	15
16		NGV	45	46	47	49	52	16
17		Subtotal-CORE	885	871	858	822	806	17
18	NONCORE	Commercial	52	51	51	51	51	18
19		Industrial	395	395	391	380	369	19
20		EOR Steaming	32	32	32	32	32	20
21		Electric Generation (EG)	614	607	577	503	499	21
22		Subtotal-NONCORE	1,093	1,086	1,051	966	951	22
23	WHOLESALE &	Core	187	186	186	185	187	23
24	INTERNATIONAL	Noncore Excl. EG	54	54	54	54	54	24
25		Electric Generation (EG)	94	91	84	78	78	25
26		Subtotal-WHOLESALE & INTL.	334	331	323	317	319	26
27		Co. Use & LUAF	30	29	29	27	27	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,342	2,317	2,261	2,132	2,103	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	70	69	69	68	68	29
30	NONCORE	Commercial/Industrial	447	447	442	431	419	30
31		EOR Steaming	32	32	32	32	32	31
32		Electric Generation (EG)	614	607	577	503	499	32
33		Subtotal-RETAIL	1,162	1,155	1,119	1,034	1,018	33
34	WHOLESALE & INTERNATIONAL	All End Uses	334	331	323	317	319	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,497	1,486	1,443	1,351	1,337	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.

6/ Excludes own-source gas supply of 1.1 1.1 1.1 1.1 1.1
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: 843 829 816 779 763

2020 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS - AVERAGE TEMPERATURE YEAR-DETAIL

Work Paper: TABLE 1-SCG

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/]		990	990	990	990	990	990	990	990	990	990	990	990	990	5
6	Total Out-of-State Gas		2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	6
7	TOTAL CAPACITY AVAILABLE [4/]		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	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,946	2,734	2,343	2,127	1,825	1,779	2,208	2,561	2,404	2,207	2,531	3,121	2,399	9
10	TOTAL SUPPLY TAKEN		3,009	2,797	2,406	2,190	1,888	1,842	2,271	2,624	2,467	2,270	2,594	3,184	2,462	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,009	2,797	2,406	2,190	1,888	1,842	2,271	2,624	2,467	2,270	2,594	3,184	2,462	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,032	960	785	671	469	374	348	347	354	428	707	1,084	629	13
14		Commercial	271	271	230	217	180	172	163	164	169	174	224	280	209	14
15		Industrial	58	60	56	56	50	51	48	48	52	55	58	55	54	15
16		NGV	40	39	41	43	43	41	42	44	44	45	42	41	42	16
17		Subtotal-CORE	1,400	1,331	1,111	987	743	638	600	602	620	701	1,030	1,459	934	17
18	NONCORE	Commercial	61	59	56	53	46	43	40	42	51	47	53	62	51	18
19		Industrial	389	387	389	386	401	391	393	398	400	398	387	377	391	19
20		EOR Steaming	32	31	32	32	32	32	32	32	32	32	32	32	32	20
21		Electric Generation (EG)	649	549	461	421	405	490	841	1,111	972	717	666	731	669	21
22		Subtotal-NONCORE	1,132	1,025	938	893	885	956	1,306	1,584	1,454	1,194	1,138	1,202	1,143	22
23	WHOLESALE &	Core	280	268	228	197	151	130	121	121	125	139	205	286	187	23
24	INTERNATIONAL	Noncore Excl. EG	54	54	53	52	51	52	50	53	54	53	54	54	53	24
25		Electric Generation (EG)	105	84	46	32	35	42	164	232	183	154	134	143	113	25
26		Subtotal-WHOLESALE & INT	439	406	327	282	237	224	336	406	362	346	394	483	353	26
27		Co. Use & LUAF	38	35	30	28	24	23	29	33	31	29	33	40	31	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,009	2,797	2,406	2,190	1,888	1,842	2,271	2,624	2,467	2,270	2,594	3,184	2,462	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	84	83	75	73	63	60	58	59	61	64	73	86	70	29
30	NONCORE	Commercial/Industrial	450	446	445	439	447	434	432	441	451	445	440	439	442	30
31		EOR Steaming	32	31	32	32	32	32	32	32	32	32	32	32	32	31
32		Electric Generation (EG)	649	549	461	421	405	490	841	1,111	972	717	666	731	669	32
33		Subtotal-RETAIL	1,216	1,108	1,012	965	948	1,016	1,364	1,643	1,515	1,258	1,211	1,288	1,213	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	439	406	327	282	237	224	336	406	362	346	394	483	353	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,655	1,514	1,339	1,247	1,185	1,240	1,699	2,049	1,878	1,603	1,604	1,771	1,566	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 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: 1,361 1,290 1,072 945 702 598 560 561 578 659 989 1,419 894

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/		990	990	990	990	990	990	990	990	990	990	990	990	990	5
6	Total Out-of-State Gas		2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	6
7	TOTAL CAPACITY AVAILABLE 4/		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	7
	GAS SUPPLY TAKEN															
8	California Source Gas 5/		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,839	2,839	2,339	2,131	1,806	1,767	2,162	2,503	2,393	2,216	2,534	3,095	2,384	9
10	TOTAL SUPPLY TAKEN		2,902	2,902	2,402	2,194	1,869	1,830	2,225	2,566	2,456	2,279	2,597	3,158	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/		2,902	2,902	2,402	2,194	1,869	1,830	2,225	2,566	2,456	2,279	2,597	3,158	2,447	12
	REQUIREMENTS FORECAST BY END-USE 7/															
13	CORE 8/	Residential	1,020	983	775	663	464	370	344	343	350	422	699	1,071	624	13
14		Commercial	268	278	228	215	179	170	162	162	168	172	222	276	208	14
15		Industrial	55	59	54	54	48	49	46	46	50	52	55	53	52	15
16		NGV	41	42	41	44	44	42	43	44	45	46	42	41	43	16
17		Subtotal-CORE	1,383	1,362	1,098	976	734	630	594	595	613	693	1,018	1,441	926	17
18	NONCORE	Commercial	61	61	56	52	46	42	39	42	51	46	52	62	51	18
19		Industrial	382	380	381	384	393	385	387	393	394	393	383	375	386	19
20		EOR Steaming	32	32	32	32	32	32	32	32	32	32	32	32	32	20
21		Electric Generation (EG)	591	598	469	442	407	490	805	1,072	962	737	690	735	667	21
22		Subtotal-NONCORE	1,066	1,071	937	910	879	950	1,264	1,539	1,440	1,209	1,158	1,204	1,136	22
23	WHOLESALE &	Core	280	277	228	197	151	131	122	121	126	139	205	286	188	23
24	INTERNATIONAL	Noncore Excl. EG	53	55	52	52	51	52	50	53	54	53	55	54	53	24
25		Electric Generation (EG)	83	100	57	32	30	44	168	226	193	156	128	133	113	25
26		Subtotal-WHOLESALE & INT	415	432	337	281	232	227	340	400	373	348	388	473	353	26
27		Co. Use & LUAF	37	37	30	28	24	23	28	32	31	29	33	40	31	27
28	SYSTEM TOTAL THROUGHPUT 6/		2,902	2,902	2,402	2,194	1,869	1,830	2,225	2,566	2,456	2,279	2,597	3,158	2,447	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	84	85	74	72	63	60	58	59	61	64	73	85	70	29
30	NONCORE	Commercial/Industrial	443	441	436	436	439	427	426	435	445	440	436	437	437	30
31		EOR Steaming	32	32	32	32	32	32	32	32	32	32	32	32	32	31
32		Electric Generation (EG)	591	598	469	442	407	490	805	1,072	962	737	690	735	667	32
33		Subtotal-RETAIL	1,150	1,156	1,011	982	942	1,009	1,322	1,598	1,501	1,272	1,231	1,290	1,206	33
34	WHOLESALE & INTERNATIONAL	All End Uses	415	432	337	281	232	227	340	400	373	348	388	473	353	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,565	1,589	1,348	1,263	1,174	1,236	1,662	1,999	1,874	1,621	1,618	1,762	1,560	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 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: 1,344 1,319 1,058 934 693 590 553 554 570 650 977 1,402 885

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/		990	990	990	990	990	990	990	990	990	990	990	990	990	5
6	Total Out-of-State Gas		2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	6
7	TOTAL CAPACITY AVAILABLE 4/		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	7
	GAS SUPPLY TAKEN															
8	California Source Gas 5/		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,893	2,870	2,334	2,115	1,798	1,746	2,179	2,519	2,405	2,183	2,596	3,117	2,394	9
10	TOTAL SUPPLY TAKEN		2,956	2,933	2,397	2,178	1,861	1,809	2,242	2,582	2,468	2,246	2,659	3,180	2,457	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 6/		2,956	2,933	2,397	2,178	1,861	1,809	2,242	2,582	2,468	2,246	2,659	3,180	2,457	12
	REQUIREMENTS FORECAST BY END-USE 7/															
13	CORE 8/	Residential	1,004	968	764	653	457	364	338	338	345	416	688	1,054	614	13
14		Commercial	274	284	233	220	183	174	165	166	172	176	227	283	213	14
15		Industrial	55	59	54	54	48	49	46	46	50	52	55	53	52	15
16		NGV	42	42	42	45	44	42	43	45	45	47	43	42	43	16
17		Subtotal-CORE	1,374	1,354	1,092	971	732	629	593	594	612	691	1,013	1,432	922	17
18	NONCORE	Commercial	61	61	56	53	46	43	40	42	51	47	53	62	51	18
19		Industrial	385	383	384	387	397	389	390	397	398	397	387	378	389	19
20		EOR Steaming	32	32	32	32	32	32	32	32	32	32	32	32	32	20
21		Electric Generation (EG)	613	629	477	424	397	470	820	1,093	977	722	753	759	679	21
22		Subtotal-NONCORE	1,092	1,106	949	896	873	934	1,282	1,565	1,459	1,199	1,225	1,232	1,152	22
23	WHOLESALE &	Core	280	277	228	198	151	131	122	121	126	139	205	286	188	23
24	INTERNATIONAL	Noncore Excl. EG	53	56	53	52	51	52	51	53	55	54	55	54	53	24
25		Electric Generation (EG)	119	103	45	33	31	41	167	215	185	136	126	136	112	25
26		Subtotal-WHOLESALE & INT	452	436	326	283	233	224	339	390	366	329	387	477	353	26
27		Co. Use & LUAF	37	37	30	27	23	23	28	33	31	28	34	40	31	27
28	SYSTEM TOTAL THROUGHPUT 6/		2,956	2,933	2,397	2,178	1,861	1,809	2,242	2,582	2,468	2,246	2,659	3,180	2,457	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	85	86	75	73	64	61	59	60	62	65	74	87	71	29
30	NONCORE	Commercial/Industrial	447	444	440	440	444	431	430	439	449	444	440	441	441	30
31		EOR Steaming	32	32	32	32	32	32	32	32	32	32	32	32	32	31
32		Electric Generation (EG)	613	629	477	424	397	470	820	1,093	977	722	753	759	679	32
33		Subtotal-RETAIL	1,177	1,192	1,024	970	937	994	1,342	1,625	1,521	1,263	1,299	1,318	1,222	33
34	WHOLESALE & INTERNATIONAL	All End Uses	452	436	326	283	233	224	339	390	366	329	387	477	353	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,629	1,628	1,350	1,253	1,171	1,218	1,681	2,015	1,886	1,592	1,686	1,795	1,575	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1
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: 1,333 1,310 1,051 928 690 588 551 552 569 648 971 1,391 880

Work Paper: TABLE 1-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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,816	2,774	2,304	2,094	1,814	1,769	2,135	2,486	2,316	2,183	2,568	3,053	2,358	9
10	TOTAL SUPPLY TAKEN		2,879	2,837	2,367	2,157	1,877	1,832	2,198	2,549	2,379	2,246	2,631	3,116	2,421	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,879	2,837	2,367	2,157	1,877	1,832	2,198	2,549	2,379	2,246	2,631	3,116	2,421	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	990	955	753	644	451	359	334	333	340	410	678	1,040	605	13
14		Commercial	270	280	230	217	180	172	163	164	169	174	224	279	210	14
15		Industrial	55	59	53	53	48	49	45	45	50	52	55	52	51	15
16		NGV	42	43	42	45	45	43	44	46	46	48	43	42	44	16
17		Subtotal-CORE	1,357	1,336	1,078	959	723	622	586	588	605	683	1,001	1,413	911	17
18	NONCORE	Commercial	62	62	56	53	47	43	40	43	51	47	53	63	52	18
19		Industrial	388	385	386	389	399	390	392	399	400	399	389	380	391	19
20		EOR Steaming	32	32	32	32	32	32	32	32	32	32	32	32	32	20
21		Electric Generation (EG)	578	572	456	414	417	497	791	1,071	908	728	726	719	657	21
22		Subtotal-NONCORE	1,060	1,051	930	888	895	963	1,256	1,544	1,392	1,206	1,200	1,194	1,132	22
23	WHOLESALE &	Core	279	276	227	197	151	131	122	121	126	139	205	285	188	23
24	INTERNATIONAL	Noncore Excl. EG	54	56	53	52	52	52	51	54	55	54	55	54	54	24
25		Electric Generation (EG)	94	81	48	33	32	41	155	210	171	136	137	130	106	25
26		Subtotal-WHOLESALE & INT	426	413	328	283	235	224	328	385	352	329	398	470	347	26
27		Co. Use & LUAF	36	36	30	27	24	23	28	32	30	28	33	39	31	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,879	2,837	2,367	2,157	1,877	1,832	2,198	2,549	2,379	2,246	2,631	3,116	2,421	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	84	86	75	73	64	60	59	60	62	65	74	86	71	29
30	NONCORE	Commercial/Industrial	449	447	442	442	446	433	432	441	452	446	442	443	443	30
31		EOR Steaming	32	32	32	32	32	32	32	32	32	32	32	32	32	31
32		Electric Generation (EG)	578	572	456	414	417	497	791	1,071	908	728	726	719	657	32
33		Subtotal-RETAIL	1,144	1,137	1,005	962	959	1,023	1,315	1,604	1,454	1,271	1,274	1,280	1,203	33
34	WHOLESALE & INTERNATIONAL	All End Uses	426	413	328	283	235	224	328	385	352	329	398	470	347	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,570	1,550	1,333	1,244	1,194	1,247	1,643	1,989	1,806	1,599	1,671	1,750	1,550	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 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: 1,315 1,292 1,037 916 681 581 545 545 562 640 958 1,372 868

Work Paper: TABLE 1-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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,771	2,635	2,252	2,078	1,766	1,691	2,091	2,369	2,266	2,101	2,408	2,995	2,286	9
10	TOTAL SUPPLY TAKEN		2,834	2,698	2,315	2,141	1,829	1,754	2,154	2,432	2,329	2,164	2,471	3,058	2,349	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,834	2,698	2,315	2,141	1,829	1,754	2,154	2,432	2,329	2,164	2,471	3,058	2,349	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	977	909	743	635	444	354	329	328	335	405	669	1,026	596	13
14		Commercial	265	266	226	213	177	169	161	161	167	171	220	274	206	14
15		Industrial	54	56	53	52	47	48	45	45	49	51	54	52	50	15
16		NGV	43	42	43	46	46	44	45	46	47	48	44	43	45	16
17		Subtotal-CORE	1,338	1,273	1,064	947	714	615	579	581	598	675	987	1,394	896	17
18	NONCORE	Commercial	62	59	57	53	47	43	40	43	51	47	53	63	51	18
19		Industrial	389	382	388	390	401	392	394	400	402	401	391	382	393	19
20		EOR Steaming	32	31	32	32	32	32	32	32	32	32	32	32	32	20
21		Electric Generation (EG)	553	524	427	408	377	426	762	972	879	671	630	696	611	21
22		Subtotal-NONCORE	1,036	997	904	884	856	893	1,228	1,447	1,364	1,151	1,107	1,174	1,088	22
23	WHOLESALE &	Core	278	267	227	197	151	130	122	121	126	139	205	285	187	23
24	INTERNATIONAL	Noncore Excl. EG	54	55	53	53	52	53	51	54	55	54	55	55	54	24
25		Electric Generation (EG)	91	74	39	34	33	41	146	198	158	118	86	111	94	25
26		Subtotal-WHOLESALE & INT	424	395	319	284	236	224	319	373	338	311	346	451	335	26
27		Co. Use & LUAF	36	34	29	27	23	22	27	31	29	27	31	39	30	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,834	2,698	2,315	2,141	1,829	1,754	2,154	2,432	2,329	2,164	2,471	3,058	2,349	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	84	82	74	73	64	60	59	60	62	64	73	85	70	29
30	NONCORE	Commercial/Industrial	451	442	444	443	447	435	434	443	453	448	444	445	444	30
31		EOR Steaming	32	31	32	32	32	32	32	32	32	32	32	32	32	31
32		Electric Generation (EG)	553	524	427	408	377	426	762	972	879	671	630	696	611	32
33		Subtotal-RETAIL	1,120	1,079	978	957	920	953	1,287	1,508	1,426	1,216	1,180	1,259	1,158	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	424	395	319	284	236	224	319	373	338	311	346	451	335	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,543	1,474	1,297	1,240	1,156	1,178	1,606	1,880	1,764	1,527	1,526	1,710	1,493	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1
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: 1,297 1,230 1,023 903 672 573 538 538 554 631 945 1,353 854

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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,768	2,676	2,228	2,051	1,769	1,697	2,040	2,289	2,282	2,119	2,446	2,998	2,279	9
10	TOTAL SUPPLY TAKEN		2,831	2,739	2,291	2,114	1,832	1,760	2,103	2,352	2,345	2,182	2,509	3,061	2,342	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,831	2,739	2,291	2,114	1,832	1,760	2,103	2,352	2,345	2,182	2,509	3,061	2,342	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	963	928	732	626	438	349	324	324	331	399	660	1,011	589	13
14		Commercial	259	269	220	208	173	165	157	158	163	167	215	267	201	14
15		Industrial	53	57	52	51	46	47	44	44	48	50	53	51	49	15
16		NGV	43	44	44	47	46	44	45	47	47	49	45	44	45	16
17		Subtotal-CORE	1,317	1,297	1,048	932	704	605	571	572	589	665	972	1,372	885	17
22	NONCORE	Subtotal-NONCORE	1,072	1,008	899	872	869	907	1,206	1,398	1,369	1,176	1,130	1,196	1,093	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INT	406	399	316	282	237	226	300	351	356	313	375	454	334	26
27		Co. Use & LUAF	36	35	29	27	23	22	27	30	30	28	32	39	30	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,831	2,739	2,291	2,114	1,832	1,760	2,103	2,352	2,345	2,182	2,509	3,061	2,342	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	83	84	74	72	64	60	59	60	61	64	73	85	70	29
30	NONCORE	All End Uses	1,072	1,008	899	872	869	907	1,206	1,398	1,369	1,176	1,130	1,196	1,093	30
33		Subtotal-RETAIL	1,155	1,092	973	945	933	967	1,265	1,458	1,430	1,240	1,203	1,280	1,162	33
34	WHOLESALE & INTERNATIONAL	All End Uses	406	399	316	282	237	226	300	351	356	313	375	454	334	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,560	1,491	1,289	1,227	1,169	1,193	1,565	1,809	1,787	1,553	1,578	1,735	1,497	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1
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 1,254 1,006 889 662 564 529 530 545 621 930 1,331 843

Work Paper: TABLE 2-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2026

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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,738	2,688	2,235	2,047	1,752	1,690	2,020	2,271	2,225	2,074	2,370	2,956	2,254	9
10	TOTAL SUPPLY TAKEN		2,801	2,751	2,298	2,110	1,815	1,753	2,083	2,334	2,288	2,137	2,433	3,019	2,317	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,801	2,751	2,298	2,110	1,815	1,753	2,083	2,334	2,288	2,137	2,433	3,019	2,317	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	949	914	721	617	432	344	320	319	326	393	650	996	580	13
14		Commercial	252	262	214	203	169	161	153	154	159	163	210	260	196	14
15		Industrial	52	55	51	50	45	46	43	43	47	49	52	50	48	15
16		NGV	44	45	44	47	47	45	46	48	48	50	45	44	46	16
17		Subtotal-CORE	1,296	1,276	1,031	917	693	596	562	564	580	655	957	1,350	871	17
22	NONCORE	Subtotal-NONCORE	1,062	1,036	922	883	862	911	1,196	1,399	1,331	1,156	1,088	1,173	1,086	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INT	408	404	317	283	238	224	299	343	348	299	357	458	331	26
27		Co. Use & LUAF	35	35	29	27	23	22	26	29	29	27	31	38	29	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,801	2,751	2,298	2,110	1,815	1,753	2,083	2,334	2,288	2,137	2,433	3,019	2,317	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	82	83	73	72	63	60	58	60	61	64	72	84	69	29
30	NONCORE	All End Uses	1,062	1,036	922	883	862	911	1,196	1,399	1,331	1,156	1,088	1,173	1,086	30
33		Subtotal-RETAIL	1,144	1,120	995	955	925	971	1,255	1,458	1,392	1,220	1,160	1,256	1,155	33
34	WHOLESALE & INTERNATIONAL	All End Uses	408	404	317	283	238	224	299	343	348	299	357	458	331	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,552	1,524	1,312	1,237	1,163	1,195	1,554	1,801	1,740	1,519	1,517	1,714	1,486	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 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: 1,255 1,233 990 874 651 554 520 521 536 611 914 1,309 829

Work Paper: TABLE 2-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2027

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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,668	2,612	2,199	2,014	1,731	1,675	1,952	2,221	2,152	1,992	2,315	2,856	2,198	9
10	TOTAL SUPPLY TAKEN		2,731	2,675	2,262	2,077	1,794	1,738	2,015	2,284	2,215	2,055	2,378	2,919	2,261	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,731	2,675	2,262	2,077	1,794	1,738	2,015	2,284	2,215	2,055	2,378	2,919	2,261	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	935	901	711	608	425	339	315	314	321	387	640	981	572	13
14		Commercial	246	256	210	199	166	158	150	151	156	160	205	254	192	14
15		Industrial	50	54	49	49	44	45	42	42	46	48	51	48	47	15
16		NGV	45	45	45	48	48	45	47	48	49	50	46	45	47	16
17		Subtotal-CORE	1,276	1,256	1,015	904	682	587	554	556	572	645	942	1,329	858	17
22	NONCORE	Subtotal-NONCORE	1,018	1,000	896	862	846	893	1,147	1,354	1,293	1,104	1,068	1,121	1,051	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INT	404	385	322	286	243	235	290	345	322	280	338	432	323	26
27		Co. Use & LUAF	34	34	29	26	23	22	25	29	28	26	30	37	29	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,731	2,675	2,262	2,077	1,794	1,738	2,015	2,284	2,215	2,055	2,378	2,919	2,261	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	81	83	73	71	63	59	58	59	61	64	71	83	69	29
30	NONCORE	All End Uses	1,018	1,000	896	862	846	893	1,147	1,354	1,293	1,104	1,068	1,121	1,051	30
33		Subtotal-RETAIL	1,099	1,083	969	933	909	952	1,205	1,413	1,354	1,167	1,140	1,204	1,119	33
34	WHOLESALE & INTERNATIONAL	All End Uses	404	385	322	286	243	235	290	345	322	280	338	432	323	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,502	1,467	1,290	1,219	1,152	1,188	1,495	1,759	1,676	1,448	1,478	1,636	1,443	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 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: 1,235 1,213 974 860 640 546 512 513 528 601 900 1,288 816

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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,530	2,509	2,116	1,936	1,687	1,595	1,822	2,041	1,944	1,815	2,153	2,696	2,069	9
10	TOTAL SUPPLY TAKEN		2,593	2,572	2,179	1,999	1,750	1,658	1,885	2,104	2,007	1,878	2,216	2,759	2,132	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,593	2,572	2,179	1,999	1,750	1,658	1,885	2,104	2,007	1,878	2,216	2,759	2,132	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	894	862	680	581	407	324	301	301	307	371	613	939	547	13
14		Commercial	233	242	199	188	157	150	143	144	149	152	195	240	182	14
15		Industrial	47	50	46	46	41	42	39	39	43	44	47	45	44	15
16		NGV	47	47	47	50	50	47	49	51	51	52	48	47	49	16
17		Subtotal-CORE	1,220	1,201	971	865	655	564	532	534	549	619	902	1,271	822	17
22	NONCORE	Subtotal-NONCORE	941	941	853	818	820	836	1,055	1,223	1,128	974	964	1,031	966	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INT	399	397	327	291	253	238	274	320	305	261	323	422	317	26
27		Co. Use & LUAF	33	32	27	25	22	21	24	27	25	24	28	35	27	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,593	2,572	2,179	1,999	1,750	1,658	1,885	2,104	2,007	1,878	2,216	2,759	2,132	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	79	81	71	70	62	59	58	59	60	63	70	81	68	29
30	NONCORE	All End Uses	941	941	853	818	820	836	1,055	1,223	1,128	974	964	1,031	966	30
33		Subtotal-RETAIL	1,020	1,022	925	889	883	895	1,113	1,282	1,189	1,037	1,034	1,111	1,034	33
34	WHOLESALE & INTERNATIONAL	All End Uses	399	397	327	291	253	238	274	320	305	261	323	422	317	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,419	1,420	1,252	1,179	1,136	1,132	1,387	1,602	1,493	1,298	1,357	1,534	1,351	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 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: 1,179 1,158 930 822 612 522 490 491 505 575 860 1,230 779

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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,494	2,476	2,086	1,906	1,660	1,568	1,796	2,016	1,919	1,789	2,123	2,660	2,040	9
10	TOTAL SUPPLY TAKEN		2,557	2,539	2,149	1,969	1,723	1,631	1,859	2,079	1,982	1,852	2,186	2,723	2,103	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,557	2,539	2,149	1,969	1,723	1,631	1,859	2,079	1,982	1,852	2,186	2,723	2,103	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	889	857	676	578	404	322	299	299	305	368	609	933	543	13
14		Commercial	218	226	186	177	148	142	135	136	141	143	183	224	171	14
15		Industrial	42	45	41	41	37	38	35	35	38	40	42	40	39	15
16		NGV	50	50	50	53	53	51	52	54	54	56	51	50	52	16
17		Subtotal-CORE	1,198	1,179	953	849	642	553	522	524	538	608	885	1,248	806	17
22	NONCORE	Subtotal-NONCORE	926	928	840	803	804	819	1,039	1,207	1,113	959	948	1,016	951	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INT	401	400	329	292	255	239	275	321	306	262	325	425	319	26
27		Co. Use & LUAF	32	32	27	25	22	21	23	26	25	23	28	34	27	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,557	2,539	2,149	1,969	1,723	1,631	1,859	2,079	1,982	1,852	2,186	2,723	2,103	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	78	80	71	70	63	59	58	60	61	64	70	80	68	29
30	NONCORE	All End Uses	926	928	840	803	804	819	1,039	1,207	1,113	959	948	1,016	951	30
33		Subtotal-RETAIL	1,004	1,008	911	873	866	878	1,097	1,267	1,174	1,023	1,018	1,096	1,018	33
34	WHOLESALE & INTERNATIONAL	All End Uses	401	400	329	292	255	239	275	321	306	262	325	425	319	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,406	1,408	1,239	1,165	1,121	1,117	1,373	1,588	1,480	1,285	1,343	1,521	1,337	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 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: 1,157 1,135 912 805 599 510 479 480 494 562 842 1,207 763

2020 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS - COLD TEMPERATURE YEAR-SUMMARY

TABLE 3-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2020 THRU 2024

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

LINE			2020	2021	2022	2023	2024	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/]		990	990	990	1,250	1,250	5
6	Total Out-of-State Gas		2,965	2,965	2,965	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,175	3,175	3,175	3,435	3,435	7
	GAS SUPPLY TAKEN							
8	California Source Gas [5/]		63	63	63	63	63	8
9	Out-of-State		2,477	2,534	2,550	2,497	2,417	9
10	TOTAL SUPPLY TAKEN		2,540	2,597	2,613	2,560	2,480	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,540	2,597	2,613	2,560	2,480	12
	REQUIREMENTS FORECAST BY END-USE [7/]							
13	CORE [8/]	Residential	683	677	667	658	648	13
14		Commercial	218	217	222	219	215	14
15		Industrial	55	53	53	52	51	15
16		NGV	42	43	43	44	45	16
17		Subtotal-CORE	998	989	985	974	959	17
18	NONCORE	Commercial	52	52	52	53	52	18
19		Industrial	391	386	389	391	393	19
20		EOR Steaming	32	32	32	32	32	20
21		Electric Generation (EG)	669	727	740	706	654	21
22		Subtotal-NONCORE	1,144	1,197	1,214	1,183	1,131	22
23	WHOLESALE &	Core	200	201	201	200	200	23
24	INTERNATIONAL	Noncore Excl. EG	53	53	54	54	54	24
25		Electric Generation (EG)	113	124	126	118	106	25
26		Subtotal-WHOLESALE & INTL.	366	378	381	372	359	26
27		Co. Use & LUAF	32	33	33	32	31	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,540	2,597	2,613	2,560	2,480	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	72	72	73	73	72	29
30	NONCORE	Commercial/Industrial	443	438	442	444	445	30
31		EOR Steaming	32	32	32	32	32	31
32		Electric Generation (EG)	669	727	740	706	654	32
33		Subtotal-RETAIL	1,216	1,269	1,287	1,255	1,204	33
34	WHOLESALE & INTERNATIONAL	All End Uses	366	378	381	372	359	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,582	1,647	1,668	1,628	1,563	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics

6/ Excludes own-source gas supply of 1.3 1.3 1.3 1.3 1.3
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: 957 948 943 931 916

TABLE 4-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2025 THRU 2035

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

LINE			2025	2026	2027	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/]		1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN							
8	California Source Gas [5/]		63	63	63	63	63	8
9	Out-of-State		2,411	2,394	2,334	2,185	2,155	9
10	TOTAL SUPPLY TAKEN		2,474	2,457	2,397	2,248	2,218	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,474	2,457	2,397	2,248	2,218	12
	REQUIREMENTS FORECAST BY END-USE [7/]							
13	CORE [8/]	Residential	641	632	623	598	593	13
14		Commercial	210	205	201	191	180	14
15		Industrial	50	49	48	45	40	15
16		NGV	45	46	47	49	52	16
17		Subtotal-CORE	948	933	920	883	866	17
18	NONCORE	Commercial	53	52	52	52	52	18
19		Industrial	395	395	391	380	369	19
20		EOR Steaming	32	32	32	32	32	20
21		Electric Generation (EG)	654	655	621	537	533	21
22		Subtotal-NONCORE	1,134	1,135	1,096	1,000	985	22
23	WHOLESALE &	Core	200	199	199	198	199	23
24	INTERNATIONAL	Noncore Excl. EG	54	54	54	54	54	24
25		Electric Generation (EG)	107	104	98	85	85	25
26		Subtotal-WHOLESALE & INTL.	361	358	350	337	339	26
27		Co. Use & LUAF	31	31	30	28	28	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,474	2,457	2,397	2,248	2,218	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	72	71	71	70	70	29
30	NONCORE	Commercial/Industrial	448	448	443	432	420	30
31		EOR Steaming	32	32	32	32	32	31
32		Electric Generation (EG)	654	655	621	537	533	32
33		Subtotal-RETAIL	1,206	1,206	1,167	1,070	1,055	33
34	WHOLESALE & INTERNATIONAL	All End Uses	361	358	350	337	339	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,567	1,564	1,518	1,408	1,394	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics

6/ Excludes own-source gas supply of 1.3 1.3 1.3 1.3 1.3
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: 905 891 877 840 823

2020 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS - COLD TEMPERATURE YEAR-DETAIL

Work Paper: **TABLE 3-SCG**

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/]		990	990	990	990	990	990	990	990	990	990	990	990	990	5
6	Total Out-of-State Gas		2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	6
7	TOTAL CAPACITY AVAILABLE [4/]		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	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		3,136	2,910	2,465	2,209	1,860	1,786	2,209	2,563	2,408	2,230	2,630	3,323	2,477	9
10	TOTAL SUPPLY TAKEN		3,199	2,973	2,528	2,272	1,923	1,849	2,272	2,626	2,471	2,293	2,693	3,386	2,540	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,199	2,973	2,528	2,272	1,923	1,849	2,272	2,626	2,471	2,293	2,693	3,386	2,540	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,161	1,082	866	726	493	379	349	348	357	443	774	1,224	683	13
14		Commercial	293	292	244	226	184	172	163	164	170	176	236	303	218	14
15		Industrial	59	61	58	57	51	52	48	48	53	56	59	57	55	15
16		NGV	40	39	41	43	43	41	42	44	44	45	42	41	42	16
17		Subtotal-CORE	1,553	1,475	1,209	1,053	771	644	602	603	623	721	1,111	1,625	998	17
18	NONCORE	Commercial	64	61	58	54	47	43	40	42	51	47	54	65	52	18
19		Industrial	389	387	389	386	401	391	393	398	400	398	387	377	391	19
20		EOR Steaming	32	31	32	32	32	32	32	32	32	32	32	32	32	20
21		Electric Generation (EG)	649	549	461	421	405	490	841	1,111	972	717	666	731	669	21
22		Subtotal-NONCORE	1,134	1,028	939	894	885	956	1,306	1,584	1,454	1,194	1,139	1,205	1,144	22
23	WHOLESALE &	Core	312	294	248	211	157	132	122	121	126	142	220	316	200	23
24	INTERNATIONAL	Noncore Excl. EG	54	55	53	52	51	52	50	53	54	53	55	54	53	24
25		Electric Generation (EG)	105	84	46	32	35	42	164	232	183	154	134	143	113	25
26		Subtotal-WHOLESALE & INT	472	433	348	296	243	226	336	406	363	349	409	513	366	26
27		Co. Use & LUAF	40	38	32	29	24	23	29	33	31	29	34	43	32	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,199	2,973	2,528	2,272	1,923	1,849	2,272	2,626	2,471	2,293	2,693	3,386	2,540	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	89	88	78	75	64	60	58	59	61	65	76	92	72	29
30	NONCORE	Commercial/Industrial	453	448	447	440	448	434	432	441	451	445	441	442	443	30
31		EOR Steaming	32	31	32	32	32	32	32	32	32	32	32	32	32	31
32		Electric Generation (EG)	649	549	461	421	405	490	841	1,111	972	717	666	731	669	32
33		Subtotal-RETAIL	1,223	1,115	1,017	968	950	1,016	1,364	1,643	1,515	1,259	1,215	1,296	1,216	33
34	WHOLESALE & INTERNATIONAL	All End Uses	472	433	348	296	243	226	336	406	363	349	409	513	366	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,695	1,548	1,365	1,264	1,193	1,242	1,700	2,049	1,878	1,608	1,624	1,810	1,582	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3
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: 1,513 1,434 1,169 1,011 730 604 562 562 581 679 1,070 1,585 957

Work Paper: **TABLE 3-SCG**

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/]		990	990	990	990	990	990	990	990	990	990	990	990	990	5
6	Total Out-of-State Gas		2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	6
7	TOTAL CAPACITY AVAILABLE [4/]		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	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		3,053	3,046	2,479	2,253	1,916	1,902	2,329	2,631	2,519	2,269	2,688	3,349	2,534	9
10	TOTAL SUPPLY TAKEN		3,116	3,109	2,542	2,316	1,979	1,965	2,392	2,694	2,582	2,332	2,751	3,412	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/]		3,116	3,109	2,542	2,316	1,979	1,965	2,392	2,694	2,582	2,332	2,751	3,412	2,597	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,149	1,109	857	718	487	375	345	344	352	438	766	1,211	677	13
14		Commercial	290	299	241	224	182	171	162	162	168	175	233	300	217	14
15		Industrial	57	61	55	55	49	49	46	46	51	54	57	54	53	15
16		NGV	41	42	41	44	44	42	43	44	45	46	42	41	43	16
17		Subtotal-CORE	1,536	1,511	1,195	1,041	762	636	595	596	616	713	1,098	1,607	989	17
18	NONCORE	Commercial	63	63	57	53	46	42	39	42	51	47	54	65	52	18
19		Industrial	382	380	381	384	393	385	387	393	394	393	383	375	386	19
20		EOR Steaming	32	32	32	32	32	32	32	32	32	32	32	32	32	20
21		Electric Generation (EG)	609	623	484	471	474	590	949	1,176	1,061	760	739	777	727	21
22		Subtotal-NONCORE	1,087	1,098	954	940	946	1,049	1,408	1,643	1,538	1,232	1,208	1,248	1,197	22
23	WHOLESALE &	Core	312	304	248	211	157	132	122	121	126	142	220	316	201	23
24	INTERNATIONAL	Noncore Excl. EG	53	56	53	52	51	52	50	53	54	53	55	54	53	24
25		Electric Generation (EG)	89	102	60	42	38	70	187	246	214	163	134	143	124	25
26		Subtotal-WHOLESALE & INT	454	462	361	305	246	254	359	420	395	358	410	514	378	26
27		Co. Use & LUAF	39	39	32	29	25	25	30	34	33	29	35	43	33	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,116	3,109	2,542	2,316	1,979	1,965	2,392	2,694	2,582	2,332	2,751	3,412	2,597	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	89	90	78	75	64	60	58	59	61	64	76	91	72	29
30	NONCORE	Commercial/Industrial	446	443	438	437	440	427	426	435	445	440	437	439	438	30
31		EOR Steaming	32	32	32	32	32	32	32	32	32	32	32	32	32	31
32		Electric Generation (EG)	609	623	484	471	474	590	949	1,176	1,061	760	739	777	727	32
33		Subtotal-RETAIL	1,175	1,189	1,032	1,015	1,010	1,109	1,466	1,702	1,599	1,297	1,284	1,340	1,269	33
34	WHOLESALE & INTERNATIONAL	All End Uses	454	462	361	305	246	254	359	420	395	358	410	514	378	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,630	1,650	1,393	1,320	1,256	1,363	1,825	2,123	1,994	1,655	1,694	1,854	1,647	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3
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: 1,496 1,468 1,155 999 721 596 555 555 573 670 1,057 1,567 948

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/]		990	990	990	990	990	990	990	990	990	990	990	990	990	5
6	Total Out-of-State Gas		2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	2,965	6
7	TOTAL CAPACITY AVAILABLE [4/]		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	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		3,136	3,078	2,481	2,232	1,912	1,880	2,314	2,645	2,524	2,271	2,762	3,389	2,550	9
10	TOTAL SUPPLY TAKEN		3,199	3,141	2,544	2,295	1,975	1,943	2,377	2,708	2,587	2,334	2,825	3,452	2,613	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,199	3,141	2,544	2,295	1,975	1,943	2,377	2,708	2,587	2,334	2,825	3,452	2,613	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,132	1,093	844	708	480	369	339	338	347	432	755	1,194	667	13
14		Commercial	296	306	247	229	187	175	165	166	172	179	239	307	222	14
15		Industrial	57	61	56	55	49	50	46	46	51	54	57	54	53	15
16		NGV	42	42	42	45	44	42	43	45	45	47	43	42	43	16
17		Subtotal-CORE	1,526	1,502	1,188	1,037	760	635	594	595	615	711	1,093	1,597	985	17
18	NONCORE	Commercial	64	63	58	54	47	43	40	42	51	47	54	65	52	18
19		Industrial	385	383	384	387	397	389	390	397	398	397	387	378	389	19
20		EOR Steaming	32	32	32	32	32	32	32	32	32	32	32	32	32	20
21		Electric Generation (EG)	658	651	497	457	465	570	933	1,190	1,059	771	808	816	740	21
22		Subtotal-NONCORE	1,139	1,130	970	930	941	1,034	1,395	1,661	1,540	1,247	1,282	1,292	1,214	22
23	WHOLESALE &	Core	313	305	249	211	157	132	122	121	127	143	221	317	201	23
24	INTERNATIONAL	Noncore Excl. EG	54	56	53	53	52	52	51	53	55	54	55	55	54	24
25		Electric Generation (EG)	127	109	52	36	40	64	185	243	218	151	138	149	126	25
26		Subtotal-WHOLESALE & INT	494	470	353	299	249	249	358	418	399	347	414	520	381	26
27		Co. Use & LUAF	40	40	32	29	25	25	30	34	33	29	36	44	33	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,199	3,141	2,544	2,295	1,975	1,943	2,377	2,708	2,587	2,334	2,825	3,452	2,613	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	90	91	79	76	65	61	59	60	62	65	77	92	73	29
30	NONCORE	Commercial/Industrial	449	447	442	441	444	431	430	439	449	444	441	443	442	30
31		EOR Steaming	32	32	32	32	32	32	32	32	32	32	32	32	32	31
32		Electric Generation (EG)	658	651	497	457	465	570	933	1,190	1,059	771	808	816	740	32
33		Subtotal-RETAIL	1,229	1,221	1,049	1,006	1,006	1,095	1,455	1,721	1,602	1,312	1,358	1,384	1,287	33
34	WHOLESALE & INTERNATIONAL	All End Uses	494	470	353	299	249	249	358	418	399	347	414	520	381	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,722	1,691	1,402	1,305	1,256	1,343	1,812	2,139	2,001	1,660	1,773	1,904	1,668	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 2019 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: 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3
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: 1,485 1,457 1,147 993 718 594 553 553 572 667 1,050 1,555 943

Work Paper: **TABLE 3-SCG**

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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		3,038	2,974	2,447	2,205	1,908	1,869	2,267	2,601	2,409	2,262	2,706	3,305	2,497	9
10	TOTAL SUPPLY TAKEN		3,101	3,037	2,510	2,268	1,971	1,932	2,330	2,664	2,472	2,325	2,769	3,368	2,560	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,101	3,037	2,510	2,268	1,971	1,932	2,330	2,664	2,472	2,325	2,769	3,368	2,560	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,118	1,079	834	699	474	364	335	334	342	426	745	1,179	658	13
14		Commercial	292	302	243	226	184	172	163	164	170	176	235	302	219	14
15		Industrial	56	60	55	55	48	49	45	45	50	53	56	54	52	15
16		NGV	42	43	42	45	45	43	44	46	46	48	43	42	44	16
17		Subtotal-CORE	1,508	1,484	1,174	1,025	751	628	587	589	608	703	1,080	1,577	974	17
18	NONCORE	Commercial	64	64	58	54	47	43	40	43	51	47	54	65	53	18
19		Industrial	388	385	386	389	399	390	392	399	400	399	389	380	391	19
20		EOR Steaming	32	32	32	32	32	32	32	32	32	32	32	32	32	20
21		Electric Generation (EG)	606	586	472	438	470	564	905	1,154	975	775	761	757	706	21
22		Subtotal-NONCORE	1,090	1,067	948	913	949	1,029	1,370	1,627	1,458	1,254	1,236	1,235	1,183	22
23	WHOLESALE &	Core	312	304	248	211	157	132	122	121	126	142	220	316	200	23
24	INTERNATIONAL	Noncore Excl. EG	54	57	54	53	52	52	51	54	55	54	56	55	54	24
25		Electric Generation (EG)	99	87	54	38	37	66	171	239	193	143	141	143	118	25
26		Subtotal-WHOLESALE & INT	465	448	355	302	246	250	344	414	375	339	417	513	372	26
27		Co. Use & LUAF	39	38	32	29	25	24	29	34	31	29	35	42	32	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,101	3,037	2,510	2,268	1,971	1,932	2,330	2,664	2,472	2,325	2,769	3,368	2,560	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	89	91	78	75	65	61	59	60	62	65	76	92	73	29
30	NONCORE	Commercial/Industrial	452	449	444	443	446	433	432	441	452	446	443	446	444	30
31		EOR Steaming	32	32	32	32	32	32	32	32	32	32	32	32	32	31
32		Electric Generation (EG)	606	586	472	438	470	564	905	1,154	975	775	761	757	706	32
33		Subtotal-RETAIL	1,179	1,158	1,027	988	1,014	1,090	1,429	1,687	1,520	1,319	1,313	1,327	1,255	33
34	WHOLESALE & INTERNATIONAL	All End Uses	465	448	355	302	246	250	344	414	375	339	417	513	372	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,644	1,606	1,382	1,290	1,260	1,340	1,773	2,101	1,895	1,658	1,730	1,840	1,628	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3
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: 1,466 1,439 1,133 981 709 587 546 546 565 659 1,037 1,536 931

Work Paper: **TABLE 3-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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,995	2,833	2,394	2,182	1,852	1,801	2,207	2,445	2,336	2,196	2,540	3,232	2,417	9
10	TOTAL SUPPLY TAKEN		3,058	2,896	2,457	2,245	1,915	1,864	2,270	2,508	2,399	2,259	2,603	3,295	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/]		3,058	2,896	2,457	2,245	1,915	1,864	2,270	2,508	2,399	2,259	2,603	3,295	2,480	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,104	1,029	823	689	467	359	330	329	338	420	735	1,164	648	13
14		Commercial	287	287	239	223	181	170	161	161	167	174	232	298	215	14
15		Industrial	56	57	54	54	48	48	45	45	49	52	56	53	51	15
16		NGV	43	42	43	46	46	44	45	46	47	48	44	43	45	16
17		Subtotal-CORE	1,489	1,414	1,160	1,012	742	621	580	582	601	695	1,067	1,557	959	17
18	NONCORE	Commercial	64	62	58	54	47	43	40	43	52	47	54	65	52	18
19		Industrial	389	382	388	390	401	392	394	400	402	401	391	382	393	19
20		EOR Steaming	32	31	32	32	32	32	32	32	32	32	32	32	32	20
21		Electric Generation (EG)	573	544	445	430	424	514	854	1,030	922	730	652	720	654	21
22		Subtotal-NONCORE	1,059	1,020	923	907	904	981	1,320	1,505	1,408	1,211	1,130	1,200	1,131	22
23	WHOLESALE &	Core	311	293	247	210	157	132	122	121	126	142	220	315	200	23
24	INTERNATIONAL	Noncore Excl. EG	54	55	54	53	52	53	51	54	55	54	56	55	54	24
25		Electric Generation (EG)	105	77	43	35	36	53	167	214	179	129	98	126	106	25
26		Subtotal-WHOLESALE & INT	471	425	344	298	245	238	340	389	361	325	374	496	359	26
27		Co. Use & LUAF	39	37	31	28	24	24	29	32	30	28	33	42	31	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,058	2,896	2,457	2,245	1,915	1,864	2,270	2,508	2,399	2,259	2,603	3,295	2,480	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	89	87	78	75	65	61	59	60	62	65	76	91	72	29
30	NONCORE	Commercial/Industrial	454	444	446	444	448	435	434	443	453	448	446	448	445	30
31		EOR Steaming	32	31	32	32	32	32	32	32	32	32	32	32	32	31
32		Electric Generation (EG)	573	544	445	430	424	514	854	1,030	922	730	652	720	654	32
33		Subtotal-RETAIL	1,148	1,107	1,000	982	969	1,042	1,379	1,565	1,470	1,276	1,206	1,291	1,204	33
34	WHOLESALE & INTERNATIONAL	All End Uses	471	425	344	298	245	238	340	389	361	325	374	496	359	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,618	1,532	1,344	1,280	1,214	1,280	1,720	1,955	1,830	1,601	1,580	1,787	1,563	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.

6/ Excludes own-source gas supply of 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3
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: 1,447 1,372 1,118 968 700 579 539 539 557 651 1,024 1,516 916

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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,990	2,877	2,367	2,154	1,839	1,774	2,136	2,387	2,377	2,210	2,594	3,247	2,411	9
10	TOTAL SUPPLY TAKEN		3,053	2,940	2,430	2,217	1,902	1,837	2,199	2,450	2,440	2,273	2,657	3,310	2,474	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,053	2,940	2,430	2,217	1,902	1,837	2,199	2,450	2,440	2,273	2,657	3,310	2,474	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,089	1,051	812	680	461	354	325	325	333	414	726	1,149	641	13
14		Commercial	281	290	234	218	177	166	157	158	163	170	226	291	210	14
15		Industrial	55	58	53	53	47	47	44	44	48	51	54	52	50	15
16		NGV	43	44	44	47	46	44	45	47	47	49	45	44	45	16
17		Subtotal-CORE	1,468	1,444	1,143	997	731	611	572	573	592	685	1,051	1,535	948	17
22	NONCORE	Subtotal-NONCORE	1,095	1,027	918	894	900	964	1,270	1,464	1,437	1,220	1,169	1,236	1,134	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INT	451	433	338	298	247	239	329	382	380	339	402	497	361	26
27		Co. Use & LUAF	39	37	31	28	24	23	28	31	31	29	34	42	31	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,053	2,940	2,430	2,217	1,902	1,837	2,199	2,450	2,440	2,273	2,657	3,310	2,474	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	88	90	77	75	65	60	59	60	61	65	75	90	72	29
30	NONCORE	All End Uses	1,095	1,027	918	894	900	964	1,270	1,464	1,437	1,220	1,169	1,236	1,134	30
33		Subtotal-RETAIL	1,183	1,117	995	968	965	1,024	1,329	1,524	1,498	1,285	1,245	1,327	1,206	33
34	WHOLESALE & INTERNATIONAL	All End Uses	451	433	338	298	247	239	329	382	380	339	402	497	361	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,634	1,549	1,333	1,267	1,211	1,263	1,658	1,905	1,878	1,625	1,647	1,823	1,567	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3
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: 1,426 1,400 1,101 953 689 570 530 531 548 641 1,009 1,493 905

Work Paper: **TABLE 4-SCG**

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2026

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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,988	2,900	2,387	2,149	1,824	1,759	2,107	2,390	2,314	2,185	2,528	3,215	2,394	9
10	TOTAL SUPPLY TAKEN		3,051	2,963	2,450	2,212	1,887	1,822	2,170	2,453	2,377	2,248	2,591	3,278	2,457	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		3,051	2,963	2,450	2,212	1,887	1,822	2,170	2,453	2,377	2,248	2,591	3,278	2,457	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,074	1,037	801	671	454	349	321	320	328	408	715	1,133	632	13
14		Commercial	274	283	228	212	173	162	154	154	160	166	221	284	205	14
15		Industrial	53	57	52	52	46	46	43	43	48	50	53	51	49	15
16		NGV	44	45	44	47	47	45	46	48	48	50	45	44	46	16
17		Subtotal-CORE	1,445	1,422	1,125	982	720	602	563	565	583	674	1,035	1,512	933	17
22	NONCORE	Subtotal-NONCORE	1,121	1,059	952	904	895	960	1,262	1,473	1,397	1,227	1,139	1,221	1,135	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INT	447	445	341	298	248	237	318	384	367	320	383	504	358	26
27		Co. Use & LUAF	38	37	31	28	24	23	27	31	30	28	33	41	31	27
28	SYSTEM TOTAL THROUGHPUT [6/]		3,051	2,963	2,450	2,212	1,887	1,822	2,170	2,453	2,377	2,248	2,591	3,278	2,457	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	87	89	76	74	64	60	58	60	61	65	75	89	71	29
30	NONCORE	All End Uses	1,121	1,059	952	904	895	960	1,262	1,473	1,397	1,227	1,139	1,221	1,135	30
33		Subtotal-RETAIL	1,207	1,148	1,029	978	959	1,020	1,320	1,533	1,458	1,291	1,214	1,310	1,206	33
34	WHOLESALE & INTERNATIONAL	All End Uses	447	445	341	298	248	237	318	384	367	320	383	504	358	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,654	1,593	1,370	1,276	1,208	1,257	1,638	1,917	1,825	1,611	1,597	1,815	1,564	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.

6/ Excludes own-source gas supply of 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3
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: 1,404 1,378 1,084 938 678 560 522 522 539 630 993 1,471 891

Work Paper: **TABLE 4-SCG**

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2027

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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,916	2,833	2,351	2,132	1,801	1,733	2,032	2,329	2,243	2,076	2,470	3,115	2,334	9
10	TOTAL SUPPLY TAKEN		2,979	2,896	2,414	2,195	1,864	1,796	2,095	2,392	2,306	2,139	2,533	3,178	2,397	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,979	2,896	2,414	2,195	1,864	1,796	2,095	2,392	2,306	2,139	2,533	3,178	2,397	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,060	1,023	790	661	448	344	316	315	323	403	706	1,117	623	13
14		Commercial	268	277	224	208	169	159	151	151	156	162	217	278	201	14
15		Industrial	52	56	51	50	45	45	42	42	46	49	52	50	48	15
16		NGV	45	45	45	48	48	45	47	48	49	50	46	45	47	16
17		Subtotal-CORE	1,424	1,401	1,109	968	710	593	555	557	575	665	1,020	1,490	920	17
22	NONCORE	Subtotal-NONCORE	1,064	1,028	928	896	878	936	1,204	1,434	1,358	1,141	1,113	1,167	1,096	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INT	452	430	347	303	252	244	310	372	344	307	368	481	350	26
27		Co. Use & LUAF	38	37	30	28	24	23	26	30	29	27	32	40	30	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,979	2,896	2,414	2,195	1,864	1,796	2,095	2,392	2,306	2,139	2,533	3,178	2,397	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	86	88	76	73	64	60	58	59	61	64	74	88	71	29
30	NONCORE	All End Uses	1,064	1,028	928	896	878	936	1,204	1,434	1,358	1,141	1,113	1,167	1,096	30
33		Subtotal-RETAIL	1,151	1,116	1,004	970	942	995	1,263	1,494	1,419	1,205	1,187	1,256	1,167	33
34	WHOLESALE & INTERNATIONAL	All End Uses	452	430	347	303	252	244	310	372	344	307	368	481	350	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,602	1,546	1,351	1,273	1,195	1,240	1,572	1,865	1,763	1,512	1,555	1,736	1,518	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3
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: 1,383 1,357 1,068 924 667 552 513 514 531 620 978 1,449 877

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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,764	2,708	2,260	2,035	1,736	1,623	1,887	2,100	2,039	1,883	2,288	2,934	2,185	9
10	TOTAL SUPPLY TAKEN		2,827	2,771	2,323	2,098	1,799	1,686	1,950	2,163	2,102	1,946	2,351	2,997	2,248	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,827	2,771	2,323	2,098	1,799	1,686	1,950	2,163	2,102	1,946	2,351	2,997	2,248	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,017	982	757	634	429	329	302	302	309	386	677	1,073	598	13
14		Commercial	255	264	213	198	161	151	143	144	149	155	206	264	191	14
15		Industrial	48	51	47	47	41	42	39	39	43	46	48	46	45	15
16		NGV	47	47	47	50	50	47	49	51	51	52	48	47	49	16
17		Subtotal-CORE	1,366	1,344	1,064	928	681	570	533	535	552	638	979	1,429	883	17
22	NONCORE	Subtotal-NONCORE	988	965	880	837	833	854	1,106	1,265	1,194	1,008	1,000	1,067	1,000	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INT	436	427	349	307	261	241	285	336	329	275	343	463	337	26
27		Co. Use & LUAF	36	35	29	26	23	21	25	27	27	25	30	38	28	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,827	2,771	2,323	2,098	1,799	1,686	1,950	2,163	2,102	1,946	2,351	2,997	2,248	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	84	86	75	72	63	59	58	59	61	64	73	86	70	29
30	NONCORE	All End Uses	988	965	880	837	833	854	1,106	1,265	1,194	1,008	1,000	1,067	1,000	30
33		Subtotal-RETAIL	1,073	1,051	955	910	897	913	1,164	1,324	1,255	1,072	1,073	1,153	1,070	33
34	WHOLESALE & INTERNATIONAL	All End Uses	436	427	349	307	261	241	285	336	329	275	343	463	337	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,509	1,478	1,304	1,216	1,158	1,155	1,450	1,660	1,584	1,346	1,416	1,616	1,408	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 2019 recorded California Source Gas; production less than capacity due to reservoir performance and economics.
6/ Excludes own-source gas supply of 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3
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: 1,325 1,300 1,023 885 639 528 491 492 508 594 936 1,388 840

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/]		1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	1,250	5
6	Total Out-of-State Gas		3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	3,225	6
7	TOTAL CAPACITY AVAILABLE [4/]		3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	3,435	7
	GAS SUPPLY TAKEN															
8	California Source Gas [5/]		63	63	63	63	63	63	63	63	63	63	63	63	63	8
9	Out-of-State		2,725	2,670	2,228	2,004	1,706	1,596	1,861	2,075	2,014	1,856	2,255	2,895	2,155	9
10	TOTAL SUPPLY TAKEN		2,788	2,733	2,291	2,067	1,769	1,659	1,924	2,138	2,077	1,919	2,318	2,958	2,218	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [6/]		2,788	2,733	2,291	2,067	1,769	1,659	1,924	2,138	2,077	1,919	2,318	2,958	2,218	12
	REQUIREMENTS FORECAST BY END-USE [7/]															
13	CORE [8/]	Residential	1,008	974	751	629	426	327	300	300	307	383	671	1,064	593	13
14		Commercial	240	248	200	186	152	143	136	136	141	146	194	248	180	14
15		Industrial	43	46	42	42	37	38	35	35	39	41	43	41	40	15
16		NGV	50	50	50	53	53	51	52	54	54	56	51	50	52	16
17		Subtotal-CORE	1,341	1,318	1,044	911	668	558	523	525	541	626	960	1,403	866	17
22	NONCORE	Subtotal-NONCORE	974	952	867	822	817	837	1,090	1,249	1,179	992	984	1,052	985	22
26	WHOLESALE & INTERNATIONAL	Subtotal-WHOLESALE & INT	439	429	351	308	262	243	287	337	331	276	345	466	339	26
27		Co. Use & LUAF	35	34	29	26	22	21	24	27	26	24	29	37	28	27
28	SYSTEM TOTAL THROUGHPUT [6/]		2,788	2,733	2,291	2,067	1,769	1,659	1,924	2,138	2,077	1,919	2,318	2,958	2,218	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	83	85	74	72	64	59	58	60	61	64	73	85	70	29
30	NONCORE	All End Uses	974	952	867	822	817	837	1,090	1,249	1,179	992	984	1,052	985	30
33		Subtotal-RETAIL	1,057	1,037	941	894	880	897	1,148	1,309	1,240	1,057	1,057	1,138	1,055	33
34	WHOLESALE & INTERNATIONAL	All End Uses	439	429	351	308	262	243	287	337	331	276	345	466	339	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,496	1,466	1,292	1,202	1,143	1,139	1,435	1,646	1,571	1,333	1,402	1,603	1,394	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 2019 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: 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.3
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: 1,300 1,274 1,002 867 625 516 480 481 496 581 917 1,362 823

2020 CALIFORNIA GAS REPORT

CUSTOMER FORECAST

The Gas Company

A Sempra Energy utility™

2020 CGR
Connected Meter Forecast
Historical/Recorded data through 2019

YEAR	Single Family	Multi Family	Master Meter	Commercial	Industrial	NGV	Total
2017	3,751,864	1,879,668	40,960	248,195	25,779	318	5,946,802
2018	3,775,415	1,889,285	40,789	248,643	25,457	336	5,979,928
2019	3,797,955	1,900,272	40,257	248,943	25,189	335	6,012,968
2020	3,819,837	1,913,930	38,929	249,089	24,341	341	6,046,467
2021	3,841,284	1,928,789	37,611	249,005	23,872	348	6,080,909
2022	3,864,236	1,943,565	36,301	248,647	23,412	353	6,116,514
2023	3,888,408	1,956,357	34,999	248,088	22,961	358	6,151,170
2024	3,912,632	1,969,260	33,706	247,389	22,519	363	6,185,869
2025	3,930,520	1,982,391	32,422	246,556	22,085	368	6,214,341
2026	3,946,948	1,995,135	31,146	245,612	21,659	373	6,240,873
2027	3,962,721	2,006,990	29,878	244,636	21,242	378	6,265,844
2028	3,982,213	2,018,137	28,618	243,600	20,833	383	6,293,784
2029	4,002,422	2,028,816	27,367	242,519	20,431	388	6,321,944
2030	4,021,953	2,039,116	26,124	241,475	20,037	393	6,349,098
2031	4,041,097	2,049,039	24,889	240,437	19,651	398	6,375,512
2032	4,060,047	2,058,500	23,663	239,417	19,273	403	6,401,302
2033	4,078,812	2,067,646	22,444	238,498	18,901	408	6,426,709
2034	4,097,392	2,076,453	21,233	237,635	18,537	413	6,451,663
2035	4,115,898	2,084,984	20,030	236,818	18,180	418	6,476,329

2020 CGR
Active Meter Forecast
Historical/Recorded data through 2019

YEAR	Single Family	Multi Family	Master Meter	Commercial	Industrial	NGV	Total
2017	3,693,882	1,803,794	40,296	188,894	16,706	318	5,743,846
2018	3,718,317	1,813,017	40,114	188,823	16,330	336	5,776,879
2019	3,742,106	1,824,603	39,592	189,380	16,068	335	5,812,039
2020	3,766,666	1,837,569	39,114	189,394	15,758	341	5,848,842
2021	3,785,508	1,851,434	39,288	189,196	15,455	348	5,881,229
2022	3,807,472	1,864,626	39,162	188,765	15,157	353	5,915,535
2023	3,831,307	1,877,132	39,037	188,099	14,865	358	5,950,797
2024	3,855,194	1,889,748	38,912	187,284	14,578	363	5,986,080
2025	3,872,833	1,902,585	38,787	186,327	14,297	368	6,015,198
2026	3,889,033	1,915,045	38,663	185,249	14,022	373	6,042,385
2027	3,904,586	1,926,635	38,540	184,130	13,752	378	6,068,021
2028	3,923,807	1,937,534	38,416	182,940	13,487	383	6,096,567
2029	3,943,735	1,947,975	38,293	181,696	13,227	388	6,125,314
2030	3,962,994	1,958,044	38,171	180,479	12,972	393	6,153,053
2031	3,981,872	1,967,746	38,049	179,257	12,722	398	6,180,044
2032	4,000,558	1,976,996	37,927	178,043	12,477	403	6,206,404
2033	4,019,062	1,985,938	37,805	176,919	12,236	408	6,232,369
2034	4,037,384	1,994,548	37,684	175,840	12,001	413	6,257,870
2035	4,057,542	2,002,889	37,564	174,796	11,769	418	6,284,979

2020 CALIFORNIA GAS REPORT

EUFORECASTER

I. Introduction

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

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

End Use Forecaster: An Overview

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

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

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

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

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

Table 1. Alternative Market Segmentation Designs – Utility Industry Example

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

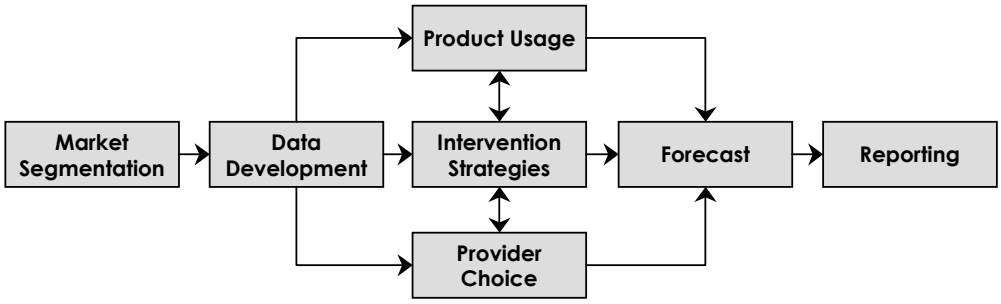
End Use Forecaster has other dimensions that capture factors affecting product demands. Perhaps the most important of these is End Use Forecaster's "vintaging" capability. Vintaging refers to product or service turnover that is a function of either physical lives or contract period. Accurate assessments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

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

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

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

Figure 1. End Use Forecaster Modules and Structure



Interface Design

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

Figure 2. Welcome Screen

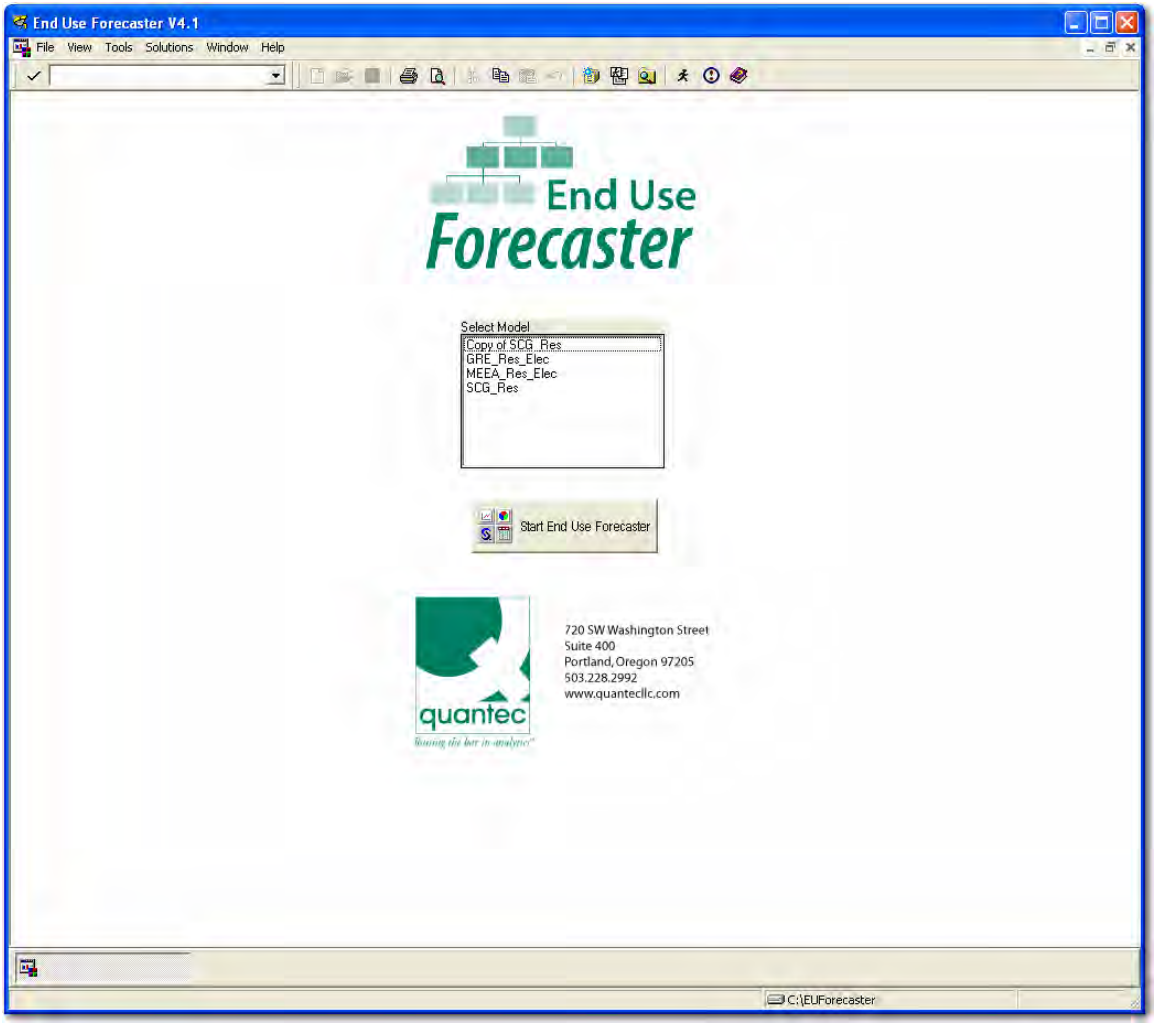
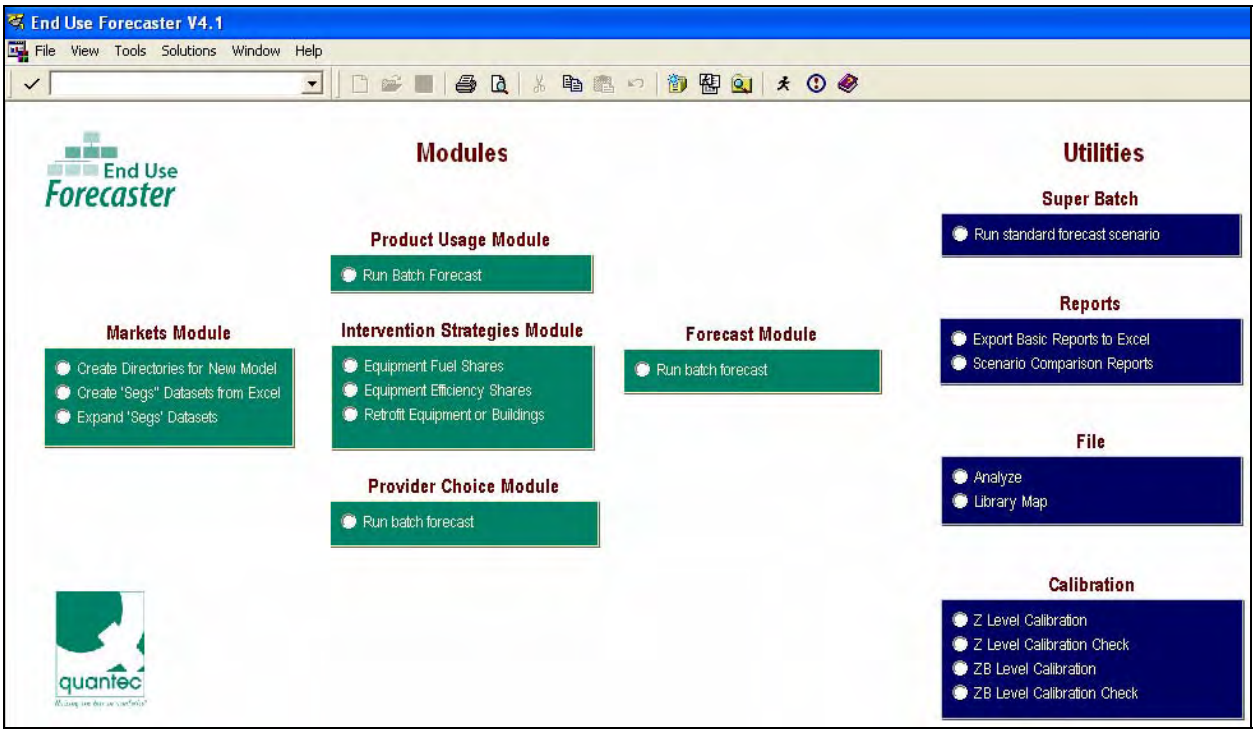


Figure 3. Main Dashboard



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

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

Data Exchange

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

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

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

Market Segmentation

Market Segments

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

Strategic Information Needs

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

Data Development and Entry

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

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

Data Entry Formats

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

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

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

Product Usage Module: Modeling Equipment Consumption

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

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

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

Provider Choice Module: Modeling Customer Service and Purchase Decisions

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

Modes of Choice Modeling

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

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

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

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

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

Average versus Marginal Shares

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

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

Intervention Strategies Module: Analyzing Marketing Scenarios and DSM Potential

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

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

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

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

Forecast Module: Putting It All Together

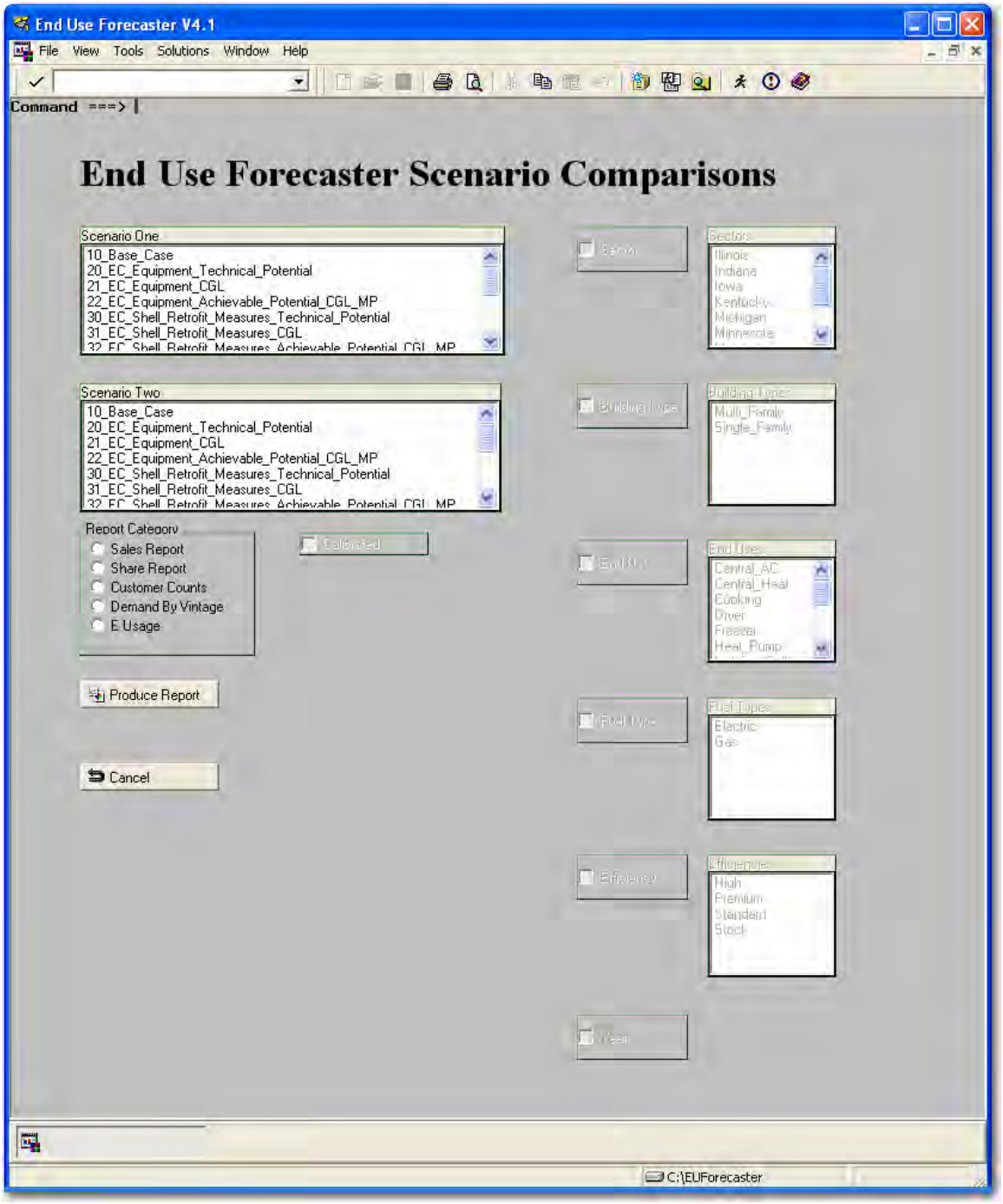
The Forecast Module incorporates all the information compiled from the other modules – Usage, Choice, and Intervention Strategies – related to the overall economic growth of the market segment and equipment lifetime (decay) functions to create the final forecast for a given scenario.

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

Reporting: Getting the Projections Out to Decision-Makers

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

Figure 4. Report Customization



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

II. Application Structure

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

Hardware and Software

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

Hardware

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

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

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

Software

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

- Base SAS

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

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

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

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

Conventions

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

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

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

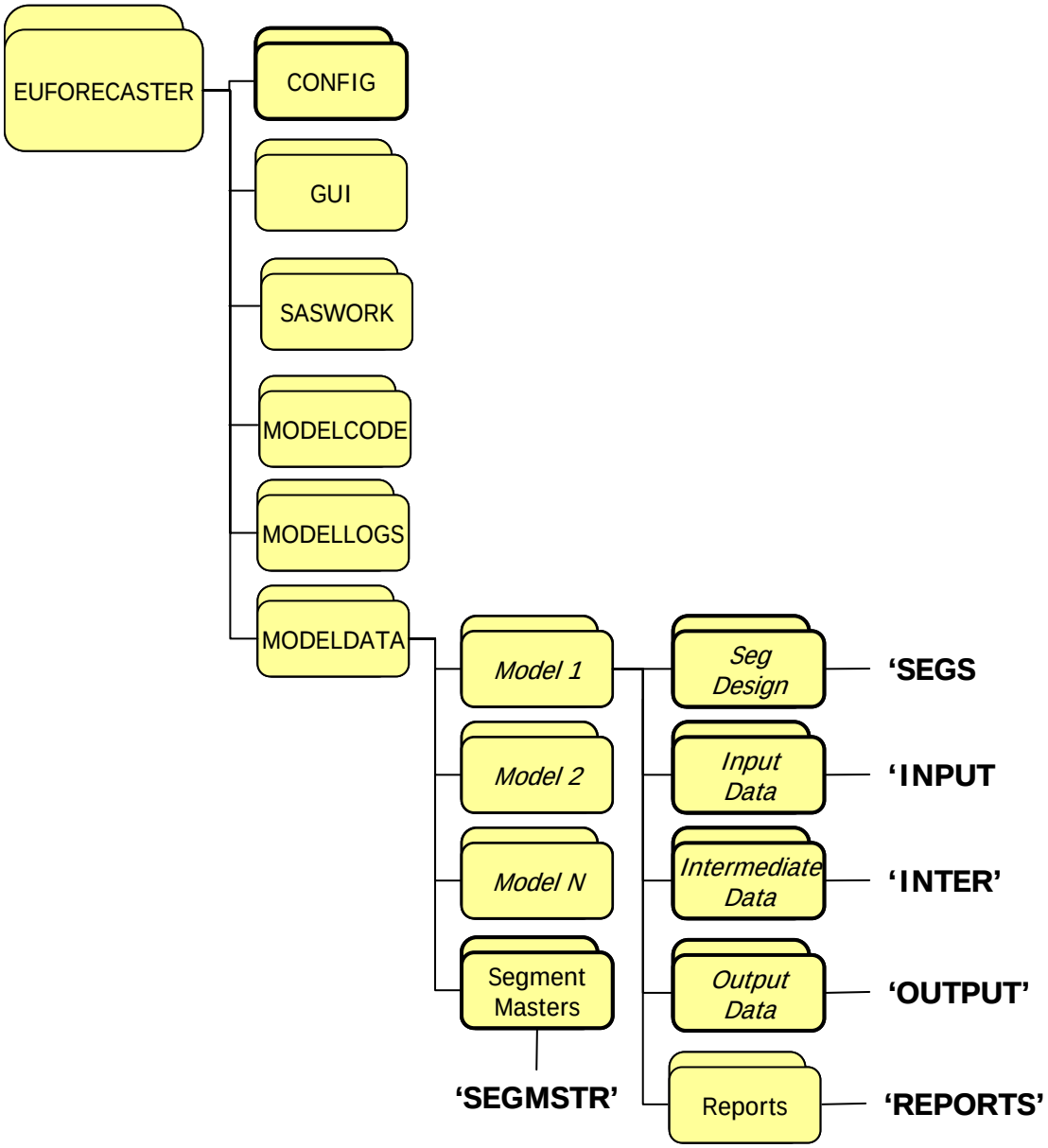
cases, where the documentation does not refer to a specific scenario, datasets are referred to with an **"_xx**" suffix, such as **saturations_xx**.

Model Organization

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

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

Figure 5. End Use Forecaster Folder Structure



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

Table 2. End Use Forecaster Folders

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

III. Market Segmentation and Data Entry Modules

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

Development of Market Segmentation Design

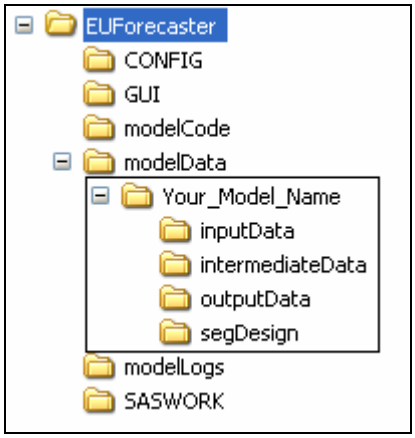
The execution of the first task – creation of a customized market segmentation design – is based on four steps, listed briefly below and then described in greater detail.

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

Creation of Model Data Folders

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

Figure 6. Data Folder Structure



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

Population of Seg_Design_Template.xls

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

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

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

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

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

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

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

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

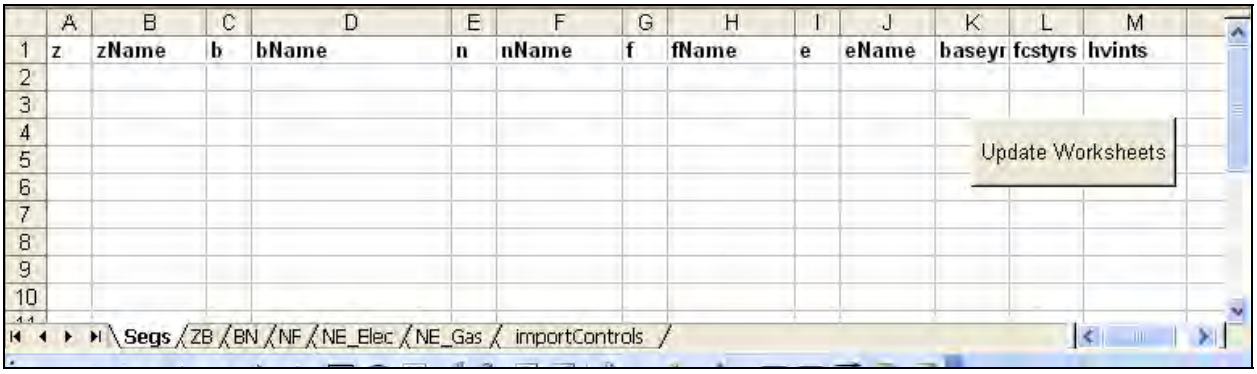
Table 3 summarizes the intended use of each of these dimensions. Note that while the model must include all five dimension, you are not required to use all of them. For example, suppose you want a design with alternative providers at Dimension 4 and do not wish to complicate the model with product/service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

Table 3. End Use Forecaster Dimension Use Summary

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

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

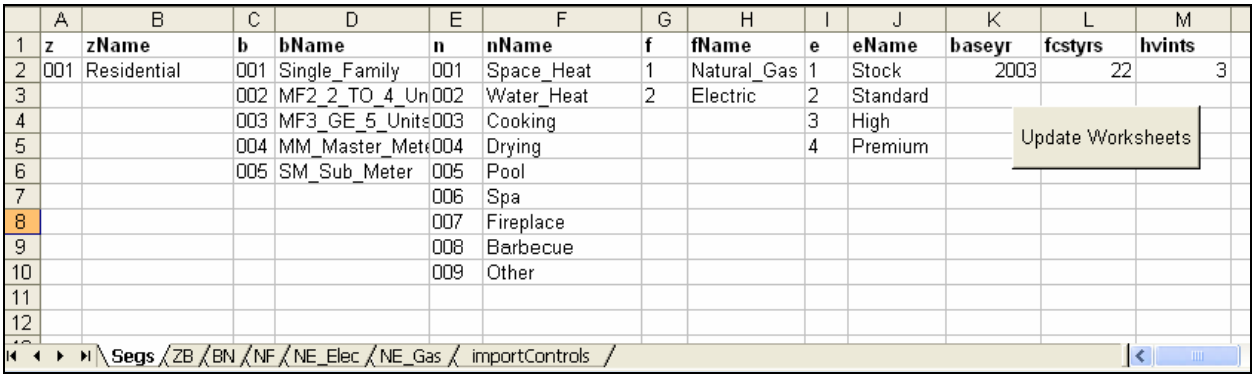
Figure 7. Empty "Segs" Tab in Seg_Design_Template.xls



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



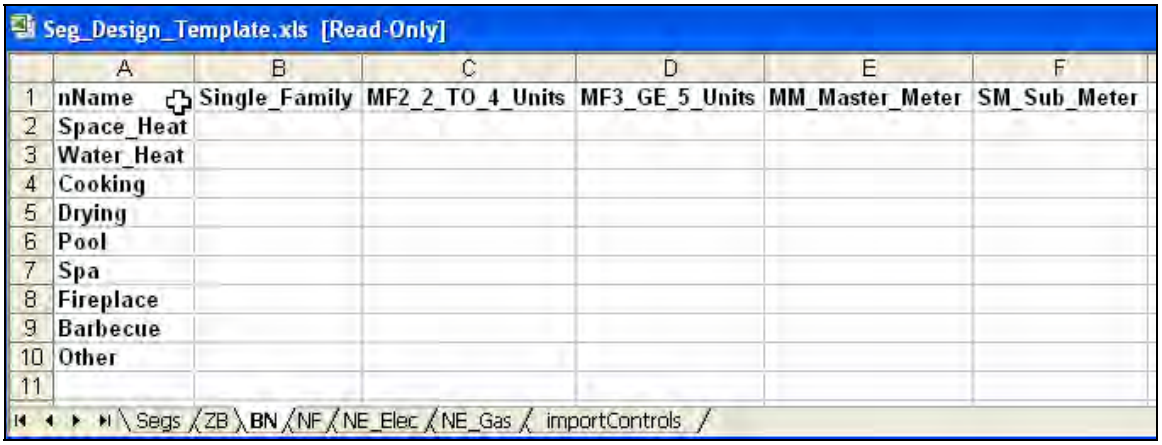
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	z	zName	b	bName	n	nName	f	fName	e	eName	baseyr	fcstyrs	hvints
2	001	Residential	001	Single_Family	001	Space_Heat	1	Natural_Gas	1	Stock	2003	22	3
3			002	MF2_2_TO_4_Un	002	Water_Heat	2	Electric	2	Standard			
4			003	MF3_GE_5_Units	003	Cooking			3	High			
5			004	MM_Master_Met	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					

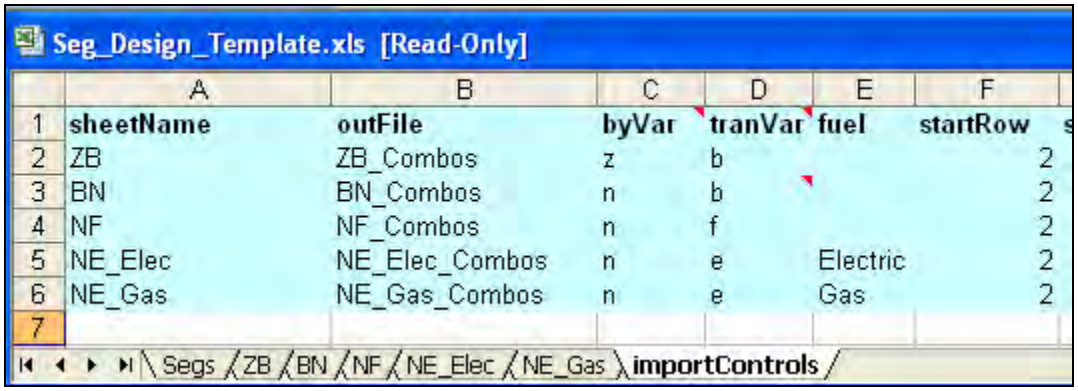
Segs | ZB | BN | NF | NE_Elec | NE_Gas | imp

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



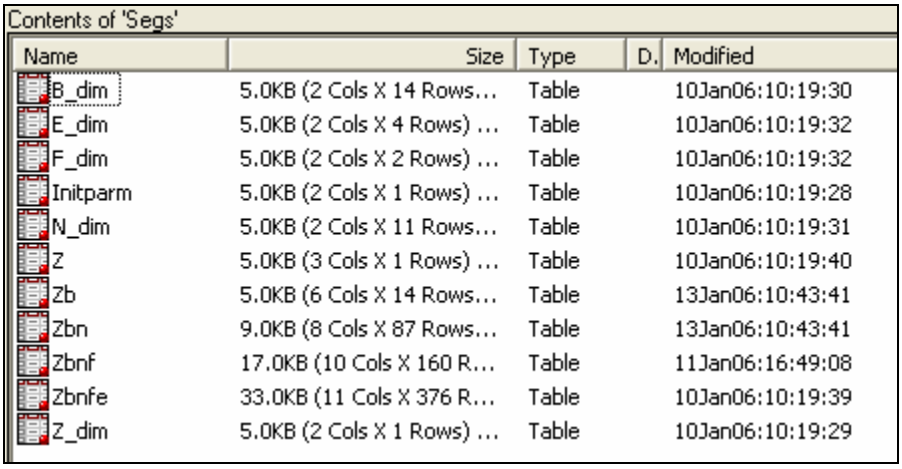
	A	B	C	D	E	F
1	**sheetName**	**outFile**	**byVar**	**tranVar**	**fuel**	**startRow**
2	ZB	ZB_Combos	z	b		2
3	BN	BN_Combos	n	b		2
4	NF	NF_Combos	n	f		2
5	NE_Elec	NE_Elec_Combos	n	e	Electric	2
6	NE_Gas	NE_Gas_Combos	n	e	Gas	2
7						

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.

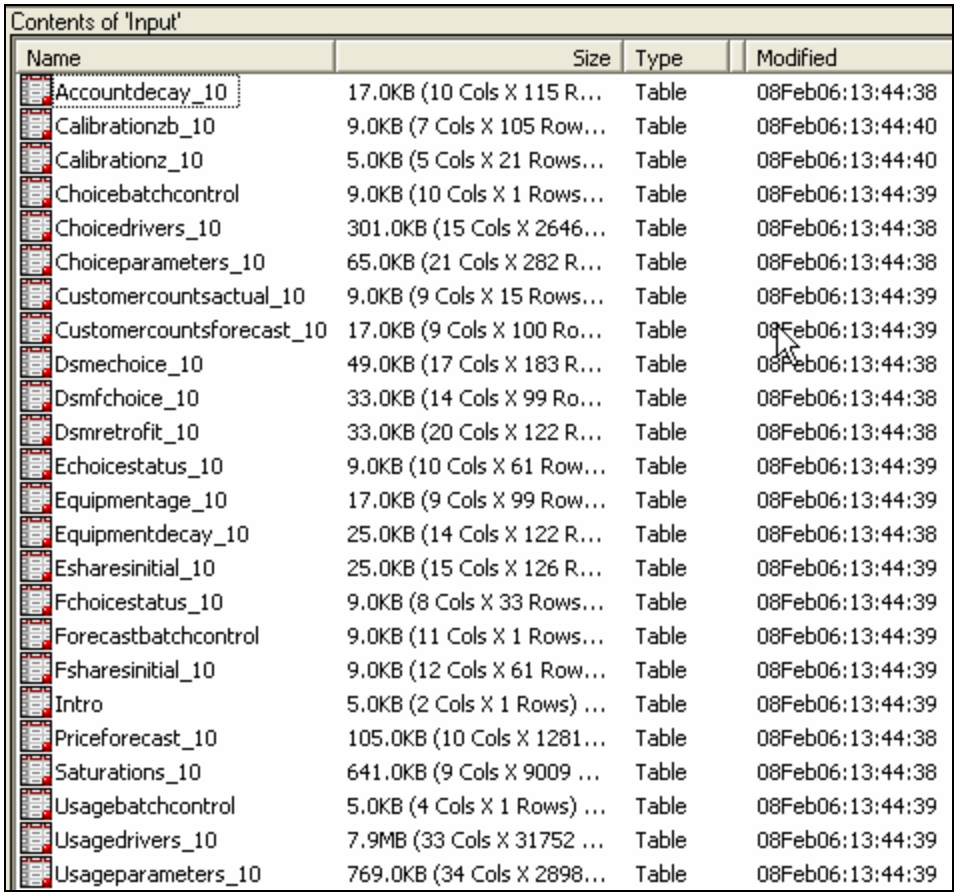
Figure 12. Contents of Segs Library



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"

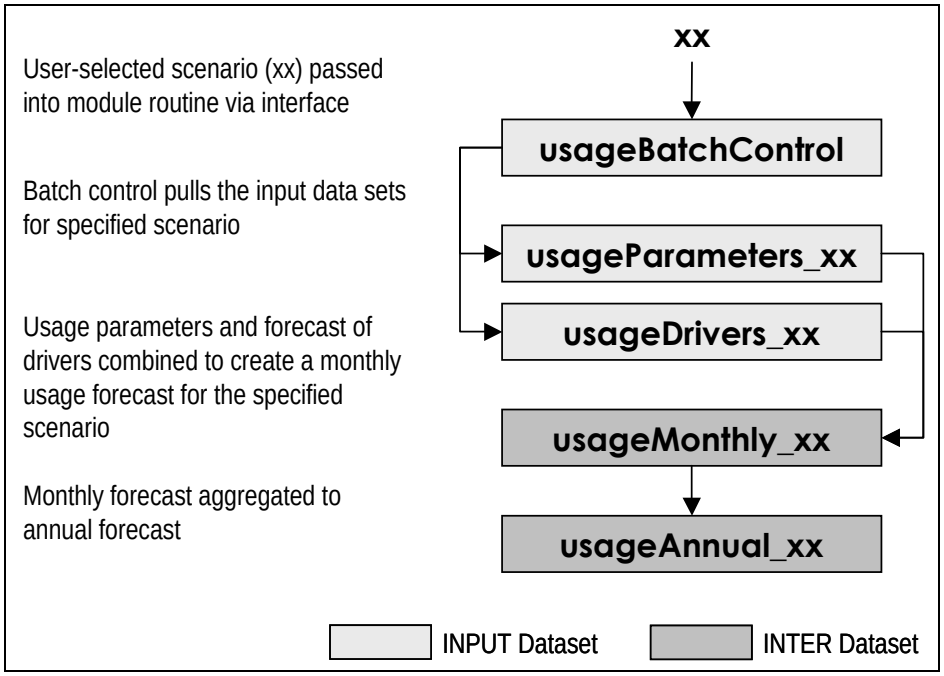


Table 5. Product Usage Module Data Library

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

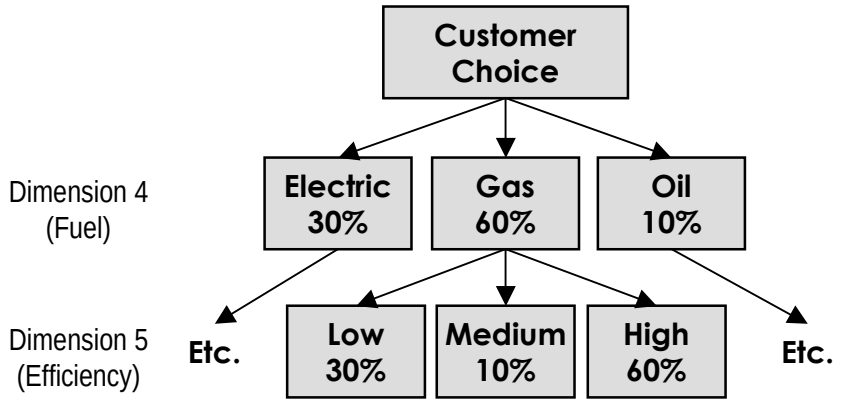
V. Provider Choice Module

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

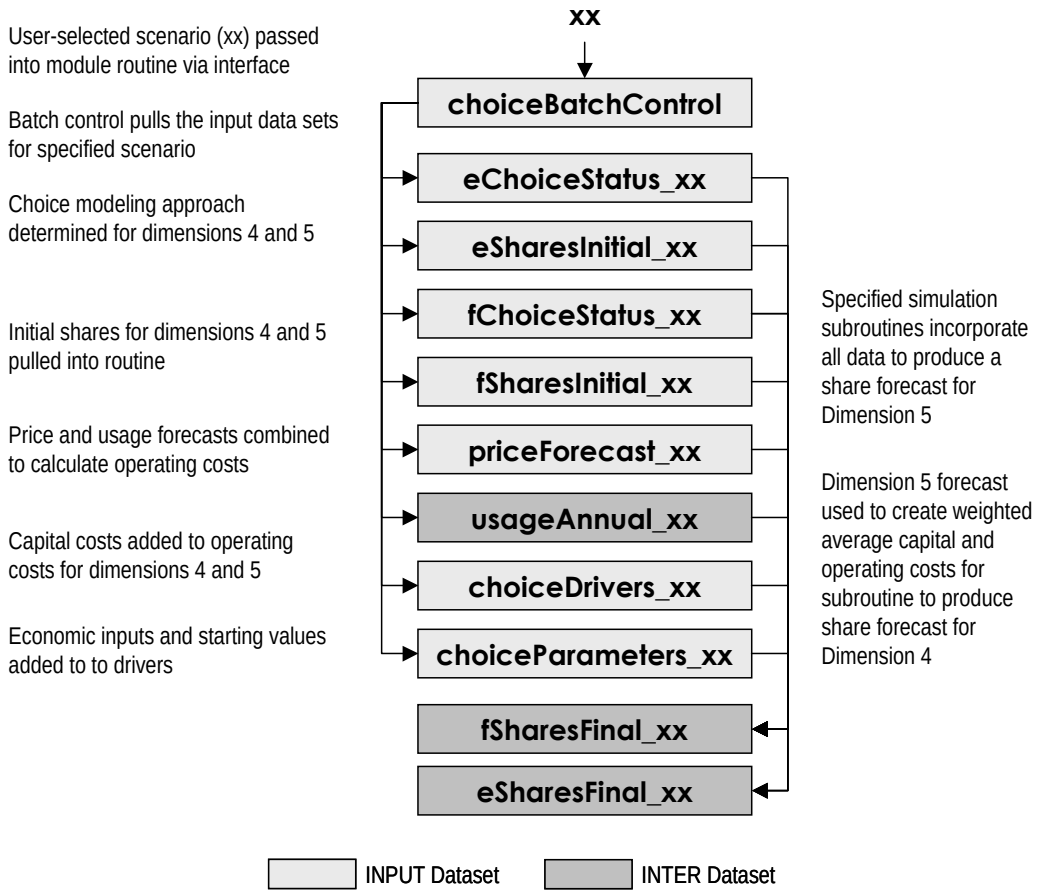
Figure 17 shows the data and analysis flow through the Provider Choice Module.

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**).

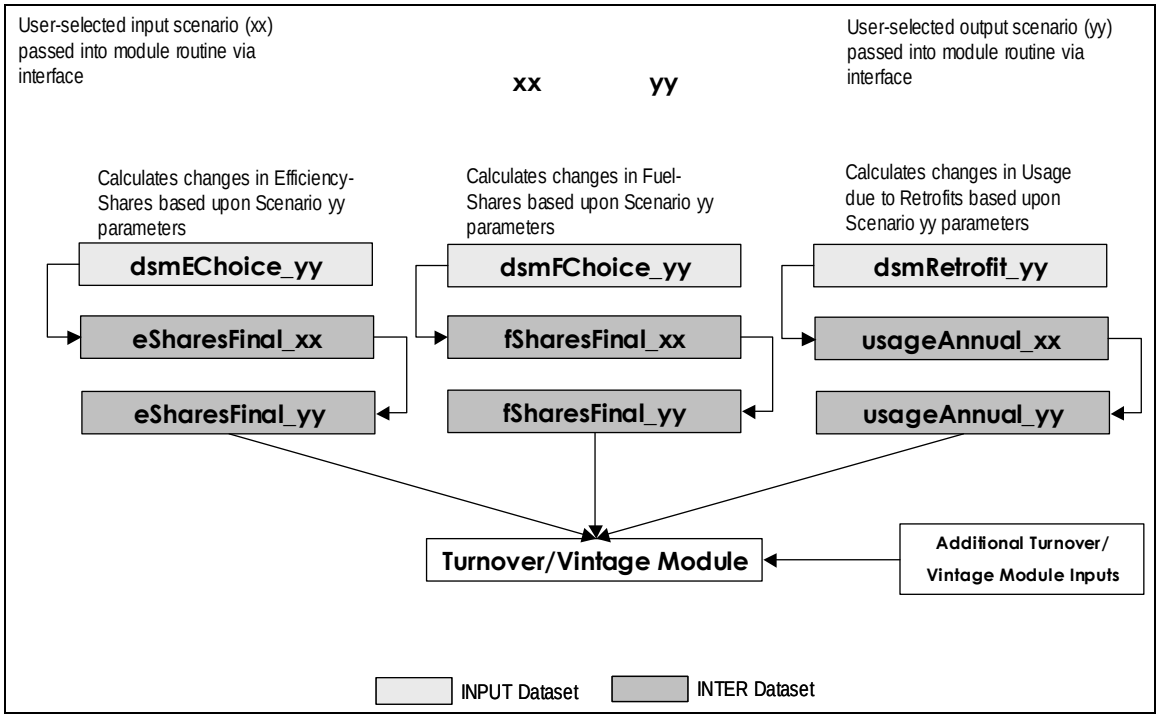
The Market Segmentation module creates base case files ("_10" files) where there is no intervention for each of these program categories. These files serve as templates that allow the user to create different scenarios of interest. To create strategies, you must copy these files to another scenario number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

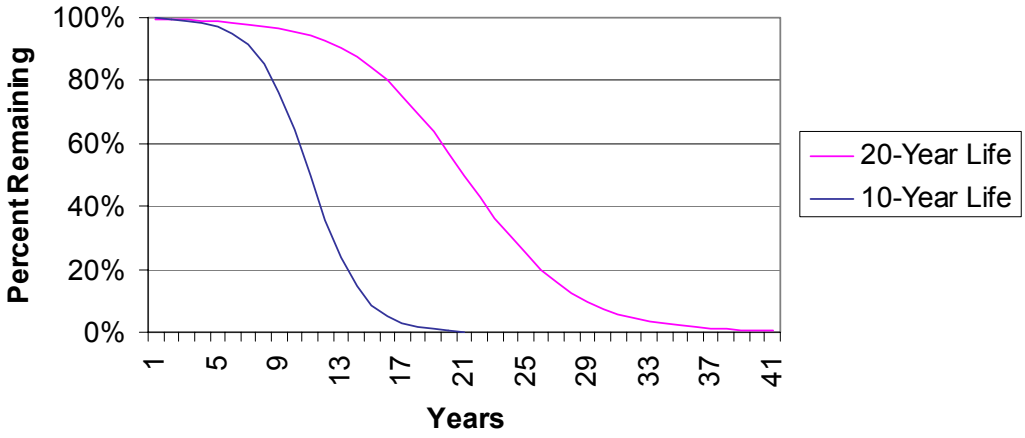
[3] These are discrete analogs to the continuous time distributions.

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:

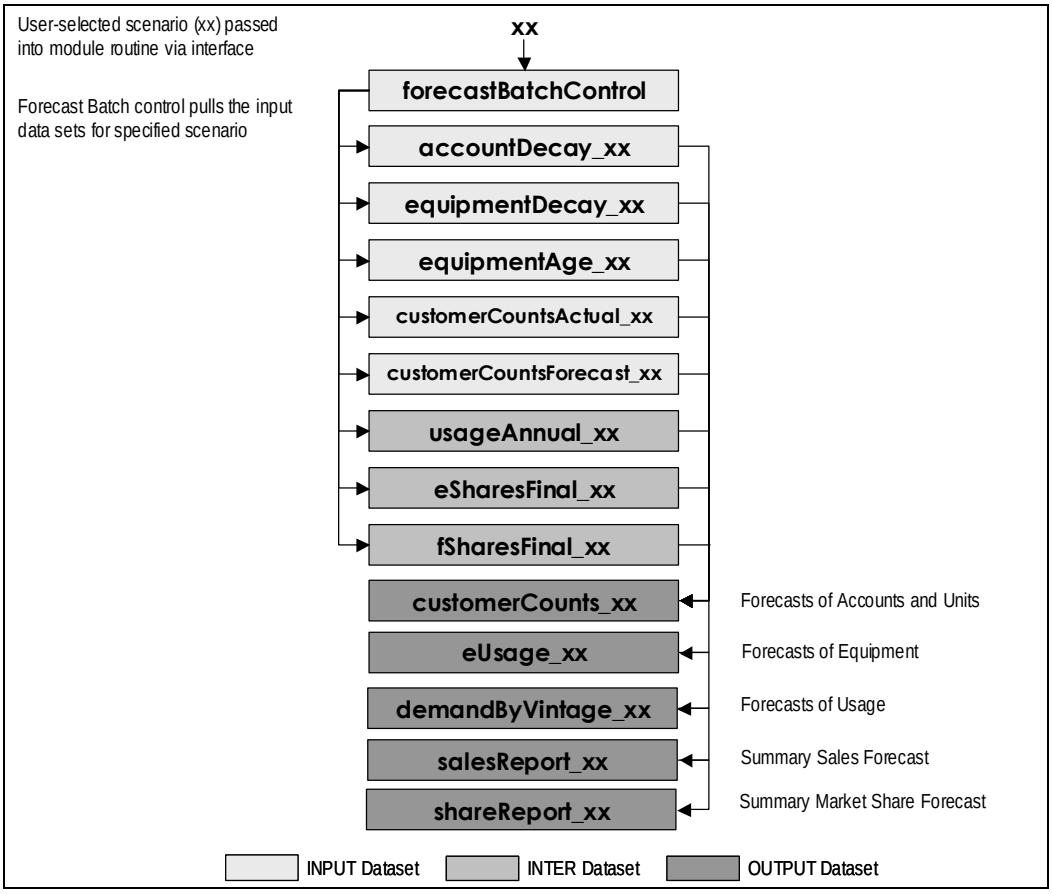
1. Merges all input data across Dimensions 1-3, including:
   - Existing accounts, plus a distribution of accounts across historical building vintages
   - New construction forecast, plus capture rates for new and conversion buildings
   - Dimension 3 saturation, equal to the number of Dimension 2 customers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

2020 CALIFORNIA GAS REPORT

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 2019 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 2019 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 2019 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 2019 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.

ResAvg

II. Residential End-Use Model Data

Southern California Gas Company
2020 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

SOUTHERN CALIFORNIA GAS COMPANY
FIGURE 2: AVERAGE TEMPERATURE YEAR FORECAST (UNITS=MDTH)

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2019	34123.16	29714.62	25940.37	21459.14	15507.31	11950.90	11475.58	11450.01	11320.15	14117.94	22614.10	35836.43	**245509.74**
2020	33061.88	28789.79	25142.31	20806.25	15043.52	11600.43	11140.89	11116.14	10989.43	13698.57	21921.47	34719.27	**238029.95**
2021	32672.27	28450.51	24846.10	20561.19	14866.40	11463.90	11009.79	10985.33	10860.11	13537.31	21663.23	34310.11	**235226.24**
2022	32170.12	28013.24	24464.31	20245.31	14638.08	11287.90	10840.77	10816.69	10693.39	13329.43	21330.37	33782.77	**231612.39**
2023	31727.94	27628.19	24128.12	19967.16	14437.04	11132.94	10691.96	10668.21	10546.60	13146.39	21037.28	33318.39	**228430.21**
2024	31293.07	27249.51	23797.50	19693.63	14239.34	10980.55	10545.63	10522.21	10402.25	12966.39	20749.04	32861.70	**225300.83**
2025	30846.23	26860.40	23457.78	19412.56	14036.19	10823.96	10395.26	10372.17	10253.91	12781.43	20452.86	32392.44	**222085.19**
2026	30393.46	26466.12	23113.53	19127.74	13830.32	10665.27	10242.87	10220.12	10103.59	12593.99	20152.74	31916.94	**218826.69**
2027	29946.94	26077.30	22774.04	18846.85	13627.30	10508.76	10092.58	10070.16	9955.34	12409.14	19856.76	31448.02	**215613.19**
2028	29496.36	25684.94	22431.45	18563.41	13422.42	10350.83	9940.91	9918.83	9805.73	12222.60	19558.09	30974.83	**212370.39**
2029	29063.91	25308.36	22102.65	18291.36	13225.78	10199.24	9795.34	9773.59	9662.14	12043.56	19271.43	30520.68	**209258.04**
2030	28648.91	24946.98	21787.13	18030.31	13037.09	10053.79	9655.67	9634.23	9524.36	11871.76	18996.35	30084.87	**206271.45**
2031	28431.46	24757.62	21621.77	17893.48	12938.17	9977.52	9582.43	9561.15	9452.11	11781.69	18852.18	29856.51	**204706.09**
2032	28343.05	24680.65	21554.54	17837.83	12897.93	9946.48	9552.61	9531.40	9422.70	11745.04	18793.56	29763.68	**204069.46**
2033	28424.62	24751.68	21616.51	17889.06	12934.91	9974.95	9579.94	9558.67	9449.66	11778.70	18847.57	29849.35	**204655.63**
2034	28561.28	24870.68	21720.35	17974.94	12996.93	10022.72	9625.80	9604.42	9494.90	11835.15	18938.08	29992.88	**205638.15**
2035	28473.20	24793.98	21653.36	17919.48	12956.82	9991.78	9596.08	9574.77	9465.59	11798.62	18879.66	29900.39	**205003.74**

ResCol

SOUTHERN CALIFORNIA GAS COMPANY
FIGURE 3: COLD TEMPERATURE YEAR FORECAST (UNITS=MDTH)

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2019	38312.63	33404.25	28585.25	23194.49	16265.52	12104.64	11509.39	11478.99	11387.76	14630.66	24728.56	40396.96	**265999.09**
2020	37206.72	32440.11	27759.01	22523.11	15793.65	11752.53	11174.33	11144.81	11056.32	14205.83	24013.39	39231.21	**258301.02**
2021	36802.63	32088.09	27453.66	22272.05	15613.91	11615.47	11043.11	11013.90	10926.76	14042.79	23747.85	38806.29	**255426.50**
2022	36274.31	31627.76	27055.35	21945.33	15380.85	11438.51	10873.89	10845.08	10759.62	13831.71	23401.78	38250.45	**251684.63**
2023	35813.34	31226.16	26707.30	21659.40	15176.41	11282.86	10724.93	10696.47	10612.53	13646.37	23099.21	37765.63	**248410.61**
2024	35361.57	30832.60	26366.01	21378.87	14975.66	11129.85	10578.46	10550.35	10467.91	13464.30	22802.44	37290.54	**245198.54**
2025	34896.38	30427.33	26014.70	21090.20	14769.19	10972.58	10427.94	10400.18	10319.28	13277.09	22497.00	36801.30	**241893.19**
2026	34420.74	30012.92	25656.02	20795.91	14559.18	10813.05	10275.37	10247.97	10168.58	13086.86	22185.34	36300.92	**238522.87**
2027	33950.29	29603.02	25301.42	20505.11	14351.82	10655.67	10124.88	10097.85	10019.95	12899.08	21877.28	35805.95	**235192.32**
2028	33474.39	29188.36	24942.85	20211.18	14142.36	10496.80	9973.01	9946.35	9869.93	12709.44	21565.83	35305.20	**231825.71**
2029	33017.02	28789.84	24598.32	19928.81	13941.21	10344.30	9827.24	9800.93	9725.94	12527.35	21266.60	34823.93	**228591.49**
2030	32581.26	28410.17	24269.69	19659.16	13748.77	10198.09	9687.40	9661.43	9587.82	12353.01	20981.04	34365.50	**225503.33**
2031	32342.16	28201.74	24090.66	19513.36	13645.93	10121.03	9613.98	9588.19	9515.22	12260.29	20825.94	34113.57	**223832.08**
2032	32238.07	28110.96	24013.53	19451.22	13602.85	10089.41	9584.04	9558.34	9485.56	12221.72	20759.40	34003.67	**223118.77**
2033	32300.54	28165.17	24063.44	19494.53	13636.37	10117.18	9611.22	9585.47	9512.21	12253.04	20803.77	34068.55	**223611.50**
2034	32419.16	28268.28	24155.89	19572.94	13695.13	10164.29	9656.93	9631.11	9557.16	12307.28	20885.18	34192.44	**224505.80**
2035	32313.12	28175.77	24077.56	19510.04	13651.77	10132.69	9627.07	9601.33	9527.56	12268.56	20817.70	34080.41	**223783.57**

ResHot

SOUTHERN CALIFORNIA GAS COMPANY
FIGURE 4: HOT TEMPERATURE YEAR FORECAST (UNITS=MDTH)

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2019	29933.70	26024.99	23295.49	19723.79	14749.10	11797.17	11441.78	11421.04	11252.54	13605.23	20499.65	31275.91	**225020.39**
2020	28917.05	25139.46	22525.61	19089.39	14293.39	11448.33	11107.44	11087.47	10922.54	13191.32	19829.54	30207.34	**217758.89**
2021	28541.92	24812.94	22238.54	18850.32	14118.89	11312.34	10976.46	10956.76	10793.45	13031.82	19578.61	29813.94	**215025.98**
2022	28065.94	24398.73	21873.28	18545.28	13895.30	11137.30	10807.66	10788.31	10627.15	12827.15	19258.96	29315.08	**211540.14**
2023	27642.54	24030.21	21548.94	18274.92	13697.66	10983.02	10659.00	10639.96	10480.66	12646.41	18975.35	28871.15	**208449.82**
2024	27224.58	23666.42	21229.00	18008.39	13503.03	10831.26	10512.80	10494.07	10336.59	12468.48	18695.65	28432.87	**205403.12**
2025	26796.08	23293.47	20900.85	17734.92	13303.20	10675.34	10362.58	10344.16	10188.55	12285.76	18408.72	27983.57	**202277.19**
2026	26366.17	22919.33	20571.04	17459.57	13101.47	10517.49	10210.37	10192.26	10038.60	12101.12	18120.14	27532.96	**199130.51**
2027	25943.58	22551.58	20246.66	17188.59	12902.77	10361.86	10060.27	10042.47	9890.73	11919.20	17836.24	27090.10	**196034.05**
2028	25518.32	22181.51	19920.05	16915.63	12702.47	10204.85	9908.81	9891.32	9741.53	11735.75	17550.35	26644.47	**192915.08**
2029	25110.79	21826.88	19606.98	16653.91	12510.34	10054.18	9763.45	9746.25	9598.34	11559.76	17276.26	26217.44	**189924.60**
2030	24716.56	21483.79	19304.57	16401.46	12325.41	9909.49	9623.94	9607.03	9460.90	11390.51	17011.67	25804.23	**187039.57**
2031	24520.76	21313.50	19152.89	16273.60	12230.41	9834.02	9550.87	9534.10	9389.00	11303.09	16878.43	25599.44	**185580.10**
2032	24448.03	21250.33	19095.55	16224.45	12193.01	9803.55	9521.18	9504.46	9359.84	11268.36	16827.71	25523.68	**185020.15**
2033	24548.71	21338.19	19169.58	16283.59	12233.45	9832.72	9548.67	9531.86	9387.11	11304.35	16891.37	25630.15	**185699.76**
2034	24703.40	21473.08	19284.81	16376.94	12298.73	9881.15	9594.67	9577.74	9432.65	11363.01	16990.99	25793.32	**186770.50**
2035	24633.27	21412.20	19229.15	16328.92	12261.87	9850.87	9565.10	9548.21	9403.62	11328.68	16941.63	25720.37	**186223.90**

ResBas

SOUTHERN CALIFORNIA GAS COMPANY
FIGURE 5: BASE TEMPERATURE YEAR FORECAST (UNITS=MDTH)

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2019	11777.35	11017.52	11777.35	11397.44	11777.35	11397.44	11777.35	11777.35	11397.44	11777.35	11397.44	11777.35	**139048.75**
2020	11295.95	10567.18	11295.95	10931.56	11295.95	10931.56	11295.95	11295.95	10931.56	11295.95	10931.56	11295.95	**133365.04**
2021	11117.37	10400.12	11117.37	10758.75	11117.37	10758.75	11117.37	11117.37	10758.75	11117.37	10758.75	11117.37	**131256.73**
2022	10894.85	10191.95	10894.85	10543.40	10894.85	10543.40	10894.85	10894.85	10543.40	10894.85	10543.40	10894.85	**128629.47**
2023	10692.86	10003.00	10692.86	10347.93	10692.86	10347.93	10692.86	10692.86	10347.93	10692.86	10347.93	10692.86	**126244.76**
2024	10491.14	9814.29	10491.14	10152.71	10491.14	10152.71	10491.14	10491.14	10152.71	10491.14	10152.71	10491.14	**123863.12**
2025	10284.90	9621.36	10284.90	9953.13	10284.90	9953.13	10284.90	10284.90	9953.13	10284.90	9953.13	10284.90	**121428.22**
2026	10084.27	9433.68	10084.27	9758.98	10084.27	9758.98	10084.27	10084.27	9758.98	10084.27	9758.98	10084.27	**119059.50**
2027	9889.39	9251.36	9889.39	9570.37	9889.39	9570.37	9889.39	9889.39	9570.37	9889.39	9570.37	9889.39	**116758.55**
2028	9694.58	9069.12	9694.58	9381.85	9694.58	9381.85	9694.58	9694.58	9381.85	9694.58	9381.85	9694.58	**114458.56**
2029	9509.65	8896.12	9509.65	9202.88	9509.65	9202.88	9509.65	9509.65	9202.88	9509.65	9202.88	9509.65	**112275.17**
2030	9326.43	8724.73	9326.43	9025.58	9326.43	9025.58	9326.43	9326.43	9025.58	9326.43	9025.58	9326.43	**110112.05**
2031	9265.14	8667.39	9265.14	8966.26	9265.14	8966.26	9265.14	9265.14	8966.26	9265.14	8966.26	9265.14	**109388.42**
2032	9269.93	8671.87	9269.93	8970.90	9269.93	8970.90	9269.93	9269.93	8970.90	9269.93	8970.90	9269.93	**109444.93**
2033	9385.10	8779.61	9385.10	9082.35	9385.10	9082.35	9385.10	9385.10	9082.35	9385.10	9082.35	9385.10	**110804.73**
2034	9531.41	8916.48	9531.41	9223.94	9531.41	9223.94	9531.41	9531.41	9223.94	9531.41	9223.94	9531.41	**112532.08**
2035	9540.34	8924.84	9540.34	9232.59	9540.34	9232.59	9540.34	9540.34	9232.59	9540.34	9232.59	9540.34	**112637.59**

SOUTHERN CALIFORNIA GAS COMPANY
FIGURE 6: HISTORICAL DATA INPUTS

Segment	2019 Therm Sales	2019 Meter Count	2019 Meter Count pre-78 customers	2019 Meter Count post-78 till "new" customers	2019 Meter Count New Customers	Average Annual Consumption pre-78 customers	Average Annual Consumption post-78 till "new" customers	Average Annual Consumption New Customers	Price Elasticity
Single_Family	1,770,683,324	3,784,284	2,408,056	1,355,868	20,360	470	466	331	**-0.1053**
MF2_2_TO_4_Units	172,806,797	560,036	405,687	151,959	2,390	311	302	255	**-0.1117**
MF3_GE_5_Units	337,761,588	1,224,044	702,223	515,348	6,473	281	269	255	**-0.0715**
MM_Master_Meter	130,850,248	36,349	32,151	4,120	78	3,130	7,093	12,832	**-0.0688**
SM_Sub_Meter	42,995,397	1,589	1,483	105	1	26,714	32,170	0	**-0.1053**

Southern California Gas Company
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7: Meter Count Forecast

SOUTHERN CALIFORNIA GAS COMPANY
FIGURE 7: **CHANGE** IN METERS BY MARKET SEGMENT

Year	SF Meters	MF2 Meters	MF3 Meters	MM Meters	SM Meters
2020	20,056	2,663	1,825	-	-
2021	18,842	4,363	2,990	-	-
2022	24,217	4,861	3,331	-	-
2023	28,461	4,644	3,183	-	-
2024	30,795	3,970	2,721	-	-
2025	29,930	4,040	2,769	-	-
2026	28,533	3,921	2,687	-	-
2027	27,344	3,648	2,500	-	-
2028	26,176	3,430	2,350	-	-
2029	25,201	3,286	2,252	-	-
2030	24,524	3,169	2,172	-	-
2031	24,152	3,053	2,092	-	-
2032	23,960	2,911	1,995	-	-
2033	23,777	2,814	1,928	-	-
2034	23,596	2,710	1,857	-	-
2035	25,474	2,625	1,799	-	-

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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

SOUTHERN CALIFORNIA GAS COMPANY
FIGURE 9: AVERAGE AND MARGINAL GAS PRICES
UNITS = ($/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
2019	98.8	0.8007	1.1392	0.7471	1.1392	0.7524	1.1392	0.7145	1.1392	0.7336	1.1392
2020	100.0	0.9222	1.2230	0.8646	1.2230	0.8703	1.2230	0.8295	1.2230	0.8500	1.2230
2021	102.2	0.9950	1.2423	0.9345	1.2423	0.9404	1.2423	0.8976	1.2423	0.9192	1.2423
2022	104.7	1.0100	1.3099	0.9483	1.3099	0.9544	1.3099	0.9107	1.3099	0.9327	1.3099
2023	107.5	1.0696	1.3733	1.0058	1.3733	1.0121	1.3733	0.9669	1.3733	0.9896	1.3733
2024	110.3	1.1240	1.4362	1.0578	1.4362	1.0644	1.4362	1.0175	1.4362	1.0411	1.4362
2025	112.8	1.1781	1.5036	1.1096	1.5036	1.1163	1.5036	1.0678	1.5036	1.0922	1.5036
2026	115.4	1.2355	1.5856	1.1643	1.5856	1.1713	1.5856	1.1209	1.5856	1.1463	1.5856
2027	117.9	1.3064	1.6723	1.2322	1.6723	1.2396	1.6723	1.1871	1.6723	1.2135	1.6723
2028	120.4	1.3823	1.7656	1.3052	1.7656	1.3128	1.7656	1.2583	1.7656	1.2858	1.7656
2029	123.0	1.4646	1.8613	1.3847	1.8613	1.3925	1.8613	1.3360	1.8613	1.3644	1.8613
2030	125.7	1.5490	1.9463	1.4660	1.9463	1.4742	1.9463	1.4155	1.9463	1.4450	1.9463
2031	128.5	1.6251	2.0388	1.5398	2.0388	1.5482	2.0388	1.4878	2.0388	1.5182	2.0388
2032	131.2	1.7055	2.1129	1.6170	2.1129	1.6257	2.1129	1.5631	2.1129	1.5946	2.1129
2033	134.1	1.7767	2.2031	1.6875	2.2031	1.6963	2.2031	1.6331	2.2031	1.6649	2.2031
2034	136.9	1.8588	2.2927	1.7674	2.2927	1.7764	2.2927	1.7117	2.2927	1.7442	2.2927
2035	139.8	1.9408	1.3994	1.8473	1.3994	1.8565	1.3994	1.7903	1.3994	2.3349	1.3994

SOUTHERN CALIFORNIA GAS COMPANY
FIGURE 10: AVERAGE AND MARGINAL ELECTRIC PRICES
UNITS = (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
2019	20.60	31.17	19.22	29.08	19.35	29.29	18.38	19.00	18.87	21.23
2020	21.57	32.64	20.22	30.60	20.35	30.80	19.40	20.06	19.88	22.37
2021	22.59	34.18	21.21	32.10	21.35	32.31	20.38	21.07	20.87	23.48
2022	23.89	36.14	22.43	33.94	22.57	34.15	21.54	22.27	22.06	24.82
2023	24.41	36.94	22.95	34.73	23.10	34.95	22.07	22.82	22.58	25.41
2024	25.38	38.40	23.88	36.14	24.03	36.36	22.97	23.75	23.50	26.45
2025	26.36	39.88	24.82	37.56	24.97	37.79	23.89	24.70	24.43	27.50
2026	27.38	41.42	25.80	39.04	25.95	39.27	24.84	25.68	25.40	28.58
2027	28.40	42.97	26.79	40.53	26.95	40.78	25.81	26.68	26.38	29.69
2028	29.43	44.53	27.79	42.05	27.95	42.29	26.79	27.70	27.37	30.80
2029	30.51	46.17	28.85	43.65	29.01	43.90	27.83	28.78	28.42	31.99
2030	31.65	47.90	29.96	45.33	30.13	45.59	28.93	29.91	29.53	33.23
2031	31.80	48.11	30.13	45.59	30.29	45.84	29.11	30.10	29.70	33.43
2032	31.93	48.32	30.28	45.82	30.44	46.06	29.27	30.26	29.86	33.60
2033	32.04	48.49	30.43	46.05	30.59	46.29	29.45	30.45	30.02	33.79
2034	32.16	48.67	30.58	46.27	30.73	46.51	29.61	30.62	30.18	33.96
2035	30.59	46.29	29.12	44.06	29.26	44.28	28.22	29.18	36.80	41.42

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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	-	-	-

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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	-	-	-

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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

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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

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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

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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

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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	-	-	-	-	-	-

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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	-	-	-	-	-	-

2020 CALIFORNIA GAS REPORT

CORE COMMERCIAL & INDUSTRIAL

Core Commercial and Industrial End Use Model

2020 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 2020 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 1,273 for an Average Year. The gas demand forecasts under Cold, Hot and Base temperature were then constructed based on Cold Year (Hdd = 1,518, Hot Year (Hdd=1,028) and Base Year (Hdd=0) annual assumptions. The annual Hdd's were adjusted annually. The annual values used can be found under the weather section of the 2020 CGR workpapers.

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 2019 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 2019 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 1,273 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 February 2020 Regional forecast, with adjustments for COVID-19 impacts based on Global Insight's March 20, 2020 interim U.S. Economic Forecast. The historical data through 2019 comes from the California Employment Development Department.

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 commercial G-10 customers, to separate monthly consumption for customers by each business type into the respective G-10 consumption tiers. (The most recent 12-month calendar period, January 2019 through December 2019, 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 *small commercial* customer class were developed based on the California Energy Commission's December 2019 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 resulting price projections for *small commercial* were set equal to 112% of the CEC's projections for the SCE commercial class. These were the average electricity prices for the G-10 core commercial market, overall.

The marginal prices were calculated by multiplying each year's respective average price by a ratio. This ratio, 1.000, was estimated from an analysis of the SCE GS-2 rate schedule posted on their web-site in March 2006. (These customers were assumed to be small non-self-generation customers who also were not on time-of-use rates.)

To impute, in each year, average and marginal electricity prices to each core commercial business type, we simply calculated the ratio of the average (or marginal) gas price to the overall core commercial gas price for each business type, 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/ENERGY EFFICIENCY 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 BASE YEAR 2019 HISTORICAL MODEL INPUTS
CORE COMMERCIAL MARKET (INCLUDES GAS AC AND GAS ENGINE LOAD)

Segment	2019 Therm Sales	2019 Meter Count	2019 Meter Count, Existing/Old customers	2019 Meter Count New Customers	Avg Use Per Meter Existing Customers	Avg Use Per Meter New Customers	Price Elasticity	Employment Elasticities
Office	76659840	41822	41626	196	**1831**	2263	-0.135376	0.504814
Restaurant	255497715	40759	40200	559	**6276**	5718	-0.091877	1.139009
Retail	60201007	23243	23104	139	**2586**	3286	-0.265060	0.669961
Laundry	58685863	3849	3836	13	**15232**	19777	-0.122795	0.410773
Warehouse	13714827	7206	7177	29	**1904**	1670	-0.043035	0.541396
School	39274191	6716	6699	17	**5853**	3784	-0.000001	0.000000
College	28357877	2832	2807	25	**9815**	32254	-0.037179	0.734460
Health	59977422	6647	6624	23	**9031**	6832	-0.096826	0.133868
Lodging	60185251	4739	4713	26	**12646**	22552	-0.105697	0.429296
Misc	98736433	34309	34095	214	**2791**	16653	-0.000001	0.000000
Government	26823341	3715	3704	11	**7239**	1081	-0.095709	1.691919
TCU	23981001	5994	5972	22	**4009**	1729	-0.129301	0.723524
Construction	8413032	5717	5673	44	**1463**	2566	-0.161076	0.106372
Agriculture	45749041	1366	1357	9	**33554**	24103	-0.315282	0.668819

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
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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
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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
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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

Southern California Gas Company
Core Commercial Market
EUI Data

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
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
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	. N/A		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 (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	732	781	78	39	8	11	1	1	23	5	153	1831
Restaurant	231	1329	1414	1411	550	927	58	1	8	1	348	6276
Retail	334	829	578	162	30	134	4	1	45	14	455	2586
Laundry	104	10432	10	12	1	4	1	1	4502	0	166	15232
Warehouse	179	987	255	15	1	15	1	1	59	6	387	1904
School	1373	3029	258	225	12	23	3	1	14	75	840	5853
College	3646	4697	202	157	46	107	1	1	42	184	734	9815
Health	1657	5704	394	435	67	88	4	1	295	27	359	9031
Lodging	1347	8449	585	513	116	152	3	1	772	20	689	12646
Misc	610	1359	162	125	30	51	3	1	50	16	386	2791
Government	2510	3491	159	154	69	31	1	1	174	104	546	7239
TCU	1035	1170	74	47	10	21	1	1	24	871	757	4009
Construction	315	798	34	9	2	3	1	1	52	1	248	1463
Agriculture	526	19720	370	80	15	112	2	1	4390	2708	5630	33554

SOUTHERN CALIFORNIA GAS COMPANY
CORE COMMERCIAL
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	318	1186	240	98	70	39	2	2	60	44	208	2263
Restaurant	188	1736	947	1509	300	567	1	1	1	1	472	5718
Retail	2052	659	329	4	13	229	1	1	1	1	1	3286
Laundry	1	7709	1	1	1	1	1	1	12068	1	1	19777
Warehouse	1372	292	1	6	1	1	1	1	1	1	1	1670
School	445	3269	14	34	2	18	1	1	1	1	1	3784
College	2229	23951	12	12	12	12	12	12	12	12	6074	32254
Health	3789	3032	7	2	2	2	2	2	2	2	2	6832
Lodging	3797	17990	2	12	1	2	2	2	518	2	235	22552
Misc	1657	11314	649	996	184	362	4	4	147	392	952	16653
Government	74	1007	0	0	0	0	0	0	0	0	0	1081
TCU	0	0	0	0	0	0	0	0	0	478	1251	1729
Construction	961	549	547	130	378	0	0	0	0	0	0	2566
Agriculture	1	1	1	1	1	1	1	1	321	23782	1	24103

SOUTHERN CALIFORNIA GAS COMPANY
CORE COMMERCIAL MARKET
AVERAGE NATURAL GAS PRICES ($/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
2020	100.00	0.9659	0.9516	0.9560	0.8371	0.9219	0.8870	0.7424	0.7743	0.8136	0.8993	0.8038	0.8164	0.9389	0.6338
2021	102.23	1.0464	1.0340	1.0372	0.9139	1.0003	0.9657	0.8136	0.8472	0.8889	0.9771	0.8781	0.8907	1.0171	0.6995
2022	104.67	1.0635	1.0515	1.0544	0.9301	1.0169	0.9823	0.8285	0.8624	0.9048	0.9935	0.8937	0.9063	1.0336	0.7130
2023	107.55	1.1049	1.0949	1.0965	0.9672	1.0559	1.0215	0.8592	0.8950	0.9401	1.0318	0.9279	0.9405	1.0722	0.7373
2024	110.27	1.1432	1.1351	1.1354	1.0014	1.0920	1.0577	0.8875	0.9251	0.9728	1.0672	0.9594	0.9720	1.1080	0.7596
2025	112.83	1.1812	1.1752	1.1741	1.0354	1.1278	1.0937	0.9154	0.9548	1.0052	1.1023	0.9907	1.0033	1.1434	0.7815
2026	115.36	1.2333	1.2291	1.2268	1.0835	1.1777	1.1437	0.9576	0.9988	1.0517	1.1515	1.0361	1.0487	1.1930	0.8177
2027	117.86	1.3121	1.3099	1.3062	1.1583	1.2543	1.2205	1.0266	1.0695	1.1250	1.2274	1.1083	1.1209	1.2692	0.8808
2028	120.40	1.3843	1.3842	1.3792	1.2262	1.3241	1.2906	1.0879	1.1328	1.1911	1.2965	1.1732	1.1859	1.3387	0.9356
2029	123.03	1.4515	1.4537	1.4471	1.2886	1.3887	1.3553	1.1433	1.1903	1.2517	1.3603	1.2325	1.2451	1.4029	0.9840
2030	125.71	1.5255	1.5299	1.5218	1.3578	1.4600	1.4269	1.2056	1.2546	1.3191	1.4308	1.2985	1.3112	1.4738	1.0392
2031	128.48	1.5831	1.5891	1.5800	1.4122	1.5158	1.4828	1.2551	1.3056	1.3721	1.4861	1.3507	1.3634	1.5293	1.0839
2032	131.23	1.6802	1.6880	1.6777	1.5058	1.6111	1.5782	1.3435	1.3956	1.4644	1.5807	1.4420	1.4547	1.6243	1.1670
2033	134.06	1.6917	1.7010	1.6897	1.5142	1.6208	1.5881	1.3472	1.4006	1.4715	1.5899	1.4482	1.4609	1.6338	1.1661
2034	136.90	1.7596	1.7706	1.7582	1.5783	1.6866	1.6541	1.4058	1.4609	1.5341	1.6551	1.5098	1.5225	1.6992	1.2191
2035	139.82	1.8267	1.8394	1.8258	1.6421	1.7519	1.7195	1.4646	1.5212	1.5966	1.7198	1.5714	1.5841	1.7643	1.2729

SOUTHERN CALIFORNIA GAS COMPANY
CORE COMMERCIAL MARKET
MARGINAL NATURAL GAS PRICES ($/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
2020	100.00	0.7998	0.8265	0.8081	0.7473	0.7557	0.7325	0.6407	0.6800	0.7006	0.7550	0.6820	0.6908	0.7637	0.5734
2021	102.23	0.8751	0.9034	0.8839	0.8197	0.8286	0.8041	0.7070	0.7485	0.7702	0.8278	0.7507	0.7599	0.8370	0.6358
2022	104.67	0.8910	0.9196	0.8999	0.8348	0.8438	0.8190	0.7207	0.7627	0.7847	0.8430	0.7649	0.7743	0.8523	0.6486
2023	107.55	0.9264	0.9567	0.9358	0.8668	0.8763	0.8500	0.7457	0.7903	0.8137	0.8755	0.7926	0.8026	0.8854	0.6693
2024	110.27	0.9590	0.9910	0.9690	0.8962	0.9063	0.8786	0.7687	0.8157	0.8403	0.9055	0.8181	0.8286	0.9158	0.6881
2025	112.83	0.9914	1.0250	1.0019	0.9254	0.9360	0.9068	0.7913	0.8407	0.8666	0.9351	0.8432	0.8543	0.9460	0.7066
2026	115.36	1.0379	1.0731	1.0489	0.9688	0.9799	0.9493	0.8282	0.8800	0.9071	0.9789	0.8827	0.8942	0.9904	0.7395
2027	117.86	1.1112	1.1480	1.1227	1.0389	1.0505	1.0185	0.8920	0.9461	0.9744	1.0495	0.9489	0.9610	1.0615	0.7992
2028	120.40	1.1774	1.2160	1.1894	1.1016	1.1137	1.0803	0.9476	1.0043	1.0340	1.1127	1.0073	1.0199	1.1252	0.8503
2029	123.03	1.2380	1.2785	1.2506	1.1584	1.1711	1.1360	0.9967	1.0563	1.0875	1.1701	1.0594	1.0727	1.1832	0.8946
2030	125.71	1.3053	1.3478	1.3186	1.2220	1.2354	1.1986	1.0528	1.1151	1.1478	1.2343	1.1184	1.1323	1.2480	0.9459
2031	128.48	1.3584	1.4021	1.3721	1.2725	1.2863	1.2483	1.0980	1.1623	1.1960	1.2852	1.1656	1.1800	1.2993	0.9878
2032	131.23	1.4507	1.4958	1.4648	1.3620	1.3762	1.3370	1.1818	1.2482	1.2829	1.3750	1.2516	1.2664	1.3897	1.0680
2033	134.06	1.4578	1.5042	1.4723	1.3666	1.3812	1.3409	1.1814	1.2496	1.2854	1.3800	1.2531	1.2684	1.3951	1.0644
2034	136.90	1.5205	1.5684	1.5354	1.4263	1.4414	1.3998	1.2351	1.3055	1.3424	1.4402	1.3092	1.3249	1.4557	1.1143
2035	139.82	1.5829	1.6322	1.5983	1.4861	1.5017	1.4589	1.2894	1.3619	1.3999	1.5004	1.3657	1.3818	1.5163	1.1652

SOUTHERN CALIFORNIA GAS COMPANY
AVERAGE ELECTRIC 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
2020	19.46	19.17	19.26	16.87	18.57	17.87	14.96	15.60	16.39	18.12	16.19	16.45	18.92	12.77
2021	20.27	20.03	20.10	17.71	19.38	18.71	15.76	16.41	17.22	18.93	17.01	17.26	19.71	13.55
2022	21.39	21.14	21.20	18.70	20.45	19.75	16.66	17.34	18.19	19.98	17.97	18.22	20.78	14.34
2023	21.74	21.55	21.58	19.03	20.78	20.10	16.91	17.61	18.50	20.31	18.26	18.51	21.10	14.51
2024	22.63	22.47	22.48	19.82	21.62	20.94	17.57	18.31	19.26	21.13	18.99	19.24	21.93	15.04
2025	23.53	23.41	23.39	20.62	22.46	21.78	18.23	19.02	20.02	21.96	19.73	19.98	22.77	15.57
2026	24.42	24.34	24.30	21.46	23.32	22.65	18.96	19.78	20.83	22.80	20.52	20.77	23.63	16.19
2027	25.28	25.23	25.16	22.31	24.16	23.51	19.78	20.60	21.67	23.65	21.35	21.59	24.45	16.97
2028	26.17	26.17	26.07	23.18	25.03	24.39	20.56	21.41	22.52	24.51	22.18	22.42	25.30	17.69
2029	27.14	27.18	27.06	24.10	25.97	25.34	21.38	22.26	23.41	25.44	23.05	23.28	26.23	18.40
2030	28.16	28.24	28.09	25.06	26.95	26.34	22.25	23.16	24.35	26.41	23.97	24.20	27.21	19.18
2031	28.25	28.36	28.20	25.20	27.05	26.46	22.40	23.30	24.49	26.52	24.11	24.33	27.29	19.34
2032	28.26	28.39	28.22	25.33	27.10	26.55	22.60	23.47	24.63	26.59	24.26	24.47	27.32	19.63
2033	28.43	28.59	28.40	25.45	27.24	26.69	22.64	23.54	24.73	26.72	24.34	24.55	27.46	19.60
2034	28.50	28.68	28.48	25.57	27.32	26.79	22.77	23.66	24.85	26.81	24.46	24.66	27.53	19.75
2035	28.57	28.77	28.56	25.68	27.40	26.90	22.91	23.79	24.97	26.90	24.58	24.78	27.60	19.91

SOUTHERN CALIFORNIA GAS COMPANY
MARGINAL ELECTRIC 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
2020	18.95	19.58	19.14	17.70	17.90	17.35	15.18	16.11	16.60	17.89	16.16	16.36	18.09	13.58
2021	19.78	20.42	19.98	18.53	18.73	18.17	15.98	16.92	17.41	18.71	16.97	17.18	18.92	14.37
2022	20.87	21.54	21.08	19.56	19.77	19.19	16.88	17.87	18.39	19.75	17.92	18.14	19.97	15.20
2023	21.26	21.95	21.48	19.89	20.11	19.51	17.11	18.14	18.67	20.09	18.19	18.42	20.32	15.36
2024	22.16	22.89	22.39	20.71	20.94	20.30	17.76	18.84	19.41	20.92	18.90	19.14	21.16	15.90
2025	23.07	23.85	23.31	21.53	21.78	21.10	18.41	19.56	20.16	21.76	19.62	19.88	22.01	16.44
2026	23.98	24.79	24.23	22.38	22.64	21.93	19.13	20.33	20.96	22.61	20.39	20.66	22.88	17.08
2027	24.84	25.67	25.10	23.23	23.48	22.77	19.94	21.15	21.78	23.46	21.21	21.48	23.73	17.87
2028	25.75	26.59	26.01	24.09	24.36	23.62	20.72	21.96	22.61	24.33	22.03	22.30	24.61	18.60
2029	26.74	27.61	27.01	25.02	25.29	24.54	21.53	22.81	23.49	25.27	22.88	23.17	25.56	19.32
2030	27.77	28.67	28.05	25.99	26.28	25.50	22.39	23.72	24.42	26.26	23.79	24.09	26.55	20.12
2031	27.88	28.77	28.16	26.11	26.40	25.62	22.53	23.85	24.54	26.37	23.92	24.22	26.66	20.27
2032	27.91	28.77	28.18	26.20	26.47	25.72	22.73	24.01	24.68	26.45	24.08	24.36	26.73	20.54
2033	28.09	28.98	28.37	26.33	26.61	25.84	22.76	24.08	24.77	26.59	24.14	24.44	26.88	20.51
2034	28.17	29.06	28.45	26.43	26.71	25.94	22.89	24.19	24.88	26.69	24.26	24.55	26.97	20.65
2035	28.26	29.14	28.53	26.53	26.81	26.04	23.02	24.31	24.99	26.78	24.38	24.67	27.07	20.80

SOUTHERN CALIFORNIA GAS COMPANY
CORE COMMERCIAL
EMPLOYMENT (IN MILLIONS)

YEAR	Office	Restaurant	Retail	Laundry	Warehouse	School	College	Health
2020	1.1759723	0.73864245	0.91449631	0.1022463	0.5051843	0.6283633	0.2094544	1.37514253
2021	1.1784806	0.74683358	0.92455987	0.1022639	0.5059921	0.6322722	0.2107574	1.39965788
2022	1.3114496	0.81027824	1.00302012	0.1029091	0.5187297	0.6373322	0.2124441	1.45197137
2023	1.3678808	0.80340355	0.99457534	0.1029525	0.5311055	0.642729	0.214243	1.48824719
2024	1.3973843	0.79741574	0.98713321	0.1018257	0.5340111	0.6485149	0.2161716	1.5030036
2025	1.4189013	0.78432469	0.97093122	0.1011801	0.5351116	0.6543391	0.218113	1.5120573
2026	1.434237	0.77218014	0.95590554	0.1009882	0.5354496	0.6600852	0.2200284	1.52080895
2027	1.4539633	0.76652856	0.94890879	0.1010933	0.536516	0.6655004	0.2218335	1.53563596
2028	1.4816935	0.76409766	0.94590157	0.1013192	0.5341965	0.6701642	0.2233881	1.55517113
2029	1.5023357	0.76316833	0.94474852	0.1012993	0.532018	0.6746008	0.2248669	1.5738849
2030	1.5136993	0.76174361	0.94298599	0.101144	0.529049	0.6789553	0.2263184	1.59120944
2031	1.5255515	0.76204275	0.94336215	0.1009933	0.5272594	0.6840863	0.2280288	1.60940121
2032	1.538228	0.76582766	0.94804701	0.1009476	0.5252954	0.6894429	0.2298143	1.62821742
2033	1.5466601	0.77081307	0.95421551	0.1008409	0.5237162	0.6946301	0.2315434	1.64648521
2034	1.5491184	0.77389265	0.95802714	0.1006301	0.5218229	0.700208	0.2334027	1.66605182
2035	1.5514748	0.77665758	0.96145162	0.1003163	0.5199332	0.705951	0.235317	1.68457354

SOUTHERN CALIFORNIA GAS COMPANY
CORE COMMERCIAL
EMPLOYMENT (IN MILLIONS)

YEAR	Lodging	Misc	Government	TCU	Construction	Agriculture
2020	0.1298672	0.2556505	0.6543719	0.5989298	0.4476986	0.2292775
2021	0.1397418	0.25571245	0.65338037	0.5824132	0.4421904	0.2114179
2022	0.1390379	0.25734574	0.65770354	0.5845025	0.4545866	0.2187997
2023	0.142413	0.25743585	0.66189972	0.5890442	0.4638841	0.2280534
2024	0.1436203	0.25461893	0.66660849	0.5861725	0.4679781	0.2326715
2025	0.1437262	0.25300854	0.67128829	0.5827182	0.472714	0.2345677
2026	0.143734	0.25253009	0.67573684	0.5812598	0.4762521	0.2359565
2027	0.1442539	0.25279531	0.67989522	0.5774545	0.481871	0.2360528
2028	0.1453052	0.25335958	0.68339703	0.5711355	0.4910876	0.2357193
2029	0.1467796	0.25330782	0.68670329	0.5635494	0.5045115	0.2354965
2030	0.1480523	0.25292002	0.69518596	0.5546759	0.5184494	0.2352728
2031	0.1494098	0.25254286	0.69478012	0.54873	0.5302857	0.2353471
2032	0.150602	0.25242898	0.69886964	0.5473781	0.5412021	0.2357673
2033	0.1518707	0.2521619	0.70273993	0.5465111	0.5503991	0.2361973
2034	0.1528211	0.25163399	0.7069229	0.5438595	0.5583722	0.2360508
2035	0.1539399	0.25084922	0.71122537	0.5397795	0.5670741	0.2355923

SOUTHERN CALIFORNIA GAS COMPANY
GAS AC METERS

Meter	For CGR2020			GAC								4/21/2020	
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2019	5	5	5	7	5	5	5	5	5	5	5	5	5
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

SOUTHERN CALIFORNIA GAS COMPANY
AC LOAD (MDTH)

Mdth

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2019	1.26	1.28	0.97	1.43	1.58	1.89	1.68	2.72	1.76	2.43	1.97	1.09	20.06
2020	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2021	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2022	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2023	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2024	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2025	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2026	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2027	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2028	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2029	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2030	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2031	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2032	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2033	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2034	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2035	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2036	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2037	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2038	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2039	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53
2040	0.88	0.90	0.79	1.08	1.14	1.17	1.56	2.37	1.91	1.54	1.31	0.89	15.53

The gas engine forecast is calculated by using the average of the last 3 years (2017, 2018 and 2019) of usage per meter times the expected number of meters.
The formula is:
Gas Engine Demand Forecast = average use per meter * (forecasted meters)

SOUTHERN CALIFORNIA GAS COMPANY
GAS ENGINE METERS

Meter Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2019	686	687	687	686	682	681	682	684	686	686	684	682	684
2020	730	729	728	726	724	724	724	724	725	724	721	720	725
2021	730	729	728	726	724	724	724	724	725	724	721	720	725
2022	730	729	728	726	724	724	724	724	725	724	721	720	725
2023	730	729	728	726	724	724	724	724	725	724	721	720	725
2024	730	729	728	726	724	724	724	724	725	724	721	720	725
2025	730	729	728	726	724	724	724	724	725	724	721	720	725
2026	730	729	728	726	724	724	724	724	725	724	721	720	725
2027	730	729	728	726	724	724	724	724	725	724	721	720	725
2028	730	729	728	726	724	724	724	724	725	724	721	720	725
2029	730	729	728	726	724	724	724	724	725	724	721	720	725
2030	730	729	728	726	724	724	724	724	725	724	721	720	725
2031	730	729	728	726	724	724	724	724	725	724	721	720	725
2032	730	729	728	726	724	724	724	724	725	724	721	720	725
2033	730	729	728	726	724	724	724	724	725	724	721	720	725
2034	730	729	728	726	724	724	724	724	725	724	721	720	725
2035	730	729	728	726	724	724	724	724	725	724	721	720	725
2036	730	729	728	726	724	724	724	724	725	724	721	720	725
2037	730	729	728	726	724	724	724	724	725	724	721	720	725
2038	730	729	728	726	724	724	724	724	725	724	721	720	725
2039	730	729	728	726	724	724	724	724	725	724	721	720	725
2040	730	729	728	726	724	724	724	724	725	724	721	720	725

SOUTHERN CALIFORNIA GAS COMPANY
GAS ENGINE LOAD (MDTH)

Mdth

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total		take out
2019	83.79	72.60	66.54	108.48	153.88	176.09	223.20	244.69	223.70	160.11	129.24	79.33	1,722	20.0628	1,742
2020	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2021	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2022	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2023	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2024	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2025	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2026	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2027	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2028	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2029	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2030	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2031	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2032	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2033	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2034	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2035	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2036	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2037	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2038	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2039	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012
2040	87.33	81.62	94.65	113.79	168.90	221.02	261.75	282.70	252.29	182.48	153.24	96.43	1,996	15.53249	2,012

Com10Avg

SOUTHERN CALIFORNIA CORE
COMMERCIAL MARKET AVERAGE YEAR
FORECAST (EXCLUDING GAS AC/ENGINE)

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2019	9334.79	8756.85	7908.51	7190.90	6089.99	5534.33	5387.24	5382.78	5424.38	5847.81	7392.96	9633.42	**83883.98**
2020	8584.70	8053.85	7275.49	6617.16	5606.02	5095.98	4960.87	4956.77	4994.98	5383.68	6802.19	8858.68	**77190.37**
2021	8491.09	7966.70	7198.66	6549.12	5550.35	5046.86	4913.36	4909.32	4947.05	5330.82	6731.34	8761.43	**76396.10**
2022	8685.34	8149.58	7365.70	6702.84	5682.48	5168.39	5031.98	5027.86	5066.40	5458.28	6888.48	8961.25	**78188.56**
2023	8558.99	8031.71	7261.12	6609.58	5605.44	5099.85	4965.58	4961.52	4999.44	5384.89	6791.70	8830.21	**77100.04**
2024	8406.89	7889.69	7134.74	6496.50	5511.62	5016.04	4884.32	4880.34	4917.53	5295.39	6674.53	8672.60	**75780.19**
2025	8200.02	7696.27	6961.95	6341.21	5382.05	4899.76	4771.44	4767.57	4803.79	5171.56	6513.98	8458.46	**73968.05**
2026	7978.48	7489.11	6776.73	6174.64	5242.92	4774.79	4650.11	4646.35	4681.52	5038.55	6341.82	8229.19	**72024.21**
2027	7802.96	7325.11	6630.50	6043.50	5133.80	4677.09	4555.32	4551.66	4586.00	4934.36	6206.09	8047.40	**70493.79**
2028	7655.01	7186.98	6507.63	5933.61	5042.68	4595.75	4476.46	4472.87	4506.50	4847.46	6092.21	7894.07	**69211.24**
2029	7511.63	7053.13	6388.63	5827.23	4954.54	4517.11	4400.22	4396.71	4429.64	4763.40	5981.94	7745.45	**67969.65**
2030	7375.90	6926.47	6276.11	5726.76	4871.39	4443.01	4328.41	4324.97	4357.24	4684.15	5877.74	7604.74	**66796.88**
2031	7204.75	6766.56	6133.58	5598.99	4765.12	4347.90	4236.15	4232.80	4264.25	4582.70	5745.48	7427.46	**65305.74**
2032	7140.32	6706.78	6081.46	5553.43	4728.49	4316.07	4205.48	4202.17	4233.28	4548.11	5697.74	7360.32	**64773.67**
2033	7025.62	6599.84	5986.76	5469.15	4659.06	4254.44	4145.80	4142.56	4173.10	4482.03	5610.19	7241.30	**63789.84**
2034	6901.05	6483.65	5883.70	5377.27	4583.19	4186.96	4080.43	4077.25	4107.19	4409.76	5514.83	7112.11	**62717.38**
2035	6886.08	6470.26	5873.49	5369.82	4578.82	4184.45	4078.31	4075.14	4104.96	4406.16	5506.26	7096.01	**62629.76**

Com10Col

SOUTHERN CALIFORNIA CORE COMMERCIAL MARKET COLD YEAR FORECAST (EXCLUDING GAS AC/ENGINE)

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2019	10,036.1	9,374.5	8,351.3	7,481.4	6,216.9	5,560.1	5,392.9	5,387.6	5,435.7	5,933.6	7,746.9	10,396.9	**87,314**
2020	9,286.0	8,671.5	7,718.3	6,907.7	5,733.0	5,121.7	4,966.5	4,961.6	5,006.3	5,469.5	7,156.2	9,622.1	**80,620**
2021	9,192.4	8,584.4	7,641.4	6,839.6	5,677.3	5,072.6	4,919.0	4,914.2	4,958.4	5,416.6	7,085.3	9,524.9	**79,826**
2022	9,386.7	8,767.2	7,808.5	6,993.3	5,809.4	5,194.1	5,037.6	5,032.7	5,077.7	5,544.1	7,242.4	9,724.7	**81,619**
2023	9,260.3	8,649.4	7,703.9	6,900.1	5,732.4	5,125.6	4,971.2	4,966.4	5,010.8	5,470.7	7,145.7	9,593.7	**80,530**
2024	9,108.2	8,507.3	7,577.5	6,787.0	5,638.5	5,041.8	4,890.0	4,885.2	4,928.9	5,381.2	7,028.5	9,436.1	**79,210**
2025	8,901.4	8,313.9	7,404.7	6,631.7	5,509.0	4,925.5	4,777.1	4,772.4	4,815.1	5,257.4	6,867.9	9,221.9	**77,398**
2026	8,679.8	8,106.8	7,219.5	6,465.1	5,369.8	4,800.5	4,655.8	4,651.2	4,692.8	5,124.4	6,695.8	8,992.6	**75,454**
2027	8,504.3	7,942.8	7,073.3	6,334.0	5,260.7	4,702.8	4,561.0	4,556.5	4,597.3	5,020.2	6,560.1	8,810.8	**73,924**
2028	8,356.3	7,804.6	6,950.4	6,224.1	5,169.6	4,621.5	4,482.1	4,477.7	4,517.8	4,933.3	6,446.2	8,657.5	**72,641**
2029	8,213.0	7,670.8	6,831.4	6,117.7	5,081.5	4,542.8	4,405.9	4,401.6	4,441.0	4,849.2	6,335.9	8,508.9	**71,400**
2030	8,077.2	7,544.1	6,718.9	6,017.3	4,998.3	4,468.7	4,334.1	4,329.8	4,368.6	4,770.0	6,231.7	8,368.2	**70,227**
2031	7,906.1	7,384.2	6,576.3	5,889.5	4,892.1	4,373.6	4,241.8	4,237.7	4,275.6	4,668.5	6,099.4	8,190.9	**68,736**
2032	7,841.7	7,324.4	6,524.2	5,843.9	4,855.4	4,341.8	4,211.1	4,207.0	4,244.6	4,633.9	6,051.7	8,123.8	**68,204**
2033	7,726.9	7,217.5	6,429.5	5,759.7	4,786.0	4,280.2	4,151.5	4,147.4	4,184.4	4,567.9	5,964.2	8,004.8	**67,220**
2034	7,602	7,101	6,326	5,668	4,710	4,213	4,086	4,082	4,119	4,496	5,869	7,876	**66,147**
2035	7,587	7,088	6,316	5,660	4,706	4,210	4,084	4,080	4,116	4,492	5,860	7,859	**66,060**

Com10Hot

SOUTHERN CALIFORNIA CORE COMMERCIAL MARKET HOT YEAR FORECAST (EXCLUDING GAS AC/ENGINE)

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2019	8,633	8,139	7,466	6,900	5,963	5,509	5,382	5,378	5,413	5,762	7,039	8,870	**80,454**
2020	7,883	7,436	6,833	6,327	5,479	5,070	4,955	4,952	4,984	5,298	6,448	8,095	**73,760**
2021	7,790	7,349	6,756	6,259	5,423	5,021	4,908	4,904	4,936	5,245	6,377	7,998	**72,966**
2022	7,984	7,532	6,923	6,412	5,556	5,143	5,026	5,023	5,055	5,372	6,535	8,198	**74,759**
2023	7,858	7,414	6,818	6,319	5,479	5,074	4,960	4,957	4,988	5,299	6,438	8,067	**73,670**
2024	7,706	7,272	6,692	6,206	5,385	4,990	4,879	4,875	4,906	5,210	6,321	7,909	**72,350**
2025	7,499	7,079	6,519	6,051	5,255	4,874	4,766	4,763	4,792	5,086	6,160	7,695	**70,538**
2026	7,277	6,871	6,334	5,884	5,116	4,749	4,644	4,641	4,670	4,953	5,988	7,466	**68,594**
2027	7,102	6,707	6,188	5,753	5,007	4,651	4,550	4,547	4,575	4,849	5,852	7,284	**67,064**
2028	6,954	6,569	6,065	5,643	4,916	4,570	4,471	4,468	4,495	4,762	5,738	7,131	**65,781**
2029	6,810	6,435	5,946	5,537	4,828	4,491	4,395	4,392	4,418	4,678	5,628	6,982	**64,540**
2030	6,675	6,309	5,833	5,436	4,744	4,417	4,323	4,320	4,346	4,598	5,524	6,841	**63,367**
2031	6,503	6,149	5,691	5,308	4,638	4,322	4,230	4,228	4,253	4,497	5,392	6,664	**61,876**
2032	6,439	6,089	5,639	5,263	4,602	4,290	4,200	4,197	4,222	4,462	5,344	6,597	**61,344**
2033	6,324	5,982	5,544	5,179	4,532	4,229	4,140	4,138	4,162	4,396	5,256	6,478	**60,360**
2034	6,200	5,866	5,441	5,087	4,456	4,161	4,075	4,072	4,096	4,324	5,161	6,349	**59,287**
2035	6,185	5,853	5,431	5,079	4,452	4,159	4,073	4,070	4,094	4,320	5,152	6,333	**59,200**

Com10Bas

SOUTHERN CALIFORNIA CORE
COMMERCIAL MARKET BASE YEAR
FORECAST (EXCLUDING GAS AC/ENGINE)

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2019	5,595	5,234	5,595	5,415	5,595	5,415	5,595	5,595	5,415	5,595	5,415	5,595	**66,062**
2020	5,038	4,713	5,038	4,875	5,038	4,875	5,038	5,038	4,875	5,038	4,875	5,038	**59,480**
2021	4,980	4,659	4,980	4,820	4,980	4,820	4,980	4,980	4,820	4,980	4,820	4,980	**58,798**
2022	5,141	4,810	5,141	4,976	5,141	4,976	5,141	5,141	4,976	5,141	4,976	5,141	**60,703**
2023	5,059	4,732	5,059	4,896	5,059	4,896	5,059	5,059	4,896	5,059	4,896	5,059	**59,726**
2024	4,956	4,637	4,956	4,797	4,956	4,797	4,956	4,956	4,797	4,956	4,797	4,956	**58,518**
2025	4,812	4,502	4,812	4,657	4,812	4,657	4,812	4,812	4,657	4,812	4,657	4,812	**56,818**
2026	4,657	4,357	4,657	4,507	4,657	4,507	4,657	4,657	4,507	4,657	4,507	4,657	**54,986**
2027	4,537	4,244	4,537	4,391	4,537	4,391	4,537	4,537	4,391	4,537	4,391	4,537	**53,568**
2028	4,438	4,152	4,438	4,295	4,438	4,295	4,438	4,438	4,295	4,438	4,295	4,438	**52,397**
2029	4,342	4,062	4,342	4,202	4,342	4,202	4,342	4,342	4,202	4,342	4,202	4,342	**51,268**
2030	4,252	3,978	4,252	4,115	4,252	4,115	4,252	4,252	4,115	4,252	4,115	4,252	**50,207**
2031	4,136	3,869	4,136	4,002	4,136	4,002	4,136	4,136	4,002	4,136	4,002	4,136	**48,828**
2032	4,100	3,836	4,100	3,968	4,100	3,968	4,100	4,100	3,968	4,100	3,968	4,100	**48,408**
2033	4,026	3,767	4,026	3,896	4,026	3,896	4,026	4,026	3,896	4,026	3,896	4,026	**47,536**
2034	3,945	3,690	3,945	3,818	3,945	3,818	3,945	3,945	3,818	3,945	3,818	3,945	**46,575**
2035	3,947	3,692	3,947	3,820	3,947	3,820	3,947	3,947	3,820	3,947	3,820	3,947	**46,600**

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
2019	13.21	12.44	12.79	12.13	12.71	11.61	13.08	12.51	13.16	12.81	13.90
2020	14.18	12.88	13.47	12.32	13.35	11.46	13.96	13.03	14.11	13.47	15.27
2021	14.82	13.52	14.12	12.96	13.99	12.09	14.60	13.67	14.75	14.10	15.91
2022	15.64	14.28	14.90	13.69	14.77	12.78	15.41	14.44	15.57	14.89	16.78
2023	15.92	14.50	15.15	13.89	15.01	12.95	15.68	14.67	15.84	15.13	17.08
2024	16.58	15.08	15.76	14.42	15.62	13.43	16.32	15.26	16.50	15.74	17.81
2025	17.24	15.66	16.38	14.97	16.23	13.92	16.98	15.86	17.16	16.36	18.54
2026	17.92	16.28	17.03	15.56	16.88	14.47	17.65	16.48	17.84	17.00	19.26
2027	18.58	16.93	17.68	16.20	17.53	15.11	18.31	17.14	18.50	17.65	19.92
2028	19.27	17.57	18.35	16.83	18.19	15.71	18.98	17.79	19.18	18.31	20.63
2029	20.01	18.26	19.06	17.49	18.90	16.33	19.72	18.48	19.92	19.01	21.41
2030	20.78	18.98	19.80	18.19	19.64	17.00	20.48	19.22	20.69	19.76	22.22
2031	20.87	19.08	19.90	18.30	19.74	17.12	20.57	19.32	20.78	19.85	22.29
2032	20.92	19.20	19.98	18.43	19.83	17.30	20.63	19.42	20.83	19.93	22.28
2033	21.04	19.26	20.07	18.48	19.91	17.31	20.74	19.50	20.94	20.02	22.44
2034	21.11	19.35	20.15	18.57	19.99	17.41	20.81	19.59	21.02	20.10	22.49
2035	21.18	19.44	20.23	18.67	20.08	17.53	20.89	19.67	21.09	20.18	22.55

(b) Marginal Price Forecast

Year	Chemical	Fab Metal	Food	Mining	Petroleum	Prim Metal	Stone	Textile	Transport	Wood Paper	Misc
2019	10.17	9.97	10.14	9.78	10.03	9.58	10.26	9.85	10.20	10.13	10.59
2020	10.78	10.39	10.72	10.04	10.52	9.65	10.94	10.17	10.84	10.70	11.58
2021	11.29	10.90	11.22	10.55	11.02	10.16	11.44	10.67	11.35	11.20	12.08
2022	11.91	11.51	11.85	11.14	11.64	10.73	12.08	11.27	11.98	11.83	12.75
2023	12.12	11.69	12.04	11.31	11.83	10.88	12.29	11.44	12.18	12.02	12.98
2024	12.61	12.16	12.53	11.75	12.30	11.29	12.80	11.89	12.68	12.51	13.54
2025	13.11	12.63	13.03	12.19	12.78	11.71	13.31	12.35	13.19	13.01	14.10
2026	13.63	13.13	13.54	12.67	13.29	12.17	13.83	12.83	13.71	13.52	14.65
2027	14.15	13.64	14.06	13.18	13.80	12.68	14.35	13.35	14.22	14.04	15.18
2028	14.67	14.16	14.59	13.69	14.32	13.17	14.88	13.86	14.75	14.56	15.73
2029	15.24	14.71	15.15	14.22	14.88	13.69	15.46	14.39	15.32	15.12	16.33
2030	15.83	15.29	15.74	14.79	15.46	14.24	16.06	14.96	15.92	15.71	16.96
2031	15.91	15.36	15.82	14.87	15.54	14.32	16.13	15.04	15.99	15.79	17.02
2032	15.96	15.44	15.87	14.96	15.61	14.44	16.18	15.13	16.05	15.85	17.03
2033	16.04	15.50	15.95	15.01	15.67	14.46	16.26	15.18	16.13	15.92	17.15
2034	16.10	15.57	16.01	15.08	15.74	14.54	16.32	15.25	16.19	15.99	17.20
2035	16.16	15.63	16.07	15.15	15.80	14.62	16.38	15.32	16.25	16.05	17.25

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
2019	100.00	0.7198	0.6780	0.6973	0.6610	0.6927	0.6330	0.7127	0.6820	0.7174	0.6984	0.7575
2020	101.17	0.7152	0.6495	0.6796	0.6214	0.6732	0.5778	0.7041	0.6572	0.7116	0.6792	0.7701
2021	103.42	0.7850	0.7159	0.7476	0.6862	0.7409	0.6405	0.7734	0.7242	0.7813	0.7469	0.8424
2022	105.89	0.7995	0.7296	0.7617	0.6995	0.7549	0.6533	0.7878	0.7380	0.7958	0.7610	0.8575
2023	108.80	0.8286	0.7548	0.7886	0.7230	0.7816	0.6741	0.8162	0.7638	0.8247	0.7877	0.8894
2024	111.56	0.8554	0.7779	0.8134	0.7444	0.8060	0.6932	0.8424	0.7875	0.8513	0.8122	0.9188
2025	114.15	0.8818	0.8007	0.8378	0.7654	0.8302	0.7118	0.8682	0.8108	0.8775	0.8364	0.9479
2026	116.70	0.9225	0.8378	0.8766	0.8008	0.8686	0.7449	0.9083	0.8485	0.9181	0.8749	0.9912
2027	119.24	0.9900	0.9017	0.9421	0.8631	0.9339	0.8048	0.9752	0.9129	0.9854	0.9402	1.0613
2028	121.81	1.0498	0.9575	0.9997	0.9170	0.9911	0.8561	1.0343	0.9694	1.0449	0.9975	1.1239
2029	124.47	1.1034	1.0068	1.0509	0.9643	1.0421	0.9007	1.0872	1.0194	1.0983	1.0485	1.1806
2030	127.18	1.1639	1.0631	1.1091	1.0186	1.0999	0.9521	1.1470	1.0763	1.1586	1.1064	1.2442
2031	129.98	1.2122	1.1084	1.1558	1.0626	1.1464	0.9942	1.1948	1.1221	1.2068	1.1528	1.2946
2032	132.77	1.2993	1.1923	1.2411	1.1450	1.2315	1.0745	1.2814	1.2065	1.2937	1.2380	1.3840
2033	135.62	1.3018	1.1920	1.2421	1.1433	1.2322	1.0710	1.2835	1.2066	1.2961	1.2388	1.3886
2034	138.50	1.3590	1.2459	1.2975	1.1956	1.2873	1.1211	1.3401	1.2610	1.3532	1.2939	1.4482
2035	141.45	1.4165	1.3004	1.3534	1.2487	1.3430	1.1722	1.3972	1.3160	1.4106	1.3496	1.5080

(b) Marginal Price Forecasat

Year	Price Deflator	Chemical	Fabricated Metal	Food	Mining	Petroleum	Primary Metal	Stone	Textile	Transport	Wood Paper	Misc
2019	100.00	0.6496	0.6365	0.6474	0.6246	0.6407	0.6114	0.6549	0.6288	0.6516	0.6467	0.6764
2020	101.17	0.6063	0.5846	0.6027	0.5647	0.5915	0.5429	0.6153	0.5717	0.6098	0.6016	0.6510
2021	103.42	0.6707	0.6477	0.6668	0.6267	0.6550	0.6036	0.6801	0.6341	0.6743	0.6657	0.7179
2022	105.89	0.6839	0.6606	0.6800	0.6394	0.6680	0.6159	0.6935	0.6468	0.6876	0.6788	0.7317
2023	108.80	0.7067	0.6820	0.7025	0.6595	0.6899	0.6346	0.7169	0.6674	0.7106	0.7013	0.7574
2024	111.56	0.7276	0.7015	0.7232	0.6778	0.7098	0.6516	0.7383	0.6861	0.7317	0.7219	0.7810
2025	114.15	0.7481	0.7207	0.7434	0.6957	0.7294	0.6682	0.7593	0.7045	0.7524	0.7421	0.8042
2026	116.70	0.7830	0.7543	0.7781	0.7281	0.7634	0.6993	0.7947	0.7373	0.7875	0.7767	0.8418
2027	119.24	0.8446	0.8146	0.8395	0.7873	0.8242	0.7571	0.8569	0.7969	0.8493	0.8381	0.9061
2028	121.81	0.8980	0.8665	0.8927	0.8379	0.8766	0.8063	0.9109	0.8479	0.9029	0.8911	0.9624
2029	124.47	0.9446	0.9117	0.9391	0.8816	0.9222	0.8484	0.9582	0.8921	0.9498	0.9374	1.0123
2030	127.18	0.9983	0.9637	0.9924	0.9322	0.9747	0.8975	1.0124	0.9432	1.0037	0.9907	1.0691
2031	129.98	1.0418	1.0062	1.0358	0.9737	1.0175	0.9379	1.0564	0.9851	1.0474	1.0340	1.1148
2032	132.77	1.1237	1.0870	1.1175	1.0534	1.0987	1.0164	1.1388	1.0652	1.1295	1.1157	1.1991
2033	135.62	1.1217	1.0839	1.1153	1.0494	1.0959	1.0114	1.1372	1.0615	1.1276	1.1134	1.1992
2034	138.50	1.1734	1.1344	1.1668	1.0988	1.1468	1.0595	1.1894	1.1113	1.1796	1.1649	1.2535
2035	141.45	1.2261	1.1859	1.2193	1.1493	1.1987	1.1090	1.2425	1.1621	1.2324	1.2173	1.3084

Southern California Gas Company
Industrial G10
Historical Throughput and Customer Counts

Business Type	therms_ 2019	meters_ 2019	meters_ 2019_ ExCust	meters_ 2019_ NewCust	avgUse_ 2019_ ExCust	avgUse_ 2019_ NewCust	Price Elasticity	Employment Elasticity
Mining	**2516466**	210	210	0	**11983**	**0**	0.000000	0.321451
Food	**73055089**	2798	2,767	31	**26234**	**15013**	0.000000	1.242506
Textile	**7190841**	468	467	1	**15394**	**1988**	0.000000	0.033325
Wood_Paper	**9420359**	409	406	3	**23193**	**1332**	-0.114000	0.508272
Chemical	**19244804**	995	993	2	**19375**	**2499**	0.000000	0.650067
Petroleum	**14469016**	135	134	1	**107976**	**218**	0.000000	0.084537
Stone	**5222965**	400	399	1	**13078**	**4871**	0.000000	0.416909
Prim_Metal	**10038892**	311	311	0	**32279**	**0**	0.000000	0.956685
Fab_Metal	**25074246**	1995	1,990	5	**12593**	**2828**	0.000000	1.023881
Transport	**16371298**	1473	1,470	3	**11124**	**6243**	0.000000	0.402505
Misc	**34335171**	6155	6,142	13	**5580**	**5049**	0.000000	0.879307

Total

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
2019	15.7083	131.3917	8.1492	29.4175	43.8383	9.1008	17.5025	10.5800	88.5592	81.5050	293.0292	728.7833
2020	14.2592	132.5933	7.3250	28.2125	42.8633	8.6617	17.0458	9.8900	84.4308	76.2800	281.3783	702.9400
2021	13.1942	134.1033	6.9917	26.1225	41.9392	8.3517	15.6592	8.3692	77.7575	72.9533	269.0858	674.5275
2022	13.8242	137.9025	6.9492	27.5417	42.5158	8.2083	16.1400	8.3100	81.6417	73.0158	272.9358	688.9900
2023	14.5450	140.0417	6.8125	28.4817	42.4408	8.0075	16.4067	8.5083	84.5825	65.8758	275.1000	690.8042
2024	15.0508	141.3875	6.6275	29.0925	42.1050	7.7375	16.5858	8.6750	86.6667	62.4967	276.6642	693.0900
2025	15.3142	141.9825	6.5058	29.4558	41.7258	7.4942	16.6058	8.6425	87.1558	61.6867	275.7342	692.3025
2026	15.3958	142.1808	6.4642	29.7492	41.4742	7.2875	16.5958	8.5267	87.3433	60.7400	273.5633	689.3217
2027	15.4025	142.1433	6.4208	29.5408	41.2500	7.0950	16.5258	8.2183	86.3292	59.6642	270.3500	682.9408
2028	15.3392	142.2225	6.3875	29.2742	41.0725	6.9225	16.4317	7.8275	84.5367	58.6458	266.4925	675.1542
2029	15.2200	142.5217	6.3708	29.3275	40.9142	6.7742	16.3650	7.4917	83.1767	57.4483	263.2608	668.8700
2030	15.0725	142.8175	6.3517	29.3425	40.6958	6.6450	16.2342	7.1442	81.7167	55.4633	260.0725	661.5583
2031	14.9183	143.1492	6.2775	29.5117	40.4250	6.5117	16.2067	6.8833	81.1017	53.9358	258.2158	657.1308
2032	14.8292	143.4108	6.1650	29.8492	40.1242	6.3525	16.3642	6.7300	81.5758	53.2942	257.9433	656.6433
2033	14.7342	143.4733	6.0292	29.5992	39.8708	6.1925	16.4142	6.6233	82.2300	53.2625	257.7525	656.1833
2034	14.6308	143.4475	5.8975	29.9100	39.6558	6.0325	16.5508	6.5550	82.8158	53.3742	257.4875	656.3600
2035	14.5383	143.3158	5.7750	30.2500	39.4608	5.8792	16.6883	6.4633	82.9817	53.4442	257.0667	655.8642

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
2019	21,693.9	0.0	0.0	0.0	0.0	0.0	21,693.9
2020	21,368.5	327.7	0.0	49.6	0.0	649.4	20,341.8
2021	20,881.4	633.3	0.0	99.2	0.0	649.4	19,499.6
2022	21,268.4	960.2	0.1	148.8	0.0	649.4	19,510.0
2023	21,461.6	1,287.2	0.1	198.4	0.0	649.4	19,326.7
2024	21,576.5	1,622.3	0.1	248.0	0.0	649.4	19,056.8
2025	21,566.9	1,957.5	0.1	297.6	0.0	649.4	18,662.5
2026	21,502.8	2,259.7	0.1	297.6	0.0	649.4	18,296.2
2027	21,344.7	2,545.5	0.2	297.6	0.0	649.4	17,852.3
2028	21,157.0	2,823.0	0.2	297.6	0.0	649.4	17,387.1
2029	21,007.8	3,084.0	0.2	297.6	0.0	649.4	16,976.9
2030	20,845.6	3,361.2	0.2	297.6	0.0	649.4	16,537.6
2031	20,721.3	3,638.4	0.2	297.6	0.0	649.4	16,136.1
2032	20,612.7	3,915.6	0.3	297.6	0.0	649.4	15,750.3
2033	20,508.3	4,192.8	0.3	297.6	0.0	649.4	15,368.8
2034	20,394.7	4,470.0	0.3	297.6	0.0	649.4	14,978.0
2035	20,255.3	4,419.5	0.3	297.6	0.0	649.4	14,889.2

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
2019	22,101.29	0.0	0.0	0.0	0.0	0.0	22,101.3
2020	21,764.10	327.7	0.0	49.6	0.0	649.4	20,737.4
2021	21,262.14	633.3	0.0	99.2	0.0	649.4	19,880.3
2022	21,650.68	960.2	0.1	148.8	0.0	649.4	19,892.3
2023	21,841.82	1,287.2	0.1	198.4	0.0	649.4	19,706.9
2024	21,953.16	1,622.3	0.1	248.0	0.0	649.4	19,433.5
2025	21,937.69	1,957.5	0.1	297.6	0.0	649.4	19,033.3
2026	21,866.71	2,259.7	0.1	297.6	0.0	649.4	18,660.1
2027	21,699.98	2,545.5	0.2	297.6	0.0	649.4	18,207.6
2028	21,503.04	2,823.0	0.2	297.6	0.0	649.4	17,733.2
2029	21,345.37	3,084.0	0.2	297.6	0.0	649.4	17,314.5
2030	21,174.43	3,361.2	0.2	297.6	0.0	649.4	16,866.4
2031	21,042.12	3,638.4	0.2	297.6	0.0	649.4	16,456.9
2032	20,925.75	3,915.6	0.3	297.6	0.0	649.4	16,063.4
2033	20,813.74	4,192.8	0.3	297.6	0.0	649.4	15,674.2
2034	20,692.34	4,470.0	0.3	297.6	0.0	649.4	15,275.6
2035	20,544.61	4,419.5	0.3	297.6	0.0	649.4	15,178.5

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
2019	21,286.5	0.0	0.0	0.0	0.0	0.0	21,286.5
2020	20,961.7	327.7	0.0	49.6	0.0	649.4	19,934.9
2021	20,478.1	633.3	0.0	99.2	0.0	649.4	19,096.3
2022	20,852.2	960.2	0.1	148.8	0.0	649.4	19,093.8
2023	21,036.2	1,287.2	0.1	198.4	0.0	649.4	18,901.3
2024	21,143.3	1,622.3	0.1	248.0	0.0	649.4	18,623.6
2025	21,128.3	1,957.5	0.1	297.6	0.0	649.4	18,223.9
2026	21,059.8	2,259.7	0.1	297.6	0.0	649.4	17,853.2
2027	20,899.1	2,545.5	0.2	297.6	0.0	649.4	17,406.7
2028	20,709.3	2,823.0	0.2	297.6	0.0	649.4	16,939.4
2029	20,557.3	3,084.0	0.2	297.6	0.0	649.4	16,526.5
2030	20,392.6	3,361.2	0.2	297.6	0.0	649.4	16,084.6
2031	20,265.0	3,638.4	0.2	297.6	0.0	649.4	15,679.8
2032	20,152.8	3,915.6	0.3	297.6	0.0	649.4	15,290.5
2033	20,044.8	4,192.8	0.3	297.6	0.0	649.4	14,905.3
2034	19,927.8	4,470.0	0.3	297.6	0.0	649.4	14,511.1
2035	19,785.4	4,419.5	0.3	297.6	0.0	649.4	14,419.2

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
2019	19,577.2	0.0	0.0	0.0	0.0	0.0	19,577.2
2020	19,283.8	327.7	0.0	49.6	0.0	649.4	18,257.1
2021	18,844.5	633.3	0.0	99.2	0.0	649.4	17,462.7
2022	19,193.9	960.2	0.1	148.8	0.0	649.4	17,435.6
2023	19,368.5	1,287.2	0.1	198.4	0.0	649.4	17,233.7
2024	19,472.5	1,622.3	0.1	248.0	0.0	649.4	16,952.8
2025	19,464.0	1,957.5	0.1	297.6	0.0	649.4	16,559.7
2026	19,406.4	2,259.7	0.1	297.6	0.0	649.4	16,199.8
2027	19,264.0	2,545.5	0.2	297.6	0.0	649.4	15,771.7
2028	19,094.9	2,823.0	0.2	297.6	0.0	649.4	15,325.0
2029	18,960.5	3,084.0	0.2	297.6	0.0	649.4	14,929.6
2030	18,814.4	3,361.2	0.2	297.6	0.0	649.4	14,506.3
2031	18,702.4	3,638.4	0.2	297.6	0.0	649.4	14,117.2
2032	18,604.6	3,915.6	0.3	297.6	0.0	649.4	13,742.3
2033	18,510.7	4,192.8	0.3	297.6	0.0	649.4	13,371.2
2034	18,408.5	4,470.0	0.3	297.6	0.0	649.4	12,991.8
2035	18,282.9	4,419.5	0.3	297.6	0.0	649.4	12,916.7

2020 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 2019. 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 2019. 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 January 2020 staff report entitled "California

Energy Demand 2020-2030 Revised Forecast". Retail electricity price forecasts for the SCE industrial customer classes were based on the MID case assumptions for the SCE planning area. (See worksheet [Form 2.3] in the EXCEL file "TN231520_20200115T103018_CED 2019 Forecast - SCE Mid Demand Case.xlsx" posted at web-link: https://www.energy.ca.gov/data-reports/reports/integrated-energy-policy-report/2019-integrated-energy-policy-report/2019-iepr; click to expand the section titled "California Energy Demand 2020-2030 Revised Forecast", then click on the link "CED 2019 Forecast - SCE Mid Demand Case".) 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 2020 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.

The employment forecast through 2035 was adjusted for Covid-19 impacts using Global Insight's March 20, 2020 interim U.S. Economic Forecast.

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
2019	2,472.0	1,963.0	244.2	2,269.7	7,000.0	905.5	968.6	41.1	135.1	30.2	99.4	0.0	1,932.7	884.9	18,946.4
2020	2,419.7	1,977.5	245.3	2,292.4	7,119.1	901.0	923.6	40.8	132.1	29.0	95.6	0.0	1,925.1	878.1	18,979.4
2021	2,327.0	1,974.8	242.9	2,280.6	7,149.9	898.3	949.5	40.7	131.6	29.1	95.6	0.0	1,893.8	875.8	18,889.5
2022	2,361.1	1,979.9	245.6	2,284.3	7,268.9	901.0	946.6	40.7	136.5	30.2	98.9	0.0	1,895.4	885.5	19,074.5
2023	2,403.6	1,985.1	247.6	2,287.5	7,348.8	901.1	955.8	40.7	138.5	30.1	98.4	0.0	1,900.2	894.9	19,232.1
2024	2,424.6	1,991.2	248.3	2,291.9	7,378.5	896.5	958.6	40.4	139.2	30.0	97.9	0.0	1,894.7	896.8	19,288.6
2025	2,432.7	1,997.3	249.1	2,296.2	7,394.3	893.8	958.1	40.3	139.7	29.7	97.1	0.0	1,888.2	897.3	19,313.7
2026	2,435.6	2,001.1	249.4	2,297.6	7,401.4	892.0	956.2	40.2	139.7	29.5	96.2	0.0	1,882.5	896.2	19,317.5
2027	2,427.5	2,000.5	249.7	2,294.0	7,408.2	889.6	953.9	40.0	139.7	29.3	95.4	0.0	1,869.7	894.0	19,291.7
2028	2,419.5	2,000.5	251.1	2,291.4	7,432.3	888.5	954.1	39.9	140.1	29.2	95.0	0.0	1,855.0	889.8	19,286.4
2029	2,413.7	2,001.6	253.7	2,290.0	7,459.3	886.9	956.2	39.8	140.4	29.1	94.6	0.0	1,839.7	886.3	19,291.2
2030	2,406.8	2,001.7	256.3	2,295.8	7,479.9	884.4	957.3	39.6	140.3	29.0	94.2	0.0	1,821.9	881.8	19,289.1
2031	2,402.7	2,004.0	258.5	2,289.1	7,506.6	882.4	959.2	39.5	140.3	29.0	94.0	0.0	1,809.3	878.7	19,293.3
2032	2,399.9	2,006.5	260.4	2,289.1	7,533.8	880.8	960.4	39.4	140.4	29.0	93.9	0.0	1,803.1	875.4	19,312.2
2033	2,397.2	2,008.7	262.0	2,288.8	7,559.9	878.9	961.9	39.3	140.3	29.0	93.9	0.0	1,797.7	872.5	19,330.2
2034	2,391.4	2,011.1	263.2	2,288.7	7,587.6	876.4	962.3	39.1	140.1	29.0	93.8	0.0	1,789.5	869.1	19,341.5
2035	2,384.1	2,013.8	264.6	2,288.8	7,612.7	873.5	963.2	39.0	139.8	29.0	93.7	0.0	1,779.2	865.8	19,347.0

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
2019	3,547.6	4,946.7	19,250.1	1,831.8	1,943.0	2,756.1	5,981.6	4,785.2	2,162.1	1,276.5	3,544.3	52,025.0
2020	3,534.8	4,872.4	19,456.7	1,766.4	1,919.9	2,713.3	5,841.5	4,760.0	2,076.0	1,247.4	3,501.2	51,689.7
2021	3,482.0	4,676.6	19,458.0	1,700.1	1,872.8	2,655.8	5,417.2	4,560.9	2,024.4	1,216.9	3,367.4	50,432.0
2022	3,501.5	4,773.4	19,703.0	1,732.7	1,883.4	2,634.2	5,398.6	4,618.6	2,018.2	1,216.7	3,443.7	50,923.9
2023	3,496.4	4,845.7	19,834.9	1,770.0	1,888.8	2,604.8	5,445.8	4,648.8	2,000.1	1,164.6	3,493.3	51,193.3
2024	3,482.3	4,896.9	19,917.0	1,796.2	1,892.7	2,565.9	5,486.4	4,669.1	1,976.6	1,139.7	3,525.5	51,348.1
2025	3,466.5	4,906.9	19,947.2	1,809.2	1,888.9	2,530.4	5,474.2	4,668.8	1,960.3	1,133.2	3,543.5	51,329.1
2026	3,449.2	4,900.8	19,916.3	1,809.5	1,878.1	2,495.9	5,431.5	4,656.8	1,950.8	1,123.6	3,551.6	51,164.0
2027	3,422.3	4,849.1	19,808.4	1,799.8	1,858.4	2,455.6	5,322.5	4,622.4	1,934.6	1,109.7	3,520.7	50,703.7
2028	3,401.8	4,784.2	19,734.4	1,789.0	1,839.4	2,421.5	5,199.9	4,591.5	1,922.5	1,097.7	3,491.5	50,273.2
2029	3,385.5	4,735.3	19,695.5	1,777.1	1,824.1	2,393.2	5,097.4	4,568.4	1,914.4	1,085.7	3,483.7	49,960.3
2030	3,365.0	4,681.3	19,643.8	1,762.6	1,808.0	2,366.4	4,989.5	4,535.2	1,904.6	1,067.4	3,471.5	49,595.2
2031	3,345.3	4,652.5	19,610.7	1,749.3	1,797.3	2,340.9	4,908.2	4,518.3	1,890.0	1,053.4	3,470.5	49,336.4
2032	3,324.1	4,650.4	19,569.4	1,739.1	1,791.1	2,311.8	4,853.8	4,523.4	1,870.6	1,045.4	3,478.1	49,157.3
2033	3,304.7	4,653.0	19,515.7	1,728.8	1,785.2	2,282.7	4,811.5	4,515.5	1,848.5	1,041.9	3,453.9	48,941.5
2034	3,286.0	4,652.6	19,451.0	1,717.6	1,778.6	2,253.1	4,777.6	4,517.1	1,826.5	1,039.0	3,459.2	48,758.2
2035	3,267.8	4,641.5	19,378.7	1,706.9	1,771.5	2,224.5	4,738.0	4,518.4	1,805.5	1,035.8	3,465.6	48,554.2

Noncore Commercial Demand Forecast

Sum of totalUsage year	Total from EUForeaster (Therms)
2019	189,464,254
2020	189,793,643
2021	188,895,312
2022	190,745,165
2023	192,321,224
2024	192,886,392
2025	193,136,804
2026	193,175,388
2027	192,916,701
2028	192,864,232
2029	192,911,837
2030	192,890,865
2031	192,932,736
2032	193,121,966
2033	193,301,915
2034	193,414,508
2035	193,470,024

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

Year	Total
2019	18,946
2020	18,979
2021	18,890
2022	19,075
2023	19,232
2024	19,289
2025	19,314
2026	19,318
2027	19,292
2028	19,286
2029	19,291
2030	19,289
2031	19,293
2032	19,312
2033	19,330
2034	19,341
2035	19,347

Noncore Industrial Demand Forecast

Sum of totalUsage year	Total from EUForeaster (Therms)
2019	520,249,878
2020	516,896,811
2021	504,319,666
2022	509,238,782
2023	511,932,885
2024	513,481,499
2025	513,290,715
2026	511,640,209
2027	507,036,560
2028	502,732,158
2029	499,603,124
2030	495,952,016
2031	493,363,529
2032	491,572,703
2033	489,414,763
2034	487,582,288
2035	485,541,812

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

Year	Total
2019	52,025
2020	51,690
2021	50,432
2022	50,924
2023	51,193
2024	51,348
2025	51,329
2026	51,164
2027	50,704
2028	50,273
2029	49,960
2030	49,595
2031	49,336
2032	49,157
2033	48,941
2034	48,758
2035	48,554

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-19	1,931	0	0	0	1,931	50	2,005	0	0	0	2,005
Feb-19	1,736	0	0	0	1,736	44	1,801	0	0	0	1,801
Mar-19	1,763	0	0	0	1,763	32	1,810	0	0	0	1,810
Apr-19	1,602	0	0	0	1,602	21	1,633	0	0	0	1,633
May-19	1,456	0	0	0	1,456	9	1,469	0	0	0	1,469
Jun-19	1,294	0	0	0	1,294	2	1,297	0	0	0	1,297
Jul-19	1,244	0	0	0	1,244	0	1,245	0	0	0	1,245
Aug-19	1,330	0	0	0	1,330	0	1,331	0	0	0	1,331
Sep-19	1,554	0	0	0	1,554	1	1,555	0	0	0	1,555
Oct-19	1,470	0	0	0	1,470	6	1,479	0	0	0	1,479
Nov-19	1,605	0	0	0	1,605	25	1,643	0	0	0	1,643
Dec-19	1,962	0	0	0	1,962	55	2,043	0	0	0	2,043
Jan-20	1,934	3	0	37	1,968	50	2,009	3	0	37	2,043
Feb-20	1,739	3	0	33	1,769	44	1,804	3	0	33	1,835
Mar-20	1,766	3	0	34	1,797	32	1,813	3	0	34	1,844
Apr-20	1,605	3	0	31	1,633	21	1,636	3	0	31	1,664
May-20	1,458	2	0	28	1,484	9	1,472	2	0	28	1,498
Jun-20	1,296	2	0	25	1,319	2	1,299	2	0	25	1,322
Jul-20	1,247	2	0	24	1,269	0	1,247	2	0	24	1,269
Aug-20	1,332	2	0	26	1,356	0	1,333	2	0	26	1,356
Sep-20	1,556	3	0	30	1,584	1	1,558	3	0	30	1,585
Oct-20	1,472	2	0	28	1,498	6	1,481	2	0	28	1,507
Nov-20	1,608	3	0	31	1,636	25	1,646	3	0	31	1,674
Dec-20	1,965	3	0	38	2,000	55	2,047	3	0	38	2,081
Jan-21	1,925	6	0	37	1,956	50	2,000	6	0	37	2,031
Feb-21	1,730	6	0	33	1,758	44	1,796	6	0	33	1,824
Mar-21	1,758	6	0	34	1,786	32	1,805	6	0	34	1,833
Apr-21	1,597	5	0	31	1,623	21	1,628	5	0	31	1,654
May-21	1,452	5	0	28	1,475	9	1,465	5	0	28	1,488
Jun-21	1,290	4	0	25	1,311	2	1,293	4	0	25	1,314
Jul-21	1,241	4	0	24	1,261	0	1,241	4	0	24	1,261
Aug-21	1,326	4	0	26	1,347	0	1,327	4	0	26	1,348
Sep-21	1,549	5	0	30	1,574	1	1,550	5	0	30	1,575
Oct-21	1,465	5	0	28	1,489	6	1,474	5	0	28	1,498
Nov-21	1,600	5	0	31	1,626	25	1,638	5	0	31	1,664
Dec-21	1,956	6	0	38	1,987	55	2,037	6	0	38	2,069
Jan-22	1,944	10	0	37	1,972	50	2,018	10	0	37	2,046
Feb-22	1,747	9	0	33	1,772	44	1,813	9	0	33	1,838
Mar-22	1,775	9	0	34	1,800	32	1,822	9	0	34	1,847
Apr-22	1,613	8	0	31	1,636	21	1,644	8	0	31	1,667
May-22	1,466	7	0	28	1,487	9	1,479	7	0	28	1,500
Jun-22	1,303	6	0	25	1,321	2	1,305	6	0	25	1,324
Jul-22	1,253	6	0	24	1,271	0	1,253	6	0	24	1,271
Aug-22	1,339	7	0	26	1,358	0	1,340	7	0	26	1,359
Sep-22	1,564	8	0	30	1,587	1	1,565	8	0	30	1,588
Oct-22	1,480	7	0	28	1,501	6	1,489	7	0	28	1,510
Nov-22	1,616	8	0	31	1,639	25	1,654	8	0	31	1,677
Dec-22	1,975	10	0	38	2,003	55	2,056	10	0	38	2,085
Jan-23	1,960	13	0	37	1,984	50	2,035	13	0	37	2,059
Feb-23	1,762	11	0	33	1,784	44	1,827	11	0	33	1,850
Mar-23	1,790	12	0	34	1,812	32	1,837	12	0	34	1,859
Apr-23	1,626	11	0	31	1,647	21	1,657	11	0	31	1,678
May-23	1,478	10	0	28	1,496	9	1,491	10	0	28	1,510
Jun-23	1,313	9	0	25	1,330	2	1,316	9	0	25	1,333
Jul-23	1,263	8	0	24	1,279	0	1,264	8	0	24	1,280
Aug-23	1,350	9	0	26	1,367	0	1,351	9	0	26	1,367
Sep-23	1,577	10	0	30	1,597	1	1,578	10	0	30	1,598
Oct-23	1,492	10	0	28	1,510	6	1,501	10	0	28	1,520
Nov-23	1,629	11	0	31	1,650	25	1,667	11	0	31	1,687
Dec-23	1,991	13	0	38	2,016	55	2,073	13	0	38	2,098

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-24	1,966	16	0	37	1,987	50	2,040	16	0	37	2,061
Feb-24	1,767	14	0	33	1,786	44	1,833	14	0	33	1,852
Mar-24	1,795	15	0	34	1,814	32	1,842	15	0	34	1,861
Apr-24	1,631	13	0	31	1,649	21	1,662	13	0	31	1,680
May-24	1,482	12	0	28	1,498	9	1,496	12	0	28	1,512
Jun-24	1,317	11	0	25	1,332	2	1,320	11	0	25	1,334
Jul-24	1,267	10	0	24	1,281	0	1,268	10	0	24	1,281
Aug-24	1,354	11	0	26	1,369	0	1,355	11	0	26	1,369
Sep-24	1,582	13	0	30	1,599	1	1,583	13	0	30	1,600
Oct-24	1,496	12	0	28	1,512	6	1,505	12	0	28	1,521
Nov-24	1,634	13	0	31	1,652	25	1,672	13	0	31	1,690
Dec-24	1,997	16	0	38	2,019	55	2,079	16	0	38	2,100
Jan-25	1,968	19	0	37	1,986	50	2,043	19	0	37	2,061
Feb-25	1,769	17	0	33	1,785	44	1,835	17	0	33	1,851
Mar-25	1,797	18	0	34	1,813	32	1,844	18	0	34	1,861
Apr-25	1,633	16	0	31	1,648	21	1,664	16	0	31	1,679
May-25	1,484	15	0	28	1,498	9	1,498	15	0	28	1,511
Jun-25	1,319	13	0	25	1,331	2	1,322	13	0	25	1,334
Jul-25	1,269	12	0	24	1,280	0	1,269	12	0	24	1,281
Aug-25	1,356	13	0	26	1,368	0	1,356	13	0	26	1,369
Sep-25	1,584	16	0	30	1,598	1	1,585	16	0	30	1,599
Oct-25	1,498	15	0	28	1,512	6	1,507	15	0	28	1,521
Nov-25	1,636	16	0	31	1,651	25	1,674	16	0	31	1,689
Dec-25	2,000	20	0	38	2,018	55	2,081	20	0	38	2,099
Jan-26	1,969	22	0	37	1,983	50	2,043	22	0	37	2,058
Feb-26	1,770	20	0	33	1,783	44	1,835	20	0	33	1,849
Mar-26	1,798	20	0	34	1,811	32	1,845	20	0	34	1,858
Apr-26	1,634	19	0	31	1,646	21	1,664	19	0	31	1,677
May-26	1,484	17	0	28	1,496	9	1,498	17	0	28	1,509
Jun-26	1,319	15	0	25	1,329	2	1,322	15	0	25	1,332
Jul-26	1,269	14	0	24	1,278	0	1,269	14	0	24	1,279
Aug-26	1,356	15	0	26	1,366	0	1,357	15	0	26	1,367
Sep-26	1,584	18	0	30	1,596	1	1,585	18	0	30	1,597
Oct-26	1,498	17	0	28	1,510	6	1,508	17	0	28	1,519
Nov-26	1,637	19	0	31	1,649	25	1,674	19	0	31	1,687
Dec-26	2,000	23	0	38	2,015	55	2,082	23	0	38	2,097
Jan-27	1,966	25	0	37	1,978	50	2,041	25	0	37	2,053
Feb-27	1,767	23	0	33	1,778	44	1,833	23	0	33	1,844
Mar-27	1,795	23	0	34	1,806	32	1,842	23	0	34	1,853
Apr-27	1,631	21	0	31	1,641	21	1,662	21	0	31	1,672
May-27	1,482	19	0	28	1,491	9	1,496	19	0	28	1,505
Jun-27	1,318	17	0	25	1,326	2	1,320	17	0	25	1,328
Jul-27	1,267	16	0	24	1,275	0	1,268	16	0	24	1,276
Aug-27	1,354	17	0	26	1,363	0	1,355	17	0	26	1,363
Sep-27	1,582	20	0	30	1,592	1	1,583	20	0	30	1,593
Oct-27	1,496	19	0	28	1,506	6	1,506	19	0	28	1,515
Nov-27	1,635	21	0	31	1,644	25	1,672	21	0	31	1,682
Dec-27	1,998	26	0	38	2,010	55	2,079	26	0	38	2,091
Jan-28	1,965	28	0	37	1,975	50	2,040	28	0	37	2,049
Feb-28	1,767	25	0	33	1,775	44	1,832	25	0	33	1,841
Mar-28	1,795	26	0	34	1,803	32	1,842	26	0	34	1,850
Apr-28	1,631	23	0	31	1,639	21	1,662	23	0	31	1,670
May-28	1,482	21	0	28	1,489	9	1,496	21	0	28	1,503
Jun-28	1,317	19	0	25	1,323	2	1,320	19	0	25	1,326
Jul-28	1,267	18	0	24	1,273	0	1,267	18	0	24	1,273
Aug-28	1,354	19	0	26	1,360	0	1,354	19	0	26	1,361
Sep-28	1,582	22	0	30	1,589	1	1,583	22	0	30	1,590
Oct-28	1,496	21	0	28	1,503	6	1,505	21	0	28	1,512
Nov-28	1,634	23	0	31	1,642	25	1,672	23	0	31	1,679
Dec-28	1,997	28	0	38	2,007	55	2,078	28	0	38	2,088

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-29	1,966	31	0	37	1,973	50	2,041	31	0	37	2,047
Feb-29	1,767	27	0	33	1,773	44	1,833	27	0	33	1,839
Mar-29	1,795	28	0	34	1,801	32	1,842	28	0	34	1,848
Apr-29	1,631	25	0	31	1,637	21	1,662	25	0	31	1,668
May-29	1,482	23	0	28	1,487	9	1,496	23	0	28	1,501
Jun-29	1,318	20	0	25	1,322	2	1,320	20	0	25	1,325
Jul-29	1,267	20	0	24	1,271	0	1,268	20	0	24	1,272
Aug-29	1,354	21	0	26	1,359	0	1,355	21	0	26	1,359
Sep-29	1,582	25	0	30	1,587	1	1,583	25	0	30	1,589
Oct-29	1,496	23	0	28	1,502	6	1,506	23	0	28	1,511
Nov-29	1,634	25	0	31	1,640	25	1,672	25	0	31	1,678
Dec-29	1,998	31	0	38	2,004	55	2,079	31	0	38	2,086
Jan-30	1,966	33	0	37	1,970	50	2,040	33	0	37	2,044
Feb-30	1,767	30	0	33	1,771	44	1,833	30	0	33	1,836
Mar-30	1,795	30	0	34	1,798	32	1,842	30	0	34	1,846
Apr-30	1,631	28	0	31	1,634	21	1,662	28	0	31	1,665
May-30	1,482	25	0	28	1,485	9	1,496	25	0	28	1,499
Jun-30	1,317	22	0	25	1,320	2	1,320	22	0	25	1,323
Jul-30	1,267	21	0	24	1,270	0	1,268	21	0	24	1,270
Aug-30	1,354	23	0	26	1,357	0	1,355	23	0	26	1,357
Sep-30	1,582	27	0	30	1,585	1	1,583	27	0	30	1,586
Oct-30	1,496	25	0	28	1,499	6	1,505	25	0	28	1,508
Nov-30	1,634	28	0	31	1,638	25	1,672	28	0	31	1,675
Dec-30	1,997	34	0	38	2,001	55	2,079	34	0	38	2,083
Jan-31	1,966	36	0	37	1,967	50	2,041	36	0	37	2,042
Feb-31	1,767	32	0	33	1,768	44	1,833	32	0	33	1,834
Mar-31	1,795	33	0	34	1,796	32	1,842	33	0	34	1,843
Apr-31	1,631	30	0	31	1,632	21	1,662	30	0	31	1,663
May-31	1,483	27	0	28	1,483	9	1,496	27	0	28	1,497
Jun-31	1,318	24	0	25	1,318	2	1,320	24	0	25	1,321
Jul-31	1,267	23	0	24	1,268	0	1,268	23	0	24	1,269
Aug-31	1,354	25	0	26	1,355	0	1,355	25	0	26	1,356
Sep-31	1,582	29	0	30	1,583	1	1,583	29	0	30	1,584
Oct-31	1,497	27	0	28	1,497	6	1,506	27	0	28	1,507
Nov-31	1,635	30	0	31	1,636	25	1,672	30	0	31	1,673
Dec-31	1,998	37	0	38	1,999	55	2,079	37	0	38	2,080
Jan-32	1,968	39	0	37	1,966	50	2,043	39	0	37	2,041
Feb-32	1,769	35	0	33	1,768	44	1,835	35	0	33	1,833
Mar-32	1,797	35	0	34	1,796	32	1,844	35	0	34	1,843
Apr-32	1,633	32	0	31	1,632	21	1,664	32	0	31	1,663
May-32	1,484	29	0	28	1,483	9	1,497	29	0	28	1,496
Jun-32	1,319	26	0	25	1,318	2	1,322	26	0	25	1,321
Jul-32	1,269	25	0	24	1,268	0	1,269	25	0	24	1,268
Aug-32	1,356	27	0	26	1,355	0	1,356	27	0	26	1,355
Sep-32	1,584	31	0	30	1,582	1	1,585	31	0	30	1,584
Oct-32	1,498	30	0	28	1,497	6	1,507	30	0	28	1,506
Nov-32	1,636	32	0	31	1,635	25	1,674	32	0	31	1,673
Dec-32	2,000	39	0	38	1,998	55	2,081	39	0	38	2,079
Jan-33	1,970	42	0	37	1,966	50	2,045	42	0	37	2,040
Feb-33	1,771	37	0	33	1,767	44	1,836	37	0	33	1,833
Mar-33	1,799	38	0	34	1,795	32	1,846	38	0	34	1,842
Apr-33	1,635	34	0	31	1,631	21	1,666	34	0	31	1,662
May-33	1,485	31	0	28	1,482	9	1,499	31	0	28	1,496
Jun-33	1,320	28	0	25	1,317	2	1,323	28	0	25	1,320
Jul-33	1,270	27	0	24	1,267	0	1,270	27	0	24	1,268
Aug-33	1,357	29	0	26	1,354	0	1,357	29	0	26	1,355
Sep-33	1,585	33	0	30	1,582	1	1,586	33	0	30	1,583
Oct-33	1,499	32	0	28	1,496	6	1,509	32	0	28	1,505
Nov-33	1,638	35	0	31	1,634	25	1,675	35	0	31	1,672
Dec-33	2,002	42	0	38	1,997	55	2,083	42	0	38	2,079

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-34	1,971	44	0	37	1,964	50	2,046	44	0	37	2,039
Feb-34	1,772	40	0	33	1,765	44	1,838	40	0	33	1,831
Mar-34	1,800	40	0	34	1,793	32	1,847	40	0	34	1,840
Apr-34	1,636	37	0	31	1,630	21	1,666	37	0	31	1,661
May-34	1,486	33	0	28	1,481	9	1,500	33	0	28	1,494
Jun-34	1,321	30	0	25	1,316	2	1,324	30	0	25	1,319
Jul-34	1,270	29	0	24	1,266	0	1,271	29	0	24	1,266
Aug-34	1,358	30	0	26	1,353	0	1,358	30	0	26	1,353
Sep-34	1,586	36	0	30	1,580	1	1,587	36	0	30	1,582
Oct-34	1,500	34	0	28	1,495	6	1,509	34	0	28	1,504
Nov-34	1,639	37	0	31	1,633	25	1,676	37	0	31	1,671
Dec-34	2,003	45	0	38	1,996	55	2,084	45	0	38	2,077
Jan-35	1,972	44	0	37	1,965	50	2,046	44	0	37	2,040
Feb-35	1,772	39	0	33	1,766	44	1,838	39	0	33	1,832
Mar-35	1,800	40	0	34	1,794	32	1,847	40	0	34	1,841
Apr-35	1,636	36	0	31	1,631	21	1,667	36	0	31	1,662
May-35	1,487	33	0	28	1,482	9	1,500	33	0	28	1,495
Jun-35	1,321	29	0	25	1,317	2	1,324	29	0	25	1,320
Jul-35	1,271	28	0	24	1,267	0	1,271	28	0	24	1,267
Aug-35	1,358	30	0	26	1,354	0	1,359	30	0	26	1,354
Sep-35	1,587	35	0	30	1,581	1	1,588	35	0	30	1,583
Oct-35	1,501	33	0	28	1,496	6	1,510	33	0	28	1,505
Nov-35	1,639	36	0	31	1,634	25	1,677	36	0	31	1,671
Dec-35	2,003	44	0	38	1,997	55	2,085	44	0	38	2,078

Noncore Industrial Monthly Demand Forecast (MDth)

	Industrial - All Temperature Years				
Date	IndModel	DSM	Vernon	Migr: g10--> g30	Ind-All
Jan-19	4,189	0	0	0	4,189
Feb-19	3,850	0	0	0	3,850
Mar-19	4,172	0	0	0	4,172
Apr-19	4,301	0	0	0	4,301
May-19	4,346	0	0	0	4,346
Jun-19	4,210	0	0	0	4,210
Jul-19	4,828	0	0	0	4,828
Aug-19	5,052	0	0	0	5,052
Sep-19	4,700	0	0	0	4,700
Oct-19	4,378	0	0	0	4,378
Nov-19	4,008	0	0	0	4,008
Dec-19	3,990	0	0	0	3,990
Jan-20	4,162	24	3	52	4,187
Feb-20	3,825	22	3	48	3,848
Mar-20	4,145	24	3	52	4,170
Apr-20	4,274	24	3	54	4,300
May-20	4,318	25	3	54	4,345
Jun-20	4,183	24	3	53	4,208
Jul-20	4,797	27	4	60	4,827
Aug-20	5,020	29	4	63	5,051
Sep-20	4,670	27	3	59	4,698
Oct-20	4,350	25	3	55	4,377
Nov-20	3,982	23	3	50	4,006
Dec-20	3,965	23	3	50	3,989
Jan-21	4,061	46	6	52	4,061
Feb-21	3,732	42	6	48	3,732
Mar-21	4,044	46	6	52	4,044
Apr-21	4,170	47	6	54	4,170
May-21	4,213	48	6	54	4,214
Jun-21	4,081	46	6	53	4,081
Jul-21	4,680	53	7	60	4,681
Aug-21	4,898	55	7	63	4,898
Sep-21	4,556	51	7	59	4,556
Oct-21	4,244	48	6	55	4,245
Nov-21	3,885	44	6	50	3,885
Dec-21	3,868	44	6	50	3,868
Jan-22	4,100	69	9	52	4,074
Feb-22	3,768	64	8	48	3,744
Mar-22	4,083	69	9	52	4,057
Apr-22	4,210	71	9	54	4,183
May-22	4,254	72	9	54	4,227
Jun-22	4,121	70	9	53	4,094
Jul-22	4,726	80	11	60	4,696
Aug-22	4,946	84	11	63	4,914
Sep-22	4,600	78	10	59	4,571
Oct-22	4,286	73	10	55	4,258
Nov-22	3,923	66	9	50	3,898
Dec-22	3,906	66	9	50	3,881
Jan-23	4,122	93	12	52	4,069
Feb-23	3,788	86	11	48	3,740
Mar-23	4,105	93	12	52	4,052
Apr-23	4,233	96	12	54	4,178
May-23	4,277	97	13	54	4,222
Jun-23	4,143	94	12	53	4,089
Jul-23	4,751	107	14	60	4,690
Aug-23	4,972	112	15	63	4,908
Sep-23	4,625	104	14	59	4,565
Oct-23	4,308	97	13	55	4,253
Nov-23	3,944	89	12	50	3,893
Dec-23	3,926	89	12	50	3,876

Noncore Industrial Monthly Demand Forecast (MDth)

	Industrial - All Temperature Years				
Date	IndModel	DSM	Vernon	Migr: g10--> g30	Ind-All
Jan-24	4,134	117	15	52	4,054
Feb-24	3,800	108	14	48	3,726
Mar-24	4,117	117	15	52	4,037
Apr-24	4,246	121	16	54	4,163
May-24	4,290	122	16	54	4,207
Jun-24	4,155	118	15	53	4,074
Jul-24	4,766	135	18	60	4,673
Aug-24	4,987	142	18	63	4,890
Sep-24	4,639	132	17	59	4,549
Oct-24	4,321	123	16	55	4,237
Nov-24	3,956	112	15	50	3,879
Dec-24	3,938	112	14	50	3,862
Jan-25	4,133	142	18	52	4,025
Feb-25	3,798	130	17	48	3,699
Mar-25	4,116	141	18	52	4,009
Apr-25	4,244	145	19	54	4,133
May-25	4,288	147	19	54	4,177
Jun-25	4,154	142	18	53	4,045
Jul-25	4,764	163	21	60	4,640
Aug-25	4,985	171	22	63	4,855
Sep-25	4,637	159	20	59	4,516
Oct-25	4,320	148	19	55	4,207
Nov-25	3,954	136	17	50	3,851
Dec-25	3,937	135	17	50	3,834
Jan-26	4,120	164	18	52	3,990
Feb-26	3,786	150	17	48	3,667
Mar-26	4,103	163	18	52	3,974
Apr-26	4,230	168	19	54	4,097
May-26	4,274	170	19	54	4,140
Jun-26	4,140	164	18	53	4,010
Jul-26	4,748	188	21	60	4,599
Aug-26	4,969	197	22	63	4,813
Sep-26	4,622	183	20	59	4,477
Oct-26	4,306	171	19	55	4,171
Nov-26	3,941	156	17	50	3,818
Dec-26	3,924	156	17	50	3,801
Jan-27	4,082	184	18	52	3,932
Feb-27	3,752	169	17	48	3,614
Mar-27	4,066	183	18	52	3,916
Apr-27	4,192	189	19	54	4,038
May-27	4,236	191	19	54	4,080
Jun-27	4,103	185	18	53	3,952
Jul-27	4,706	212	21	60	4,533
Aug-27	4,924	222	22	63	4,743
Sep-27	4,580	207	20	59	4,412
Oct-27	4,267	193	19	55	4,110
Nov-27	3,906	176	17	50	3,762
Dec-27	3,889	175	17	50	3,746
Jan-28	4,048	204	18	52	3,878
Feb-28	3,720	188	17	48	3,564
Mar-28	4,031	203	18	52	3,862
Apr-28	4,157	210	19	54	3,982
May-28	4,200	212	19	54	4,023
Jun-28	4,068	205	18	53	3,897
Jul-28	4,666	235	21	60	4,470
Aug-28	4,882	246	22	63	4,677
Sep-28	4,542	229	20	59	4,351
Oct-28	4,231	214	19	55	4,053
Nov-28	3,873	195	17	50	3,710
Dec-28	3,856	195	17	50	3,694

Noncore Industrial Monthly Demand Forecast (MDth)

	Industrial - All Temperature Years				
Date	IndModel	DSM	Vernon	Migr: g10--> g30	Ind-All
Jan-29	4,023	223	18	52	3,834
Feb-29	3,697	205	17	48	3,523
Mar-29	4,006	222	18	52	3,818
Apr-29	4,131	229	19	54	3,937
May-29	4,174	232	19	54	3,978
Jun-29	4,043	224	18	53	3,853
Jul-29	4,637	257	21	60	4,419
Aug-29	4,852	269	22	63	4,624
Sep-29	4,513	250	20	59	4,301
Oct-29	4,205	233	19	55	4,007
Nov-29	3,849	214	17	50	3,668
Dec-29	3,832	213	17	50	3,652
Jan-30	3,993	243	18	52	3,784
Feb-30	3,670	224	17	48	3,478
Mar-30	3,977	242	18	52	3,768
Apr-30	4,101	250	19	54	3,886
May-30	4,143	252	19	54	3,926
Jun-30	4,013	244	18	53	3,803
Jul-30	4,603	280	21	60	4,362
Aug-30	4,817	293	22	63	4,564
Sep-30	4,480	273	20	59	4,246
Oct-30	4,174	254	19	55	3,955
Nov-30	3,821	233	17	50	3,620
Dec-30	3,804	232	17	50	3,605
Jan-31	3,972	263	18	52	3,743
Feb-31	3,651	242	17	48	3,440
Mar-31	3,956	262	18	52	3,728
Apr-31	4,079	270	19	54	3,844
May-31	4,122	273	19	54	3,884
Jun-31	3,992	265	18	53	3,762
Jul-31	4,579	303	21	60	4,315
Aug-31	4,791	318	22	63	4,515
Sep-31	4,457	295	20	59	4,200
Oct-31	4,152	275	19	55	3,913
Nov-31	3,801	252	17	50	3,581
Dec-31	3,784	251	17	50	3,566
Jan-32	3,958	283	18	52	3,709
Feb-32	3,638	260	17	48	3,408
Mar-32	3,942	282	18	52	3,693
Apr-32	4,064	291	19	54	3,808
May-32	4,107	294	19	54	3,848
Jun-32	3,978	285	18	53	3,727
Jul-32	4,562	327	21	60	4,275
Aug-32	4,774	342	22	63	4,473
Sep-32	4,441	318	20	59	4,161
Oct-32	4,137	296	19	55	3,876
Nov-32	3,787	271	17	50	3,548
Dec-32	3,770	270	17	50	3,533
Jan-33	3,941	303	18	52	3,671
Feb-33	3,622	279	17	48	3,374
Mar-33	3,924	302	18	52	3,656
Apr-33	4,047	312	19	54	3,770
May-33	4,089	315	19	54	3,809
Jun-33	3,960	305	18	53	3,690
Jul-33	4,542	350	21	60	4,232
Aug-33	4,753	366	22	63	4,428
Sep-33	4,421	340	20	59	4,119
Oct-33	4,119	317	19	55	3,837
Nov-33	3,770	290	17	50	3,513
Dec-33	3,754	289	17	50	3,497

Noncore Industrial Monthly Demand Forecast (MDth)

	Industrial - All Temperature Years				
Date	IndModel	DSM	Vernon	Migr: g10--> g30	Ind-All
Jan-34	3,926	323	18	52	3,636
Feb-34	3,608	297	17	48	3,342
Mar-34	3,910	322	18	52	3,621
Apr-34	4,031	332	19	54	3,734
May-34	4,073	336	19	54	3,773
Jun-34	3,946	325	18	53	3,655
Jul-34	4,525	373	21	60	4,192
Aug-34	4,735	390	22	63	4,386
Sep-34	4,405	363	20	59	4,080
Oct-34	4,103	338	19	55	3,801
Nov-34	3,756	309	17	50	3,479
Dec-34	3,740	308	17	50	3,464
Jan-35	3,909	320	18	52	3,624
Feb-35	3,593	294	17	48	3,330
Mar-35	3,893	318	18	52	3,609
Apr-35	4,015	328	19	54	3,721
May-35	4,056	332	19	54	3,760
Jun-35	3,929	321	18	53	3,642
Jul-35	4,506	369	21	60	4,177
Aug-35	4,715	386	22	63	4,371
Sep-35	4,386	359	20	59	4,066
Oct-35	4,086	334	19	55	3,788
Nov-35	3,740	306	17	50	3,467
Dec-35	3,724	305	17	50	3,452

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
2019	100.00	100.00	0.5342	0.4983	0.5087	0.4814
2020	101.17	101.17	0.5179	0.4621	0.4776	0.4344
2021	103.42	103.42	0.5619	0.5041	0.5200	0.4752
2022	105.89	105.89	0.5709	0.5131	0.5290	0.4842
2023	108.80	108.80	0.5860	0.5259	0.5424	0.4958
2024	111.56	111.56	0.5983	0.5365	0.5534	0.5055
2025	114.15	114.15	0.6105	0.5470	0.5643	0.5150
2026	116.70	116.70	0.6366	0.5714	0.5892	0.5385
2027	119.24	119.24	0.6891	0.6222	0.6404	0.5884
2028	121.81	121.81	0.7324	0.6639	0.6825	0.6291
2029	124.47	124.47	0.7691	0.6986	0.7177	0.6628
2030	127.18	127.18	0.8124	0.7401	0.7596	0.7032
2031	129.98	129.98	0.8500	0.7759	0.7959	0.7380
2032	132.77	132.77	0.8902	0.8142	0.8347	0.7755
2033	135.62	135.62	0.9315	0.8537	0.8747	0.8139
2034	138.50	138.50	0.9767	0.8970	0.9184	0.8562
2035	141.45	141.45	1.0239	0.9423	0.9642	0.9005

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
2019	11.54	8.13	11.54	8.13
2020	12.09	8.52	12.09	8.52
2021	12.66	8.92	12.66	8.92
2022	13.36	9.42	13.36	9.42
2023	13.60	9.59	13.60	9.59
2024	14.15	9.98	14.15	9.98
2025	14.71	10.37	14.71	10.37
2026	15.29	10.78	15.29	10.78
2027	15.88	11.19	15.88	11.19
2028	16.47	11.61	16.47	11.61
2029	17.11	12.06	17.11	12.06
2030	17.78	12.53	17.78	12.53
2031	17.87	12.59	17.87	12.59
2032	17.95	12.65	17.95	12.65
2033	18.03	12.71	18.03	12.71
2034	18.10	12.76	18.10	12.76
2035	18.18	12.82	18.18	12.82

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**
2019	1.3693	1.3693	1.3693	1.3693
2020	1.2461	1.2461	1.2461	1.2461
2021	1.3353	1.3353	1.3353	1.3353
2022	1.4524	1.4524	1.4524	1.4524
2023	1.5494	1.5494	1.5494	1.5494
2024	1.6544	1.6544	1.6544	1.6544
2025	1.7889	1.7889	1.7889	1.7889
2026	1.9269	1.9269	1.9269	1.9269
2027	2.0251	2.0251	2.0251	2.0251
2028	2.1076	2.1076	2.1076	2.1076
2029	2.1763	2.1763	2.1763	2.1763
2030	2.2240	2.2240	2.2240	2.2240
2031	2.2865	2.2865	2.2865	2.2865
2032	2.3609	2.3609	2.3609	2.3609
2033	2.4656	2.4656	2.4656	2.4656
2034	2.5686	2.5686	2.5686	2.5686
2035	2.6775	2.6775	2.6775	2.6775

Noncore C and I Rate Components

Annual G30 Noncore C&I Gas Rates						Nominal Dollars					Constant 2019 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 $/Dth	CPI (Yr-2019 = 1.0000)	Com B/T Average 2019-$ /Dth	Com B/T Marginal 2019-$ /Dth	Ind B/T Average 2019-$ /Dth	Ind B/T Marginal 2019-$ /Dth
2019	21.359	17.771	18.813	16.078	32.058	5.342	4.983	5.087	4.814	1.0000	5.342	4.983	5.087	4.814
2020	27.832	22.254	23.798	19.479	23.957	5.179	4.621	4.776	4.344	1.0117	5.119	4.568	4.720	4.294
2021	28.708	22.927	24.521	20.040	27.483	5.619	5.041	5.200	4.752	1.0342	5.433	4.874	5.028	4.595
2022	28.924	23.144	24.736	20.256	28.163	5.709	5.131	5.290	4.842	1.0589	5.391	4.845	4.995	4.572
2023	29.857	23.847	25.497	20.834	28.743	5.860	5.259	5.424	4.958	1.0880	5.386	4.834	4.985	4.557
2024	30.658	24.481	26.173	21.377	29.168	5.983	5.365	5.534	5.055	1.1156	5.363	4.809	4.961	4.531
2025	31.493	25.140	26.876	21.939	29.556	6.105	5.470	5.643	5.150	1.1415	5.348	4.791	4.944	4.511
2026	32.473	25.956	27.733	22.667	31.183	6.366	5.714	5.892	5.385	1.1670	5.454	4.896	5.048	4.614
2027	34.759	28.076	29.895	24.696	34.147	6.891	6.222	6.404	5.884	1.1924	5.779	5.218	5.371	4.935
2028	37.125	30.274	32.135	26.803	36.111	7.324	6.639	6.825	6.291	1.2181	6.012	5.450	5.603	5.165
2029	39.621	32.570	34.481	28.990	37.288	7.691	6.986	7.177	6.628	1.2447	6.179	5.613	5.766	5.325
2030	42.223	34.985	36.943	31.302	39.021	8.124	7.401	7.596	7.032	1.2718	6.388	5.819	5.973	5.530
2031	44.735	37.316	39.319	33.535	40.269	8.500	7.759	7.959	7.380	1.2998	6.540	5.969	6.123	5.678
2032	47.461	39.864	41.912	35.985	41.561	8.902	8.142	8.347	7.755	1.3277	6.705	6.133	6.287	5.841
2033	50.256	42.473	44.568	38.494	42.899	9.315	8.537	8.747	8.139	1.3562	6.869	6.295	6.449	6.001
2034	53.390	45.418	47.560	41.335	44.285	9.767	8.970	9.184	8.562	1.3850	7.052	6.477	6.631	6.182
2035	56.668	48.509	50.698	44.325	45.721	10.239	9.423	9.642	9.005	1.4145	7.239	6.662	6.817	6.366

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	26.42%	15.11%
Average	D	2	D2	41.19%	28.75%
Average	D	3	D3	16.70%	16.97%
Average	D	4	D4	15.69%	39.17%
Average	T	1	T1	99.40%	37.50%
Average	T	2	T2	0.60%	62.50%
Marginal	D	1	D1	3.17%	1.05%
Marginal	D	2	D2	35.74%	18.01%
Marginal	D	3	D3	25.16%	17.94%
Marginal	D	4	D4	35.92%	63.01%
Marginal	T	1	T1	85.21%	6.23%
Marginal	T	2	T2	14.79%	93.77%

2017 Volume (Therms)			Percent
Com&Ind	D&T	710,538,151	100.00%
Com&Ind	D	675,670,676	95.09%
Com&Ind	T	34,867,475	4.91%
Com	D&T	190,288,273	26.78%
Ind	D&T	520,249,878	73.22%
Com	D	182,064,065	95.68%
Com	T	8,224,208	4.32%
Ind	D	493,606,611	94.88%
Ind	T	26,643,267	5.12%

Obs	seg	service	_TYPE_	("Cust Cnt") _FREQ_	G-30 C&I (Non-Refinery) Therms	Prop/Pct.	Annual Therms/"Cust"
1			0	565	710,538,151	100.0%	1,257,590
2		D	1	543	675,670,676	95.1%	1,244,329
3		T	1	22	34,867,475	4.9%	1,584,885
4	COM		2	228	190,288,273	26.8%	834,598
5	IND		2	337	520,249,878	73.2%	1,543,768
6	COM	D	3	218	182,064,065	95.7%	835,156
7	COM	T	3	10	8,224,208	4.3%	822,421
8	IND	D	3	325	493,606,611	94.88%	1,518,790
9	IND	T	3	12	26,643,267	5.12%	2,220,272

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
2019	3.06	$350	24.68	18.30	14.21	11.29	$0	9.34	9.34	0.71	8.29	8.29	-6.369	1.000	100.00	2.890	0.32
2020	3.33	$350	35.26	24.79	18.09	13.30	$0	10.40	10.40	1.05	8.59	8.59	-6.477	1.012	101.17	2.036	0.36
2021	3.40	$350	36.52	25.63	18.66	13.69	$0	10.46	10.46	1.07	8.63	8.63	-6.593	1.034	103.42	2.358	0.39
2022	3.49	$350	36.66	25.77	18.80	13.83	$0	10.50	10.50	1.08	8.64	8.64	-6.714	1.059	105.89	2.430	0.39
2023	3.58	$350	38.00	26.64	19.38	14.18	$0	10.68	10.68	1.10	8.79	8.79	-6.840	1.088	108.80	2.481	0.39
2024	3.67	$350	39.08	27.38	19.89	14.54	$0	10.94	10.94	1.10	9.02	9.02	-7.033	1.116	111.56	2.524	0.39
2025	3.76	$350	40.22	28.16	20.44	14.92	$0	11.22	11.22	1.11	9.25	9.25	-7.234	1.142	114.15	2.563	0.39
2026	3.84	$350	41.48	29.08	21.14	15.47	$0	11.66	11.66	1.12	9.67	9.67	-7.616	1.167	116.70	2.725	0.39
2027	3.92	$350	44.05	31.31	23.15	17.33	$0	13.41	13.41	1.12	11.38	11.38	-9.294	1.192	119.24	3.022	0.39
2028	4.01	$350	46.70	33.61	25.24	19.26	$0	15.22	15.22	1.13	13.17	13.17	-11.052	1.218	121.81	3.218	0.39
2029	4.10	$350	49.55	36.05	27.42	21.25	$0	17.07	17.07	1.14	14.99	14.99	-12.842	1.245	124.47	3.336	0.39
2030	4.19	$350	52.48	38.59	29.71	23.36	$0	19.09	19.09	1.15	16.97	16.97	-14.784	1.272	127.18	3.509	0.39
2031	4.28	$350	55.30	41.04	31.92	25.40	$0	21.01	21.01	1.16	18.88	18.88	-16.680	1.300	129.98	3.634	0.39
2032	4.37	$350	58.33	43.70	34.35	27.66	$0	23.16	23.16	1.16	21.01	21.01	-18.780	1.328	132.77	3.763	0.39
2033	4.46	$350	61.44	46.43	36.83	29.98	$0	25.35	25.35	1.17	23.19	23.19	-20.987	1.356	135.62	3.897	0.39
2034	4.56	$350	64.90	49.50	39.65	32.62	$0	27.87	27.87	1.17	25.70	25.70	-23.489	1.385	138.50	4.036	0.39
2035	4.66	$350	68.49	52.71	42.62	35.41	$0	30.55	30.55	1.18	28.36	28.36	-26.151	1.414	141.45	4.179	0.39

Example Calculation for 2023 Noncore Industrial

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

Transportation Charge (¢/Thm): (including GHG)	25.497	=	**+ (94.88% Ind Dist of total Ind) * { [(100 ¢/$ *12 Mo/Yr)*($350.00 /mo/mtr)/(1,518,790 Thm/Mtr Ind Dist)]** **+ (15.11%*38.00 ¢/Thm + 28.75%* 26.64 ¢/Thm + 16.97%* 19.38 ¢/Thm + 39.17%* 14.18 ¢/Thm) }** **+ (5.12% Ind Trans of total Ind) * { [(100 ¢/$ *12 Mo/Yr)*($0.00 /mo/mtr)/(2,220,272 Thm/Mtr Ind Trans)]** **+ (37.50%* 10.68 ¢/Thm+62.50%* 10.68¢/Thm) }** **+ PPP Surcharge (¢/Thm): 3.58¢/Thm, in 2023**
Gas Commodity Price (¢/Thm):	28.743	=	**("CBSP" + BTS, market price of gas at the SoCalGas City Gate)**
Customer's "Burner-Tip" Price:	**54.240**	=	**(25.497 + 28.743) ¢/Thm (Final Average price in 'GasPrices' worksheet)**

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

Transportation Charge (¢/Thm): (including GHG)	20.834	=	**+ (94.88% Ind Dist of total Ind) * {(1.05%* 38.00 ¢/Thm + 18.01%* 26.64 ¢/Thm + 17.94%* 19.38 ¢/Thm + 63.01%* 14.18 ¢/Thm) }** **+ (5.12% Ind Trans of total Ind) * { (6.23%* 10.68¢/Thm+93.77%* 10.68¢/Thm) }** **+ PPP Surcharge (¢/Thm): 3.58¢/Thm, in 2023**
Gas Commodity Price (¢/Thm):	28.743	=	**("CBSP" + BTS, market price of gas at the SoCalGas City Gate)**
Customer's "Burner-Tip" Price:	**49.578**	=	**(20.834 + 28.743) ¢/Thm (Final Marginal price in 'GasPrices' worksheet)**

Noncore Commercial: Annual Employment (millions) by Business Types

YEAR	Office	Restaurant	Retail	Laundry	Warehouse	School	College	Health	Lodging	Misc	Governmer	TCU	Constructic	Agriculture	EMPLTOT
2019	1.69971	0.81292	1.00637	0.10415	0.51718	0.70540	0.23513	1.33309	0.14565	0.26043	0.64301	0.60792	0.44561	0.24197	8.75852
2020	1.60793	0.73864	0.91450	0.10225	0.50518	0.71332	0.23777	1.37514	0.12987	0.25565	0.65437	0.59893	0.44770	0.22928	8.51054
2021	1.61042	0.74683	0.92456	0.10226	0.50599	0.71776	0.23925	1.39966	0.13974	0.25571	0.65338	0.58241	0.44219	0.21142	8.53160
2022	1.75793	0.81028	1.00302	0.10291	0.51873	0.72350	0.24117	1.45197	0.13904	0.25735	0.65770	0.58450	0.45459	0.21880	8.92149
2023	1.81918	0.80340	0.99458	0.10295	0.53111	0.72963	0.24321	1.48825	0.14241	0.25744	0.66190	0.58904	0.46388	0.22805	9.05504
2024	1.84706	0.79742	0.98713	0.10183	0.53401	0.73620	0.24540	1.50300	0.14362	0.25462	0.66661	0.58617	0.46798	0.23267	9.10371
2025	1.86546	0.78432	0.97093	0.10118	0.53511	0.74281	0.24760	1.51206	0.14373	0.25301	0.67129	0.58272	0.47271	0.23457	9.11750
2026	1.87705	0.77218	0.95591	0.10099	0.53545	0.74933	0.24978	1.52081	0.14373	0.25253	0.67574	0.58126	0.47625	0.23596	9.12696
2027	1.89371	0.76653	0.94891	0.10109	0.53652	0.75548	0.25183	1.53564	0.14425	0.25280	0.67990	0.57745	0.48187	0.23605	9.16202
2028	1.92111	0.76410	0.94590	0.10132	0.53420	0.76077	0.25359	1.55517	0.14531	0.25336	0.68340	0.57114	0.49109	0.23572	9.21616
2029	1.94065	0.76317	0.94475	0.10130	0.53202	0.76581	0.25527	1.57388	0.14678	0.25331	0.68670	0.56355	0.50451	0.23550	9.26720
2030	1.95156	0.76174	0.94299	0.10114	0.52905	0.77075	0.25692	1.59121	0.14805	0.25292	0.69519	0.55468	0.51845	0.23527	9.30992
2031	1.96314	0.76204	0.94336	0.10099	0.52726	0.77658	0.25886	1.60940	0.14941	0.25254	0.69478	0.54873	0.53029	0.23535	9.35274
2032	1.97633	0.76583	0.94805	0.10095	0.52530	0.78266	0.26089	1.62822	0.15060	0.25243	0.69887	0.54738	0.54120	0.23577	9.41446
2033	1.98602	0.77081	0.95422	0.10084	0.52372	0.78855	0.26285	1.64649	0.15187	0.25216	0.70274	0.54651	0.55040	0.23620	9.47336
2034	1.99008	0.77389	0.95803	0.10063	0.52182	0.79488	0.26496	1.66605	0.15282	0.25163	0.70692	0.54386	0.55837	0.23605	9.52000
2035	1.99346	0.77666	0.96145	0.10032	0.51993	0.80140	0.26713	1.68457	0.15394	0.25085	0.71123	0.53978	0.56707	0.23559	9.56338

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

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

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

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

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

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

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

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other	Total Building
Office	256091	106324	12968	4311	3289	13414	2877	4390	12765	3647	255341	675418
Restaurant	21218	41070	68547	28199	54154	59917	14590	845	378	0	13465	302384
Retail	113881	69170	25185	4194	28053	48358	29905	6635	12752	1019	157802	496955
Laundry	1986	31571	259	40	65	375	2	60	317141	0	295305	646802
Warehouse	404653	117556	16724	4661	40306	46345	59251	46044	134567	39974	1302070	2212152
School	0	0	0	0	0	0	0	0	0	0	0	0
College	504188	249039	24329	7177	12477	29948	6922	31514	7643	10710	342906	1226854
Health	270495	169493	27165	5262	7380	20890	11816	4896	37210	2775	285996	843376
Lodging	83161	169859	23445	5723	7327	28550	14052	1374	44252	28	191983	569755
Misc	148860	90915	18407	3675	6058	15130	4836	15327	5885	1129	100468	410691
Government	306103	177955	15640	7707	4575	12874	6983	8172	4128	45210	119949	709295
TCU	127414	45805	4035	1003	1903	3533	2413	6224	393	199909	211342	603972
Construction	266360	83245	6684	39	993	3712	2277	7898	49800	171	392949	814129
Agriculture	168497	40824	6933	1157	14420	32066	29152	396	42495	278619	562583	1177142

Noncore Commercial: EUForecaster Historical Base Year Data

Segment	2019 Therm Sales	2019 Meter Count	2019 Meter Count, Existing/Old customers	2019 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	11,702,360	19	19	0	615,914	0	-0.046000	0.474000	6,881,366
Warehouse + School + College	28,478,267	20	20	0	1,423,913	0	-0.046000	0.474000	10,064,926
Health	70,000,190	83	83	0	843,376	0	-0.046000	0.474000	1,707,720
Lodging + Misc	10,096,529	18	18	0	560,918	0	-0.046000	0.474000	14,736,871
Government	22,697,434	32	32	0	709,295	0	-0.046000	0.474000	3,533,422
TCU	19,327,113	32	32	0	603,972	0	-0.046000	0.474000	2,992,940
Construction + Agriculture	27,162,360	24	24	0	1,131,765	0	-0.046000	0.474000	2,571,346
Total	189,464,254	228							

Adjustment for Normal Year Year

Normal Year HDD	**1,273**	HDD
Actual 2019 HDD	**1,328**	HDD
HDD Difference	-55	HDD
Load per HDD	14,901	Therm/HDD
Temperature Adj.	-824,019	Therms

	Actual 2019	Ratio
Office + Restaurant + Retail + Laundry	11,753,256	6.18%
Warehouse + School + College	28,602,125	15.03%
Health	70,304,635	36.95%
Lodging + Misc	10,140,441	5.33%
Government	22,796,150	11.98%
TCU	19,411,171	10.20%
Construction + Agriculture	27,280,495	14.34%
Total	190,288,273	100.00%

Noncore Industrial: Annual Employment (thousands) by Business Types

YEAR	Mining	Food	Textile	Wood_Paper	Chemical	Petroleum	Stone	Prim_Metal	Fab_Metal	Transport	Misc	EMPLTOT
2019	15.70896	131.39101	8.14918	29.41841	43.83734	9.10232	17.50361	10.57994	88.55927	81.50439	293.02953	728.78
2020	14.25943	132.59381	7.32415	28.21210	42.86491	8.66225	17.04681	9.89027	84.42993	76.28088	281.37666	702.94
2021	13.19368	134.10467	6.99102	26.12304	41.93788	8.35148	15.65895	8.36996	77.75779	72.95293	269.08551	674.53
2022	13.82417	137.90334	6.95044	27.54169	42.51545	8.20692	16.14126	8.31170	81.64212	73.01734	272.93485	688.99
2023	14.54528	140.04183	6.81283	28.48174	42.43974	8.00777	16.40735	8.50845	84.58259	65.87426	275.10122	690.80
2024	15.05155	141.38782	6.62839	29.09383	42.10314	7.73708	16.58717	8.67626	86.66521	62.49579	276.66396	693.09
2025	15.31362	141.98339	6.50476	29.45539	41.72678	7.49251	16.60547	8.64164	87.15566	61.68747	275.73551	692.30
2026	15.39719	142.18028	6.46444	29.74912	41.47418	7.28723	16.59704	8.52628	87.34307	60.73977	273.56416	689.32
2027	15.40291	142.14262	6.42095	29.54019	41.25136	7.09578	16.52730	8.21816	86.32861	59.66200	270.35023	682.94
2028	15.34001	142.22073	6.38828	29.27306	41.07298	6.92338	16.43358	7.82671	84.53660	58.64662	266.49334	675.16
2029	15.22061	142.52245	6.37197	29.32867	40.91342	6.77398	16.36356	7.49073	83.17544	57.44875	263.25976	668.87
2030	15.07274	142.81728	6.35194	29.34359	40.69651	6.64566	16.23485	7.14401	81.71639	55.46366	260.07253	661.56
2031	14.91886	143.14870	6.27749	29.51046	40.42346	6.51078	16.20665	6.88326	81.10049	53.93549	258.21547	657.13
2032	14.82927	143.41141	6.16607	29.85043	40.12395	6.35273	16.36352	6.73075	81.57529	53.29517	257.94395	656.64
2033	14.73422	143.47322	6.03005	29.59934	39.86989	6.19302	16.41375	6.62410	82.22986	53.26252	257.75312	656.18
2034	14.63192	143.44811	5.89820	29.91169	39.65487	6.03305	16.55168	6.55513	82.81352	53.37387	257.48732	656.36
2035	14.53981	143.31587	5.77466	30.24993	39.45950	5.87958	16.68979	6.46386	82.98124	53.44393	257.06605	655.86

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

Segment	Fire_Tube_Boil	Wat_Tube_Boil	Space_Heat	Water_Heat	Dryer	Furnace_Oven_Kiln	AC	Engine	Misc_Other	Total
Mining	63892	252926	3288	1958	169781	444949	0	18453	8870	964117
Food	879689	238082	9519	12401	327015	80205	905	2641	62989	1613447
Textile	556160	76538	4592	14607	254343	80584	0	8424	34315	1029563
Wood_Paper	287066	720880	122	502	107185	61598	0	0	44830	1222184
Chemical	642192	200984	4511	3136	0	31080	10328	0	374779	1267009
Petroleum	42389	0	19025	1467	160593	511072	0	0	52901	787446
Stone	126327	0	19582	3545	79543	3293072	0	0	158829	3680898
Prim_Metal	52325	187794	5896	678	61981	2315936	212	0	223570	2848391
Fab_Metal	154286	16207	20985	2178	3411	920862	70	1282	182483	1301763
Transport	91372	137012	27827	2914	1625	765270	215	0	134192	1160428
Misc	300048	99442	12174	12732	22303	206740	4	0	191347	844789

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

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

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

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

Noncore Industrial: EUForecaster Gas UECs for End-Uses by Business Types

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

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

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

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

Segment	Fire_Tube_Boil	Wat_Tube_Boil	Space_Heat	Water_Heat	Dryer	Furnace_Oven_Kiln	AC	Engine	Misc_Other
Mining	1979	1976	1971	1989	1973	1972	.	1985	1972
Food	1981	1979	1978	1980	1984	1978	1999	1989	1976
Textile	1977	1975	.	1980	1988	1975	1990	.	1971
Wood_Paper	1980	1975	1975	1975	1981	1977	.	1968	1981
Chemical	1985	1976	1978	1985	1986	1979	1996	.	1983
Petroleum	1970	.	1980	1982	1968	1988	.	.	1968
Stone	1976	.	1984	1982	1978	1976	.	.	1967
Prim_Metal	1990	1975	1974	1983	1989	1982	1975	.	1979
Fab_Metal	1974	1972	1976	1981	1976	1980	1998	.	1978
Transport	1977	1989	1970	1976	.	1981	1976	.	1982
Misc	1980	1978	1978	1982	1984	1980	.	.	1984

* Year Equipment Installed

Noncore Industrial: EUForecaster Historical Base Year Data

Segment	2019 Therm Sales	2019 Meter Count	2019 Meter Count, Existing/Old customers	2019 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	18,318,231	19	19	0	964117	.	-0.071000	0.474000	13.29	177.20	8539
Food	192,500,887	99	99	0	1613447	.	-0.071000	0.474000	12.77	116.35	2356
Textile	21,620,829	21	21	0	1029563	.	-0.071000	0.474000	13.02	271.46	11002
Wood_Paper	35,443,326	29	29	0	1222184	.	-0.071000	0.474000	8.37	11.88	3237
Chemical	35,476,246	28	28	0	1267009	.	-0.071000	0.474000	17.27	728.27	17662
Petroleum	27,560,612	35	35	0	787446	.	-0.071000	0.474000	3.73	0.31	47145
Stone + Transport	60,616,376	24	24	0	2525682	.	-0.071000	0.474000	14.22	1006.48	49366
Prim_Metal	59,816,208	21	21	0	2848391	.	-0.071000	0.474000	20.02	184.54	15764
Fab_Metal	49,467,010	38	38	0	1301763	.	-0.071000	0.474000	9.01	16.82	21333
Misc	19,430,153	23	23	0	844789	.	-0.071000	0.474000	9.48	226.53	17929
Total	520,249,878	337									

No temperature adjustment for noncore Industrial

2020 CALIFORNIA GAS REPORT

NATURAL GAS VEHICLES

Year	January	February	March	April	May	June	July	August	Sept	October	Nov	Dec	Annual
SoCalGas Monthly Compressed Volumes - Total (M decatherms)													
2019	32	28	32	32	34	32	36	38	38	40	36	37	415
2020	38	36	37	38	41	38	42	43	44	44	42	43	484
2021	40	38	39	40	43	40	44	45	46	46	44	45	508
2022	40	38	39	40	43	40	44	45	46	46	44	45	508
2023	40	38	39	40	43	40	44	45	46	46	44	45	508
2024	40	38	39	40	43	40	44	45	46	46	44	45	508
2025	40	38	39	40	43	40	44	45	46	46	44	45	508
2026	40	38	39	40	43	40	44	45	46	46	44	45	508
2027	40	38	39	40	43	40	44	45	46	46	44	45	508
2028	40	38	39	40	43	40	44	45	46	46	44	45	508
2029	40	38	39	40	43	40	44	45	46	46	44	45	508
2030	40	38	39	40	43	40	44	45	46	46	44	45	508
2031	40	38	39	40	43	40	44	45	46	46	44	45	508
2032	40	38	39	40	43	40	44	45	46	46	44	45	508
2033	40	38	39	40	43	40	44	45	46	46	44	45	508
2034	40	38	39	40	43	40	44	45	46	46	44	45	508
2035	40	38	39	40	43	40	44	45	46	46	44	45	508
Compressed Volumes - Public Use (M decatherms)													
2019 - MDTherm	23	21	22	22	25	22	26	27	27	28	26	27	295
2020	27	25	26	27	30	27	31	32	33	33	31	32	353
2021	27	25	26	27	30	27	31	32	33	33	31	32	353
2022	27	25	26	27	30	27	31	32	33	33	31	32	353
2023	27	25	26	27	30	27	31	32	33	33	31	32	353
2024	27	25	26	27	30	27	31	32	33	33	31	32	353
2025	27	25	26	27	30	27	31	32	33	33	31	32	353
2026	27	25	26	27	30	27	31	32	33	33	31	32	353
2027	27	25	26	27	30	27	31	32	33	33	31	32	353
2028	27	25	26	27	30	27	31	32	33	33	31	32	353
2029	27	25	26	27	30	27	31	32	33	33	31	32	353
2030	27	25	26	27	30	27	31	32	33	33	31	32	353
2031	27	25	26	27	30	27	31	32	33	33	31	32	353
2032	27	25	26	27	30	27	31	32	33	33	31	32	353
2033	27	25	26	27	30	27	31	32	33	33	31	32	353
2034	27	25	26	27	30	27	31	32	33	33	31	32	353
2035	27	25	26	27	30	27	31	32	33	33	31	32	353
Compressed Volumes - Utility Use (M decatherms)													
2019 - MDThrms	10	7	10	10	9	9	10	11	11	12	10	11	120
2020	11	11	11	11	11	11	11	11	11	11	11	11	131
2021	13	13	13	13	13	13	13	13	13	13	13	13	155
2022	13	13	13	13	13	13	13	13	13	13	13	13	155
2023	13	13	13	13	13	13	13	13	13	13	13	13	155
2024	13	13	13	13	13	13	13	13	13	13	13	13	155
2025	13	13	13	13	13	13	13	13	13	13	13	13	155
2026	13	13	13	13	13	13	13	13	13	13	13	13	155
2027	13	13	13	13	13	13	13	13	13	13	13	13	155
2028	13	13	13	13	13	13	13	13	13	13	13	13	155
2029	13	13	13	13	13	13	13	13	13	13	13	13	155
2030	13	13	13	13	13	13	13	13	13	13	13	13	155
2031	13	13	13	13	13	13	13	13	13	13	13	13	155
2032	13	13	13	13	13	13	13	13	13	13	13	13	155
2033	13	13	13	13	13	13	13	13	13	13	13	13	155
2034	13	13	13	13	13	13	13	13	13	13	13	13	155
2035	13	13	13	13	13	13	13	13	13	13	13	13	155

Months	Meters	2019 SoCalGas Public Access Therms				
		GGEs	GGEs per mtr	therms per mtr	M Dtherms per mtr	Jan thru Sept 2019 - GGEs
1/1/2019 to 9/1/2019	13	2,207,226.35	169,787	220,503	22.05	1,655,419.76
Oct-19	14	215,858	15,418	20,024	2.00	
Nov-19	15	198,254	13,217	17,165	1.72	Bakersfield and Branford have not fully rampted up as yet, therefore I use the first 9 months prorated.
Dec-19	15	205,485	13,699	17,791	1.78	
				Use 9 months prorated thrms/meter/year	22.05	

SoCalGas Slowfill MD Therms per Meter Calcs								
12/1/2019		11/1/2019		10/1/2019		9/1/2019		
SCG Base	Therms	SCG Base	Therms	SCG Base	Therms	SCG Base	Therms	
182ND STREET	5,082	182ND STREET	5,119	182ND STRE	5,436	182ND STRE	4,939	
ALHAMBRA	354	ALHAMBRA	417	ALHAMBRA	570	ALHAMBRA	479	
ANAHEIM	4,023	ANAHEIM	3,951	ANAHEIM	4,389	ANAHEIM	4,187	
AZUSA	5,734	AZUSA	5,651	AZUSA	6,494	AZUSA	5,934	
BAKERSFIELD-McMurtrey	1,555	BAKERSFIELD-M	2,058	BAKERSFIEL	1,478	BAKERSFIEL	1,077	
BELVEDERE	763	BELVEDERE	1,006	BELVEDERE	911	BELVEDERE	536	
BRANFORD/PACOIMA	577	BRANFORD/PAC	412	BRANFORD/I	517	BRANFORD/I	460	
CANOGA	2,563	CANOGA	2,559	CANOGA	3,599	CANOGA	2,713	
CHATSWORTH	81	CHATSWORTH	220	CHATSWORT	11	CHATSWORT	453	
CHINO	3,418	CHINO	3,092	CHINO	3,570	CHINO	2,952	
COMPTON	5,569	COMPTON	6,397	COMPTON	7,430	COMPTON	7,375	
CRENSHAW	6,262	CRENSHAW	5,757	CRENSHAW	6,731	CRENSHAW	6,255	
DOWNEY	239	DOWNEY	267	DOWNEY	400	DOWNEY	327	
FONTANA	1,760	FONTANA	1,732	FONTANA	1,907	FONTANA	1,546	
GARDEN GROVE	6,136	GARDEN GROVE	6,141	GARDEN GR	6,599	GARDEN GR	5,497	
HUNTINGTON PARK	3,863	HUNTINGTON PA	3,833	HUNTINGTOI	4,075	HUNTINGTOI	3,645	
LANCASTER	2,615	LANCASTER	2,116	LANCASTER	3,023	LANCASTER	2,585	
MURRIETA	3,076	MURRIETA	2,795	MURRIETA	2,568	MURRIETA	3,691	
OXNARD	4,806	OXNARD	4,635	OXNARD	5,928	OXNARD	5,398	
PALM DESERT	5,802	PALM DESERT	4,635	PALM DESEF	5,238	PALM DESEF	4,269	
PASADENA	4,100	PASADENA	4,309	PASADENA	4,990	PASADENA	4,620	
PICO RIVERA	3,924	PICO RIVERA	3,087	PICO RIVERA	6,213	PICO RIVERA	5,081	
RIVERSIDE	4,099	RIVERSIDE	3,813	RIVERSIDE	5,749	RIVERSIDE	5,810	
SAN BERNARDINO	5,289	SAN BERNARDIN	5,699	SAN BERNAF	5,201	SAN BERNAF	4,374	
SAN PEDRO	4,053	SAN PEDRO	3,530	SAN PEDRO	3,783	SAN PEDRO	3,438	
SANTA ANA	5,022	SANTA ANA	4,771	SANTA ANA	6,149	SANTA ANA	5,402	Monthly Mdtherms per meter
SANTA BARBARA	1,460	SANTA BARBARA	1,395	SANTA BARE	1,796	SANTA BARE	1,401	
SANTA MONICA	4,917	SANTA MONICA	4,763	SANTA MONI	5,640	SANTA MONI	5,009	0.99595758
VAN NUYS/SATICOY	5,663	VAN NUYS/SATIC	5,823	VAN NUYS/S	6,953	VAN NUYS/S	6,023	Monthly avg therms
YUKON	3,199	YUKON	3,370	YUKON	3,221	YUKON	2,816	
	106,005		103,355		120,570		108,292	109555.334

SoCalGas CGR Meter Forecast Through 2035				
Year	Uncompresse	Compressed	Compressed	Total Meters
2015	294	12	9	315
2016	296	12	9	317
2017	297	12	9	318
2018	311	13	12	336
2019	309	15	11	335
2020	314	16	11	341
2021	319	16	13	348
2022	324	16	13	353
2023	329	16	13	358
2024	334	16	13	363
2025	339	16	13	368
2026	344	16	13	373
2027	349	16	13	378
2028	354	16	13	383
2029	359	16	13	388
2030	364	16	13	393
2031	369	16	13	398
2032	374	16	13	403
2033	379	16	13	408
2034	384	16	13	413
2035	389	16	13	418

Meters added per year 2020 through 2035

5

2019 Uncompressed Throughput and Meter Count			
Throughput (M	Meter Count	Mdtherms per Meter per yr	
15309.3409	309	49.5447926	
2019 Compressed Public Throughput and Meter Count			
Mdtherms per Meter per yr			
22.0503318			
2019 Compressed Company Usage and Meter Count			
Mdtherms per Meter per mth			
0.99595758			

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2020 CALIFORNIA GAS REPORT

ENERGY EFFICIENCY

2020 California Gas Report
SoCalGas Energy Efficiency (EE) forecast

Summary:

SoCalGas' EE forecast is based upon inputs from the 2020 energy efficiency annual budget advice letter (AL 5510-A), utilizing program level energy savings values forecasted for the 2020 program year. Savings estimates from SoCalGas' 2020 EE programs are grouped by the classifications identified in the 2020 CGR (Residential, Commercial, Industrial, Industrial Refinery). These savings estimates are further split between the core and non-core classifications based on the estimated historical core and non-core savings achievements in 2017-2019. EE program savings for 2017-2019 have been updated for this report.

Forecasted savings for the 2021-2030 period are based on the 2020 EE forecast scaled to the goals approved in the recent EE proceeding goals decision, D.19-08-034, which set EE goals through 2030. Forecasted savings beyond 2030 are held constant based on 2030 forecasted values. Cumulative savings reflect the lifecycle EE program achievements from forecasted program savings starting in 2020, and does not include lifecycle savings from prior program years. SoCalGas currently uses a 15-year lifecycle for cumulative savings calculations.

2020-2030 Goals

	EE Incentive Programs [1] Goal (Net, MMTh)	EE C&S Programs [1] Goal (Net, MMTh)	LI/ESA Potential [2] Potential (Net, MMTh)	Total w/o C&S Total (Net, MMTh)	Total w/ C&S Total (Net, MMTh)
2020	13.0	21.0	1.4	14.4	35.4
2021	14.0	22.0	1.4	15.4	37.4
2022	17.0	22.0	1.0	18.0	40.0
2023	17.0	22.0	1.0	18.0	40.0
2024	17.0	23.0	1.0	18.0	41.0
2025	17.0	23.0	1.0	18.0	41.0
2026	17.0	19.0	1.0	18.0	37.0
2027	17.0	17.0	1.0	18.0	35.0
2028	17.0	16.0	1.0	18.0	34.0
2029	17.0	14.0	1.0	18.0	32.0
2030	19.0	14.0	0.9	19.9	33.9

[1] Therm savings figures based on EE program goals (excluding savings from Low Income/Energy Savings Assistance programs) in D.19-08-034.
[2] Low income/Energy Savings Assistance program therm savings figures based Reference Scenario savings potential identified by CPUC's 2019 Energy Efficiency Potential and Goals Study.

Table 3 of D.19-08-034 (excludes low income program savings potential)

	Pacific Gas and Electric Company			Southern California Gas Company			San Diego Gas & Electric Company		
Year	Incentive Programs	Codes & Standards	Total	Incentive Programs	Codes & Standards	Total	Incentive Programs	Codes & Standards	Total
2020	12	13	25	13	21	34	2.0	1.5	3.5
2021	14	13	27	14	22	36	2.2	1.5	3.7
2022	15	14	29	17	22	39	2.2	1.5	3.8
2023	18	14	32	17	22	39	2.3	1.6	3.9
2024	18	15	33	17	23	40	2.3	1.7	4.0
2025	18	14	32	17	23	40	2.4	1.6	4.0
2026	18	12	30	17	19	36	2.5	1.3	3.8
2027	19	10	29	17	17	34	2.5	1.2	3.7
2028	19	10	29	17	16	32	2.6	1.1	3.7
2029	19	9	27	17	14	31	2.7	1.0	3.6
2030	20	9	28	19	14	33	2.8	1.0	3.7

	Reported 2017 NET	Reported 2018 NET	Reported 2019 NET	Forecast 2020 NET	Forecast 2021	Forecast 2022	Forecast 2023	Forecast 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029	Forecast 2030	Forecast 2031	Forecast 2032	Forecast 2033	Forecast 2034	Forecast 2035	Forecast 2036	Forecast 2037	Forecast 2038	Forecast 2039	Forecast 2040
SoCalGas EE Program TOTAL	**33,320,672**	**48,732,219**	**50,848,155**	**40,115,175**																				
PUC Goal	30,300,000	46,000,000	48,000,000	35,400,000	37,400,000	40,020,000	40,020,000	41,030,000	41,020,000	37,000,000	34,980,000	33,970,000	31,950,000	33,930,000	33,930,000	33,930,000	33,930,000	33,930,000	33,930,000	33,930,000	33,930,000	33,930,000	33,930,000	33,930,000
Difference	**3,020,672**	**2,732,219**	**2,848,155**	**4,715,175**																				

SoCalGas	**2017 therms**	**2018 therms**	**2019 therms**	**2020 therms**
Core Residential	20,833,175	35,227,014	38,643,542	22,539,943
Core Commercial	10,448,422	11,831,578	11,578,442	10,395,571
Core Industrial	611,937	456,371	353,446	3,277,226
NonCore Commercial	290,846	56,422	180,107	318,487
NonCore Industrial retail	1,013,868	1,093,600	92,618	2,945,094
NonCore Industrial refinery	122,423	67,235	-	638,853
Total	**33,320,672**	**48,732,219**	**50,848,155**	**40,115,175**

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

ANNUAL NET SAVINGS	**2017 Mdth**	**2018 Mdth**	**2019 Mdth**	**2020 Mdth**	**2021 Mdth**	**2022 Mdth**	**2023 Mdth**	**2024 Mdth**	**2025 Mdth**	**2026 Mdth**	**2027 Mdth**	**2028 Mdth**	**2029 Mdth**	**2030 Mdth**	**2031 Mdth**	**2032 Mdth**	**2033 Mdth**	**2034 Mdth**	**2035 Mdth**	**2036 Mdth**	**2037 Mdth**	**2038 Mdth**	**2039 Mdth**	**2040 Mdth**
Core Residential	2,083	3,523	3,864	2,254	2101	2249	2249	2305	2305	2079	1965	1909	1795	1906	1906	1906	1906	1906	1906	1906	1906	1906	1906	1906
Core Commercial	1,045	1,183	1,158	1,040	969	1,037	1,037	1,063	1,063	959	906	880	828	879	879	879	879	879	879	879	879	879	879	879
Core Industrial	61	46	35	328	306	327	327	335	335	302	286	278	261	277	277	277	277	277	277	277	277	277	277	277
NonCore Commercial	29	6	18	32	30	32	32	33	33	29	28	27	25	27	27	27	27	27	27	27	27	27	27	27
NonCore Industrial retail	101	109	9	295	275	294	294	301	301	272	257	249	235	249	249	249	249	249	249	249	249	249	249	249
NonCore Industrial refinery	12	7	-	64	60	64	64	65	65	59	56	54	51	54	54	54	54	54	54	54	54	54	54	54
Total	**3,332**	**4,873**	**5,085**	**4,012**	**3,740**	**4,002**	**4,002**	**4,103**	**4,102**	**3,700**	**3,498**	**3,397**	**3,195**	**3,393**	**3,393**	**3,393**	**3,393**	**3,393**	**3,393**	**3,393**	**3,393**	**3,393**	**3,393**	**3,393**

Cumulative Savings Mdth	**2017 Mdth**	**2018 Mdth**	**2019 Mdth**	**2020 Mdth**	**2021 Mdth**	**2022 Mdth**	**2023 Mdth**	**2024 Mdth**	**2025 Mdth**	**2026 Mdth**	**2027 Mdth**	**2028 Mdth**	**2029 Mdth**	**2030 Mdth**	**2031 Mdth**	**2032 Mdth**	**2033 Mdth**	**2034 Mdth**	**2035 Mdth**	**2036 Mdth**	**2037 Mdth**	**2038 Mdth**	**2039 Mdth**	**2040 Mdth**
Core Residential				2,254	4,355	6,604	8,853	11,158	13,463	15,542	17,507	19,416	21,211	23,118	25,024	26,931	28,837	30,744	30,396	30,201	29,859	29,517	29,118	28,719
Core Commercial				1,040	2,009	3,046	4,083	5,146	6,209	7,168	8,075	8,955	9,783	10,662	11,541	12,421	13,300	14,179	14,019	13,929	13,771	13,613	13,429	13,246
Core Industrial				328	633	960	1,287	1,622	1,957	2,260	2,546	2,823	3,084	3,361	3,638	3,916	4,193	4,470	4,419	4,391	4,341	4,292	4,234	4,176
NonCore Commercial				32	62	93	125	158	190	220	247	274	300	327	354	381	407	434	429	427	422	417	411	406
NonCore Industrial regular				295	569	863	1,157	1,458	1,759	2,031	2,288	2,537	2,771	3,021	3,270	3,519	3,768	4,017	3,972	3,946	3,901	3,857	3,805	3,753
NonCore Industrial refinery				64	123	187	251	316	382	441	496	550	601	655	709	763	817	871	862	856	846	837	825	814
Total Load Impacts				**4,012**	**7,752**	**11,754**	**15,756**	**19,859**	**23,961**	**27,661**	**31,159**	**34,556**	**37,751**	**41,144**	**44,537**	**47,930**	**51,323**	**54,716**	**54,097**	**53,750**	**53,141**	**52,532**	**51,822**	**51,113**

MMCF factor: **1.0336**

Cumulative Savings MMCF	**2017 mmcf**	**2018 mmcf**	**2019 mmcf**	**2020 mmcf**	**2021 mmcf**	**2022 mmcf**	**2023 mmcf**	**2024 mmcf**	**2025 mmcf**	**2026 mmcf**	**2027 mmcf**	**2028 mmcf**	**2029 mmcf**	**2030 mmcf**	**2031 mmcf**	**2032 mmcf**	**2033 mmcf**	**2034 mmcf**	**2035 mmcf**	**2036 mmcf**	**2037 mmcf**	**2038 mmcf**	**2039 mmcf**	**2040 mmcf**
Core Residential	-	-	-	2,181	4,214	6,389	8,565	10,795	13,025	15,037	16,938	18,785	20,522	22,366	24,211	26,055	27,900	29,744	29,408	29,219	28,888	28,557	28,171	27,786
Core Commercial	-	-	-	1,006	1,943	2,947	3,950	4,979	6,007	6,935	7,812	8,664	9,465	10,315	11,166	12,017	12,868	13,718	13,563	13,476	13,323	13,171	12,993	12,815
Core Industrial	-	-	-	317	613	929	1,245	1,570	1,894	2,186	2,463	2,731	2,984	3,252	3,520	3,788	4,057	4,325	4,276	4,248	4,200	4,152	4,096	4,040
NonCore Commercial	-	-	-	31	60	90	121	153	184	212	239	265	290	316	342	368	394	420	416	413	408	404	398	393
NonCore Industrial regular	-	-	-	285	551	835	1,119	1,411	1,702	1,965	2,213	2,454	2,681	2,922	3,163	3,404	3,645	3,886	3,842	3,818	3,775	3,731	3,681	3,631
NonCore Industrial refinery	-	-	-	62	119	181	243	306	369	426	480	532	582	634	686	738	791	843	834	828	819	809	798	788
Total Cumulative Load	**-**	**-**	**-**	**3,881**	**7,500**	**11,371**	**15,243**	**19,213**	**23,182**	**26,761**	**30,146**	**33,432**	**36,523**	**39,806**	**43,089**	**46,371**	**49,654**	**52,937**	**52,338**	**52,003**	**51,414**	**50,824**	**50,137**	**49,451**
Forecast Year ====>				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Life cycle is 15 years.

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	Reported 2017 NET	Reported 2018 NET	Reported 2019 NET	Forecast 2020 NET	Forecast 2021	Forecast 2022	Forecast 2023	Forecast 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029	Forecast 2030	Forecast 2031	Forecast 2032	Forecast 2033	Forecast 2034	Forecast 2035	Forecast 2036	Forecast 2037	Forecast 2038	Forecast 2039	Forecast 2040
SoCalGas EE Program TOTAL	**8,851,583**	**19,380,337**	**21,181,496**	**25,263,310**																				
PUC Goal	18,100,000	20,000,000	22,000,000	14,400,000	15,400,000	18,020,000	18,020,000	18,030,000	18,020,000	18,000,000	17,980,000	17,970,000	17,950,000	19,930,000	19,930,000	19,930,000	19,930,000	19,930,000	19,930,000	19,930,000	19,930,000	19,930,000	19,930,000	19,930,000
Difference	**(9,248,417)**	**(619,663)**	**(818,504)**	**10,863,310**																				

SoCalGas	**2017 therms**	**2018 therms**	**2019 therms**	**2020 therms**
Core Residential	4,296,916	13,457,604	16,480,736	10,424,846
Core Commercial	2,515,592	4,249,106	4,074,588	7,658,804
Core Industrial	611,937	456,371	353,446	3,277,226
NonCore Commercial	290,846	56,422	180,107	318,487
NonCore Industrial retail	1,013,868	1,093,600	92,618	2,945,094
NonCore Industrial refinery	122,423	67,235	-	638,853
Total	**8,851,583**	**19,380,337**	**21,181,496**	**25,263,310**

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

ANNUAL NET SAVINGS	**2017 Mdth**	**2018 Mdth**	**2019 Mdth**	**2020 Mdth**	**2021 Mdth**	**2022 Mdth**	**2023 Mdth**	**2024 Mdth**	**2025 Mdth**	**2026 Mdth**	**2027 Mdth**	**2028 Mdth**	**2029 Mdth**	**2030 Mdth**	**2031 Mdth**	**2032 Mdth**	**2033 Mdth**	**2034 Mdth**	**2035 Mdth**	**2036 Mdth**	**2037 Mdth**	**2038 Mdth**	**2039 Mdth**	**2040 Mdth**
Core Residential	430	1,346	1,648	1,042	635	744	744	744	744	743	742	742	741	822	822	822	822	822	822	822	822	822	822	822
Core Commercial	252	425	407	766	467	546	546	547	546	546	545	545	544	604	604	604	604	604	604	604	604	604	604	604
Core Industrial	61	46	35	328	200	234	234	234	234	234	233	233	233	259	259	259	259	259	259	259	259	259	259	259
NonCore Commercial	29	6	18	32	19	23	23	23	23	23	23	23	23	25	25	25	25	25	25	25	25	25	25	25
NonCore Industrial retail	101	109	9	295	180	210	210	210	210	210	210	209	209	232	232	232	232	232	232	232	232	232	232	232
NonCore Industrial refinery	12	7	-	64	39	46	46	46	46	46	45	45	45	50	50	50	50	50	50	50	50	50	50	50
Total	**885**	**1,938**	**2,118**	**2,526**	**1,540**	**1,802**	**1,802**	**1,803**	**1,802**	**1,800**	**1,798**	**1,797**	**1,795**	**1,993**	**1,993**	**1,993**	**1,993**	**1,993**	**1,993**	**1,993**	**1,993**	**1,993**	**1,993**	**1,993**

Cumulative Savings Mdth	**2017 Mdth**	**2018 Mdth**	**2019 Mdth**	**2020 Mdth**	**2021 Mdth**	**2022 Mdth**	**2023 Mdth**	**2024 Mdth**	**2025 Mdth**	**2026 Mdth**	**2027 Mdth**	**2028 Mdth**	**2029 Mdth**	**2030 Mdth**	**2031 Mdth**	**2032 Mdth**	**2033 Mdth**	**2034 Mdth**	**2035 Mdth**	**2036 Mdth**	**2037 Mdth**	**2038 Mdth**	**2039 Mdth**	**2040 Mdth**
Core Residential				1,042	1,678	2,422	3,165	3,909	4,653	5,396	6,137	6,879	7,620	8,442	9,264	10,087	10,909	11,732	11,512	11,699	11,777	11,856	11,935	12,013
Core Commercial				766	1,233	1,779	2,325	2,872	3,418	3,964	4,509	5,054	5,598	6,202	6,806	7,411	8,015	8,619	8,457	8,595	8,652	8,710	8,768	8,826
Core Industrial				328	527	761	995	1,229	1,463	1,696	1,929	2,163	2,395	2,654	2,912	3,171	3,430	3,688	3,619	3,678	3,702	3,727	3,752	3,777
NonCore Commercial				32	51	74	97	119	142	165	188	210	233	258	283	308	333	358	352	357	360	362	365	367
NonCore Industrial regular				295	474	684	894	1,104	1,314	1,524	1,734	1,943	2,153	2,385	2,617	2,850	3,082	3,314	3,252	3,305	3,327	3,349	3,372	3,394
NonCore Industrial refinery				64	103	148	194	240	285	331	376	422	467	517	568	618	669	719	705	717	722	727	731	736
Total Load Impacts				**2,526**	**4,066**	**5,868**	**7,670**	**9,473**	**11,275**	**13,075**	**14,873**	**16,670**	**18,465**	**20,458**	**22,451**	**24,444**	**26,437**	**28,430**	**27,897**	**28,350**	**28,541**	**28,732**	**28,922**	**29,113**

MMCF factor: **1.0336**

Cumulative Savings MMCF	**2017 mmcf**	**2018 mmcf**	**2019 mmcf**	**2020 mmcf**	**2021 mmcf**	**2022 mmcf**	**2023 mmcf**	**2024 mmcf**	**2025 mmcf**	**2026 mmcf**	**2027 mmcf**	**2028 mmcf**	**2029 mmcf**	**2030 mmcf**	**2031 mmcf**	**2032 mmcf**	**2033 mmcf**	**2034 mmcf**	**2035 mmcf**	**2036 mmcf**	**2037 mmcf**	**2038 mmcf**	**2039 mmcf**	**2040 mmcf**
Core Residential	-	-	-	1,009	1,623	2,343	3,062	3,782	4,501	5,220	5,938	6,655	7,372	8,168	8,963	9,759	10,555	11,350	11,137	11,318	11,395	11,471	11,547	11,623
Core Commercial	-	-	-	741	1,193	1,721	2,250	2,779	3,307	3,835	4,362	4,889	5,416	6,001	6,585	7,170	7,754	8,339	8,182	8,315	8,371	8,427	8,483	8,539
Core Industrial	-	-	-	317	510	737	963	1,189	1,415	1,641	1,867	2,092	2,318	2,568	2,818	3,068	3,318	3,568	3,501	3,558	3,582	3,606	3,630	3,654
NonCore Commercial	-	-	-	31	50	72	94	116	138	159	181	203	225	250	274	298	322	347	340	346	348	350	353	355
NonCore Industrial regular	-	-	-	285	459	662	865	1,068	1,272	1,475	1,678	1,880	2,083	2,307	2,532	2,757	2,982	3,207	3,146	3,197	3,219	3,241	3,262	3,284
NonCore Industrial refinery	-	-	-	62	99	144	188	232	276	320	364	408	452	501	549	598	647	696	683	694	698	703	708	712
Total Cumulative Load	**-**	**-**	**-**	**2,444**	**3,934**	**5,678**	**7,421**	**9,165**	**10,909**	**12,650**	**14,390**	**16,128**	**17,865**	**19,793**	**21,721**	**23,650**	**25,578**	**27,506**	**26,990**	**27,428**	**27,613**	**27,798**	**27,982**	**28,167**
Forecast Year ====>				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Life cycle is 15 years.

	Reported 2017 NET	Reported 2018 NET	Reported 2019 NET	Forecast 2020 NET	Forecast 2021	Forecast 2022	Forecast 2023	Forecast 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029	Forecast 2030	Forecast 2031	Forecast 2032	Forecast 2033	Forecast 2034	Forecast 2035	Forecast 2036	Forecast 2037	Forecast 2038	Forecast 2039	Forecast 2040
SoCalGas EE Program TOTAL	**24,469,089**	**29,351,882**	**29,666,660**	**14,851,865**																				
PUC Goal	18,100,000	26,000,000	26,000,000	21,000,000	22,000,000	22,000,000	22,000,000	23,000,000	23,000,000	19,000,000	17,000,000	16,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000	14,000,000
Difference	**6,369,089**	**3,351,882**	**3,666,660**	**(6,148,135)**																				

SoCalGas	**2017 therms**	**2018 therms**	**2019 therms**	**2020 therms**
Core Residential	16,536,258	21,769,410	22,162,806	12,115,097
Core Commercial	7,932,831	7,582,472	7,503,854	2,736,768
Core Industrial	-	-	-	-
NonCore Commercial	-	-	-	-
NonCore Industrial retail	-	-	-	-
NonCore Industrial refinery	-	-	-	-
Total	**24,469,089**	**29,351,882**	**29,666,660**	**14,851,865**

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

ANNUAL NET SAVINGS	**2017 Mdth**	**2018 Mdth**	**2019 Mdth**	**2020 Mdth**	**2021 Mdth**	**2022 Mdth**	**2023 Mdth**	**2024 Mdth**	**2025 Mdth**	**2026 Mdth**	**2027 Mdth**	**2028 Mdth**	**2029 Mdth**	**2030 Mdth**	**2031 Mdth**	**2032 Mdth**	**2033 Mdth**	**2034 Mdth**	**2035 Mdth**	**2036 Mdth**	**2037 Mdth**	**2038 Mdth**	**2039 Mdth**	**2040 Mdth**
Core Residential	1,654	2,177	2,216	1,212	1795	1795	1795	1876	1876	1550	1387	1305	1142	1142	1142	1142	1142	1142	1142	1142	1142	1142	1142	1142
Core Commercial	793	758	750	274	405	405	405	424	424	350	313	295	258	258	258	258	258	258	258	258	258	258	258	258
Core Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NonCore Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NonCore Industrial retail	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NonCore Industrial refinery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	**2,447**	**2,935**	**2,967**	**1,485**	**2,200**	**2,200**	**2,200**	**2,300**	**2,300**	**1,900**	**1,700**	**1,600**	**1,400**	**1,400**	**1,400**	**1,400**	**1,400**	**1,400**	**1,400**	**1,400**	**1,400**	**1,400**	**1,400**	**1,400**

Cumulative Savings Mdth	**2017 Mdth**	**2018 Mdth**	**2019 Mdth**	**2020 Mdth**	**2021 Mdth**	**2022 Mdth**	**2023 Mdth**	**2024 Mdth**	**2025 Mdth**	**2026 Mdth**	**2027 Mdth**	**2028 Mdth**	**2029 Mdth**	**2030 Mdth**	**2031 Mdth**	**2032 Mdth**	**2033 Mdth**	**2034 Mdth**	**2035 Mdth**	**2036 Mdth**	**2037 Mdth**	**2038 Mdth**	**2039 Mdth**	**2040 Mdth**
Core Residential				1,212	3,006	4,801	6,595	8,471	10,348	11,898	13,284	14,589	15,731	16,874	18,016	19,158	20,300	21,442	21,372	20,720	20,067	19,414	18,680	17,946
Core Commercial				274	679	1,084	1,490	1,914	2,338	2,688	3,001	3,296	3,554	3,812	4,070	4,328	4,586	4,844	4,828	4,680	4,533	4,386	4,220	4,054
Core Industrial				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NonCore Commercial				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NonCore Industrial regular				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NonCore Industrial refinery				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Load Impacts				**1,485**	**3,685**	**5,885**	**8,085**	**10,385**	**12,685**	**14,585**	**16,285**	**17,885**	**19,285**	**20,685**	**22,085**	**23,485**	**24,885**	**26,285**	**26,200**	**25,400**	**24,600**	**23,800**	**22,900**	**22,000**

MMCF factor: **1.0336**

Cumulative Savings MMCF	**2017 mmcf**	**2018 mmcf**	**2019 mmcf**	**2020 mmcf**	**2021 mmcf**	**2022 mmcf**	**2023 mmcf**	**2024 mmcf**	**2025 mmcf**	**2026 mmcf**	**2027 mmcf**	**2028 mmcf**	**2029 mmcf**	**2030 mmcf**	**2031 mmcf**	**2032 mmcf**	**2033 mmcf**	**2034 mmcf**	**2035 mmcf**	**2036 mmcf**	**2037 mmcf**	**2038 mmcf**	**2039 mmcf**	**2040 mmcf**
Core Residential	-	-	-	1,172	2,908	4,645	6,381	8,196	10,011	11,511	12,852	14,115	15,220	16,325	17,430	18,535	19,640	20,745	20,677	20,046	19,415	18,783	18,073	17,363
Core Commercial	-	-	-	265	657	1,049	1,441	1,851	2,262	2,600	2,903	3,189	3,438	3,688	3,937	4,187	4,437	4,686	4,671	4,528	4,386	4,243	4,083	3,922
Core Industrial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NonCore Commercial	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NonCore Industrial regular	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NonCore Industrial refinery	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Cumulative Load	**-**	**-**	**-**	**1,437**	**3,565**	**5,694**	**7,822**	**10,048**	**12,273**	**14,111**	**15,756**	**17,304**	**18,658**	**20,013**	**21,367**	**22,722**	**24,076**	**25,431**	**25,348**	**24,574**	**23,800**	**23,026**	**22,156**	**21,285**
Forecast Year ====>				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Life cycle is 15 years.

2020 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

Southern California Gas Company
Exchange Volumes

MARKET	RATE	YEAR	"VlookUp" Target:	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
E	G40	2019	2019E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2019	2019I	46.25	48.84	33.34	19.90	17.80	13.97	13.20	13.50	14.27	16.29	28.04	46.93	312.32
E	G40	2020	2020E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2020	2020I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2021	2021E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2021	2021I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2022	2022E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2022	2022I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2023	2023E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2023	2023I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2024	2024E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2024	2024I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2025	2025E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2025	2025I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2026	2026E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2026	2026I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2027	2027E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2027	2027I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2028	2028E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2028	2028I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2029	2029E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2029	2029I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2030	2030E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2030	2030I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2031	2031E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2031	2031I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2032	2032E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2032	2032I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2033	2033E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2033	2033I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2034	2034E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2034	2034I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63
E	G40	2035	2035E	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I	G30	2035	2035I	46.29	48.89	33.37	19.92	17.82	13.99	13.21	13.51	14.28	16.30	28.06	46.98	312.63

2020 CALIFORNIA GAS REPORT

ENHANCED OIL RECOVERY-STEAM

Enhanced Oil Recovery

2020 CALIFORNIA GAS REPORT WORKPAPERS

Forecasted demand for 2020 to 2035 assumes that, for both Steaming & Cogen use, EOR is going to maintain at 2019 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 2019 actuals.

Southern California Gas Company
EOR Workpaper

		MDTH/Year				MDTH/Year			
		Steaming				Cogen			
		MPD	HPD	TLS	Total	MPD	HPD	TLS	Total
Units	**Year**								
Mdth/year	2019 actual	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2020 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2021 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2022 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2023 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2024 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2025 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2026 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2027 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2028 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2029 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2030 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2031 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2032 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2033 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2034 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2035 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426

2020 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 2019 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) = 5.675784 + (-0.204482) 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-2019.

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 2022 is as follows:

LN[Ref_MDth/d] = 5.675784 + (-0.204482) x
LN[((4.3474+4.3830/2)/((6.4623+6.6224)/2)]
LN[Ref_MDth/d] = 5.758524

Ref_MDth = (31 days) x (EXP[5.758524])
= (31 days) x (316.8803 MDth/d)
= (9,823.3 MDth)

This total refinery gas demand was "split" between G-30 and G-50 load using the 2019 monthly proportions that the G-30 load represented relative to the total refinery load. The table below provides these proportions.

Month	2019 G-30 % of total Refinery
Jan	80.9%
Feb	79.8%
Mar	81.7%
Apr	78.3%
May	81.7%
Jun	79.6%
Jul	78.2%
Aug	77.9%
Sep	79.3%
Oct	81.4%
Nov	81.9%
Dec	81.6%

Based on the August 2022 example above, the total refinery gas demand is split into G-30 and G-50 values:

Ref_G-30 = (7,649.1 MDth) = (9,823.3 MDth) x (77.866%), and
Ref_G-50 = (2,174.2 MDth) = (9,823.3 MDth) x (22.134%)

.

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 (2019-2035)

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-19	80.91%	31	1	10,679.6	344.5	5.8421	-0.3857	5.2516	8.4854
Feb-19	79.79%	28	2	8,697.6	310.6	5.7386	-0.2048	8.5492	8.4526
Mar-19	81.73%	31	3	10,051.7	324.2	5.7815	-0.2122	4.9639	8.2555
Apr-19	78.30%	30	4	8,988.0	299.6	5.7024	-0.5749	3.7483	7.2263
May-19	81.72%	31	5	10,585.8	341.5	5.8333	-0.6228	3.6231	6.5146
Jun-19	79.58%	30	6	9,757.6	325.3	5.7846	-0.5014	3.5923	5.3978
Jul-19	78.17%	31	7	10,020.6	323.2	5.7784	-0.3140	4.1743	5.2336
Aug-19	77.87%	31	8	9,812.7	316.5	5.7574	-0.2009	4.2083	5.0146
Sep-19	79.34%	30	9	9,519.3	317.3	5.7599	-0.1627	4.4921	5.2226
Oct-19	81.41%	31	10	10,601.9	342.0	5.8348	-0.2405	4.2968	5.9562
Nov-19	81.87%	30	11	10,296.1	343.2	5.8383	-0.3955	4.5428	7.1715
Dec-19	81.59%	31	12	10,490.9	338.4	5.8243	-0.4036	4.8250	6.8540
Jan-20	80.91%	31	1	9,959.2	321.3	5.7723	-0.4718	4.0245	7.3310
Feb-20	79.79%	29	2	9,582.8	330.4	5.8004	-0.6096	3.7107	6.8990
Mar-20	81.73%	31	3	10,070.9	324.9	5.7834	-0.5264	4.2441	6.5667
Apr-20	78.30%	30	4	9,760.3	325.3	5.7849	-0.5335	3.1448	6.0309
May-20	81.72%	31	5	10,337.7	333.5	5.8096	-0.6543	3.1468	6.0725
Jun-20	79.58%	30	6	9,821.5	327.4	5.7911	-0.5641	3.3793	5.3996
Jul-20	78.17%	31	7	9,815.7	316.6	5.7578	-0.4008	3.9425	5.5325
Aug-20	77.87%	31	8	9,701.2	312.9	5.7460	-0.3435	4.0032	5.6696
Sep-20	79.34%	30	9	9,536.7	317.9	5.7617	-0.4202	3.6177	5.9313
Oct-20	81.41%	31	10	10,014.2	323.0	5.7778	-0.4988	3.7476	6.1971
Nov-20	81.87%	30	11	9,635.2	321.2	5.7720	-0.4704	3.9670	6.1514
Dec-20	81.59%	31	12	9,688.3	312.5	5.7447	-0.3369	4.6475	5.9146
Jan-21	80.91%	31	1	9,865.4	318.2	5.7628	-0.4256	4.3525	7.8597
Feb-21	79.79%	28	2	8,989.3	321.0	5.7716	-0.4685	5.1970	7.3965
Mar-21	81.73%	31	3	9,898.6	319.3	5.7662	-0.4420	4.0823	7.0403
Apr-21	78.30%	30	4	9,819.3	327.3	5.7909	-0.5630	3.6093	6.4659
May-21	81.72%	31	5	10,212.7	329.4	5.7974	-0.5948	3.5496	6.5104
Jun-21	79.58%	30	6	9,734.6	324.5	5.7822	-0.5206	3.7579	5.7890
Jul-21	78.17%	31	7	9,767.3	315.1	5.7528	-0.3767	4.2840	5.9315
Aug-21	77.87%	31	8	9,681.5	312.3	5.7440	-0.3335	4.3197	6.0784
Sep-21	79.34%	30	9	9,521.8	317.4	5.7601	-0.4126	3.9133	6.3590
Oct-21	81.41%	31	10	10,004.9	322.7	5.7768	-0.4942	4.0193	6.6440
Nov-21	81.87%	30	11	9,654.8	321.8	5.7740	-0.4804	4.1697	6.5950
Dec-21	81.59%	31	12	9,747.4	314.4	5.7508	-0.3667	4.7953	6.3412
Jan-22	80.91%	31	1	9,966.2	321.5	5.7730	-0.4752	4.4712	8.5631
Feb-22	79.79%	28	2	9,102.3	325.1	5.7841	-0.5296	5.3165	8.0585
Mar-22	81.73%	31	3	10,027.6	323.5	5.7791	-0.5053	4.1729	7.6704
Apr-22	78.30%	30	4	9,949.4	331.6	5.8041	-0.6274	3.6847	7.0445
May-22	81.72%	31	5	10,351.0	333.9	5.8109	-0.6605	3.6183	7.0930
Jun-22	79.58%	30	6	9,870.0	329.0	5.7961	-0.5882	3.8234	6.3071
Jul-22	78.17%	31	7	9,907.7	319.6	5.7671	-0.4465	4.3474	6.4623
Aug-22	77.87%	31	8	9,823.3	316.9	5.7585	-0.4046	4.3830	6.6224
Sep-22	79.34%	30	9	9,658.8	322.0	5.7744	-0.4824	3.9817	6.9281
Oct-22	81.41%	31	10	10,144.6	327.2	5.7907	-0.5620	4.0940	7.2386
Nov-22	81.87%	30	11	9,788.3	326.3	5.7877	-0.5475	4.2484	7.1852
Dec-22	81.59%	31	12	9,884.5	318.9	5.7647	-0.4350	4.8739	6.9087
Jan-23	80.91%	31	1	10,074.5	325.0	5.7838	-0.5281	4.5810	9.1247
Feb-23	79.79%	28	2	9,181.4	327.9	5.7927	-0.5719	5.4163	8.5871
Mar-23	81.73%	31	3	10,116.7	326.3	5.7880	-0.5485	4.2678	8.1735
Apr-23	78.30%	30	4	10,032.8	334.4	5.8124	-0.6682	3.7703	7.5066
May-23	81.72%	31	5	10,436.5	336.7	5.8191	-0.7007	3.7052	7.5583
Jun-23	79.58%	30	6	9,953.1	331.8	5.8044	-0.6292	3.9061	6.7208
Jul-23	78.17%	31	7	9,997.0	322.5	5.7761	-0.4904	4.4269	6.8862
Aug-23	77.87%	31	8	9,914.4	319.8	5.7678	-0.4498	4.4656	7.0568
Sep-23	79.34%	30	9	9,745.6	324.9	5.7834	-0.5261	4.0664	7.3825
Oct-23	81.41%	31	10	10,233.9	330.1	5.7995	-0.6049	4.1778	7.7134
Nov-23	81.87%	30	11	9,875.5	329.2	5.7966	-0.5909	4.3343	7.6565
Dec-23	81.59%	31	12	9,974.1	321.7	5.7738	-0.4791	4.9668	7.3618

Base Forecast of Refinery Gas Demand (2019-2035)

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-24	80.91%	31	1	10,169.9	328.1	5.7932	-0.5742	4.6623	9.7370
Feb-24	79.79%	29	2	9,603.7	331.2	5.8026	-0.6202	5.5025	9.1633
Mar-24	81.73%	31	3	10,213.9	329.5	5.7975	-0.5953	4.3593	8.7219
Apr-24	78.30%	30	4	10,120.4	337.3	5.8211	-0.7107	3.8614	8.0103
May-24	81.72%	31	5	10,523.1	339.5	5.8273	-0.7412	3.7996	8.0654
Jun-24	79.58%	30	6	10,035.7	334.5	5.8127	-0.6696	4.0003	7.1717
Jul-24	78.17%	31	7	10,087.1	325.4	5.7850	-0.5342	4.5100	7.3483
Aug-24	77.87%	31	8	10,010.5	322.9	5.7774	-0.4970	4.5416	7.5303
Sep-24	79.34%	30	9	9,840.9	328.0	5.7931	-0.5737	4.1396	7.8779
Oct-24	81.41%	31	10	10,334.7	333.4	5.8093	-0.6528	4.2462	8.2309
Nov-24	81.87%	30	11	9,977.5	332.6	5.8069	-0.6412	4.3918	8.1703
Dec-24	81.59%	31	12	10,081.4	325.2	5.7845	-0.5315	5.0272	7.8558
Jan-25	80.91%	31	1	10,293.8	332.1	5.8053	-0.6334	4.7338	10.5342
Feb-25	79.79%	28	2	9,396.2	335.6	5.8159	-0.6850	5.5739	9.9135
Mar-25	81.73%	31	3	10,347.4	333.8	5.8105	-0.6588	4.4388	9.4360
Apr-25	78.30%	30	4	10,244.4	341.5	5.8333	-0.7703	3.9406	8.6661
May-25	81.72%	31	5	10,648.5	343.5	5.8392	-0.7991	3.8811	8.7258
Jun-25	79.58%	30	6	10,157.4	338.6	5.8248	-0.7285	4.0747	7.7589
Jul-25	78.17%	31	7	10,214.3	329.5	5.7976	-0.5955	4.5853	7.9499
Aug-25	77.87%	31	8	10,138.9	327.1	5.7902	-0.5593	4.6158	8.1469
Sep-25	79.34%	30	9	9,965.0	332.2	5.8056	-0.6350	4.2179	8.5229
Oct-25	81.41%	31	10	10,460.6	337.4	5.8214	-0.7121	4.3327	8.9048
Nov-25	81.87%	30	11	10,098.4	336.6	5.8189	-0.7000	4.4783	8.8392
Dec-25	81.59%	31	12	10,211.0	329.4	5.7972	-0.5940	5.0947	8.4990
Jan-26	80.91%	31	1	10,420.3	336.1	5.8175	-0.6932	4.8219	11.3347
Feb-26	79.79%	28	2	9,505.9	339.5	5.8275	-0.7418	5.6568	10.6668
Mar-26	81.73%	31	3	10,466.1	337.6	5.8219	-0.7146	4.5321	10.1530
Apr-26	78.30%	30	4	10,337.5	344.6	5.8423	-0.8145	4.0935	9.3246
May-26	81.72%	31	5	10,712.0	345.5	5.8451	-0.8282	4.0813	9.3888
Jun-26	79.58%	30	6	10,195.2	339.8	5.8285	-0.7467	4.3247	8.3485
Jul-26	78.17%	31	7	10,242.8	330.4	5.8003	-0.6091	4.8673	8.5540
Aug-26	77.87%	31	8	10,167.3	328.0	5.7929	-0.5729	4.8987	8.7659
Sep-26	79.34%	30	9	9,983.5	332.8	5.8075	-0.6441	4.5201	9.1705
Oct-26	81.41%	31	10	10,473.1	337.8	5.8226	-0.7179	4.6267	9.5815
Nov-26	81.87%	30	11	10,121.0	337.4	5.8212	-0.7110	4.7505	9.5108
Dec-26	81.59%	31	12	10,242.3	330.4	5.8003	-0.6089	5.3972	9.1448
Jan-27	80.91%	31	1	10,413.1	335.9	5.8168	-0.6898	5.1413	11.8610
Feb-27	79.79%	28	2	9,484.8	338.7	5.8252	-0.7309	5.9439	11.1621
Mar-27	81.73%	31	3	10,436.0	336.6	5.8190	-0.7005	4.8691	10.6245
Apr-27	78.30%	30	4	10,223.9	340.8	5.8313	-0.7605	4.6584	9.7576
May-27	81.72%	31	5	10,524.6	339.5	5.8275	-0.7419	4.6671	9.8248
Jun-27	79.58%	30	6	10,017.8	333.9	5.8109	-0.6609	4.9176	8.7361
Jul-27	78.17%	31	7	10,093.9	325.6	5.7857	-0.5375	5.4152	8.9512
Aug-27	77.87%	31	8	10,052.7	324.3	5.7816	-0.5175	5.3865	9.1729
Sep-27	79.34%	30	9	9,868.0	328.9	5.7959	-0.5872	5.0472	9.5963
Oct-27	81.41%	31	10	10,333.9	333.4	5.8092	-0.6524	5.1718	10.0264
Nov-27	81.87%	30	11	10,001.1	333.4	5.8092	-0.6527	5.2300	9.9525
Dec-27	81.59%	31	12	10,145.6	327.3	5.7908	-0.5625	5.8930	9.5694
Jan-28	80.91%	31	1	10,325.8	333.1	5.8084	-0.6486	5.5346	12.2900
Feb-28	79.79%	29	2	9,765.5	336.7	5.8193	-0.7019	6.2892	11.5658
Mar-28	81.73%	31	3	10,362.1	334.3	5.8119	-0.6658	5.3115	11.0088
Apr-28	78.30%	30	4	10,093.8	336.5	5.8185	-0.6978	5.1989	10.1105
May-28	81.72%	31	5	10,379.3	334.8	5.8136	-0.6739	5.1439	10.1802
Jun-28	79.58%	30	6	9,912.0	330.4	5.8003	-0.6089	5.3169	9.0521
Jul-28	78.17%	31	7	10,027.8	323.5	5.7791	-0.5054	5.7391	9.2749
Aug-28	77.87%	31	8	9,995.7	322.4	5.7759	-0.4897	5.7687	9.5047
Sep-28	79.34%	30	9	9,793.6	326.5	5.7883	-0.5502	5.4497	9.9434
Oct-28	81.41%	31	10	10,261.1	331.0	5.8021	-0.6179	5.5115	10.3890
Nov-28	81.87%	30	11	9,948.5	331.6	5.8040	-0.6269	5.5479	10.3125
Dec-28	81.59%	31	12	10,107.6	326.1	5.7871	-0.5442	6.1907	9.9156

Base Forecast of Refinery Gas Demand (2019-2035)

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-29	80.91%	31	1	10,277.2	331.5	5.8037	-0.6256	5.8745	12.6378
Feb-29	79.79%	28	2	9,365.7	334.5	5.8126	-0.6691	6.6891	11.8931
Mar-29	81.73%	31	3	10,292.4	332.0	5.8052	-0.6327	5.6402	11.3203
Apr-29	78.30%	30	4	10,041.4	334.7	5.8133	-0.6724	5.4460	10.3966
May-29	81.72%	31	5	10,345.6	333.7	5.8103	-0.6580	5.3597	10.4682
Jun-29	79.58%	30	6	9,885.7	329.5	5.7976	-0.5959	5.5380	9.3083
Jul-29	78.17%	31	7	9,984.1	322.1	5.7748	-0.4841	6.0762	9.5374
Aug-29	77.87%	31	8	9,938.9	320.6	5.7702	-0.4618	6.0922	9.7737
Sep-29	79.34%	30	9	9,737.1	324.6	5.7825	-0.5219	5.7747	10.2248
Oct-29	81.41%	31	10	10,197.4	328.9	5.7959	-0.5874	5.8448	10.6830
Nov-29	81.87%	30	11	9,889.0	329.6	5.7980	-0.5976	5.8660	10.6043
Dec-29	81.59%	31	12	10,046.1	324.1	5.7810	-0.5143	6.5707	10.1961
Jan-30	80.91%	31	1	10,179.5	328.4	5.7941	-0.5788	6.3466	12.8475
Feb-30	79.79%	28	2	9,267.0	331.0	5.8020	-0.6173	7.1047	12.0905
Mar-30	81.73%	31	3	10,204.4	329.2	5.7966	-0.5908	5.9664	11.5082
Apr-30	78.30%	30	4	9,960.4	332.0	5.8052	-0.6328	5.7592	10.5692
May-30	81.72%	31	5	10,268.4	331.2	5.8028	-0.6214	5.6358	10.6420
Jun-30	79.58%	30	6	9,801.8	326.7	5.7891	-0.5543	5.9139	9.4628
Jul-30	78.17%	31	7	9,883.3	318.8	5.7646	-0.4344	6.4937	9.6957
Aug-30	77.87%	31	8	9,839.6	317.4	5.7602	-0.4127	6.4994	9.9359
Sep-30	79.34%	30	9	9,638.7	321.3	5.7723	-0.4722	6.1792	10.3945
Oct-30	81.41%	31	10	10,091.8	325.5	5.7855	-0.5365	6.2503	10.8603
Nov-30	81.87%	30	11	9,784.8	326.2	5.7874	-0.5458	6.2878	10.7803
Dec-30	81.59%	31	12	9,949.0	320.9	5.7712	-0.4668	6.9705	10.3654
Jan-31	80.91%	31	1	10,102.3	325.9	5.7865	-0.5416	6.7066	13.1428
Feb-31	79.79%	28	2	9,225.1	329.5	5.7975	-0.5952	7.3622	12.3684
Mar-31	81.73%	31	3	10,166.6	328.0	5.7929	-0.5726	6.2545	11.7727
Apr-31	78.30%	30	4	9,916.4	330.5	5.8007	-0.6111	6.0032	10.8121
May-31	81.72%	31	5	10,211.6	329.4	5.7973	-0.5942	5.9744	10.8866
Jun-31	79.58%	30	6	9,731.8	324.4	5.7820	-0.5192	6.2625	9.6803
Jul-31	78.17%	31	7	9,821.9	316.8	5.7584	-0.4039	6.8235	9.9186
Aug-31	77.87%	31	8	9,784.8	315.6	5.7546	-0.3855	6.8357	10.1643
Sep-31	79.34%	30	9	9,586.4	319.5	5.7669	-0.4456	6.4836	10.6334
Oct-31	81.41%	31	10	10,030.4	323.6	5.7794	-0.5067	6.6165	11.1100
Nov-31	81.87%	30	11	9,717.9	323.9	5.7805	-0.5123	6.6473	11.0281
Dec-31	81.59%	31	12	9,881.3	318.8	5.7644	-0.4334	7.3764	10.6036
Jan-32	80.91%	31	1	10,065.1	324.7	5.7828	-0.5236	6.9050	13.5039
Feb-32	79.79%	29	2	9,536.0	328.8	5.7955	-0.5856	7.6891	12.7082
Mar-32	81.73%	31	3	10,122.5	326.5	5.7885	-0.5513	6.6025	12.0961
Apr-32	78.30%	30	4	9,852.0	328.4	5.7942	-0.5793	6.3998	11.1091
May-32	81.72%	31	5	10,126.1	326.6	5.7889	-0.5531	6.4231	11.1857
Jun-32	79.58%	30	6	9,647.8	321.6	5.7733	-0.4768	6.6944	9.9462
Jul-32	78.17%	31	7	9,756.7	314.7	5.7517	-0.3714	7.1961	10.1910
Aug-32	77.87%	31	8	9,740.4	314.2	5.7501	-0.3632	7.1543	10.4435
Sep-32	79.34%	30	9	9,544.3	318.1	5.7625	-0.4241	6.8287	10.9255
Oct-32	81.41%	31	10	9,980.5	322.0	5.7744	-0.4823	6.9642	11.4152
Nov-32	81.87%	30	11	9,667.3	322.2	5.7753	-0.4867	7.0164	11.3310
Dec-32	81.59%	31	12	9,834.4	317.2	5.7597	-0.4102	7.7312	10.8949
Jan-33	80.91%	31	1	10,034.2	323.7	5.7798	-0.5085	7.2680	14.0460
Feb-33	79.79%	28	2	9,190.3	328.2	5.7937	-0.5766	8.0487	13.2184
Mar-33	81.73%	31	3	10,102.6	325.9	5.7866	-0.5417	6.9600	12.5817
Apr-33	78.30%	30	4	9,823.3	327.4	5.7913	-0.5650	6.7587	11.5551
May-33	81.72%	31	5	10,094.5	325.6	5.7858	-0.5378	6.7847	11.6347
Jun-33	79.58%	30	6	9,619.1	320.6	5.7703	-0.4623	7.0597	10.3455
Jul-33	78.17%	31	7	9,732.9	314.0	5.7493	-0.3594	7.5621	10.6002
Aug-33	77.87%	31	8	9,720.0	313.5	5.7480	-0.3530	7.5180	10.8628
Sep-33	79.34%	30	9	9,521.9	317.4	5.7601	-0.4126	7.1949	11.3641
Oct-33	81.41%	31	10	9,954.9	321.1	5.7718	-0.4697	7.3324	11.8735
Nov-33	81.87%	30	11	9,643.9	321.5	5.7729	-0.4748	7.3835	11.7859
Dec-33	81.59%	31	12	9,814.7	316.6	5.7576	-0.4004	8.1077	11.3323

Base Forecast of Refinery Gas Demand (2019-2035)

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-34	80.91%	31	1	10,008.0	322.8	5.7772	-0.4957	7.6687	14.5677
Feb-34	79.79%	28	2	9,163.4	327.3	5.7908	-0.5623	8.4460	13.7093
Mar-34	81.73%	31	3	10,071.7	324.9	5.7835	-0.5268	7.3551	13.0490
Apr-34	78.30%	30	4	9,783.9	326.1	5.7873	-0.5454	7.1552	11.9843
May-34	81.72%	31	5	10,052.0	324.3	5.7815	-0.5172	7.1840	12.0668
Jun-34	79.58%	30	6	9,580.1	319.3	5.7662	-0.4424	7.4628	10.7297
Jul-34	78.17%	31	7	9,698.6	312.9	5.7457	-0.3422	7.9661	10.9939
Aug-34	77.87%	31	8	9,689.1	312.6	5.7448	-0.3374	7.9194	11.2662
Sep-34	79.34%	30	9	9,489.2	316.3	5.7567	-0.3957	7.5989	11.7862
Oct-34	81.41%	31	10	9,918.8	320.0	5.7682	-0.4519	7.7385	12.3144
Nov-34	81.87%	30	11	9,610.0	320.3	5.7694	-0.4576	7.7884	12.2237
Dec-34	81.59%	31	12	9,784.5	315.6	5.7546	-0.3853	8.5224	11.7532
Jan-35	80.91%	31	1	9,977.5	321.9	5.7741	-0.4808	8.0898	15.1148
Feb-35	79.79%	28	2	9,137.5	326.3	5.7879	-0.5485	8.8635	14.2242
Mar-35	81.73%	31	3	10,041.9	323.9	5.7805	-0.5123	7.7703	13.5391
Apr-35	78.30%	30	4	9,746.2	324.9	5.7834	-0.5265	7.5719	12.4344
May-35	81.72%	31	5	10,011.4	322.9	5.7775	-0.4974	7.6036	12.5200
Jun-35	79.58%	30	6	9,542.7	318.1	5.7623	-0.4233	7.8864	11.1327
Jul-35	78.17%	31	7	9,665.7	311.8	5.7423	-0.3255	8.3904	11.4067
Aug-35	77.87%	31	8	9,659.4	311.6	5.7417	-0.3224	8.3413	11.6893
Sep-35	79.34%	30	9	9,457.7	315.3	5.7534	-0.3795	8.0234	12.2289
Oct-35	81.41%	31	10	9,884.1	318.8	5.7647	-0.4348	8.1652	12.7769
Nov-35	81.87%	30	11	9,577.5	319.3	5.7660	-0.4411	8.2139	12.6827
Dec-35	81.59%	31	12	9,755.4	314.7	5.7516	-0.3707	8.9579	12.1946

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 2022 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-2022 = (7,649.1) - (15.9) = (7,633.2 MDth).

The reduction of 15.9 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 2022 is:

G-50 Refinery Gas Demand, Aug-2020 = (2,174.2 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 2019, while forecasts cover years 2020-2035.

B. Monthly Forecast Tables

The additional four tables below provide monthly gas demand for the refinery segment. Recorded data are for year 2019, while forecasts cover years 2020-2035.

Annual Refinery Gas Demand: Recorded (2019)

Forecast (2020-2035) (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)
2019	**119,502**	95,897	0	95,897	365	23,605	0	23,605
2020	**117,860**	94,581	64	94,517	366	23,343	0	23,343
2021	**116,774**	93,757	123	93,634	365	23,140	0	23,140
2022	**118,286**	95,021	187	94,833	365	23,453	0	23,453
2023	**119,284**	95,872	251	95,621	365	23,663	0	23,663
2024	**120,683**	97,045	316	96,729	366	23,954	0	23,954
2025	**121,794**	97,990	382	97,609	365	24,186	0	24,186
2026	**122,426**	98,545	441	98,105	365	24,322	0	24,322
2027	**121,099**	97,527	496	97,031	365	24,068	0	24,068
2028	**120,422**	97,027	550	96,477	366	23,946	0	23,946
2029	**119,400**	96,248	601	95,647	365	23,752	0	23,752
2030	**118,213**	95,340	655	94,685	365	23,528	0	23,528
2031	**117,467**	94,785	709	94,076	365	23,392	0	23,392
2032	**117,110**	94,541	763	93,777	366	23,333	0	23,333
2033	**116,435**	94,044	817	93,226	365	23,208	0	23,208
2034	**115,978**	93,721	871	92,849	365	23,129	0	23,129
2035	**115,595**	93,406	862	92,545	365	23,051	0	23,051

Monthly Refinery Gas Demand: Recorded (2019)

Forecast (2020-2035) (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-19	**10,680**	8,641	0	8,641	31	2,039	0	2,039
Feb-19	**8,698**	6,940	0	6,940	28	1,758	0	1,758
Mar-19	**10,052**	8,215	0	8,215	31	1,837	0	1,837
Apr-19	**8,988**	7,037	0	7,037	30	1,951	0	1,951
May-19	**10,586**	8,651	0	8,651	31	1,935	0	1,935
Jun-19	**9,758**	7,765	0	7,765	30	1,992	0	1,992
Jul-19	**10,021**	7,834	0	7,834	31	2,187	0	2,187
Aug-19	**9,813**	7,641	0	7,641	31	2,172	0	2,172
Sep-19	**9,519**	7,552	0	7,552	30	1,967	0	1,967
Oct-19	**10,602**	8,631	0	8,631	31	1,971	0	1,971
Nov-19	**10,296**	8,429	0	8,429	30	1,867	0	1,867
Dec-19	**10,491**	8,559	0	8,559	31	1,931	0	1,931
Jan-20	**9,954**	8,058	5	8,053	31	1,901	0	1,901
Feb-20	**9,578**	7,646	5	7,641	29	1,936	0	1,936
Mar-20	**10,065**	8,231	5	8,225	31	1,840	0	1,840
Apr-20	**9,755**	7,642	5	7,637	30	2,118	0	2,118
May-20	**10,332**	8,448	5	8,443	31	1,889	0	1,889
Jun-20	**9,816**	7,816	5	7,811	30	2,005	0	2,005
Jul-20	**9,810**	7,673	5	7,668	31	2,142	0	2,142
Aug-20	**9,696**	7,554	5	7,549	31	2,147	0	2,147
Sep-20	**9,531**	7,566	5	7,561	30	1,971	0	1,971
Oct-20	**10,009**	8,153	5	8,148	31	1,861	0	1,861
Nov-20	**9,630**	7,888	5	7,883	30	1,747	0	1,747
Dec-20	**9,683**	7,905	5	7,899	31	1,784	0	1,784
Jan-21	**9,855**	7,982	10	7,972	31	1,883	0	1,883
Feb-21	**8,980**	7,173	9	7,163	28	1,816	0	1,816
Mar-21	**9,888**	8,090	10	8,079	31	1,809	0	1,809
Apr-21	**9,809**	7,688	10	7,678	30	2,131	0	2,131
May-21	**10,202**	8,346	10	8,336	31	1,866	0	1,866
Jun-21	**9,724**	7,747	10	7,737	30	1,988	0	1,988
Jul-21	**9,757**	7,636	10	7,625	31	2,132	0	2,132
Aug-21	**9,671**	7,539	10	7,528	31	2,143	0	2,143
Sep-21	**9,512**	7,554	10	7,544	30	1,968	0	1,968
Oct-21	**9,994**	8,145	10	8,135	31	1,860	0	1,860
Nov-21	**9,645**	7,904	10	7,894	30	1,751	0	1,751
Dec-21	**9,737**	7,953	10	7,942	31	1,795	0	1,795
Jan-22	**9,950**	8,064	16	8,048	31	1,903	0	1,903
Feb-22	**9,088**	7,263	14	7,249	28	1,839	0	1,839
Mar-22	**10,012**	8,195	16	8,179	31	1,832	0	1,832
Apr-22	**9,934**	7,790	15	7,775	30	2,159	0	2,159
May-22	**10,335**	8,459	16	8,443	31	1,892	0	1,892
Jun-22	**9,855**	7,855	15	7,839	30	2,015	0	2,015
Jul-22	**9,892**	7,745	16	7,729	31	2,162	0	2,162
Aug-22	**9,807**	7,649	16	7,633	31	2,174	0	2,174
Sep-22	**9,643**	7,663	15	7,647	30	1,996	0	1,996
Oct-22	**10,129**	8,259	16	8,243	31	1,886	0	1,886
Nov-22	**9,773**	8,013	15	7,998	30	1,775	0	1,775
Dec-22	**9,869**	8,065	16	8,049	31	1,820	0	1,820

Monthly Refinery Gas Demand: Recorded (2019)

Forecast (2020-2035) (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-23	**10,053**	8,151	21	8,130	31	1,923	0	1,923
Feb-23	**9,162**	7,326	19	7,307	28	1,855	0	1,855
Mar-23	**10,095**	8,268	21	8,247	31	1,849	0	1,849
Apr-23	**10,012**	7,856	21	7,835	30	2,177	0	2,177
May-23	**10,415**	8,529	21	8,508	31	1,907	0	1,907
Jun-23	**9,932**	7,921	21	7,900	30	2,032	0	2,032
Jul-23	**9,976**	7,815	21	7,794	31	2,182	0	2,182
Aug-23	**9,893**	7,720	21	7,699	31	2,194	0	2,194
Sep-23	**9,725**	7,732	21	7,711	30	2,014	0	2,014
Oct-23	**10,213**	8,332	21	8,311	31	1,902	0	1,902
Nov-23	**9,855**	8,085	21	8,064	30	1,791	0	1,791
Dec-23	**9,953**	8,138	21	8,116	31	1,836	0	1,836
Jan-24	**10,143**	8,228	27	8,202	31	1,941	0	1,941
Feb-24	**9,579**	7,663	25	7,638	29	1,941	0	1,941
Mar-24	**10,187**	8,348	27	8,321	31	1,866	0	1,866
Apr-24	**10,094**	7,924	26	7,898	30	2,196	0	2,196
May-24	**10,496**	8,600	27	8,573	31	1,923	0	1,923
Jun-24	**10,010**	7,987	26	7,961	30	2,049	0	2,049
Jul-24	**10,060**	7,886	27	7,859	31	2,202	0	2,202
Aug-24	**9,984**	7,795	27	7,768	31	2,216	0	2,216
Sep-24	**9,815**	7,807	26	7,781	30	2,034	0	2,034
Oct-24	**10,308**	8,414	27	8,387	31	1,921	0	1,921
Nov-24	**9,952**	8,168	26	8,142	30	1,809	0	1,809
Dec-24	**10,055**	8,225	27	8,199	31	1,856	0	1,856
Jan-25	**10,261**	8,329	32	8,296	31	1,965	0	1,965
Feb-25	**9,367**	7,497	29	7,468	28	1,899	0	1,899
Mar-25	**10,315**	8,457	32	8,424	31	1,891	0	1,891
Apr-25	**10,213**	8,021	31	7,990	30	2,223	0	2,223
May-25	**10,616**	8,702	32	8,670	31	1,946	0	1,946
Jun-25	**10,126**	8,083	31	8,052	30	2,074	0	2,074
Jul-25	**10,182**	7,985	32	7,953	31	2,229	0	2,229
Aug-25	**10,107**	7,895	32	7,862	31	2,244	0	2,244
Sep-25	**9,934**	7,906	31	7,874	30	2,059	0	2,059
Oct-25	**10,428**	8,516	32	8,484	31	1,944	0	1,944
Nov-25	**10,067**	8,267	31	8,236	30	1,831	0	1,831
Dec-25	**10,179**	8,331	32	8,299	31	1,880	0	1,880
Jan-26	**10,383**	8,431	37	8,394	31	1,989	0	1,989
Feb-26	**9,472**	7,585	34	7,551	28	1,921	0	1,921
Mar-26	**10,429**	8,554	37	8,516	31	1,912	0	1,912
Apr-26	**10,301**	8,094	36	8,058	30	2,243	0	2,243
May-26	**10,675**	8,754	37	8,717	31	1,958	0	1,958
Jun-26	**10,159**	8,113	36	8,077	30	2,082	0	2,082
Jul-26	**10,205**	8,007	37	7,970	31	2,236	0	2,236
Aug-26	**10,130**	7,917	37	7,879	31	2,250	0	2,250
Sep-26	**9,947**	7,920	36	7,884	30	2,063	0	2,063
Oct-26	**10,436**	8,527	37	8,489	31	1,947	0	1,947
Nov-26	**10,085**	8,286	36	8,250	30	1,835	0	1,835
Dec-26	**10,205**	8,357	37	8,319	31	1,886	0	1,886
Jan-27	**10,371**	8,425	42	8,383	31	1,988	0	1,988
Feb-27	**9,447**	7,568	38	7,530	28	1,917	0	1,917
Mar-27	**10,394**	8,529	42	8,487	31	1,907	0	1,907
Apr-27	**10,183**	8,005	41	7,964	30	2,219	0	2,219
May-27	**10,482**	8,601	42	8,559	31	1,923	0	1,923
Jun-27	**9,977**	7,972	41	7,932	30	2,046	0	2,046
Jul-27	**10,052**	7,891	42	7,849	31	2,203	0	2,203
Aug-27	**10,011**	7,828	42	7,786	31	2,225	0	2,225
Sep-27	**9,827**	7,829	41	7,788	30	2,039	0	2,039
Oct-27	**10,292**	8,413	42	8,371	31	1,921	0	1,921
Nov-27	**9,960**	8,188	41	8,147	30	1,813	0	1,813
Dec-27	**10,103**	8,278	42	8,236	31	1,868	0	1,868

Monthly Refinery Gas Demand: Recorded (2019)

Forecast (2020-2035) (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-28	**10,279**	8,355	47	8,308	31	1,971	0	1,971
Feb-28	**9,722**	7,792	44	7,749	29	1,973	0	1,973
Mar-28	**10,315**	8,469	47	8,422	31	1,893	0	1,893
Apr-28	**10,049**	7,903	45	7,858	30	2,190	0	2,190
May-28	**10,333**	8,482	47	8,436	31	1,897	0	1,897
Jun-28	**9,867**	7,888	45	7,843	30	2,024	0	2,024
Jul-28	**9,981**	7,839	47	7,793	31	2,189	0	2,189
Aug-28	**9,949**	7,783	47	7,737	31	2,212	0	2,212
Sep-28	**9,749**	7,770	45	7,725	30	2,024	0	2,024
Oct-28	**10,214**	8,354	47	8,307	31	1,907	0	1,907
Nov-28	**9,903**	8,145	45	8,099	30	1,804	0	1,804
Dec-28	**10,061**	8,247	47	8,200	31	1,861	0	1,861
Jan-29	**10,226**	8,315	51	8,264	31	1,962	0	1,962
Feb-29	**9,320**	7,473	46	7,427	28	1,893	0	1,893
Mar-29	**10,241**	8,412	51	8,361	31	1,881	0	1,881
Apr-29	**9,992**	7,862	49	7,813	30	2,179	0	2,179
May-29	**10,295**	8,455	51	8,404	31	1,891	0	1,891
Jun-29	**9,836**	7,867	49	7,818	30	2,019	0	2,019
Jul-29	**9,933**	7,805	51	7,754	31	2,179	0	2,179
Aug-29	**9,888**	7,739	51	7,688	31	2,200	0	2,200
Sep-29	**9,688**	7,725	49	7,676	30	2,012	0	2,012
Oct-29	**10,146**	8,302	51	8,251	31	1,895	0	1,895
Nov-29	**9,840**	8,096	49	8,046	30	1,793	0	1,793
Dec-29	**9,995**	8,197	51	8,145	31	1,850	0	1,850
Jan-30	**10,124**	8,236	56	8,181	31	1,943	0	1,943
Feb-30	**9,217**	7,394	50	7,344	28	1,873	0	1,873
Mar-30	**10,149**	8,340	56	8,284	31	1,865	0	1,865
Apr-30	**9,907**	7,799	54	7,745	30	2,162	0	2,162
May-30	**10,213**	8,392	56	8,336	31	1,877	0	1,877
Jun-30	**9,748**	7,800	54	7,747	30	2,001	0	2,001
Jul-30	**9,828**	7,726	56	7,671	31	2,157	0	2,157
Aug-30	**9,784**	7,662	56	7,606	31	2,178	0	2,178
Sep-30	**9,585**	7,647	54	7,593	30	1,992	0	1,992
Oct-30	**10,036**	8,216	56	8,160	31	1,876	0	1,876
Nov-30	**9,731**	8,011	54	7,957	30	1,774	0	1,774
Dec-30	**9,893**	8,117	56	8,062	31	1,832	0	1,832
Jan-31	**10,042**	8,174	60	8,114	31	1,929	0	1,929
Feb-31	**9,171**	7,361	54	7,307	28	1,864	0	1,864
Mar-31	**10,106**	8,309	60	8,249	31	1,858	0	1,858
Apr-31	**9,858**	7,764	58	7,706	30	2,152	0	2,152
May-31	**10,151**	8,345	60	8,285	31	1,866	0	1,866
Jun-31	**9,674**	7,745	58	7,686	30	1,987	0	1,987
Jul-31	**9,762**	7,678	60	7,618	31	2,144	0	2,144
Aug-31	**9,725**	7,619	60	7,559	31	2,166	0	2,166
Sep-31	**9,528**	7,605	58	7,547	30	1,981	0	1,981
Oct-31	**9,970**	8,166	60	8,106	31	1,864	0	1,864
Nov-31	**9,660**	7,956	58	7,898	30	1,762	0	1,762
Dec-31	**9,821**	8,062	60	8,002	31	1,819	0	1,819
Jan-32	**10,000**	8,144	65	8,079	31	1,921	0	1,921
Feb-32	**9,475**	7,609	60	7,549	29	1,927	0	1,927
Mar-32	**10,058**	8,273	65	8,208	31	1,850	0	1,850
Apr-32	**9,789**	7,714	63	7,651	30	2,138	0	2,138
May-32	**10,061**	8,276	65	8,211	31	1,851	0	1,851
Jun-32	**9,585**	7,678	63	7,615	30	1,970	0	1,970
Jul-32	**9,692**	7,627	65	7,563	31	2,129	0	2,129
Aug-32	**9,676**	7,585	65	7,520	31	2,156	0	2,156
Sep-32	**9,482**	7,572	63	7,509	30	1,972	0	1,972
Oct-32	**9,916**	8,125	65	8,061	31	1,855	0	1,855
Nov-32	**9,605**	7,914	63	7,852	30	1,753	0	1,753
Dec-32	**9,770**	8,024	65	7,959	31	1,811	0	1,811

Monthly Refinery Gas Demand: Recorded (2019)

Forecast (2020-2035) (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-33	**9,965**	8,119	69	8,049	31	1,916	0	1,916
Feb-33	**9,128**	7,333	63	7,271	28	1,857	0	1,857
Mar-33	**10,033**	8,257	69	8,187	31	1,846	0	1,846
Apr-33	**9,756**	7,691	67	7,624	30	2,132	0	2,132
May-33	**10,025**	8,250	69	8,180	31	1,845	0	1,845
Jun-33	**9,552**	7,655	67	7,588	30	1,964	0	1,964
Jul-33	**9,663**	7,609	69	7,539	31	2,124	0	2,124
Aug-33	**9,651**	7,569	69	7,499	31	2,151	0	2,151
Sep-33	**9,455**	7,554	67	7,487	30	1,968	0	1,968
Oct-33	**9,886**	8,105	69	8,035	31	1,850	0	1,850
Nov-33	**9,577**	7,895	67	7,828	30	1,749	0	1,749
Dec-33	**9,745**	8,008	69	7,938	31	1,807	0	1,807
Jan-34	**9,934**	8,097	74	8,023	31	1,911	0	1,911
Feb-34	**9,097**	7,312	67	7,245	28	1,852	0	1,852
Mar-34	**9,998**	8,231	74	8,157	31	1,840	0	1,840
Apr-34	**9,712**	7,661	72	7,589	30	2,123	0	2,123
May-34	**9,978**	8,215	74	8,141	31	1,837	0	1,837
Jun-34	**9,508**	7,624	72	7,552	30	1,956	0	1,956
Jul-34	**9,625**	7,582	74	7,508	31	2,117	0	2,117
Aug-34	**9,615**	7,545	74	7,471	31	2,145	0	2,145
Sep-34	**9,418**	7,528	72	7,457	30	1,961	0	1,961
Oct-34	**9,845**	8,075	74	8,001	31	1,844	0	1,844
Nov-34	**9,538**	7,868	72	7,796	30	1,743	0	1,743
Dec-34	**9,710**	7,983	74	7,909	31	1,801	0	1,801
Jan-35	**9,904**	8,073	73	8,000	31	1,905	0	1,905
Feb-35	**9,071**	7,291	66	7,225	28	1,846	0	1,846
Mar-35	**9,969**	8,207	73	8,134	31	1,835	0	1,835
Apr-35	**9,675**	7,631	71	7,560	30	2,115	0	2,115
May-35	**9,938**	8,182	73	8,109	31	1,830	0	1,830
Jun-35	**9,472**	7,594	71	7,523	30	1,948	0	1,948
Jul-35	**9,592**	7,556	73	7,483	31	2,110	0	2,110
Aug-35	**9,586**	7,521	73	7,448	31	2,138	0	2,138
Sep-35	**9,387**	7,503	71	7,433	30	1,954	0	1,954
Oct-35	**9,811**	8,047	73	7,974	31	1,837	0	1,837
Nov-35	**9,507**	7,841	71	7,770	30	1,737	0	1,737
Dec-35	**9,682**	7,959	73	7,886	31	1,796	0	1,796

2020 CALIFORNIA GAS REPORT

ELECTRIC GENERATION

2020 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 PLEXOS model from Energy Exemplar. 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, 2019 – 2030 Managed Forecast, dated February 2020. SoCalGas selected the Mid Energy Demand scenario with Mid Additional Achievable Energy Efficiency (AAEE) 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 60% 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 2019-2030 Managed Forecast - Mid Demand / Mid AAEE Case

Total Energy to Serve Load by Agency and Balancing Authority (GWh)

Balancing Authority	Agency	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Average Annual Growth (2019-2030)
	PG&E Service Area - Greater Bay Area	35,296	34,649	34,248	33,806	33,602	33,514	33,532	33,552	33,571	33,568	33,585	33,575	33,595	-0.28%
	NCPA - Greater Bay Area	1,407	1,390	1,378	1,363	1,356	1,353	1,355	1,357	1,358	1,358	1,359	1,358	1,359	-0.20%
	Power Enterprise of the San Francisco PUC	1,085	1,072	1,062	1,051	1,045	1,043	1,045	1,046	1,047	1,047	1,047	1,047	1,048	-0.20%
	Silicon Valley Power	3,876	4,117	4,302	4,390	4,436	4,507	4,593	4,660	4,688	4,688	4,688	4,689	4,688	1.19%
	Other NP15 LSEs - Bay Area	24	24	24	23	23	23	23	23	23	23	23	23	23	-0.20%
	CDWR - Greater Bay Area	764	808	808	808	808	808	808	808	808	808	808	808	808	0.00%
	WAPA - Greater Bay Area	501	501	501	501	501	501	501	501	501	501	501	501	501	0.00%
Greater Bay Area Subtotal		**42,953**	**42,561**	**42,324**	**41,943**	**41,771**	**41,750**	**41,858**	**41,948**	**41,997**	**41,994**	**42,012**	**42,002**	**42,022**	**-0.12%**
	PG&E Service Area - Non Bay Area	43,510	42,893	42,385	41,843	41,566	41,445	41,459	41,488	41,516	41,516	41,535	41,526	41,547	-0.29%
	NCPA - Non Bay Area	997	985	976	966	961	959	960	961	962	962	963	962	963	-0.20%
	Other NP15 LSEs - Non Bay Area	228	226	224	221	220	220	220	220	221	220	221	221	221	-0.20%
	CDWR - Non Bay Area	876	809	809	809	809	809	809	809	809	809	809	809	809	0.00%
	WAPA - Non Bay Area	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	1,768	0.00%
Total North of Path 15		**90,334**	**89,243**	**88,486**	**87,551**	**87,096**	**86,951**	**87,075**	**87,196**	**87,273**	**87,270**	**87,308**	**87,289**	**87,330**	**-0.20%**
	PG&E Service Area - ZP26	8,875	8,570	8,454	8,331	8,268	8,240	8,244	8,250	8,257	8,257	8,261	8,259	8,264	-0.33%
	CDWR - ZP26	1,556	1,704	1,704	1,704	1,704	1,704	1,704	1,704	1,704	1,704	1,704	1,704	1,704	0.00%
	WAPA - ZP26	141	141	141	141	141	141	141	141	141	141	141	141	141	0.00%
Total Zone Path 26		**10,572**	**10,416**	**10,300**	**10,177**	**10,113**	**10,086**	**10,089**	**10,096**	**10,102**	**10,102**	**10,107**	**10,105**	**10,110**	**-0.27%**
Total Valley		**57,952**	**57,097**	**56,462**	**55,784**	**55,437**	**55,287**	**55,306**	**55,344**	**55,379**	**55,378**	**55,403**	**55,391**	**55,418**	**-0.27%**
Total North of Path 26 (Total PG&E TAC Area)		**100,906**	**99,658**	**98,786**	**97,727**	**97,209**	**97,037**	**97,164**	**97,292**	**97,375**	**97,372**	**97,415**	**97,394**	**97,440**	**-0.20%**
	Turlock Irrigation District	2,229	2,206	2,178	2,162	2,158	2,150	2,143	2,136	2,131	2,127	2,127	2,128	2,129	-0.33%
	Merced	539	534	527	523	522	520	519	517	515	515	515	515	515	-0.33%
Total Turlock Irrigation District Control Area		**2,768**	**2,740**	**2,705**	**2,686**	**2,680**	**2,670**	**2,662**	**2,653**	**2,646**	**2,642**	**2,642**	**2,643**	**2,644**	**-0.33%**
	Sacramento Municipal Utility District	10,956	10,953	10,791	10,708	10,674	10,618	10,570	10,530	10,511	10,517	10,548	10,590	10,646	-0.26%
	Modesto Irrigation District	2,639	2,612	2,579	2,561	2,555	2,545	2,538	2,530	2,523	2,519	2,519	2,520	2,520	-0.33%
	Roseville, City of	1,229	1,217	1,201	1,193	1,190	1,186	1,182	1,178	1,175	1,173	1,173	1,174	1,174	-0.33%
	Redding, City of	793	785	775	769	768	765	763	760	758	757	757	757	757	-0.33%
	Shasta Lake, City of	209	207	204	203	203	202	201	201	200	200	200	200	200	-0.33%
	WAPA (BANC)	419	419	419	419	419	419	419	419	419	419	419	419	419	0.00%
Total Balancing Authority of Northern California Control Area		**16,245**	**16,193**	**15,969**	**15,852**	**15,808**	**15,734**	**15,672**	**15,617**	**15,586**	**15,584**	**15,616**	**15,658**	**15,716**	**-0.27%**
	SCE Service Area - LA Basin	68,858	68,550	67,953	67,726	67,664	67,955	68,030	68,140	68,237	68,391	68,649	68,929	69,222	0.09%
	Anaheim, City of	2,463	2,469	2,449	2,446	2,444	2,454	2,456	2,460	2,463	2,469	2,477	2,487	2,497	0.10%
	Pasadena Water and Power	1,111	1,114	1,105	1,104	1,103	1,107	1,108	1,110	1,111	1,114	1,118	1,122	1,126	0.10%
	Riverside, City of	2,335	2,340	2,321	2,318	2,316	2,326	2,328	2,331	2,335	2,340	2,348	2,357	2,366	0.10%
	Vernon, City of	1,095	1,098	1,089	1,281	1,280	1,284	1,285	1,287	1,288	1,291	1,295	1,299	1,303	1.57%
	Other SP15 LSEs - LA Basin	1,184	1,187	1,177	1,176	1,175	1,180	1,181	1,183	1,184	1,187	1,191	1,196	1,200	0.10%
	MWD - LA Basin	203	203	203	203	203	203	203	203	203	203	203	203	203	0.00%
LA Basin Subtotal		**77,250**	**76,960**	**76,296**	**76,254**	**76,185**	**76,508**	**76,591**	**76,714**	**76,821**	**76,993**	**77,280**	**77,592**	**77,918**	**0.11%**
	SCE Service Area - Big Creek/Ventura	17,101	17,037	16,889	16,837	16,822	16,894	16,912	16,939	16,963	17,001	17,065	17,134	17,206	0.09%
	CDWR - Big Creek/Ventura	2,842	3,241	3,241	3,241	3,241	3,241	3,241	3,241	3,241	3,241	3,241	3,241	3,241	0.00%
Big Creek/Ventura Subtotal		**19,943**	**20,278**	**20,131**	**20,078**	**20,063**	**20,135**	**20,153**	**20,181**	**20,204**	**20,243**	**20,306**	**20,375**	**20,448**	**0.08%**
	SCE Service Area - Other	5,331	5,310	5,264	5,247	5,242	5,265	5,271	5,279	5,287	5,298	5,318	5,340	5,363	0.09%
	Other SP15 LSEs - Other	164	164	163	163	163	163	163	164	164	164	165	165	166	0.10%
	CDWR - Other	502	530	530	530	530	530	530	530	530	530	530	530	530	0.00%
	MWD - Other	1,654	1,846	1,846	1,846	1,846	1,846	1,846	1,846	1,846	1,846	1,846	1,846	1,846	0.00%
Total SCE TAC Area		**104,845**	**105,088**	**104,230**	**104,119**	**104,029**	**104,448**	**104,555**	**104,714**	**104,853**	**105,075**	**105,447**	**105,850**	**106,271**	**0.10%**
SDG&E TAC Area		**20,306**	**19,807**	**19,307**	**19,145**	**19,081**	**19,053**	**19,079**	**19,152**	**19,237**	**19,350**	**19,470**	**19,588**	**19,706**	**-0.05%**
Valley Electric Association (CA Territory)		**11**	**12**	**12**	**12**	**12**	**12**	**13**	**13**	**13**	**13**	**13**	**14**	**14**	**1.55%**
Total South of Path 26		**125,162**	**124,907**	**123,549**	**123,276**	**123,123**	**123,514**	**123,647**	**123,878**	**124,102**	**124,439**	**124,929**	**125,451**	**125,990**	**0.08%**
	LADWP	25,059	24,691	24,293	23,970	23,865	23,567	23,406	23,109	23,008	22,830	22,723	22,651	22,559	-0.82%
	Burbank	1,142	1,145	1,145	1,152	1,168	1,176	1,184	1,194	1,204	1,216	1,232	1,250	1,269	0.94%
	Glendale	1,110	1,113	1,113	1,119	1,135	1,143	1,151	1,160	1,170	1,182	1,197	1,215	1,233	0.94%
Total LADWP Control Area		**27,310**	**26,949**	**26,550**	**26,241**	**26,167**	**25,887**	**25,741**	**25,462**	**25,382**	**25,227**	**25,152**	**25,116**	**25,061**	**-0.66%**
Imperial Irrigation District Control Area		**3,917**	**3,895**	**3,843**	**3,806**	**3,778**	**3,757**	**3,740**	**3,728**	**3,720**	**3,720**	**3,728**	**3,742**	**3,755**	**-0.33%**
Total California ISO		**226,068**	**224,565**	**222,334**	**221,003**	**220,331**	**220,551**	**220,811**	**221,171**	**221,478**	**221,811**	**222,344**	**222,845**	**223,430**	**-0.05%**
Total STATEWIDE		**276,307**	**274,341**	**271,403**	**269,587**	**268,765**	**268,598**	**268,626**	**268,631**	**268,811**	**268,983**	**269,483**	**270,004**	**270,605**	**-0.12%**

This table includes retail sales and other deliveries at the customer level including losses - total energy to serve load. Table developed based on actual 2018 data.

Total California ISO at Line 60 does not include total energy to serve load for the Nevada portion of the VEA service territory

Schedule 2: Form 1.5b - STATEWIDE

California Energy Demand 2019-2030 Managed Forecast - Mid Demand / Mid AAEE Case

1-in-2 Net Electricity Peak Demand by Agency and Balancing Authority (MW)

Balancing Authority	Agency	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Average Annual Growth (2019-2030)
	PG&E Service Area - Greater Bay Area	7,223	7,113	6,970	6,926	6,902	6,898	6,922	6,951	6,977	7,032	7,025	7,062	-0.20%
	NCPA - Greater Bay Area	198	194	190	188	186	185	186	186	186	187	186	188	-0.49%
	Power Enterprise of the San Francisco PUC	125	123	120	118	117	117	117	117	117	118	118	118	-0.49%
	Silicon Valley Power	530	542	540	546	553	562	569	570	570	573	571	575	0.75%
	Other NP15 LSEs - Bay Area	5	5	5	5	5	5	5	5	5	5	5	5	-0.69%
	CDWR - Greater Bay Area	55	55	57	57	57	57	56	56	56	56	56	60	0.92%
	WAPA - Greater Bay Area	52	52	52	52	52	52	52	52	52	52	52	52	0.00%
Greater Bay Area Subtotal		**8,188**	**8,083**	**7,933**	**7,892**	**7,873**	**7,876**	**7,907**	**7,937**	**7,964**	**8,023**	**8,013**	**8,061**	**-0.14%**
	PG&E Service Area - Non Bay Area	9,955	9,803	9,606	9,545	9,513	9,507	9,540	9,580	9,616	9,691	9,682	9,734	-0.20%
	NCPA - Non Bay Area	211	207	202	200	199	198	198	198	199	200	199	200	-0.49%
	Other NP15 LSEs - Non Bay Area	7	7	7	7	7	7	7	7	7	7	7	7	-0.49%
	CDWR - Non Bay Area	55	55	57	57	57	57	56	56	56	56	56	60	0.92%
	WAPA - Non Bay Area	185	185	185	185	185	185	185	185	185	185	185	185	0.00%
Total North of Path 15		**18,602**	**18,341**	**17,991**	**17,886**	**17,832**	**17,829**	**17,893**	**17,964**	**18,026**	**18,161**	**18,142**	**18,247**	**-0.17%**
	PG&E Service Area - ZP26	2,047	2,016	1,975	1,963	1,956	1,955	1,962	1,970	1,977	1,993	1,991	2,002	-0.20%
	CDWR - ZP26	115	115	120	120	120	120	119	118	118	118	118	127	0.92%
	WAPA - ZP26	15	15	15	15	15	15	15	15	15	15	15	15	0.00%
Total Zone Path 26		**2,177**	**2,146**	**2,110**	**2,097**	**2,091**	**2,090**	**2,095**	**2,103**	**2,111**	**2,126**	**2,124**	**2,144**	**-0.14%**
Total Valley		**12,591**	**12,403**	**12,167**	**12,091**	**12,050**	**12,043**	**12,081**	**12,130**	**12,173**	**12,265**	**12,253**	**12,330**	**-0.19%**
Total North of Path 26 (Total PG&E TAC Area)		**20,779**	**20,486**	**20,100**	**19,983**	**19,923**	**19,919**	**19,988**	**20,067**	**20,137**	**20,287**	**20,266**	**20,391**	**-0.17%**
	Turlock Irrigation District	543	535	531	530	528	527	525	524	524	524	525	527	-0.27%
	Merced	109	108	107	107	106	106	106	106	106	106	106	106	-0.27%
Total Turlock Irrigation District Control Area		**652**	**643**	**638**	**637**	**634**	**633**	**631**	**630**	**629**	**630**	**631**	**633**	**-0.27%**
	SMUD	2,959	2,916	2,899	2,897	2,890	2,881	2,870	2,861	2,861	2,869	2,882	2,895	-0.20%
	Modesto Irrigation District	674	664	659	658	656	654	652	651	650	651	652	654	-0.27%
	Roseville	325	321	318	318	316	316	315	314	314	314	315	316	-0.27%
	Redding	221	217	216	215	215	214	213	213	213	213	213	214	-0.27%
	City of Shasta Lake	35	34	34	34	34	34	33	33	33	33	34	34	-0.27%
	WAPA (BANC)	90	90	90	90	90	90	90	90	90	90	90	90	0.00%
Total Balancing Authority of Northern California Control Area		**4,304**	**4,242**	**4,215**	**4,211**	**4,200**	**4,188**	**4,174**	**4,163**	**4,161**	**4,171**	**4,186**	**4,202**	**-0.22%**
	SCE Service Area - LA Basin	16,297	16,109	15,975	15,861	15,850	15,796	15,753	15,749	15,769	15,789	15,883	16,027	-0.15%
	Anaheim	526	520	515	512	511	509	508	508	509	509	512	517	-0.15%
	Pasadena Water and Power	273	270	267	265	265	264	264	264	264	264	266	268	-0.15%
	Riverside	594	587	582	578	577	575	574	574	574	575	579	584	-0.15%
	Vernon	149	147	171	170	169	169	169	169	169	169	170	171	1.26%
	Other SP15 LSEs - LA Basin	246	243	241	240	239	239	238	238	238	239	240	242	-0.15%
	MWD - LA Basin	20	20	20	20	20	20	20	20	20	20	20	20	0.00%
LA Basin Subtotal		**18,104**	**17,895**	**17,771**	**17,645**	**17,633**	**17,572**	**17,525**	**17,521**	**17,542**	**17,565**	**17,669**	**17,829**	**-0.14%**
	SCE Service Area - Big Creek/Ventura	3,996	3,950	3,917	3,889	3,886	3,873	3,862	3,861	3,866	3,871	3,894	3,929	-0.15%
	CDWR - Big Creek/Ventura	290	275	275	275	275	275	275	276	276	303	303	303	0.40%
Big Creek/Ventura Subtotal		**4,286**	**4,224**	**4,192**	**4,164**	**4,161**	**4,148**	**4,137**	**4,137**	**4,142**	**4,174**	**4,197**	**4,233**	**-0.11%**
	SCE Service Area - Other	1,010	999	990	983	983	979	977	976	977	979	985	993	-0.15%
	Other SP15 LSEs - Other	26	26	25	25	25	25	25	25	25	25	25	25	-0.15%
	CDWR - Other	47	45	45	45	45	45	45	45	45	50	50	50	0.40%
	MWD - Other	163	154	154	154	154	154	154	154	154	171	172	172	0.45%
Total SCE TAC Area		**23,637**	**23,343**	**23,177**	**23,015**	**23,000**	**22,923**	**22,862**	**22,859**	**22,886**	**22,964**	**23,097**	**23,301**	**-0.13%**
SDG&E TAC Area		**4,194**	**4,138**	**4,158**	**4,194**	**4,224**	**4,250**	**4,273**	**4,292**	**4,313**	**4,334**	**4,354**	**4,373**	**0.38%**
Valley Electric Association (CA + NV Territory)		**133**	**145**	**153**	**156**	**159**	**161**	**164**	**166**	**169**	**171**	**173**	**176**	**2.53%**
Total South of Path 26		**27,964**	**27,625**	**27,488**	**27,366**	**27,383**	**27,334**	**27,299**	**27,317**	**27,368**	**27,469**	**27,625**	**27,850**	**-0.04%**
	LADWP	5,787	5,696	5,608	5,555	5,450	5,368	5,246	5,160	5,059	4,992	4,940	4,872	-1.55%
	Burbank	286	284	284	285	283	282	281	279	279	279	281	283	-0.11%
	Glendale	297	295	294	295	294	292	291	290	289	290	291	293	-0.11%
Total LADWP Control Area		**6,370**	**6,275**	**6,186**	**6,135**	**6,028**	**5,942**	**5,818**	**5,729**	**5,627**	**5,561**	**5,512**	**5,448**	**-1.41%**
Imperial Irrigation District Control Area		**1,071**	**1,056**	**1,045**	**1,037**	**1,030**	**1,024**	**1,019**	**1,017**	**1,017**	**1,020**	**1,026**	**1,033**	**-0.33%**
Total California ISO Noncoincident Peak		**48,743**	**48,112**	**47,589**	**47,349**	**47,306**	**47,253**	**47,287**	**47,384**	**47,505**	**47,757**	**47,891**	**48,241**	**-0.09%**
Total California ISO Coincident Peak		**46,117**	**45,647**	**45,184**	**45,280**	**45,447**	**45,610**	**45,827**	**46,011**	**46,227**	**46,493**	**46,702**	**47,016**	**0.18%**
Total STATEWIDE Noncoincident Peak		**61,141**	**60,327**	**59,673**	**59,369**	**59,198**	**59,040**	**58,929**	**58,923**	**58,940**	**59,138**	**59,246**	**59,558**	**-0.24%**
Total STATEWIDE Coincident Peak		**57,848**	**57,236**	**56,658**	**56,775**	**56,872**	**56,987**	**57,109**	**57,216**	**57,354**	**57,572**	**57,776**	**58,045**	**0.03%**

Table developed using weather normalized 2019 net peak demand values for each BA area. Inlcudes the impact of IOU load-modifying demand response programs.

Agency peak demand within a BA area is adjusted to be coincident with the respective BA area net peak demand total.

Schedule 3: Form 1.1c - STATEWIDE

California Energy Demand 2019-2030 Managed Forecast - Mid Demand / Mid AAEE Case

Electricity Deliveries to End Users by Agency (GWh)

Planning Area	Agency	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Average Annual Growth (2019-2030)
PG&E	Pacific Gas & Electric Company (Bundled)	49,436	32,619	29,073	26,555	25,593	25,446	25,428	25,428	25,442	25,440	25,461	25,450	25,473	-2.22%
	Pacific Gas & Electric Company (Direct Access)	9,410	9,520	10,418	11,400	11,400	11,400	11,400	11,400	11,400	11,400	11,400	11,400	11,400	1.65%
	Pacific Gas & Electric Company (BART)	377	380	380	380	380	380	380	380	380	380	380	380	380	0.00%
	CCA - Butte Choice Energy	-	-	-	448	922	920	922	923	924	924	924	924	924	--
	CCA - CleanPowerSF	1,239	2,728	3,116	3,083	3,066	3,061	3,065	3,069	3,071	3,071	3,073	3,072	3,073	1.09%
	CCA - East Bay Community Energy	2,014	7,602	7,535	7,455	7,415	7,402	7,412	7,422	7,428	7,428	7,431	7,429	7,433	-0.20%
	CCA - King City Community Power	23	30	30	30	29	29	29	29	29	29	29	29	29	-0.20%
	CCA - Marin Clean Energy	4,329	5,342	5,498	5,879	6,039	6,028	6,036	6,044	6,049	6,049	6,052	6,050	6,053	1.14%
	CCA - Monterrey Bay Community Power	1,999	4,572	4,881	4,828	4,803	4,794	4,801	4,807	4,811	4,811	4,813	4,812	4,814	0.47%
	CCA - Peninsula Clean Energy Authority	3,519	3,642	3,610	3,571	3,552	3,546	3,550	3,555	3,558	3,558	3,560	3,559	3,560	-0.20%
	CCA - Pioneer Community Energy	936	1,167	1,157	1,145	1,139	1,137	1,138	1,140	1,141	1,140	1,141	1,141	1,141	-0.20%
	CCA - Redwood Coast Energy Authority	640	644	638	631	628	627	628	628	629	629	629	629	629	-0.20%
	CCA - San José Clean Energy	32	3,507	4,510	4,462	4,438	4,431	4,436	4,442	4,446	4,446	4,448	4,447	4,449	2.19%
	CCA - Silicon Valley Clean Energy	3,643	4,097	4,061	4,018	3,996	3,989	3,995	4,000	4,003	4,003	4,005	4,004	4,006	-0.20%
	CCA - Sonoma Clean Power	2,372	2,398	2,377	2,351	2,339	2,334	2,338	2,341	2,343	2,343	2,344	2,343	2,344	-0.20%
	CCA - Valley Clean Energy Alliance	399	682	706	740	736	735	736	737	737	737	738	738	738	0.72%
	Alameda Municipal Power	346	342	339	335	333	333	333	333	334	334	334	334	334	-0.20%
	Biggs Municipal Utilities	15	15	15	15	15	15	15	15	15	15	15	15	15	-0.20%
	Calaveras Public Power Agency	31	31	30	30	30	30	30	30	30	30	30	30	30	-0.20%
	Gridley, City of	32	31	31	31	31	31	31	31	31	31	31	31	31	-0.20%
	Healdsburg, City of	73	73	72	71	71	71	71	71	71	71	71	71	71	-0.20%
	Pittsburg, City of (dba Island Energy)	22	22	22	21	21	21	21	21	21	21	21	21	21	-0.20%
	Lassen Municipal Utility District	125	123	122	121	120	120	120	120	120	120	120	120	120	-0.20%
	Lathrop Irrigation District	9	9	9	9	9	9	9	9	9	9	9	9	9	-0.20%
	Lodi, City of	413	408	405	400	398	397	398	399	399	399	399	399	399	-0.20%
	Lompoc, City of	128	126	125	124	123	123	123	123	123	123	123	123	123	-0.20%
	Palo Alto, City of	890	879	871	862	857	856	857	858	859	859	859	859	859	-0.20%
	Plumas-Sierra Rural Electric Cooperation	144	142	141	139	139	138	138	139	139	139	139	139	139	-0.20%
	Power Enterprise of the San Francisco PUC	994	982	974	963	958	956	958	959	960	960	960	960	960	-0.20%
	Port of Oakland	54	53	53	52	52	52	52	52	52	52	52	52	52	-0.20%
	Port of Stockton	20	20	20	20	20	20	20	20	20	20	20	20	20	-0.20%
	Silicon Valley Power	3,552	3,774	3,943	4,024	4,066	4,131	4,210	4,271	4,297	4,297	4,297	4,298	4,297	1.19%
	Tuolumne County Public Power Agency	25	24	24	24	24	24	24	24	24	24	24	24	24	-0.20%
	Ukiah, City of	108	107	106	105	104	104	104	104	105	105	105	105	105	-0.20%
	California Department of Water Resources - North	2,943	3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	0.00%
	WAPA	2,210	2,210	2,210	2,210	2,210	2,210	2,210	2,210	2,210	2,210	2,210	2,210	2,210	0.00%
PG&E Total		**92,504**	**91,360**	**90,560**	**89,590**	**89,115**	**88,957**	**89,074**	**89,191**	**89,267**	**89,264**	**89,303**	**89,284**	**89,327**	**-0.20%**
SCE	Southern California Edison Company (Bundled)	71,184	61,843	56,660	53,289	52,529	52,817	52,890	53,000	53,095	53,248	53,504	53,781	54,071	-1.21%
	Southern California Edison Company (Direct Access)	11,926	12,290	12,665	13,052	13,450	13,450	13,450	13,450	13,450	13,450	13,450	13,450	13,450	0.82%
	CCA - Apple Valley Choice Energy	258	235	233	233	233	234	234	234	235	235	236	237	238	0.10%
	CCA - Baldwin Park, City of	-	-	16	241	241	242	242	242	243	243	244	245	246	--
	CCA - Commerce, City of	-	-	-	213	393	394	395	395	396	397	398	400	401	--
	CCA - Hanford, City of	-	-	25	112	112	112	112	113	113	113	113	114	114	--
	CCA - Palmdale, City of	-	-	49	218	218	219	219	220	220	220	221	222	223	--
	CCA - Pomona, City of	-	-	43	409	409	410	411	411	412	413	414	416	417	--
	CCA - Clean Power Alliance	777	9,246	11,639	11,626	11,616	11,663	11,675	11,693	11,708	11,733	11,775	11,820	11,867	2.29%
	CCA - Desert Community Energy	-	-	271	1,433	1,432	1,438	1,439	1,441	1,443	1,446	1,451	1,457	1,463	--
	CCA - Lancaster Choice Energy	583	556	551	551	550	552	553	554	554	556	558	560	562	0.10%
	CCA - Pico Rivera Innovative Municipal Energy	166	243	241	241	240	241	242	242	242	243	244	245	246	0.10%
	CCA - Rancho Mirage Energy Authority	196	266	264	264	263	264	265	265	265	266	267	268	269	0.10%
	CCA - San Jacinto Power	118	160	159	159	159	159	159	160	160	160	161	161	162	0.10%
	CCA - Santa Barbara Clean Energy	-	-	-	211	331	332	333	333	334	334	336	337	338	--
	CCA - Western Community Energy	-	-	1,285	1,575	1,574	1,580	1,582	1,584	1,586	1,589	1,595	1,601	1,607	--
	Anaheim, City of	2,307	2,312	2,293	2,290	2,288	2,298	2,300	2,303	2,306	2,311	2,320	2,328	2,338	0.10%
	Anza Electric Cooperative, Inc.	57	57	57	57	57	57	57	57	57	57	57	58	58	0.10%
	Azusa Light & Water	250	251	249	248	248	249	249	250	250	251	252	252	253	0.10%
	Banning, City of	123	123	122	122	122	122	122	123	123	123	124	124	125	0.10%
	Bear Valley Electric Service	121	121	120	120	120	121	121	121	121	121	122	122	123	0.10%
	Cerritos, City of	66	67	66	66	66	66	66	66	66	66	67	67	67	0.10%
	Colton Public Utilities	356	357	354	354	353	355	355	356	356	357	358	360	361	0.10%
	Corona, City of	153	154	152	152	152	153	153	153	153	154	154	155	155	0.10%
	Industry, City of	39	39	39	39	39	39	39	39	39	39	39	39	40	0.10%
	Moreno Valley Utilities	193	194	192	192	192	193	193	193	193	194	194	195	196	0.10%
	Pasadena Water and Power	1,041	1,043	1,034	1,033	1,032	1,037	1,038	1,039	1,041	1,043	1,047	1,051	1,055	0.10%
	Rancho Cucamonga Municipal Utility	76	76	75	75	75	75	75	75	76	76	76	76	77	0.10%
	Riverside, City of	2,186	2,191	2,173	2,171	2,169	2,177	2,180	2,183	2,186	2,191	2,198	2,207	2,216	0.10%
	Vernon, City of	1,026	1,028	1,019	1,199	1,198	1,202	1,204	1,205	1,206	1,209	1,212	1,216	1,220	1.57%
	Victorville Municipal	96	96.65	95.86	95.75	95.67	96.06	96.16	96.30	96.43	96.63	96.98	97.35	97.73	0.10%
	California Department of Water Resources - South	3,080	3,473	3,473	3,473	3,473	3,473	3,473	3,473	3,473	3,473	3,473	3,473	3,473	0.00%
	Metropolitan Water District	1,710	1,887	1,887	1,887	1,887	1,887	1,887	1,887	1,887	1,887	1,887	1,887	1,887	0.00%
SCE Total		**98,089**	**98,307**	**97,503**	**97,399**	**97,315**	**97,707**	**97,808**	**97,956**	**98,086**	**98,295**	**98,642**	**99,020**	**99,414**	**0.10%**
SDG&E	San Diego Gas & Electric Company (Bundled)	15,123	14,528	13,959	10,383	5,359	5,349	5,359	5,385	5,416	5,457	5,500	5,543	5,585	-8.32%
	San Diego Gas & Electric Company (Direct Access)	3,611	3,717	3,827	3,940	3,940	3,940	3,940	3,940	3,940	3,940	3,940	3,940	3,940	0.53%
	CCA - Clean Energy Alliance	-	-	-	144	929	927	929	933	938	946	953	960	968	--
	CCA - Solana Energy Alliance	33	60	58	(expected to join Clean Energy Alliance in 2021)										--
	CCA - San Diego Community Power	-	-	-	3,227	7,407	7,393	7,406	7,442	7,485	7,541	7,601	7,660	7,719	--
SDG&E Total		**18,767**	**18,306**	**17,844**	**17,694**	**17,635**	**17,609**	**17,633**	**17,701**	**17,779**	**17,884**	**17,994**	**18,104**	**18,212**	**-0.05%**
Northern California Non-California ISO (NCNC)	Sacramento Municipal Utility District	10,297	10,294	10,142	10,064	10,032	9,979	9,934	9,896	9,879	9,884	9,914	9,953	10,006	-0.26%
	Modesto Irrigation District	2,480	2,455	2,424	2,407	2,401	2,392	2,385	2,378	2,371	2,367	2,368	2,368	2,369	-0.33%
	Roseville, City of	1,155	1,144	1,129	1,121	1,119	1,114	1,111	1,107	1,104	1,103	1,103	1,103	1,103	-0.33%
	Redding, City of	745	738	728	723	722	719	717	714	712	711	711	711	712	-0.33%
	Shasta Lake, City of	197	195	192	191	190	190	189	189	188	188	188	188	188	-0.33%
	WAPA (BANC)	393	393	393	393	393	393	393	393	393	393	393	393	393	0.00%
	Turlock Irrigation District	2,095	2,074	2,047	2,032	2,028	2,020	2,014	2,008	2,002	1,999	1,999	2,000	2,001	-0.33%
	Merced Irrigation District	507	502	495	492	491	489	487	486	484	484	484	484	484	-0.33%
NCNC Total		**17,870**	**17,794**	**17,551**	**17,423**	**17,376**	**17,297**	**17,231**	**17,171**	**17,135**	**17,129**	**17,160**	**17,200**	**17,255**	**-0.28%**
LADWP	Los Angeles Department of Water and Power	**22,078**	**21,754**	**21,403**	**21,119**	**21,026**	**20,764**	**20,622**	**20,360**	**20,272**	**20,115**	**20,021**	**19,957**	**19,875**	**-0.82%**
Burbank/Glendale (BUGL)	Burbank, City of	1,073	1,076	1,076	1,082	1,097	1,105	1,113	1,122	1,131	1,143	1,158	1,175	1,193	0.94%
	Glendale, City of	1,043	1,046	1,046	1,052	1,067	1,074	1,081	1,090	1,099	1,111	1,125	1,142	1,159	0.94%
BUGL Total		**2,116**	**2,122**	**2,122**	**2,134**	**2,164**	**2,180**	**2,194**	**2,212**	**2,231**	**2,253**	**2,283**	**2,317**	**2,352**	**0.94%**
IID	Imperial Irrigation District	**3,472**	**3,453**	**3,407**	**3,374**	**3,349**	**3,331**	**3,316**	**3,305**	**3,298**	**3,298**	**3,305**	**3,318**	**3,329**	**-0.33%**
VEA (CA Territory)	Valley Electric Association, Inc.	**11**	**11**	**11**	**11**	**12**	**12**	**12**	**12**	**12**	**13**	**13**	**13**	**13**	**1.55%**
OTHER	PacifiCorp	739	736	730	727	728	728	729	730	732	735	738	742	746	0.11%
	Liberty Utilities	561	558	553	551	552	552	553	554	555	557	560	562	565	0.11%
	Surprise Valley Electrification Corp.	97	97	96	95	96	96	96	96	96	96	97	97	98	0.11%
	Kirkwood Meadows Public Utility District	7	7	7	7	7	7	7	7	7	7	7	7	7	0.11%
	Needles, City of	45	45	45	45	45	45	45	45	45	45	45	45	46	0.11%
	Truckee Donner Public Utility District	152	151	150	149	150	150	150	150	151	151	152	152	153	0.11%
OTHER Total		**1,601**	**1,595**	**1,581**	**1,575**	**1,577**	**1,577**	**1,579**	**1,582**	**1,586**	**1,591**	**1,598**	**1,607**	**1,615**	**0.11%**
STATEWIDE Total		**256,508**	**254,701**	**251,983**	**250,319**	**249,569**	**249,434**	**249,469**	**249,490**	**249,666**	**249,841**	**250,320**	**250,818**	**251,392**	**-0.12%**
Total Pumping Load		**8,464**	**8,419**	**8,419**	**8,419**	**8,419**	**8,419**	**8,419**	**8,419**	**8,419**	**8,419**	**8,419**	**8,419**	**8,419**	**0.00%**
STATEWIDE Total Excluding Pumping		**248,044**	**246,283**	**243,564**	**241,900**	**241,150**	**241,015**	**241,050**	**241,071**	**241,247**	**241,422**	**241,901**	**242,400**	**242,973**	**-0.12%**

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 2018 data.

Table includes sales from entities outside of California control area. Thus, STATEWIDE Total in row 105 is higher than total given in STATEWIDE Form 1.1b.

Schedule 4
Statewide Total Renewable Generation by Year (GWh)

Year	Biogas & Biomass	Geothermal	Hydro (Small)	Solar PV/Thermal	Wind	Out-of-State	Total	RPS
2020	6,158	12,038	5,297	28,179	14,753	19,360	85,785	33%
2021	6,138	12,000	5,297	28,298	14,907	19,743	86,385	36%
2022	6,140	11,990	5,297	28,996	14,907	19,266	86,595	38%
2023	6,255	12,183	5,297	32,950	17,276	20,630	94,592	41%
2024	6,510	12,464	5,297	37,192	19,650	20,514	101,626	44%
2025	7,184	13,115	5,297	42,557	21,278	22,532	111,962	47%
2026	7,430	13,787	5,297	45,948	22,270	22,989	117,721	49%
2027	7,371	14,149	5,297	49,872	22,718	25,228	124,635	52%
2028	7,500	14,096	5,297	55,632	23,532	25,007	131,063	55%
2029	7,737	14,165	5,297	60,520	24,485	25,077	137,281	57%
2030	8,574	14,657	5,297	63,779	25,393	26,275	143,976	60%
2031	8,574	14,657	5,297	63,779	25,393	26,275	143,976	60%
2032	8,574	14,657	5,297	63,779	25,393	26,275	143,976	60%
2033	8,574	14,657	5,297	63,779	25,393	26,275	143,976	60%
2034	8,574	14,657	5,297	63,779	25,393	26,275	143,976	60%
2035	8,574	14,657	5,297	63,779	25,393	26,275	143,976	60%

Note: The annual renewable generation assumption is roughly based on the Energy Almanac data and CEC RPS goals.
https://www.energy.ca.gov/sites/default/files/2019-12/renewable_ada.pdf

Schedule 5
Energy Storage (MW)

Year	SCE	PG&E	SDG&E	IID	LADWP	SMUD	Total
2020	242	242	59	-	-	-	543
2021	242	242	59	-	-	-	543
2022	412	412	109	-	-	-	933
2023	412	412	109	-	-	-	933
2024	550	580	155	-	-	-	1,285
2025	550	580	155	-	-	-	1,285
2026	809	839	232	28	49	28	1,985
2027	809	839	232	28	49	28	1,985
2028	1,069	1,099	309	56	98	56	2,687
2029	1,069	1,099	309	56	98	56	2,687
2030	1,328	1,358	386	84	147	84	3,387
2031	1,328	1,358	386	84	147	84	3,387
2032	1,328	1,358	386	84	147	84	3,387
2033	1,328	1,358	386	84	147	84	3,387
2034	1,328	1,358	386	84	147	84	3,387
2035	1,328	1,358	386	84	147	84	3,387

Schedule 6

GHG Compliance Cost

Year	Nominal $/Ton
2020	$ 12.50
2021	$ 13.29
2022	$ 14.10
2023	$ 15.30
2024	$ 16.50
2025	$ 17.70
2026	$ 19.37
2027	$ 21.69
2028	$ 23.98
2029	$ 26.13
2030	$ 28.45
2031	$ 30.96
2032	$ 33.69
2033	$ 36.66
2034	$ 39.89
2035	$ 43.40

Note: Nominal $/tonne: 2020 through 2025 is from ICE futures (March 20, 2020 settle prices for December contracts for California Carbon Allowances Vintage 2020); 2026 to 2030 uses growth rates from Base Case of Independent Commodity Intelligence Services (ICIS).

Schedule 7
OTC Schedule

Plants	Existing Capacity (MW)	SWRCB Approved Compliance Dates	Updated Compliance Dates	2020 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
Moss Landing (6,7)	1,510	12/31/2020	12/31/2016	Offline
Pittsburg (5,6,7)	1,307	12/31/2017	12/31/2016	Offline
Encina (1)	104	12/31/2017	3/1/2017	Offline
Mandalay (1,2)	430	12/31/2020	2/5/2018	Offline
Encina (2)	104	12/31/2017	12/31/2018	Offline
Encina (3)	110	12/31/2017	12/31/2018	Offline
Encina (4,5)	628	12/31/2017	12/31/2018	Offline
Redondo (7)	493	12/31/2020	10/1/2019	Offline
Alamitos (1,2,6)	848	12/31/2020	12/31/2019	Offline
Huntington Beach (1)	226	12/31/2020	12/31/2019	Offline
Moss Landing (1,2)	1,020	12/31/2020	12/31/2020	12/31/2020
Redondo (5,6,8)	850	12/31/2020	12/31/2021	12/31/2021
Alamitos (3,4,5)	1,163	12/31/2020	12/31/2023	12/31/2023
Huntington Beach (2)	226	12/31/2020	12/31/2023	12/31/2023
Ormond Beach (1,2)	1,516	12/31/2020	12/31/2023	12/31/2023
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
Harbor (5)	229	12/31/2029	12/31/2029	12/31/2029
Haynes (1,2)	444	12/31/2029	12/31/2029	12/31/2029
Haynes (8)	575	12/31/2029	12/31/2029	12/31/2029

Based on CEC Tracking Progress updated April 2019 and updated March 18, 2020 Staff Report.

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

Year	SDG&E	SoCalGas	Total
2020	29	188	218
2021	29	188	217
2022	29	191	219
2023	27	183	209
2024	23	166	189
2025	23	166	188
2026	22	163	185
2027	19	153	172
2028	20	141	161
2029	19	137	156
2030	18	127	144
2031	18	127	144
2032	18	127	144
2033	18	127	144
2034	18	127	144
2035	18	127	144

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

Year	SDG&E	SoCalGas	Total
2020	29	188	218
2021	33	209	242
2022	34	213	247
2023	31	201	231
2024	27	182	208
2025	27	181	208
2026	26	181	207
2027	24	169	193
2028	24	156	179
2029	22	151	173
2030	20	139	159
2031	20	139	159
2032	20	139	159
2033	20	139	159
2034	20	139	159
2035	20	139	159

Schedule 10

Base Case Winter Coincidental Peak Day Demand (MMCFD)

EG (Including Large Cogen)

Year	SDG&E	SoCalGas	Total
2020	149	718	867
2021	122	752	875
2022	141	754	896
2023	124	775	898
2024	104	775	879
2025	171	738	909
2026	135	755	889
2027	88	727	816
2028	90	669	759
2029	106	679	785
2030	141	609	750
2031	141	609	750
2032	141	609	750
2033	141	609	750
2034	141	609	750
2035	141	609	750

Schedule 11

Dry Hydro Summer Coincidental Peak Day Demand (MMCFD)

EG (Including Large Cogen)

Year	SDG&E	SoCalGas	Total
2020	213	1,517	1,730
2021	272	1,433	1,705
2022	281	1,455	1,736
2023	298	1,452	1,750
2024	288	1,143	1,431
2025	279	1,163	1,442
2026	354	1,068	1,422
2027	209	1,118	1,327
2028	197	959	1,156
2029	203	841	1,043
2030	186	830	1,016
2031	186	830	1,016
2032	186	830	1,016
2033	186	830	1,016
2034	186	830	1,016
2035	186	830	1,016

2020 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) = 7.658552+ LN(#Cust) x (0.415935)
+ LN(G/E) x (-0.2299617), 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 2021 is as follows:

LN[SmCoGen_MDth/yr] = 7.658552+LN(312.46)*0.415935
+ LN[(5.2929 ¢/Kwh)/(12.6559 ¢/Kwh)] x (-0.2299617)

LN[SmCoGen_MDth/yr] = 10.24835

(EXP[10.24835]) = 28,236 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 ¢/Kw h at 87.60 Thm/Yr per Kw
2020	28,392	313	10.254	5.745	-0.894	0.41	12.09	4.94
2021	28,236	312	10.248	5.744	-0.872	0.42	12.66	5.29
2022	29,023	326	10.276	5.787	-0.914	0.40	13.36	5.36
2023	29,149	331	10.280	5.801	-0.907	0.40	13.60	5.49
2024	29,283	333	10.285	5.807	-0.918	0.40	14.15	5.65
2025	29,405	333	10.289	5.808	-0.933	0.39	14.71	5.78
2026	29,383	333	10.288	5.809	-0.929	0.40	15.29	6.04
2027	29,117	334	10.279	5.812	-0.884	0.41	15.88	6.56
2028	28,996	336	10.275	5.816	-0.857	0.42	16.47	6.99
2029	28,968	337	10.274	5.821	-0.845	0.43	17.11	7.35
2030	28,869	338	10.271	5.824	-0.824	0.44	17.78	7.80
2031	28,640	340	10.263	5.828	-0.782	0.46	17.87	8.17
2032	28,429	342	10.255	5.834	-0.739	0.48	17.95	8.57
2033	28,222	344	10.248	5.840	-0.697	0.50	18.03	8.98
2034	27,987	345	10.239	5.845	-0.652	0.52	18.10	9.43
2035	27,750	347	10.231	5.849	-0.607	0.54	18.18	9.90

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)
2020	5.6
2021	11.2
2022	16.8
2023	22.4
2024	28.0
2025	33.6
2026	39.2
2027	44.8
2028	50.4
2029	56.0
2030	61.6
2031	67.2
2032	72.8
2033	78.4
2034	84.0
2035	89.6

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 (2017-2019)
1	Jan	8.146%
2	Feb	7.084%
3	Mar	7.724%
4	Apr	7.872%
5	May	8.399%
6	Jun	8.501%
7	Jul	9.002%
8	Aug	9.064%
9	Sep	8.587%
10	Oct	8.531%
11	Nov	8.572%
12	Dec	8.518%
	Total	**100.000%**

FORECAST RESULTS

Based on the year 2021 example above together with the monthly percentages of annual total load in the table above, the August 2021 small cogeneration (G-50) gas demand is calculated as:

SmCoGen_G-50 = (28,236 MDth/yr, base forecast
+ 11.2 MDth/yr, from G-50 SGIP)
x (9.0638%, monthly % of annual)
= 2,560 MDth

The tables below provide the small cogeneration annual and monthly gas demand forecasts. Recorded data are for year 2019, while forecasts cover years from 2020 through 2035.

**Monthly Small CoGen (C&I) Gas Demand:
Recorded (2019) and
Forecast (2020-2035) (MDth)**

Date	Small Cogen (C&I) (G-50) Gas Demand (MDth)
2019	28,983
2020	28,398
2021	28,247
2022	29,040
2023	29,171
2024	29,311
2025	29,438
2026	29,422
2027	29,161
2028	29,046
2029	29,024
2030	28,930
2031	28,708
2032	28,502
2033	28,301
2034	28,071
2035	27,840

**Monthly Small CoGen (C&I) Gas Demand:
Recorded (2019) and
Forecast (2020-2035) (MDth)**

Year	Month	Small Cogen (C&I) (G-50) Gas Demand (MDth)
2019	Jan-19	2,361
2019	Feb-19	2,053
2019	Mar-19	2,239
2019	Apr-19	2,282
2019	May-19	2,434
2019	Jun-19	2,464
2019	Jul-19	2,609
2019	Aug-19	2,627
2019	Sep-19	2,489
2019	Oct-19	2,473
2019	Nov-19	2,484
2019	Dec-19	2,469
2020	Jan-20	2,313
2020	Feb-20	2,012
2020	Mar-20	2,193
2020	Apr-20	2,235
2020	May-20	2,385
2020	Jun-20	2,414
2020	Jul-20	2,556
2020	Aug-20	2,574
2020	Sep-20	2,439
2020	Oct-20	2,423
2020	Nov-20	2,434
2020	Dec-20	2,419
2021	Jan-21	2,301
2021	Feb-21	2,001
2021	Mar-21	2,182
2021	Apr-21	2,224
2021	May-21	2,372
2021	Jun-21	2,401
2021	Jul-21	2,543
2021	Aug-21	2,560
2021	Sep-21	2,426
2021	Oct-21	2,410
2021	Nov-21	2,421
2021	Dec-21	2,406
2022	Jan-22	2,366
2022	Feb-22	2,057
2022	Mar-22	2,243
2022	Apr-22	2,286
2022	May-22	2,439
2022	Jun-22	2,469
2022	Jul-22	2,614
2022	Aug-22	2,632
2022	Sep-22	2,494
2022	Oct-22	2,477
2022	Nov-22	2,489
2022	Dec-22	2,474

**Monthly Small CoGen (C&I) Gas Demand:
Recorded (2019) and
Forecast (2020-2035) (MDth)**

Year	Month	Small Cogen (C&I) (G-50) Gas Demand (MDth)
2023	Jan-23	2,376
2023	Feb-23	2,066
2023	Mar-23	2,253
2023	Apr-23	2,296
2023	May-23	2,450
2023	Jun-23	2,480
2023	Jul-23	2,626
2023	Aug-23	2,644
2023	Sep-23	2,505
2023	Oct-23	2,489
2023	Nov-23	2,501
2023	Dec-23	2,485
2024	Jan-24	2,388
2024	Feb-24	2,076
2024	Mar-24	2,264
2024	Apr-24	2,307
2024	May-24	2,462
2024	Jun-24	2,492
2024	Jul-24	2,639
2024	Aug-24	2,657
2024	Sep-24	2,517
2024	Oct-24	2,501
2024	Nov-24	2,513
2024	Dec-24	2,497
2025	Jan-25	2,398
2025	Feb-25	2,085
2025	Mar-25	2,274
2025	Apr-25	2,317
2025	May-25	2,473
2025	Jun-25	2,503
2025	Jul-25	2,650
2025	Aug-25	2,668
2025	Sep-25	2,528
2025	Oct-25	2,511
2025	Nov-25	2,523
2025	Dec-25	2,507
2026	Jan-26	2,397
2026	Feb-26	2,084
2026	Mar-26	2,273
2026	Apr-26	2,316
2026	May-26	2,471
2026	Jun-26	2,501
2026	Jul-26	2,649
2026	Aug-26	2,667
2026	Sep-26	2,526
2026	Oct-26	2,510
2026	Nov-26	2,522
2026	Dec-26	2,506
2027	Jan-27	2,375
2027	Feb-27	2,066
2027	Mar-27	2,252
2027	Apr-27	2,296
2027	May-27	2,449
2027	Jun-27	2,479
2027	Jul-27	2,625
2027	Aug-27	2,643
2027	Sep-27	2,504
2027	Oct-27	2,488
2027	Nov-27	2,500
2027	Dec-27	2,484

**Monthly Small CoGen (C&I) Gas Demand:
Recorded (2019) and
Forecast (2020-2035) (MDth)**

Year	Month	Small Cogen (C&I) (G-50) Gas Demand (MDth)
2028	Jan-28	2,366
2028	Feb-28	2,058
2028	Mar-28	2,244
2028	Apr-28	2,287
2028	May-28	2,440
2028	Jun-28	2,469
2028	Jul-28	2,615
2028	Aug-28	2,633
2028	Sep-28	2,494
2028	Oct-28	2,478
2028	Nov-28	2,490
2028	Dec-28	2,474
2029	Jan-29	2,364
2029	Feb-29	2,056
2029	Mar-29	2,242
2029	Apr-29	2,285
2029	May-29	2,438
2029	Jun-29	2,467
2029	Jul-29	2,613
2029	Aug-29	2,631
2029	Sep-29	2,492
2029	Oct-29	2,476
2029	Nov-29	2,488
2029	Dec-29	2,472
2030	Jan-30	2,357
2030	Feb-30	2,049
2030	Mar-30	2,235
2030	Apr-30	2,277
2030	May-30	2,430
2030	Jun-30	2,459
2030	Jul-30	2,604
2030	Aug-30	2,622
2030	Sep-30	2,484
2030	Oct-30	2,468
2030	Nov-30	2,480
2030	Dec-30	2,464
2031	Jan-31	2,338
2031	Feb-31	2,034
2031	Mar-31	2,217
2031	Apr-31	2,260
2031	May-31	2,411
2031	Jun-31	2,441
2031	Jul-31	2,584
2031	Aug-31	2,602
2031	Sep-31	2,465
2031	Oct-31	2,449
2031	Nov-31	2,461
2031	Dec-31	2,445
2032	Jan-32	2,322
2032	Feb-32	2,019
2032	Mar-32	2,202
2032	Apr-32	2,244
2032	May-32	2,394
2032	Jun-32	2,423
2032	Jul-32	2,566
2032	Aug-32	2,583
2032	Sep-32	2,447
2032	Oct-32	2,431
2032	Nov-32	2,443
2032	Dec-32	2,428

**Monthly Small CoGen (C&I) Gas Demand:
Recorded (2019) and
Forecast (2020-2035) (MDth)**

Year	Month	Small Cogen (C&I) (G-50) Gas Demand (MDth)
2033	Jan-33	2,305
2033	Feb-33	2,005
2033	Mar-33	2,186
2033	Apr-33	2,228
2033	May-33	2,377
2033	Jun-33	2,406
2033	Jul-33	2,548
2033	Aug-33	2,565
2033	Sep-33	2,430
2033	Oct-33	2,414
2033	Nov-33	2,426
2033	Dec-33	2,411
2034	Jan-34	2,287
2034	Feb-34	1,989
2034	Mar-34	2,168
2034	Apr-34	2,210
2034	May-34	2,358
2034	Jun-34	2,386
2034	Jul-34	2,527
2034	Aug-34	2,544
2034	Sep-34	2,410
2034	Oct-34	2,395
2034	Nov-34	2,406
2034	Dec-34	2,391
2035	Jan-35	2,268
2035	Feb-35	1,972
2035	Mar-35	2,150
2035	Apr-35	2,192
2035	May-35	2,338
2035	Jun-35	2,367
2035	Jul-35	2,506
2035	Aug-35	2,523
2035	Sep-35	2,391
2035	Oct-35	2,375
2035	Nov-35	2,386
2035	Dec-35	2,371

2020 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.

2020 CALIFORNIA GAS REPORT

ENHANED OIL RECOVERY-RELATED COGENERATION

Enhanced Oil Recovery

2020 CALIFORNIA GAS REPORT WORKPAPERS

Forecasted demand for 2020 to 2035 assumes that, for both Steaming & Cogen use, EOR is going to maintain at 2019 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 2019 actuals.

Southern California Gas Company
EOR Workpaper

		MDTH/Year				MDTH/Year			
		Steaming				Cogen			
		MPD	HPD	TLS	Total	MPD	HPD	TLS	Total
Units	**Year**								
Mdth/year	2019 actual	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2020 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2021 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2022 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2023 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2024 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2025 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2026 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2027 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2028 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2029 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2030 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2031 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2032 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2033 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2034 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426
Mdth/year	2035 forecast	62	10,074	2,015	12,151	0	0	6,426	6,426

2020 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.

2020 CALIFORNIA GAS REPORT

WHOLESALE AND INTERNATIONAL REQUIREMENTS

2020 CALIFORNIA GAS REPORT

SAN DIEGO GAS & ELECTRIC COMPANY

FOR DETAILS ABOUT SDG&E PLEASE REFER TO THE 2020 CALIFORNIA GAS REPORT WORKPAPERS FILED BY SAN DIEGO GAS & ELECTRIC COMPANY

2020 CALIFORNIA GAS REPORT

LONG BEACH ENERGY RESOURCES DEPARTMENT

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

2020 CALIFORNIA GAS REPORT

SOUTHWEST GAS CORPORATION

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

2020 CALIFORNIA GAS REPORT

CITY OF VERNON

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

2020 CALIFORNIA GAS REPORT

ECOGAS- MEXICO

The workpapers for ECOGAS have been redacted in this version.

2020 CALIFORNIA GAS REPORT

CORE PEAK DAY FORECAST

SoCalGas Monthly Heating Degree Day (HDD) Weather Designs (Calendar Based)					
Month	Cold		Average	Hot	
	1-in-35 Design	1-in-10 Design		1-in-10 Design	1-in-35 Design
Jan-2019	310.4	293.2	260.3	227.4	210.2
Feb-2019	273.4	258.2	229.2	200.2	185.1
Mar-2019	196.0	185.1	164.3	143.5	132.7
Apr-2019	128.6	121.5	107.8	94.2	87.1
May-2019	56.2	53.1	47.1	41.1	38.0
Jun-2019	11.4	10.8	9.6	8.3	7.7
Jul-2019	2.5	2.4	2.1	1.8	1.7
Aug-2019	2.1	2.0	1.8	1.6	1.5
Sep-2019	5.0	4.7	4.2	3.7	3.4
Oct-2019	38.0	35.9	31.9	27.8	25.7
Nov-2019	156.7	148.0	131.4	114.8	106.1
Dec-2019	337.9	319.2	283.3	247.5	228.8
Jan-2020	309.6	292.4	259.5	226.6	209.4
Feb-2020	272.6	257.5	228.5	199.5	184.4
Mar-2020	195.4	184.6	163.8	143.0	132.2
Apr-2020	128.2	121.1	107.5	93.8	86.7
May-2020	56.0	52.9	47.0	41.0	37.9
Jun-2020	11.4	10.7	9.5	8.3	7.7
Jul-2020	2.5	2.4	2.1	1.8	1.7
Aug-2020	2.1	2.0	1.8	1.6	1.4
Sep-2020	5.0	4.7	4.2	3.7	3.4
Oct-2020	37.9	35.8	31.8	27.7	25.6
Nov-2020	156.2	147.6	131.0	114.3	105.7
Dec-2020	337.0	318.3	282.5	246.6	227.9
Jan-2021	308.8	291.6	258.7	225.7	208.6
Feb-2021	271.9	256.8	227.8	198.8	183.7
Mar-2021	194.9	184.1	163.3	142.5	131.7
Apr-2021	127.9	120.8	107.1	93.5	86.4
May-2021	55.9	52.8	46.8	40.9	37.7
Jun-2021	11.3	10.7	9.5	8.3	7.7
Jul-2021	2.5	2.4	2.1	1.8	1.7
Aug-2021	2.1	2.0	1.8	1.6	1.4
Sep-2021	5.0	4.7	4.2	3.6	3.4
Oct-2021	37.8	35.7	31.7	27.6	25.5
Nov-2021	155.8	147.2	130.5	113.9	105.3
Dec-2021	336.1	317.4	281.6	245.7	227.0
Jan-2022	307.9	290.8	257.8	224.9	207.7
Feb-2022	271.2	256.1	227.1	198.1	183.0
Mar-2022	194.4	183.6	162.8	142.0	131.2
Apr-2022	127.6	120.4	106.8	93.2	86.1
May-2022	55.7	52.6	46.7	40.7	37.6
Jun-2022	11.3	10.7	9.5	8.3	7.6
Jul-2022	2.5	2.3	2.1	1.8	1.7
Aug-2022	2.1	2.0	1.8	1.6	1.4
Sep-2022	5.0	4.7	4.2	3.6	3.4
Oct-2022	37.7	35.6	31.6	27.5	25.4
Nov-2022	155.4	146.7	130.1	113.5	104.8
Dec-2022	335.2	316.5	280.7	244.8	226.1
Jan-2023	307.1	289.9	257.0	224.1	206.9
Feb-2023	270.5	255.3	226.4	197.4	182.2
Mar-2023	193.9	183.0	162.3	141.5	130.6
Apr-2023	127.2	120.1	106.5	92.8	85.7
May-2023	55.6	52.5	46.5	40.6	37.4
Jun-2023	11.3	10.6	9.4	8.2	7.6
Jul-2023	2.5	2.3	2.1	1.8	1.7
Aug-2023	2.1	2.0	1.8	1.5	1.4

SoCalGas Monthly Heating Degree Day (HDD) Weather Designs (Calendar Based)					
Month	Cold		Average	Hot	
	1-in-35 Design	1-in-10 Design		1-in-10 Design	1-in-35 Design
Sep-2023	5.0	4.7	4.1	3.6	3.3
Oct-2023	37.6	35.5	31.5	27.4	25.3
Nov-2023	155.0	146.3	129.7	113.1	104.4
Dec-2023	334.3	315.6	279.8	243.9	225.3
Jan-2024	306.3	289.1	256.2	223.3	206.1
Feb-2024	269.8	254.6	225.6	196.6	181.5
Mar-2024	193.4	182.5	161.7	141.0	130.1
Apr-2024	126.9	119.8	106.1	92.5	85.4
May-2024	55.4	52.3	46.4	40.4	37.3
Jun-2024	11.2	10.6	9.4	8.2	7.6
Jul-2024	2.5	2.3	2.1	1.8	1.7
Aug-2024	2.1	2.0	1.8	1.5	1.4
Sep-2024	4.9	4.7	4.1	3.6	3.3
Oct-2024	37.5	35.4	31.4	27.3	25.2
Nov-2024	154.6	145.9	129.3	112.7	104.0
Dec-2024	333.4	314.7	278.9	243.1	224.4
Jan-2025	305.5	288.3	255.4	222.5	205.3
Feb-2025	269.0	253.9	224.9	195.9	180.8
Mar-2025	192.9	182.0	161.2	140.4	129.6
Apr-2025	126.5	119.4	105.8	92.1	85.0
May-2025	55.3	52.2	46.2	40.3	37.2
Jun-2025	11.2	10.6	9.4	8.2	7.5
Jul-2025	2.5	2.3	2.1	1.8	1.7
Aug-2025	2.1	2.0	1.8	1.5	1.4
Sep-2025	4.9	4.7	4.1	3.6	3.3
Oct-2025	37.4	35.3	31.3	27.2	25.1
Nov-2025	154.2	145.5	128.9	112.3	103.6
Dec-2025	332.5	313.8	278.0	242.2	223.5
Jan-2026	304.7	287.5	254.6	221.6	204.5
Feb-2026	268.3	253.2	224.2	195.2	180.1
Mar-2026	192.3	181.5	160.7	139.9	129.1
Apr-2026	126.2	119.1	105.4	91.8	84.7
May-2026	55.1	52.0	46.1	40.1	37.0
Jun-2026	11.2	10.5	9.3	8.1	7.5
Jul-2026	2.5	2.3	2.1	1.8	1.6
Aug-2026	2.1	2.0	1.8	1.5	1.4
Sep-2026	4.9	4.6	4.1	3.6	3.3
Oct-2026	37.3	35.2	31.2	27.1	25.0
Nov-2026	153.8	145.1	128.5	111.9	103.2
Dec-2026	331.6	312.9	277.1	241.3	222.6
Jan-2027	303.8	286.7	253.7	220.8	203.7
Feb-2027	267.6	252.5	223.5	194.5	179.4
Mar-2027	191.8	181.0	160.2	139.4	128.6
Apr-2027	125.9	118.7	105.1	91.5	84.4
May-2027	55.0	51.9	45.9	40.0	36.9
Jun-2027	11.1	10.5	9.3	8.1	7.5
Jul-2027	2.5	2.3	2.0	1.8	1.6
Aug-2027	2.1	2.0	1.8	1.5	1.4
Sep-2027	4.9	4.6	4.1	3.6	3.3
Oct-2027	37.2	35.1	31.1	27.0	24.9
Nov-2027	153.4	144.7	128.1	111.5	102.8
Dec-2027	330.8	312.1	276.2	240.4	221.7
Jan-2028	303.0	285.8	252.9	220.0	202.8
Feb-2028	266.9	251.7	222.8	193.8	178.6
Mar-2028	191.3	180.5	159.7	138.9	128.1
Apr-2028	125.5	118.4	104.8	91.1	84.0

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

Month	Cold		Average	Hot	
	1-in-35 Design	1-in-10 Design		1-in-10 Design	1-in-35 Design
May-2028	54.8	51.7	45.8	39.8	36.7
Jun-2028	11.1	10.5	9.3	8.1	7.4
Jul-2028	2.4	2.3	2.0	1.8	1.6
Aug-2028	2.1	2.0	1.7	1.5	1.4
Sep-2028	4.9	4.6	4.1	3.6	3.3
Oct-2028	37.1	35.0	31.0	26.9	24.8
Nov-2028	152.9	144.3	127.7	111.0	102.4
Dec-2028	329.9	311.2	275.3	239.5	220.8
Jan-2029	302.2	285.0	252.1	219.2	202.0
Feb-2029	266.2	251.0	222.0	193.0	177.9
Mar-2029	190.8	179.9	159.2	138.4	127.5
Apr-2029	125.2	118.1	104.4	90.8	83.7
May-2029	54.7	51.6	45.6	39.7	36.6
Jun-2029	11.1	10.5	9.3	8.0	7.4
Jul-2029	2.4	2.3	2.0	1.8	1.6
Aug-2029	2.1	2.0	1.7	1.5	1.4
Sep-2029	4.9	4.6	4.1	3.5	3.3
Oct-2029	37.0	34.9	30.9	26.8	24.7
Nov-2029	152.5	143.9	127.2	110.6	102.0
Dec-2029	329.0	310.3	274.4	238.6	219.9
Jan-2030	301.4	284.2	251.3	218.4	201.2
Feb-2030	265.4	250.3	221.3	192.3	177.2
Mar-2030	190.3	179.4	158.6	137.9	127.0
Apr-2030	124.8	117.7	104.1	90.5	83.3
May-2030	54.5	51.4	45.5	39.5	36.4
Jun-2030	11.1	10.4	9.2	8.0	7.4
Jul-2030	2.4	2.3	2.0	1.8	1.6
Aug-2030	2.1	2.0	1.7	1.5	1.4
Sep-2030	4.9	4.6	4.1	3.5	3.2
Oct-2030	36.9	34.8	30.8	26.7	24.6
Nov-2030	152.1	143.4	126.8	110.2	101.5
Dec-2030	328.1	309.4	273.6	237.7	219.0
Jan-2031	300.6	283.4	250.5	217.6	200.4
Feb-2031	264.7	249.6	220.6	191.6	176.5
Mar-2031	189.8	178.9	158.1	137.3	126.5
Apr-2031	124.5	117.4	103.8	90.1	83.0
May-2031	54.4	51.3	45.3	39.4	36.3
Jun-2031	11.0	10.4	9.2	8.0	7.4
Jul-2031	2.4	2.3	2.0	1.8	1.6
Aug-2031	2.1	2.0	1.7	1.5	1.4
Sep-2031	4.9	4.6	4.0	3.5	3.2
Oct-2031	36.8	34.7	30.7	26.6	24.5
Nov-2031	151.7	143.0	126.4	109.8	101.1
Dec-2031	327.2	308.5	272.7	236.8	218.1
Jan-2032	299.8	282.6	249.7	216.7	199.6
Feb-2032	264.0	248.9	219.9	190.9	175.8
Mar-2032	189.2	178.4	157.6	136.8	126.0
Apr-2032	124.2	117.0	103.4	89.8	82.7
May-2032	54.2	51.1	45.2	39.2	36.1
Jun-2032	11.0	10.4	9.2	8.0	7.3
Jul-2032	2.4	2.3	2.0	1.7	1.6
Aug-2032	2.1	2.0	1.7	1.5	1.4
Sep-2032	4.8	4.6	4.0	3.5	3.2
Oct-2032	36.7	34.6	30.6	26.5	24.4
Nov-2032	151.3	142.6	126.0	109.4	100.7
Dec-2032	326.3	307.6	271.8	235.9	217.2

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

Month	Cold		Average	Hot	
	1-in-35 Design	1-in-10 Design		1-in-10 Design	1-in-35 Design
Jan-2033	298.9	281.8	248.8	215.9	198.7
Feb-2033	263.3	248.1	219.2	190.2	175.0
Mar-2033	188.7	177.9	157.1	136.3	125.5
Apr-2033	123.8	116.7	103.1	89.4	82.3
May-2033	54.1	51.0	45.0	39.1	36.0
Jun-2033	11.0	10.3	9.1	7.9	7.3
Jul-2033	2.4	2.3	2.0	1.7	1.6
Aug-2033	2.1	1.9	1.7	1.5	1.4
Sep-2033	4.8	4.5	4.0	3.5	3.2
Oct-2033	36.6	34.5	30.5	26.4	24.3
Nov-2033	150.9	142.2	125.6	109.0	100.3
Dec-2033	325.4	306.7	270.9	235.0	216.3
Jan-2034	298.1	280.9	248.0	215.1	197.9
Feb-2034	262.5	247.4	218.4	189.4	174.3
Mar-2034	188.2	177.4	156.6	135.8	125.0
Apr-2034	123.5	116.4	102.7	89.1	82.0
May-2034	54.0	50.8	44.9	38.9	35.8
Jun-2034	10.9	10.3	9.1	7.9	7.3
Jul-2034	2.4	2.3	2.0	1.7	1.6
Aug-2034	2.1	1.9	1.7	1.5	1.4
Sep-2034	4.8	4.5	4.0	3.5	3.2
Oct-2034	36.5	34.4	30.4	26.3	24.2
Nov-2034	150.5	141.8	125.2	108.6	99.9
Dec-2034	324.5	305.8	270.0	234.2	215.5
Jan-2035	297.3	280.1	247.2	214.3	197.1
Feb-2035	261.8	246.7	217.7	188.7	173.6
Mar-2035	187.7	176.8	156.1	135.3	124.4
Apr-2035	123.1	116.0	102.4	88.8	81.6
May-2035	53.8	50.7	44.7	38.8	35.7
Jun-2035	10.9	10.3	9.1	7.9	7.2
Jul-2035	2.4	2.3	2.0	1.7	1.6
Aug-2035	2.1	1.9	1.7	1.5	1.4
Sep-2035	4.8	4.5	4.0	3.5	3.2
Oct-2035	36.4	34.3	30.3	26.2	24.1
Nov-2035	150.0	141.4	124.8	108.2	99.5
Dec-2035	323.6	304.9	269.1	233.3	214.6

SoCalGas Annual Heating Degree Day (HDD) Weather Designs (Calendar Based)					
Year	Cold		Average	Hot	
	1-in-35 Design	1-in-10 Design		1-in-10 Design	1-in-35 Design
2019	1,518	1,434	1,273	1,112	1,028
2020	1,514	1,430	1,269	1,108	1,024
2021	1,510	1,426	1,265	1,104	1,020
2022	1,506	1,422	1,261	1,100	1,016
2023	1,502	1,418	1,257	1,096	1,012
2024	1,498	1,414	1,253	1,092	1,008
2025	1,494	1,410	1,249	1,088	1,004
2026	1,490	1,406	1,245	1,084	1,000
2027	1,486	1,402	1,241	1,080	996
2028	1,482	1,398	1,237	1,076	992
2029	1,478	1,394	1,233	1,072	988
2030	1,474	1,390	1,229	1,068	984
2031	1,470	1,386	1,225	1,064	980
2032	1,466	1,382	1,221	1,060	976
2033	1,462	1,378	1,217	1,056	972
2034	1,458	1,374	1,213	1,052	968
2035	1,454	1,370	1,209	1,048	964

2020-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-2" Likelihood Cold Day Temperature

No.	"CGR_B"	CLASS	2019	2020	2021	2022	2023	2024	2025	2026	2027	2030	2035
1		RESIDEN	2005.7	1963.0	1949.2	1929.2	1912.7	1896.9	1880.3	1862.5	1844.7	1792.8	1778.5
2		Com G10	453.0	428.4	425.7	432.5	428.7	424.0	417.5	410.5	405.0	392.0	377.6
2		GAC 2/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2		GEN 2/	2.6	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
3		Ind G10	70.1	66.0	63.1	63.1	62.4	61.5	60.2	58.9	57.3	52.7	46.5
4		NGV 2/	41.1	42.0	42.6	43.3	43.9	44.6	45.2	45.9	46.5	48.5	51.7
Total:		MDth/day	2572.5	2502.4	2483.8	2471.2	2450.9	2430.1	2406.3	2380.9	2356.8	2289.1	2257.5
		MMcf/day 4/	2488.9	2421.1	2403.0	2390.9	2371.2	2351.1	2328.1	2303.5	2280.1	2214.6	2184.1
		Days per Mo	31	31	31	31	31	31	31	31	31	31	31
		Pk-Day Temp. (deg-F) =	45.7	45.7	45.7	45.7	45.7	45.7	45.7	45.7	45.7	45.7	45.7
		Hdd: December--AvgYr =	283.3	282.5	281.6	280.7	279.8	278.9	278.0	277.1	276.2	273.6	269.1
		Hdd: December--ColdYr =	337.9	337.0	336.1	335.2	334.3	333.4	332.5	331.6	330.8	328.1	323.6
		"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 2020-CGR Res and C&I Calculations

Notes:

1/ =("Avg-Dec" / 31 days) + {[("Cold-Dec" - "Avg-Dec") / ("Cold-Dec-Hdd" - "Avg-Dec-Hdd")]
* [(65 degF - 45.7 degF) - (Avg-Dec-Hdd / 31 days)]}

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf= 1.0336

2020-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-10" Likelihood Cold Day Temperature

No.	"CGR_B"	CLASS	2019	2020	2021	2022	2023	2024	2025	2026	2027	2030	2035
1		RESIDEN	2298.4	2252.6	2237.8	2215.9	2198.2	2181.1	2163.2	2143.9	2124.4	2067.5	2046.8
2		Com G10	502.0	477.4	474.7	481.5	477.7	473.0	466.5	459.5	454.0	441.0	426.6
2		GAC 2/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2		GEN 2/	2.6	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
3		Ind G10	73.3	69.0	66.0	66.0	65.3	64.3	62.8	61.4	59.8	54.8	48.2
4		NGV 2/	41.1	42.0	42.6	43.3	43.9	44.6	45.2	45.9	46.5	48.5	51.7
	Total:	MDth/day	2917.4	2844.1	2824.2	2809.8	2788.2	2766.1	2740.9	2713.8	2687.9	2614.9	2576.5
		MMcf/day 4/	2822.6	2751.6	2732.4	2718.5	2697.5	2676.2	2651.8	2625.6	2600.5	2529.9	2492.7
		Days per Mo	31	31	31	31	31	31	31	31	31	31	31
		Pk-Day Temp. (deg-F) =	42.2	42.2	42.2	42.2	42.2	42.2	42.2	42.2	42.2	42.2	42.2
		Hdd: December--AvgYr =	283.3	282.5	281.6	280.7	279.8	278.9	278.0	277.1	276.2	273.6	269.1
		Hdd: December--ColdYr =	337.9	337.0	336.1	335.2	334.3	333.4	332.5	331.6	330.8	328.1	323.6
		"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 2020-CGR Res and C&I Calculations

Notes:

1/ =("Avg-Dec" / 31 days) + {[("Cold-Dec" - "Avg-Dec") / ("Cold-Dec-Hdd" - "Avg-Dec-Hdd")]
* [(65 degF - 42.2 degF) - (Avg-Dec-Hdd / 31 days)]}

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf= 1.0336

2020-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-35" Likelihood Cold Day Temperature

No.	"CGR_B"	CLASS	2019	2020	2021	2022	2023	2024	2025	2026	2027	2030	2035
1		RESIDEN	2440.6	2393.2	2377.9	2355.2	2336.8	2319.2	2300.7	2280.6	2260.3	2201.0	2177.1
2		Com G10	525.8	501.2	498.5	505.3	501.5	496.8	490.3	483.3	477.8	464.8	450.4
2		GAC 2/	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2		GEN 2/	2.6	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
3		Ind G10	74.8	70.5	67.4	67.4	66.6	65.6	64.1	62.7	61.0	55.9	49.0
4		NGV 2/	41.1	42.0	42.6	43.3	43.9	44.6	45.2	45.9	46.5	48.5	51.7
Total:		MDth/day	3084.9	3010.0	2989.6	2974.3	2952.0	2929.3	2903.5	2875.6	2848.8	2773.2	2731.4
		MMcf/day 4/	2984.6	2912.1	2892.4	2877.6	2856.0	2834.0	2809.1	2782.1	2756.2	2683.1	2642.6
		Days per Mo	31	31	31	31	31	31	31	31	31	31	31
		Pk-Day Temp. (deg-F) =	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5	40.5
		Hdd: December--AvgYr =	283.3	282.5	281.6	280.7	279.8	278.9	278.0	277.1	276.2	273.6	269.1
		Hdd: December--ColdYr =	337.9	337.0	336.1	335.2	334.3	333.4	332.5	331.6	330.8	328.1	323.6
		"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 2020-CGR Res and C&I Calculations

Notes:

1/ =("Avg-Dec" / 31 days) + {[("Cold-Dec" - "Avg-Dec") / ("Cold-Dec-Hdd" - "Avg-Dec-Hdd")]
* [(65 degF - 40.5 degF) - (Avg-Dec-Hdd / 31 days)]}

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf = 1.0336

2020-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
Temp=December, Average Year

No.	"CGR_CLASS	2019	2020	2021	2022	2023	2024	2025	2026	2027	2030	2035
1	Residen	35836.4	34719.3	34310.1	33782.8	33318.4	32861.7	32392.4	31916.9	31448.0	30084.9	29900.4
2	Com G10	9633.4	8858.7	8761.4	8961.3	8830.2	8672.6	8458.5	8229.2	8047.4	7604.7	7096.0
2	GAC	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
2	GEN	79.3	96.4	96.4	96.4	96.4	96.4	96.4	96.4	96.4	96.4	96.4
3	Ind G10	1888.3	1770.0	1696.1	1696.5	1680.1	1656.1	1621.3	1588.8	1549.6	1433.5	1287.5
4	NGV	1275.4	1300.8	1321.0	1341.2	1361.4	1381.6	1401.8	1422.0	1442.2	1502.8	1603.8
		48714	46746	46186	45879	45287	44669	43971	43254	42585	40723	39985

2020-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
Temp=December, Cold Year

No.	"CGR_CLASS	2019	2020	2021	2022	2023	2024	2025	2026	2027	2030	2035
1	Residen	40397.0	39231.2	38806.3	38250.5	37765.6	37290.5	36801.3	36300.9	35805.9	34365.5	34080.4
2	Com G10	10396.9	9622.1	9524.9	9724.7	9593.7	9436.1	9221.9	8992.6	8810.8	8368.2	7859.5
2	GAC	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
2	GEN	79.3	96.4	96.4	96.4	96.4	96.4	96.4	96.4	96.4	96.4	96.4
3	Ind G10	1937.7	1817.4	1741.2	1741.2	1723.9	1698.9	1662.8	1628.9	1588.0	1466.9	1313.2
4	NGV	1275.4	1300.8	1321.0	1341.2	1361.4	1381.6	1401.8	1422.0	1442.2	1502.8	1603.8
		54087	52069	51491	51155	50542	49904	49185	48442	47744	45801	44954
	Mdth/Hdd	98.5	97.6	97.3	96.7	96.4	96.0	95.6	95.1	94.6	93.1	91.1

2020 CALIFORNIA GAS REPORT

SUPPORTING DATA

2020 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

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	0.0056	Big Bear Lake	Lake Arrowhead
2. Low desert	0.0376	Palm Springs	Palm Springs
		El Centro	Brawley
3. Coastal	0.1794	Los Angeles Airport	Los Angeles Airport
		Newport Beach	Newport Beach Harbor
		Santa Barbara Airport	Santa Barbara Airport
4. High desert	0.0701	Bakersfield	Bakersfield Airport
		Lancaster Airport	Palmdale
		Fresno	Visalia
5. Interior valleys	0.3731	Burbank	Burbank
		Pasadena	Pasadena
		Ontario	Pomona Cal Poly
		Rialto	Redlands
6. Basin	0.33416	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 2019 customer counts. These weights have been used in calculating the data shown from January 2000 to December 2019.

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: utilinet.sempra.com/departments/massmarkets/weather/b_detail/prelimdeci.txt for various individual weather stations as well as for its system average values of HDD. Annual HDDs for the entire service area from 2000 to 2019 are listed in Table 2, below.

Table 2

Calendar Month Heating Degree-Days (Jan. 2000 through Dec. 2019)

	Month												Total
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	"Cal-Year"
2000	246	242	209	80	25	5	2	1	3	64	246	240	1363
2001	377	336	194	207	26	6	4	3	3	20	145	357	1678
2002	332	201	225	148	78	10	2	4	8	77	91	313	1489
2003	140	231	165	179	73	17	1	1	3	15	199	304	1328
2004	290	300	85	84	17	8	3	2	3	72	226	290	1380
2005	285	207	175	115	34	11	4	1	9	44	98	233	1216
2006	270	199	337	161	28	3	0	1	5	36	102	276	1418
2007	345	213	124	116	50	16	1	1	12	36	125	351	1390
2008	345	261	148	123	75	8	1	0	2	23	74	332	1392
2009	194	258	192	133	18	15	3	4	1	43	115	318	1294
2010	252	219	172	163	71	13	8	9	13	42	202	267	1431
2011	248	306	210	104	79	26	2	3	6	39	206	348	1577
2012	222	235	221	117	38	11	5	1	1	16	110	299	1276
2013	328	262	125	65	17	4	1	2	2	43	102	255	1206
2014	141	147	89	75	19	4	0	1	1	5	65	222	769
2015	178	93	63	67	68	5	1	0	1	4	160	314	954
2016	280	110	112	53	45	8	1	1	3	14	110	266	1003
2017	317	207	97	43	49	6	1	0	4	12	49	173	958
2018	154	209	179	71	56	6	0	0	1	10	78	246	1010
2019	261	348	164	52	76	9	2	1	3	22	124	262	1324
20-Yr-Avg (Jan2000-Dec2019)													
Avg.	**260.3**	**229.2**	**164.3**	**107.8**	**47.1**	**9.6**	**2.1**	**1.8**	**4.2**	**31.9**	**131.4**	**283.3**	**1272.8**
St.Dev.	**71.1**	**65.9**	**63.1**	**46.5**	**23.4**	**5.6**	**2.0**	**2.1**	**3.6**	**21.5**	**56.8**	**48.1**	**230.3**
Min.	**140.0**	**93.0**	**63.0**	**43.0**	**17.0**	**3.0**	**0.0**	**0.0**	**1.0**	**4.0**	**49.0**	**173.0**	**769.0**
Max.	**377.0**	**348.0**	**337.0**	**207.0**	**79.0**	**26.0**	**8.0**	**9.0**	**13.0**	**77.0**	**246.0**	**357.0**	**1678.0**

II. Calculations to Define Our Average-Temperature Year

The simple average of the 20-year period (January 2000 through December 2019) 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 2014-2018 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 2014-2018 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 2014-2018. The dataset is SoCalGas system-wide annual HDD for the years 1998-2018. The regression equation is:

$$HDD_t = \alpha + \beta * t + \beta_{2014-2018} * D_{2014-2018} + \varepsilon$$

where $D_{2014-2018}$ is a dummy variable for the years 2014-2018 and $\beta_{2014-2018}$is the corresponding dummy coefficient. This regression equation estimates average HDD over the period 1998-2018 controlling for time trends in HDD and the warm weather regime of years 2014-2018. It's important to note that p-value for the estimate of $\beta_{2014-2018}$ is 0.02% indicating an extremely low probability that membership in the group of years 2014-2018 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	0.870186092
R Square	0.757223834
Adjusted R Squar	0.728661932
Standard Error	119.9424451
Observations	20

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	2	762803.9678	381401.9839	26.51167408	5.94636E-06
Residual	17	244565.2322	14386.19013		
Total	19	1007369.2			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	15552.41565	12297.17854	1.264714145	0.22303748
Regime Dummy	-384.1617391	81.57926606	-4.709060987	0.00020228
YEAR	-7.05826087	6.126107381	-1.152160815	0.265200563

The dummy variable's estimated effect, $\beta_{2014-2018}$, is subtracted from the actual annual HDD data for years 2014-2018 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, which is 120.9 HDD, these equations yield values of about 1,518 HDD for a "1-in-35" cold year and 1,434 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 = 1,518 which equals approximately
1,273 average-year HDDs + 2.025 * 120.9

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 2000 to 2019, as

shown as the bottom of Table 2, above. For example, the average-year December value of 283.3 HDD equals the simple average of the 20 December HDD figures from 2000 to 2019. SoCalGas calculates the cold--temperature-year monthly HDD values using the same distribution of average-year HDDs. For example, since 22.25 percent of average-temperature-year HDDs occurred in December, the estimated number of HDDs during December for a 1-in-35 cold-year is equal to 1,518 HDDs multiplied by 22.25 percent, or 337.9 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	310.4	293.2	260.3	227.4	210.2
February	273.4	258.2	229.2	200.2	185.1
March	196.0	185.1	164.3	143.5	132.7
April	128.6	121.5	107.8	94.2	87.1
May	56.2	53.1	47.1	41.1	38.0
June	11.4	10.8	9.6	8.3	7.7
July	2.5	2.4	2.1	1.8	1.7
August	2.1	2.0	1.8	1.6	1.5
September	5.0	4.7	4.2	3.7	3.4
October	38.0	35.9	31.9	27.8	25.7
November	156.7	148.0	131.4	114.8	106.1
December	337.9	319.2	283.3	247.5	228.8
	1518	1434	1273	1112	1028

IV. Adjusting Forecasted HDDs for a Climate-Change Trend

SoCalGas incorporates a climate-change warming trend that gradually reduces HDDs by 4 HDDs per year over the forecast period. The annual reduction is based on the latest twenty-year trend in 20-year-averaged HDDs. That is, they are based on the observed trend in changes starting with average HDDs for years 1981-2000, then 1982-2001, 1983-2002...and ending with the average HDDs for years 2000-2019.

Table 5 below shows system HDDs, rolling 20-year averaged HDDs, and the annual changes in those rolling 20-year averages. The actual average annual change is -3.8 HDDs for the most recent twenty of the 20-year averages (with ending years from 2000 through 2019). A simple “ordinary least squares” regression-fitted time trend (using Microsoft Excel’s “LINEST” function) was applied to those same annual changes, resulting in a fitted estimation of -3.9 HDDs per year. Given the fitted and actual average annual changes of -3.9 and -3.8 HDDs, respectively, it was decided to decrease average-year and cold-year forecasted HDD’s by an even 4 HDDs per year, starting with the first forecast year of 2020.

Table 5

Average Annual Changes in 20-Year Averaged Heating-Degree Days

	Regression Fitted trend	Actual
20 years (2000-2019)	-3.9	-3.8

Year	SoCalGas System HDDs	20-year averaged HDDs	Annual change in 20-year averaged HDDs
1981	1178		
1982	1640		
1983	1372		
1984	1322		
1985	1572		
1986	1077		
1987	1489		
1988	1357		
1989	1350		
1990	1428		
1991	1396		
1992	1237		
1993	1199		
1994	1450		
1995	1229		
1996	1174		
1997	1143		
1998	1554		
1999	1527	1348.4	
2000	1363	1352.9	4.4
2001	1678	1377.9	25.0
2002	1489	1370.3	-7.5
2003	1328	1368.1	-2.2
2004	1380	1371.0	2.9
2005	1216	1353.2	-17.8
2006	1418	1370.3	17.1
2007	1390	1365.3	-5.0
2008	1392	1367.1	1.8
2009	1294	1364.3	-2.8
2010	1431	1364.4	0.2
2011	1577	1373.5	9.0
2012	1276	1375.4	2.0
2013	1206	1375.8	0.3
2014	769	1341.7	-34.1
2015	954	1328.0	-13.8
2016	1003	1319.4	-8.5
2017	958	1310.2	-9.3
2018	1010	1283.0	-27.2
2019	1324	1272.8	-10.2

V. Calculating the Peak-Day Design Temperature

SoCalGas' 1-in-35 Peak-Day design temperature of 40.5 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) $AVG_{y,d}$ = sy stem avg value of temperature for calendar year "y" and day "d".

The calendar year, y, can range from 1950 through 2019, 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:

$$(2) \qquad MinAVG_y = \min_{d=1}^{n(y)} \{ AVG_{y,d} \}, \text{ for } y=1950, 1951, \ldots, 2019.$$

(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 6.1 and 6.2, 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 "-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 6.1 and 6.2, below.

In Tables 7.1 and 7.2, the data for -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 7.1 and Table 7.2) 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 "-MinAVG$_y$ " shown in Table 7.1 and Table 7.2, 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

[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

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

(4) $z = (-MinAVG_y - \gamma) / \theta$, 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 7.2 along with the fitted values of the model CDF (the column: "Fitted" Model CDF).

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

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

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

where $z_\delta = [(-TPDD_\delta - \gamma) / \theta]$. In terms of our probability model,

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

which yields the following equation for z_δ,

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

(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 $(1-\delta) = (1 - 1/35) = 1 - 0.0286$,

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

The value of $z_\delta = 1.935$ and $TPDD_\delta = - [\gamma + (z_\delta)(\theta)] = 40.5$ degrees Fahrenheit, with values for "v=N-2"; along with "γ" and "θ" in Tables 7.1 & 7.2, below.

SoCalGas' 1-in-10 peak-day design temperature of 42.2 degrees Fahrenheit, is calculated in a methodologically similar way as for the 40.5 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 $(1-\delta) = (1 - 1/10) = 1 - 0.1000$,

which yields a "z_δ" value of $z_\delta = 1.294$ and, $TPDD_\delta = - [\gamma + (z_\delta)(\theta)] = 42.2$ with values for "v=N-2"; along with "γ" and "θ" in Tables 7.1 and 7.2, 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 7.1 and 7.2, below, is shown in Figure 1.

such that $T\_Dist\{z; \gamma, \theta, v=N-2\} = \int f(t)\, dt$, 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.

[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 6.1

YEAR	MINAVG	Month(MinAvg)
1950	40.9280	Jan
1951	44.6067	Dec
1952	43.1207	Jan
1953	45.7867	Feb
1954	45.7860	Dec
1955	45.8901	Dec
1956	44.9588	Feb
1957	39.5598	Jan
1958	46.3349	Nov
1959	48.3131	Feb
1960	42.3960	Jan
1961	47.2970	Dec
1962	43.4970	Jan
1963	42.7252	Jan
1964	45.2918	Nov
1965	44.8673	Jan
1966	46.7810	Jan
1967	40.8709	Dec
1968	40.7207	Dec
1969	44.8966	Jan
1970	46.8826	Dec
1971	43.1333	Jan
1972	41.5115	Dec
1973	45.1526	Jan
1974	43.0755	Jan
1975	44.6961	Jan
1976	44.9244	Jan
1977	48.4232	Jan
1978	41.7668	Dec
1979	41.4354	Jan
1980	50.4168	Jan
1981	49.3827	Jan
1982	45.4135	Jan
1983	48.7916	Jan
1984	47.0043	Dec
1985	45.1978	Feb
1986	48.6434	Feb
1987	43.5238	Dec
1988	43.3547	Dec
1989	40.6547	Feb
1990	39.1080	Dec
1991	48.7053	Mar
1992	47.4418	Dec
1993	46.2069	Jan
1994	47.2234	Nov

Table 6.2

YEAR	MINAVG	Month(MinAvg)
1995	49.9712	Dec
1996	45.0264	Feb
1997	48.4541	Jan
1998	43.7465	Dec
1999	49.0853	Jan
2000	48.8468	Mar
2001	47.2071	Feb
2002	45.8624	Jan
2003	47.1490	Dec
2004	48.2856	Nov
2005	47.3216	Jan
2006	45.8638	Mar
2007	41.6327	Jan
2008	45.8445	Dec
2009	45.3328	Dec
2010	44.7541	Dec
2011	46.8141	Feb
2012	46.8332	Dec
2013	44.0042	Jan
2014	48.1340	Dec
2015	45.7011	Jan
2016	46.8040	Dec
2017	47.6336	Jan
2018	47.4364	Feb
2019	47.3085	Feb

Table 7.1

alpha= 0.375

Year	Days/Yr	-MinAvg	Month (-MinAvg)	Rank	Emprical CDF	Fitted Model CDF
1980	366	-50.4168	Jan	1	0.0141	-2.243
1995	365	-49.9712	Dec	2	0.0282	-1.942
1981	365	-49.3827	Jan	3	0.0423	-1.751
1999	365	-49.0853	Jan	4	0.0563	-1.607
2000	366	-48.8468	Mar	5	0.0704	-1.490
1983	365	-48.7916	Jan	6	0.0845	-1.390
1991	365	-48.7053	Mar	7	0.0986	-1.302
1986	365	-48.6434	Feb	8	0.1127	-1.224
1997	365	-48.4541	Jan	9	0.1268	-1.152
1977	365	-48.4232	Jan	10	0.1408	-1.085
1959	365	-48.3131	Feb	11	0.1549	-1.023
2004	366	-48.2856	Nov	12	0.1690	-0.965
2014	365	-48.1340	Dec	13	0.1831	-0.910
2017	365	-47.6336	Jan	14	0.1972	-0.857
1992	366	-47.4418	Dec	15	0.2113	-0.807
2018	365	-47.4364	Feb	16	0.2254	-0.759
2005	365	-47.3216	Jan	17	0.2394	-0.712
2019	365	-47.3085	Feb	18	0.2535	-0.667
1961	365	-47.2970	Dec	19	0.2676	-0.623
1994	365	-47.2234	Nov	20	0.2817	-0.581
2001	365	-47.2071	Feb	21	0.2958	-0.539
2003	365	-47.1490	Dec	22	0.3099	-0.499
1984	366	-47.0043	Dec	23	0.3239	-0.459
1970	365	-46.8826	Dec	24	0.3380	-0.420
2012	366	-46.8332	Dec	25	0.3521	-0.381
2011	365	-46.8141	Feb	26	0.3662	-0.343
2016	366	-46.8040	Dec	27	0.3803	-0.306
1966	365	-46.7810	Jan	28	0.3944	-0.269
1958	365	-46.3349	Nov	29	0.4085	-0.232
1993	365	-46.2069	Jan	30	0.4225	-0.196
1955	365	-45.8901	Dec	31	0.4366	-0.160
2006	365	-45.8638	Mar	32	0.4507	-0.124
2002	365	-45.8624	Jan	33	0.4648	-0.089
2008	366	-45.8445	Dec	34	0.4789	-0.053
1953	365	-45.7867	Feb	35	0.4930	-0.018
1954	365	-45.7860	Dec	36	0.5070	0.018
2015	365	-45.7011	Jan	37	0.5211	0.053
1982	365	-45.4135	Jan	38	0.5352	0.089
2009	365	-45.3328	Dec	39	0.5493	0.124
1964	366	-45.2918	Nov	40	0.5634	0.160
1985	365	-45.1978	Feb	41	0.5775	0.196
1973	365	-45.1526	Jan	42	0.5915	0.232
1996	366	-45.0264	Feb	43	0.6056	0.269
1956	366	-44.9588	Feb	44	0.6197	0.306
1976	366	-44.9244	Jan	45	0.6338	0.343

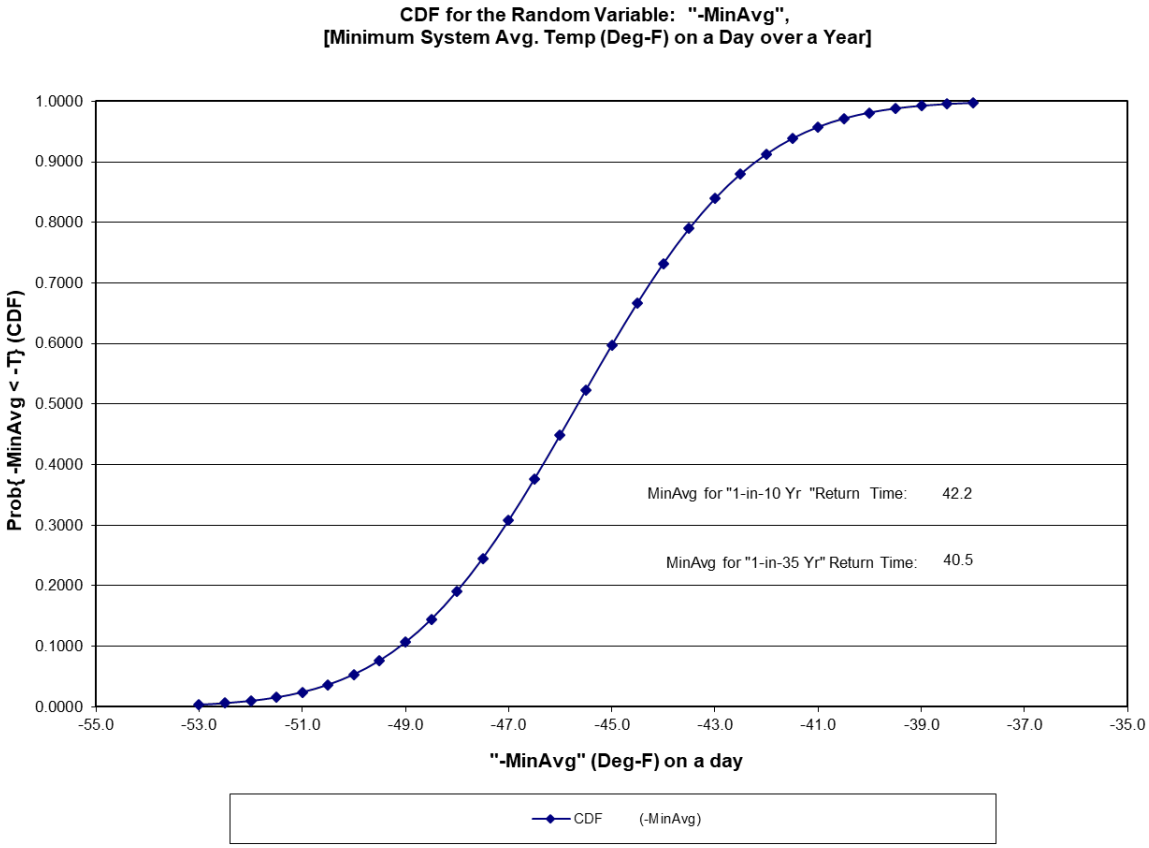
Table 7.2

alpha= 0.375

Year	Days/Yr	-MinAvg	Month (-MinAvg)	Rank	Emprical CDF	Fitted Model CDF
1969	365	-44.8966	Jan	46	0.6479	0.381
1965	365	-44.8673	Jan	47	0.6620	0.420
2010	365	-44.7541	Dec	48	0.6761	0.459
1975	365	-44.6961	Jan	49	0.6901	0.499
1951	365	-44.6067	Dec	50	0.7042	0.539
2013	365	-44.0042	Jan	51	0.7183	0.581
1998	365	-43.7465	Dec	52	0.7324	0.623
1987	365	-43.5238	Dec	53	0.7465	0.667
1962	365	-43.4970	Jan	54	0.7606	0.712
1988	366	-43.3547	Dec	55	0.7746	0.759
1971	365	-43.1333	Jan	56	0.7887	0.807
1952	366	-43.1207	Jan	57	0.8028	0.857
1974	365	-43.0755	Jan	58	0.8169	0.910
1963	365	-42.7252	Jan	59	0.8310	0.965
1960	366	-42.3960	Jan	60	0.8451	1.023
1978	365	-41.7668	Dec	61	0.8592	1.085
2007	365	-41.6327	Jan	62	0.8732	1.152
1972	366	-41.5115	Dec	63	0.8873	1.224
1979	365	-41.4354	Jan	64	0.9014	1.302
1950	365	-40.9280	Jan	65	0.9155	1.390
1967	365	-40.8709	Dec	66	0.9296	1.490
1968	366	-40.7207	Dec	67	0.9437	1.607
1989	365	-40.6547	Feb	68	0.9577	1.751
1957	365	-39.5598	Jan	69	0.9718	1.942
1990	365	-39.1080	Dec	70	0.9859	2.243

"Gamma" (Fitted) =	**-45.66**
"Theta" (Fitted) =	**2.66**
Deg. Freedom=	**68**

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 for "1-in-10 Yr "Return Time: 42.2
MinAvg for "1-in-35 Yr" Return Time: 40.5
"-MinAvg" (Deg-F) on a day
CDF (-MinAvg)

VI. 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 7.1 and 7.2, above) to calculate the fitted temperatures as a function of the empirical CDF listed in Tables 7.1 and 7.2, 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 8.1 and 8.2, 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 parameters (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 0.55 Deg-F.

Table 8.1

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	50.4168	52.1192	-1.7024	2.898273
U	49.9712	51.0581	-1.0869	1.181276
U	49.3827	50.4722	-1.0895	1.187041
U	49.0853	50.0514	-0.9662	0.933491
U	48.8468	49.7167	-0.8698	0.756610
U	48.7916	49.4352	-0.6436	0.414242
U	48.7053	49.1902	-0.4849	0.235086
U	48.6434	48.9717	-0.3282	0.107725
U	48.4541	48.7733	-0.3192	0.101870
U	48.4232	48.5908	-0.1676	0.028099
U	48.3131	48.4212	-0.1081	0.011688
U	48.2856	48.2621	0.0235	0.000552
U	48.1340	48.1118	0.0222	0.000495
U	47.6336	47.9689	-0.3353	0.112429
U	47.4418	47.8325	-0.3907	0.152624
U	47.4364	47.7016	-0.2652	0.070305
U	47.3216	47.5754	-0.2538	0.064416
U	47.3085	47.4535	-0.1451	0.021043
U	47.2970	47.3353	-0.0383	0.001465
U	47.2234	47.2203	0.0031	0.000009
U	47.2071	47.1082	0.0989	0.009777
U	47.1490	46.9986	0.1503	0.022600
U	47.0043	46.8913	0.1130	0.012763
M	46.8826	46.7860	0.0966	0.009330
M	46.8332	46.6825	0.1507	0.022703
M	46.8141	46.5805	0.2336	0.054570
M	46.8040	46.4798	0.3241	0.105046
M	46.7810	46.3804	0.4006	0.160491
M	46.3349	46.2819	0.0529	0.002802
M	46.2069	46.1844	0.0226	0.000509
M	45.8901	46.0875	-0.1974	0.038962
M	45.8638	45.9912	-0.1273	0.016217
M	45.8624	45.8953	-0.0330	0.001087
M	45.8445	45.7998	0.0447	0.001994
M	45.7867	45.7044	0.0822	0.006761
M	45.7860	45.6092	0.1769	0.031286
M	45.7011	45.5138	0.1873	0.035085
M	45.4135	45.4183	-0.0047	0.000022
M	45.3328	45.3224	0.0104	0.000109
M	45.2918	45.2261	0.0657	0.004311
M	45.1978	45.1292	0.0685	0.004698
M	45.1526	45.0317	0.1209	0.014618
M	45.0264	44.9332	0.0931	0.008676
M	44.9588	44.8338	0.1251	0.015645
M	44.9244	44.7331	0.1912	0.036574
M	44.8966	44.6311	0.2655	0.070501
M	44.8673	44.5276	0.3397	0.115398

Table 8.2

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	44.7541	44.4223	0.3318	0.110088
L	44.6961	44.3150	0.3812	0.145303
L	44.6067	44.2054	0.4013	0.161032
L	44.0042	44.0933	-0.0891	0.007931
L	43.7465	43.9783	-0.2318	0.053729
L	43.5238	43.8601	-0.3363	0.113094
L	43.4970	43.7382	-0.2412	0.058155
L	43.3547	43.6120	-0.2574	0.066233
L	43.1333	43.4811	-0.3478	0.120964
L	43.1207	43.3447	-0.2240	0.050163
L	43.0755	43.2018	-0.1264	0.015970
L	42.7252	43.0515	-0.3264	0.106510
L	42.3960	42.8924	-0.4964	0.246428
L	41.7668	42.7228	-0.9560	0.913841
L	41.6327	42.5403	-0.9076	0.823691
L	41.5115	42.3419	-0.8305	0.689680
L	41.4354	42.1234	-0.6880	0.473398
L	40.9280	41.8784	-0.9503	0.903144
L	40.8709	41.5969	-0.7260	0.527050
L	40.7207	41.2622	-0.5415	0.293201
L	40.6547	40.8414	-0.1866	0.034833
L	39.5598	40.2555	-0.6957	0.483996
L	39.1080	39.1944	-0.0864	0.007459
L	44.7541	44.4223	0.3318	0.110088

Overall RMSE ($e_{[i]}$):	**0.48**	**°F**
Upper 3rd RMSE ($e_{[i]}$):	**0.63**	**°F**
Middle 3rd RMSE ($e_{[i]}$):	**0.19**	**°F**
Lower 3rd RMSE ($e_{[i]}$):	**0.55**	**°F**

VII. 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 (40.5°F) associated with a 1-in-35 annual likelihood, the return period is 35 years (δ=1/35). For the 42.2°F peak-day design temperature, the return period is 10 years (δ=1/10). Occasionally, a less precise terminology is used. For example, the 40.5°F peak-day design temperature may be referred to as a "1-in-35 year cold day"; and the 42.2°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*] = $(E[\textit{ return period }])^2 \times (1 - (1 / E[\textit{ return period }]))$,

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

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.

2020 CALIFORNIA GAS REPORT

GAS PRICE FORECAST

The natural gas price forecast used to develop the demand forecasts for SoCalGas and SDG&E was prepared in February 2020 using New York Mercantile Exchange (NYMEX)-based natural gas futures prices and other forecast sources. Consistent with the gas price forecast methodology used to develop demand forecasts authorized by Commission Decision (D.)09-11-006,[1] SoCalGas and SDG&E used this methodology to forecast the cost of gas to be used for determining the cost of Unaccounted-For (UAF) and Company-Use (CU) fuel.

This forecast is based on NYMEX Henry Hub ClearPort Basis Swap futures prices through December 2025. For the period covering January 2026 to December 2027, the natural gas price was forecast was spliced. Beyond December 2027, the gas price forecast at Henry Hub was a blended forecast composed of a composite of proprietary and public market gas price forecasts. Consistent with the integration of the gas procurement function for both SoCalGas and SDG&E set forth in D.07-12-019, a combined core Weighted Average Cost of Gas (WACOG) for both utilities was estimated using 2019 purchase weights by production basin and interstate pipeline receipt points.

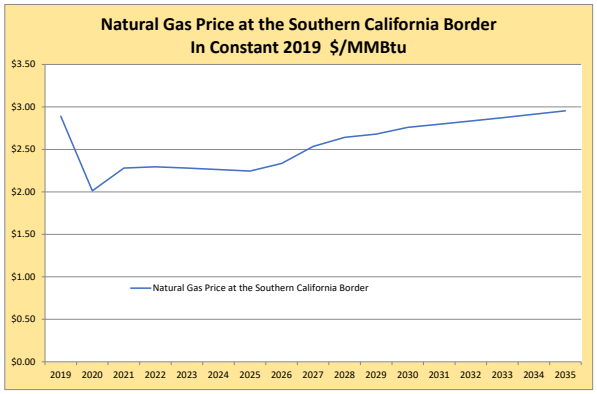
[1] D.09-11-002 approved a settlement agreement in Phase 2 of SoCalGas and SDG&E's 2009 BCAP.

Gas Price Forecast **SoCal Border**

Consistent with the prior CGR practices, the 2020 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 2025. The forecast for 2026 and 2027 reflect a blending of market and fundamental prices, with declining weights for market prices over the two year period. For 2027 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.

SoCal Border **Current $/MMbtu** **Updated Feb 27 2020**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
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
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
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
2018	$ 3.30	$ 3.45	$ 2.24	$ 2.10	$ 1.97	$ 2.47	$ 3.96	$ 3.87	$ 2.39	$ 2.94	$ 4.19	$ 4.90	$ 3.15
2019	$ 3.53	$ 6.83	$ 3.24	$ 1.99	$ 1.77	$ 1.76	$ 2.35	$ 2.39	$ 2.66	$ 2.46	$ 2.71	$ 2.99	$ 2.89
2020	$ 2.26	$ 1.95	$ 2.48	$ 1.39	$ 1.38	$ 1.62	$ 2.19	$ 2.25	$ 1.86	$ 1.98	$ 2.20	$ 2.88	$ 2.04
2021	$ 2.54	$ 3.39	$ 2.26	$ 1.80	$ 1.73	$ 1.95	$ 2.48	$ 2.51	$ 2.10	$ 2.20	$ 2.35	$ 2.98	$ 2.36
2022	$ 2.65	$ 3.50	$ 2.35	$ 1.87	$ 1.79	$ 2.00	$ 2.53	$ 2.57	$ 2.16	$ 2.27	$ 2.42	$ 3.05	$ 2.43
2023	$ 2.72	$ 3.56	$ 2.40	$ 1.92	$ 1.84	$ 2.05	$ 2.58	$ 2.61	$ 2.21	$ 2.31	$ 2.47	$ 3.10	$ 2.48
2024	$ 2.76	$ 3.61	$ 2.46	$ 1.97	$ 1.90	$ 2.11	$ 2.62	$ 2.65	$ 2.25	$ 2.35	$ 2.49	$ 3.13	$ 2.52
2025	$ 2.80	$ 3.64	$ 2.50	$ 2.01	$ 1.94	$ 2.14	$ 2.66	$ 2.69	$ 2.29	$ 2.39	$ 2.54	$ 3.15	$ 2.56
2026	$ 2.83	$ 3.67	$ 2.54	$ 2.11	$ 2.09	$ 2.34	$ 2.89	$ 2.92	$ 2.53	$ 2.63	$ 2.76	$ 3.40	$ 2.73
2027	$ 2.97	$ 3.77	$ 2.69	$ 2.49	$ 2.49	$ 2.75	$ 3.25	$ 3.22	$ 2.88	$ 2.99	$ 3.05	$ 3.71	$ 3.02
2028	$ 3.17	$ 3.93	$ 2.94	$ 2.84	$ 2.77	$ 2.95	$ 3.38	$ 3.41	$ 3.09	$ 3.14	$ 3.18	$ 3.82	$ 3.22
2029	$ 3.31	$ 4.13	$ 3.07	$ 2.89	$ 2.79	$ 2.98	$ 3.52	$ 3.54	$ 3.22	$ 3.28	$ 3.30	$ 4.00	$ 3.34
2030	$ 3.57	$ 4.33	$ 3.19	$ 2.99	$ 2.85	$ 3.14	$ 3.73	$ 3.73	$ 3.41	$ 3.47	$ 3.51	$ 4.19	$ 3.51
2031	$ 3.73	$ 4.39	$ 3.27	$ 3.03	$ 2.99	$ 3.29	$ 3.85	$ 3.87	$ 3.51	$ 3.63	$ 3.66	$ 4.39	$ 3.63
2032	$ 3.70	$ 4.49	$ 3.39	$ 3.20	$ 3.21	$ 3.49	$ 4.00	$ 3.96	$ 3.63	$ 3.75	$ 3.81	$ 4.52	$ 3.76
2033	$ 3.83	$ 4.62	$ 3.52	$ 3.33	$ 3.34	$ 3.63	$ 4.14	$ 4.09	$ 3.76	$ 3.89	$ 3.94	$ 4.67	$ 3.90
2034	$ 3.97	$ 4.75	$ 3.65	$ 3.47	$ 3.48	$ 3.77	$ 4.28	$ 4.23	$ 3.90	$ 4.03	$ 4.08	$ 4.82	$ 4.04
2035	$ 4.11	$ 4.89	$ 3.79	$ 3.60	$ 3.62	$ 3.91	$ 4.42	$ 4.37	$ 4.05	$ 4.18	$ 4.23	$ 4.97	$ 4.18



Gas Price Forecast

SAN JUAN

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
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	$ 1.87	$ 1.93	$ 1.79	$ 2.13	$ 2.42	$ 2.37	$ 2.01	$ 2.19	$ 2.84	$ 3.48	$ 2.35
2019	$ 2.93	$ 2.58	$ 2.41	$ 1.31	$ 1.25	$ 1.49	$ 1.79	$ 1.78	$ 1.97	$ 1.52	$ 2.18	$ 2.32	$ 1.96
2020	$ 1.79	$ 1.59	$ 2.18	$ 1.16	$ 1.18	$ 1.40	$ 1.65	$ 1.69	$ 1.55	$ 1.52	$ 1.71	$ 2.29	$ 1.64
2021	$ 2.28	$ 2.23	$ 1.97	$ 1.58	$ 1.53	$ 1.73	$ 1.94	$ 1.96	$ 1.79	$ 1.74	$ 1.86	$ 2.39	$ 1.92
2022	$ 2.39	$ 2.34	$ 2.05	$ 1.64	$ 1.59	$ 1.79	$ 2.00	$ 2.01	$ 1.85	$ 1.81	$ 1.93	$ 2.46	$ 1.99
2023	$ 2.46	$ 2.40	$ 2.11	$ 1.69	$ 1.64	$ 1.83	$ 2.04	$ 2.06	$ 1.90	$ 1.86	$ 1.98	$ 2.51	$ 2.04
2024	$ 2.50	$ 2.45	$ 2.17	$ 1.74	$ 1.69	$ 1.89	$ 2.09	$ 2.10	$ 1.94	$ 1.89	$ 2.00	$ 2.54	$ 2.08
2025	$ 2.54	$ 2.48	$ 2.21	$ 1.79	$ 1.74	$ 1.93	$ 2.12	$ 2.13	$ 1.98	$ 1.94	$ 2.05	$ 2.57	$ 2.12
2026	$ 2.57	$ 2.51	$ 2.25	$ 1.88	$ 1.88	$ 2.12	$ 2.35	$ 2.36	$ 2.22	$ 2.17	$ 2.27	$ 2.81	$ 2.28
2027	$ 2.70	$ 2.61	$ 2.40	$ 2.26	$ 2.28	$ 2.53	$ 2.72	$ 2.66	$ 2.57	$ 2.54	$ 2.56	$ 3.12	$ 2.58
2028	$ 2.91	$ 2.77	$ 2.65	$ 2.61	$ 2.57	$ 2.74	$ 2.85	$ 2.85	$ 2.78	$ 2.68	$ 2.69	$ 3.23	$ 2.78
2029	$ 3.05	$ 2.97	$ 2.78	$ 2.66	$ 2.59	$ 2.76	$ 2.99	$ 2.98	$ 2.91	$ 2.82	$ 2.81	$ 3.41	$ 2.89
2030	$ 3.31	$ 3.17	$ 2.89	$ 2.76	$ 2.65	$ 2.93	$ 3.19	$ 3.18	$ 3.10	$ 3.01	$ 3.02	$ 3.60	$ 3.07
2031	$ 3.47	$ 3.23	$ 2.98	$ 2.81	$ 2.79	$ 3.07	$ 3.32	$ 3.31	$ 3.20	$ 3.17	$ 3.18	$ 3.80	$ 3.19
2032	$ 3.44	$ 3.33	$ 3.10	$ 2.98	$ 3.01	$ 3.28	$ 3.47	$ 3.40	$ 3.32	$ 3.30	$ 3.32	$ 3.93	$ 3.32
2033	$ 3.57	$ 3.46	$ 3.23	$ 3.10	$ 3.14	$ 3.41	$ 3.60	$ 3.54	$ 3.45	$ 3.43	$ 3.45	$ 4.08	$ 3.46
2034	$ 3.71	$ 3.59	$ 3.36	$ 3.24	$ 3.27	$ 3.55	$ 3.74	$ 3.67	$ 3.59	$ 3.58	$ 3.60	$ 4.23	$ 3.59
2035	$ 3.85	$ 3.73	$ 3.49	$ 3.38	$ 3.42	$ 3.70	$ 3.89	$ 3.82	$ 3.74	$ 3.72	$ 3.74	$ 4.38	$ 3.74

Gas Price Forecast AECO

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
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	$ 1.92	$ 1.39	$ 0.98	$ 1.12	$ 1.26	$ 0.96	$ 1.21	$ 1.29	$ 1.69	$ 1.71	$ 1.46
2019	$ 1.79	$ 2.98	$ 2.66	$ 0.85	$ 1.55	$ 0.58	$ 1.15	$ 0.94	$ 0.61	$ 2.07	$ 2.68	$ 2.30	$ 1.68
2020	$ 2.19	$ 1.75	$ 2.22	$ 0.84	$ 1.01	$ 0.84	$ 1.04	$ 0.95	$ 0.81	$ 1.23	$ 1.65	$ 1.82	$ 1.36
2021	$ 1.73	$ 2.23	$ 2.00	$ 1.26	$ 1.36	$ 1.17	$ 1.33	$ 1.22	$ 1.06	$ 1.45	$ 1.80	$ 1.91	$ 1.54
2022	$ 1.84	$ 2.34	$ 2.09	$ 1.32	$ 1.42	$ 1.22	$ 1.38	$ 1.27	$ 1.12	$ 1.52	$ 1.87	$ 1.98	$ 1.62
2023	$ 1.92	$ 2.40	$ 2.14	$ 1.37	$ 1.47	$ 1.27	$ 1.43	$ 1.32	$ 1.16	$ 1.56	$ 1.92	$ 2.04	$ 1.67
2024	$ 1.96	$ 2.45	$ 2.20	$ 1.43	$ 1.53	$ 1.33	$ 1.47	$ 1.36	$ 1.20	$ 1.59	$ 1.94	$ 2.06	$ 1.71
2025	$ 1.99	$ 2.49	$ 2.24	$ 1.47	$ 1.57	$ 1.36	$ 1.51	$ 1.39	$ 1.24	$ 1.64	$ 1.99	$ 2.09	$ 1.75
2026	$ 2.03	$ 2.51	$ 2.28	$ 1.57	$ 1.71	$ 1.56	$ 1.74	$ 1.62	$ 1.49	$ 1.88	$ 2.20	$ 2.34	$ 1.91
2027	$ 2.16	$ 2.62	$ 2.43	$ 1.95	$ 2.12	$ 1.97	$ 2.10	$ 1.92	$ 1.83	$ 2.24	$ 2.50	$ 2.65	$ 2.21
2028	$ 2.36	$ 2.77	$ 2.68	$ 2.29	$ 2.40	$ 2.17	$ 2.23	$ 2.12	$ 2.04	$ 2.39	$ 2.62	$ 2.75	$ 2.40
2029	$ 2.51	$ 2.97	$ 2.81	$ 2.35	$ 2.42	$ 2.20	$ 2.37	$ 2.24	$ 2.17	$ 2.53	$ 2.75	$ 2.94	$ 2.52
2030	$ 2.76	$ 3.18	$ 2.92	$ 2.45	$ 2.48	$ 2.36	$ 2.58	$ 2.44	$ 2.36	$ 2.72	$ 2.95	$ 3.12	$ 2.69
2031	$ 2.92	$ 3.23	$ 3.01	$ 2.49	$ 2.62	$ 2.51	$ 2.71	$ 2.57	$ 2.46	$ 2.88	$ 3.11	$ 3.33	$ 2.82
2032	$ 2.89	$ 3.33	$ 3.13	$ 2.66	$ 2.84	$ 2.71	$ 2.85	$ 2.66	$ 2.58	$ 3.00	$ 3.25	$ 3.46	$ 2.95
2033	$ 3.03	$ 3.46	$ 3.26	$ 2.79	$ 2.97	$ 2.85	$ 2.99	$ 2.80	$ 2.72	$ 3.14	$ 3.39	$ 3.60	$ 3.08
2034	$ 3.16	$ 3.59	$ 3.39	$ 2.92	$ 3.11	$ 2.99	$ 3.13	$ 2.93	$ 2.86	$ 3.28	$ 3.53	$ 3.75	$ 3.22
2035	$ 3.31	$ 3.73	$ 3.52	$ 3.06	$ 3.25	$ 3.13	$ 3.27	$ 3.08	$ 3.00	$ 3.43	$ 3.68	$ 3.91	$ 3.36

Gas Price Forecast

PERMIAN

$/MMBTU

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
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	$ 1.76	$ 1.63	$ 1.70	$ 1.91	$ 2.11	$ 1.98	$ 1.55	$ 1.84	$ 1.78	$ 1.99	$ 1.94
2019	$ 2.13	$ 1.54	$ 0.85	$ (0.10)	$ (0.15)	$ 0.21	$ 0.49	$ 0.80	$ 1.47	$ 0.87	$ 1.36	$ 1.13	$ 0.88
2020	$ 0.68	$ 0.55	$ 1.85	$ 0.82	$ 0.87	$ 1.10	$ 1.32	$ 1.41	$ 1.35	$ 1.32	$ 1.31	$ 1.71	$ 1.19
2021	$ 2.08	$ 1.98	$ 1.64	$ 1.23	$ 1.22	$ 1.43	$ 1.61	$ 1.68	$ 1.60	$ 1.54	$ 1.46	$ 1.80	$ 1.61
2022	$ 2.19	$ 2.09	$ 1.72	$ 1.30	$ 1.28	$ 1.49	$ 1.67	$ 1.73	$ 1.66	$ 1.61	$ 1.53	$ 1.87	$ 1.68
2023	$ 2.27	$ 2.16	$ 1.78	$ 1.35	$ 1.33	$ 1.53	$ 1.71	$ 1.78	$ 1.71	$ 1.66	$ 1.58	$ 1.93	$ 1.73
2024	$ 2.31	$ 2.21	$ 1.83	$ 1.40	$ 1.39	$ 1.59	$ 1.75	$ 1.81	$ 1.74	$ 1.69	$ 1.60	$ 1.95	$ 1.77
2025	$ 2.34	$ 2.24	$ 1.87	$ 1.44	$ 1.43	$ 1.63	$ 1.79	$ 1.85	$ 1.78	$ 1.74	$ 1.65	$ 1.98	$ 1.81
2026	$ 2.38	$ 2.27	$ 1.91	$ 1.54	$ 1.58	$ 1.82	$ 2.02	$ 2.08	$ 2.03	$ 1.97	$ 1.87	$ 2.23	$ 1.97
2027	$ 2.51	$ 2.37	$ 2.06	$ 1.92	$ 1.98	$ 2.23	$ 2.38	$ 2.38	$ 2.37	$ 2.34	$ 2.16	$ 2.54	$ 2.27
2028	$ 2.71	$ 2.52	$ 2.31	$ 2.27	$ 2.26	$ 2.44	$ 2.52	$ 2.57	$ 2.58	$ 2.48	$ 2.29	$ 2.64	$ 2.47
2029	$ 2.86	$ 2.73	$ 2.44	$ 2.32	$ 2.28	$ 2.46	$ 2.66	$ 2.70	$ 2.71	$ 2.62	$ 2.41	$ 2.83	$ 2.58
2030	$ 3.11	$ 2.93	$ 2.56	$ 2.42	$ 2.34	$ 2.63	$ 2.86	$ 2.89	$ 2.90	$ 2.81	$ 2.62	$ 3.01	$ 2.76
2031	$ 3.27	$ 2.98	$ 2.64	$ 2.46	$ 2.48	$ 2.77	$ 2.99	$ 3.03	$ 3.00	$ 2.97	$ 2.77	$ 3.22	$ 2.88
2032	$ 3.24	$ 3.08	$ 2.76	$ 2.63	$ 2.70	$ 2.98	$ 3.13	$ 3.12	$ 3.12	$ 3.10	$ 2.92	$ 3.35	$ 3.01
2033	$ 3.38	$ 3.21	$ 2.89	$ 2.76	$ 2.83	$ 3.11	$ 3.27	$ 3.25	$ 3.26	$ 3.23	$ 3.05	$ 3.49	$ 3.15
2034	$ 3.51	$ 3.35	$ 3.02	$ 2.89	$ 2.97	$ 3.25	$ 3.41	$ 3.39	$ 3.40	$ 3.38	$ 3.19	$ 3.64	$ 3.28
2035	$ 3.66	$ 3.49	$ 3.16	$ 3.03	$ 3.11	$ 3.40	$ 3.56	$ 3.53	$ 3.54	$ 3.52	$ 3.34	$ 3.80	$ 3.43

Gas Price Forecast

KERN

$/MMBTU

5 yr avg basis differential (source: NGI)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
	$0.1386	-$0.6866	$0.1952	$0.4440	$0.4803	$0.4363	$0.2695	$0.2577	$0.3405	$0.2101	-$0.0333	-$0.2970	
Year													
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	$ 2.96	$ 2.31	$ 2.14	$ 2.00	$ 1.82	$ 2.21	$ 2.46	$ 2.54	$ 2.29	$ 2.93	$ 4.49	$ 4.72	$ 2.74
2019	$ 3.42	$ 7.20	$ 3.28	$ 1.97	$ 1.88	$ 1.60	$ 1.97	$ 1.85	$ 2.20	$ 2.18	$ 2.80	$ 2.93	$ 2.77
2020	$ 2.17	$ 1.74	$ 2.41	$ 1.31	$ 1.32	$ 1.43	$ 1.68	$ 1.73	$ 1.66	$ 1.83	$ 2.21	$ 2.70	$ 1.85
2021	$ 2.37	$ 3.17	$ 2.20	$ 1.72	$ 1.67	$ 1.76	$ 1.97	$ 2.00	$ 1.90	$ 2.05	$ 2.36	$ 2.80	$ 2.17
2022	$ 2.48	$ 3.28	$ 2.28	$ 1.79	$ 1.73	$ 1.82	$ 2.03	$ 2.05	$ 1.96	$ 2.12	$ 2.43	$ 2.87	$ 2.24
2023	$ 2.56	$ 3.34	$ 2.34	$ 1.84	$ 1.78	$ 1.86	$ 2.07	$ 2.10	$ 2.01	$ 2.17	$ 2.48	$ 2.92	$ 2.29
2024	$ 2.60	$ 3.39	$ 2.39	$ 1.89	$ 1.84	$ 1.92	$ 2.12	$ 2.14	$ 2.04	$ 2.20	$ 2.50	$ 2.95	$ 2.33
2025	$ 2.63	$ 3.42	$ 2.43	$ 1.93	$ 1.88	$ 1.95	$ 2.15	$ 2.17	$ 2.08	$ 2.24	$ 2.55	$ 2.98	$ 2.37
2026	$ 2.67	$ 3.45	$ 2.47	$ 2.03	$ 2.03	$ 2.15	$ 2.38	$ 2.40	$ 2.33	$ 2.48	$ 2.77	$ 3.22	$ 2.53
2027	$ 2.80	$ 3.55	$ 2.62	$ 2.41	$ 2.43	$ 2.56	$ 2.75	$ 2.70	$ 2.67	$ 2.85	$ 3.06	$ 3.54	$ 2.83
2028	$ 3.00	$ 3.71	$ 2.87	$ 2.76	$ 2.71	$ 2.77	$ 2.88	$ 2.90	$ 2.88	$ 2.99	$ 3.19	$ 3.64	$ 3.03
2029	$ 3.15	$ 3.91	$ 3.00	$ 2.81	$ 2.73	$ 2.79	$ 3.02	$ 3.02	$ 3.01	$ 3.13	$ 3.31	$ 3.82	$ 3.14
2030	$ 3.41	$ 4.11	$ 3.12	$ 2.91	$ 2.79	$ 2.95	$ 3.22	$ 3.22	$ 3.21	$ 3.32	$ 3.52	$ 4.01	$ 3.32
2031	$ 3.56	$ 4.17	$ 3.20	$ 2.95	$ 2.93	$ 3.10	$ 3.35	$ 3.35	$ 3.31	$ 3.48	$ 3.67	$ 4.21	$ 3.44
2032	$ 3.53	$ 4.27	$ 3.32	$ 3.12	$ 3.15	$ 3.31	$ 3.50	$ 3.44	$ 3.43	$ 3.61	$ 3.82	$ 4.34	$ 3.57
2033	$ 3.67	$ 4.40	$ 3.45	$ 3.25	$ 3.28	$ 3.44	$ 3.63	$ 3.58	$ 3.56	$ 3.74	$ 3.95	$ 4.49	$ 3.70
2034	$ 3.80	$ 4.53	$ 3.58	$ 3.38	$ 3.42	$ 3.58	$ 3.77	$ 3.71	$ 3.70	$ 3.89	$ 4.10	$ 4.64	$ 3.84
2035	$ 3.95	$ 4.67	$ 3.72	$ 3.52	$ 3.56	$ 3.72	$ 3.92	$ 3.86	$ 3.85	$ 4.03	$ 4.24	$ 4.80	$ 3.99

Gas Price Forecast

WACOG

$/MMBTU

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
2015	$ 2.81	$ 2.49	$ 2.44	$ 2.29	$ 2.56	$ 2.54	$ 2.69	$ 2.64	$ 2.52	$ 2.20	$ 2.02	$ 1.97	$ 2.43
2016	$ 2.22	$ 1.75	$ 1.49	$ 1.65	$ 1.68	$ 2.29	$ 2.55	$ 2.54	$ 2.68	$ 2.64	$ 2.23	$ 3.43	$ 2.26
2017	$ 3.22	$ 2.63	$ 2.56	$ 2.76	$ 2.81	$ 2.65	$ 2.65	$ 2.65	$ 2.58	$ 2.54	$ 2.70	$ 2.75	$ 2.71
2018	$ 2.87	$ 2.04	$ 2.34	$ 2.46	$ 2.50	$ 2.55	$ 2.56	$ 2.59	$ 2.49	$ 2.48	$ 2.59	$ 2.80	$ 2.52
2019	$ 3.05	$ 4.64	$ 2.64	$ 1.44	$ 1.37	$ 1.38	$ 1.79	$ 1.81	$ 2.09	$ 1.87	$ 2.38	$ 2.49	$ 2.25
2020	$ 1.88	$ 1.60	$ 2.28	$ 1.20	$ 1.22	$ 1.41	$ 1.74	$ 1.79	$ 1.60	$ 1.68	$ 1.91	$ 2.45	$ 1.73
2021	$ 2.33	$ 2.73	$ 2.07	$ 1.62	$ 1.57	$ 1.74	$ 2.04	$ 2.06	$ 1.85	$ 1.91	$ 2.06	$ 2.55	$ 2.04
2022	$ 2.44	$ 2.84	$ 2.15	$ 1.68	$ 1.63	$ 1.80	$ 2.09	$ 2.11	$ 1.91	$ 1.97	$ 2.13	$ 2.62	$ 2.11
2023	$ 2.51	$ 2.90	$ 2.21	$ 1.73	$ 1.68	$ 1.84	$ 2.13	$ 2.16	$ 1.96	$ 2.02	$ 2.18	$ 2.67	$ 2.17
2024	$ 2.55	$ 2.95	$ 2.26	$ 1.79	$ 1.74	$ 1.90	$ 2.18	$ 2.20	$ 1.99	$ 2.05	$ 2.20	$ 2.70	$ 2.21
2025	$ 2.59	$ 2.98	$ 2.30	$ 1.83	$ 1.78	$ 1.93	$ 2.22	$ 2.23	$ 2.03	$ 2.10	$ 2.24	$ 2.73	$ 2.25
2026	$ 2.62	$ 3.01	$ 2.34	$ 1.93	$ 1.93	$ 2.13	$ 2.44	$ 2.46	$ 2.28	$ 2.34	$ 2.46	$ 2.97	$ 2.41
2027	$ 2.75	$ 3.11	$ 2.49	$ 2.31	$ 2.33	$ 2.54	$ 2.81	$ 2.77	$ 2.62	$ 2.70	$ 2.76	$ 3.28	$ 2.71
2028	$ 2.95	$ 3.27	$ 2.74	$ 2.65	$ 2.61	$ 2.75	$ 2.94	$ 2.96	$ 2.83	$ 2.84	$ 2.88	$ 3.39	$ 2.90
2029	$ 3.10	$ 3.47	$ 2.87	$ 2.71	$ 2.63	$ 2.77	$ 3.08	$ 3.08	$ 2.96	$ 2.98	$ 3.00	$ 3.57	$ 3.02
2030	$ 3.36	$ 3.67	$ 2.99	$ 2.81	$ 2.70	$ 2.93	$ 3.29	$ 3.28	$ 3.15	$ 3.17	$ 3.21	$ 3.76	$ 3.19
2031	$ 3.51	$ 3.73	$ 3.07	$ 2.85	$ 2.83	$ 3.08	$ 3.41	$ 3.41	$ 3.25	$ 3.34	$ 3.37	$ 3.96	$ 3.32
2032	$ 3.49	$ 3.83	$ 3.19	$ 3.02	$ 3.06	$ 3.28	$ 3.56	$ 3.50	$ 3.37	$ 3.46	$ 3.51	$ 4.09	$ 3.45
2033	$ 3.62	$ 3.96	$ 3.32	$ 3.15	$ 3.19	$ 3.42	$ 3.69	$ 3.64	$ 3.51	$ 3.60	$ 3.65	$ 4.24	$ 3.58
2034	$ 3.76	$ 4.09	$ 3.45	$ 3.28	$ 3.32	$ 3.56	$ 3.83	$ 3.78	$ 3.65	$ 3.74	$ 3.79	$ 4.39	$ 3.72
2035	$ 3.90	$ 4.23	$ 3.59	$ 3.42	$ 3.46	$ 3.70	$ 3.98	$ 3.92	$ 3.80	$ 3.89	$ 3.94	$ 4.54	$ 3.86

Gas Price Forecast

SOCALGAS CITIGATE

$/MMBTU

SoCalGas Citygate
May, 2020
BTS + Core Brokerage + FF&U ($/dth) $ 0.43

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
2020	$ 2.31	$ 2.03	$ 2.71	$ 1.63	$ 1.65	$ 1.84	$ 2.17	$ 2.22	$ 2.03	$ 2.11	$ 2.33	$ 2.88	$ 2.16
2021	$ 2.75	$ 3.15	$ 2.49	$ 2.04	$ 2.00	$ 2.16	$ 2.46	$ 2.48	$ 2.27	$ 2.33	$ 2.48	$ 2.97	$ 2.47
2022	$ 2.86	$ 3.26	$ 2.57	$ 2.11	$ 2.06	$ 2.22	$ 2.52	$ 2.54	$ 2.33	$ 2.40	$ 2.55	$ 3.04	$ 2.54
2023	$ 2.93	$ 3.33	$ 2.63	$ 2.16	$ 2.11	$ 2.27	$ 2.56	$ 2.58	$ 2.38	$ 2.44	$ 2.60	$ 3.10	$ 2.59
2024	$ 2.98	$ 3.38	$ 2.69	$ 2.21	$ 2.17	$ 2.32	$ 2.60	$ 2.62	$ 2.42	$ 2.47	$ 2.62	$ 3.12	$ 2.63
2025	$ 3.01	$ 3.41	$ 2.73	$ 2.25	$ 2.21	$ 2.36	$ 2.64	$ 2.66	$ 2.46	$ 2.52	$ 2.67	$ 3.15	$ 2.67
2026	$ 3.04	$ 3.44	$ 2.77	$ 2.35	$ 2.35	$ 2.56	$ 2.87	$ 2.89	$ 2.71	$ 2.76	$ 2.89	$ 3.40	$ 2.83
2027	$ 3.18	$ 3.54	$ 2.92	$ 2.73	$ 2.76	$ 2.96	$ 3.23	$ 3.19	$ 3.05	$ 3.12	$ 3.18	$ 3.71	$ 3.13
2028	$ 3.38	$ 3.69	$ 3.17	$ 3.08	$ 3.04	$ 3.17	$ 3.37	$ 3.38	$ 3.26	$ 3.27	$ 3.31	$ 3.82	$ 3.33
2029	$ 3.52	$ 3.90	$ 3.30	$ 3.13	$ 3.06	$ 3.20	$ 3.51	$ 3.51	$ 3.39	$ 3.41	$ 3.43	$ 4.00	$ 3.45
2030	$ 3.78	$ 4.10	$ 3.41	$ 3.23	$ 3.12	$ 3.36	$ 3.71	$ 3.70	$ 3.58	$ 3.60	$ 3.64	$ 4.19	$ 3.62
2031	$ 3.94	$ 4.15	$ 3.50	$ 3.27	$ 3.26	$ 3.50	$ 3.84	$ 3.84	$ 3.68	$ 3.76	$ 3.79	$ 4.39	$ 3.74
2032	$ 3.91	$ 4.25	$ 3.62	$ 3.44	$ 3.48	$ 3.71	$ 3.98	$ 3.93	$ 3.80	$ 3.88	$ 3.94	$ 4.52	$ 3.87
2033	$ 4.04	$ 4.38	$ 3.75	$ 3.57	$ 3.61	$ 3.84	$ 4.12	$ 4.06	$ 3.93	$ 4.02	$ 4.07	$ 4.66	$ 4.01
2034	$ 4.18	$ 4.52	$ 3.88	$ 3.70	$ 3.75	$ 3.98	$ 4.26	$ 4.20	$ 4.08	$ 4.16	$ 4.21	$ 4.81	$ 4.15
2035	$ 4.32	$ 4.66	$ 4.01	$ 3.84	$ 3.89	$ 4.13	$ 4.41	$ 4.34	$ 4.22	$ 4.31	$ 4.36	$ 4.97	$ 4.29

Gas Price Forecast

MALIN

$/MMBTU

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
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	$ 2.18	$ 2.04	$ 1.84	$ 2.23	$ 2.50	$ 2.61	$ 2.34	$ 3.01	$ 4.55	$ 4.74	$ 2.77
2019	$ 3.46	$ 7.29	$ 3.42	$ 2.04	$ 1.93	$ 1.68	$ 2.02	$ 1.91	$ 2.27	$ 2.24	$ 2.85	$ 2.94	$ 2.84
2020	$ 2.19	$ 1.79	$ 2.48	$ 1.36	$ 1.36	$ 1.48	$ 1.73	$ 1.80	$ 1.72	$ 1.89	$ 2.27	$ 2.74	$ 1.90
2021	$ 2.37	$ 3.22	$ 2.26	$ 1.77	$ 1.72	$ 1.81	$ 2.02	$ 2.06	$ 1.96	$ 2.11	$ 2.42	$ 2.84	$ 2.21
2022	$ 2.48	$ 3.33	$ 2.34	$ 1.84	$ 1.78	$ 1.87	$ 2.07	$ 2.12	$ 2.02	$ 2.18	$ 2.49	$ 2.91	$ 2.29
2023	$ 2.56	$ 3.39	$ 2.40	$ 1.89	$ 1.82	$ 1.91	$ 2.12	$ 2.16	$ 2.07	$ 2.23	$ 2.54	$ 2.96	$ 2.34
2024	$ 2.60	$ 3.44	$ 2.46	$ 1.94	$ 1.88	$ 1.97	$ 2.16	$ 2.20	$ 2.10	$ 2.26	$ 2.56	$ 2.99	$ 2.38
2025	$ 2.63	$ 3.47	$ 2.50	$ 1.98	$ 1.92	$ 2.01	$ 2.20	$ 2.24	$ 2.14	$ 2.31	$ 2.61	$ 3.02	$ 2.42
2026	$ 2.67	$ 3.50	$ 2.54	$ 2.08	$ 2.07	$ 2.20	$ 2.43	$ 2.47	$ 2.39	$ 2.55	$ 2.82	$ 3.26	$ 2.58
2027	$ 2.80	$ 3.60	$ 2.69	$ 2.46	$ 2.47	$ 2.61	$ 2.79	$ 2.77	$ 2.73	$ 2.91	$ 3.12	$ 3.58	$ 2.88
2028	$ 3.00	$ 3.76	$ 2.94	$ 2.81	$ 2.76	$ 2.82	$ 2.92	$ 2.96	$ 2.95	$ 3.05	$ 3.24	$ 3.68	$ 3.07
2029	$ 3.15	$ 3.96	$ 3.07	$ 2.86	$ 2.78	$ 2.84	$ 3.06	$ 3.09	$ 3.07	$ 3.19	$ 3.37	$ 3.86	$ 3.19
2030	$ 3.41	$ 4.16	$ 3.18	$ 2.96	$ 2.84	$ 3.01	$ 3.27	$ 3.28	$ 3.27	$ 3.38	$ 3.57	$ 4.05	$ 3.37
2031	$ 3.56	$ 4.22	$ 3.27	$ 3.00	$ 2.97	$ 3.15	$ 3.40	$ 3.42	$ 3.37	$ 3.55	$ 3.73	$ 4.25	$ 3.49
2032	$ 3.53	$ 4.32	$ 3.39	$ 3.17	$ 3.20	$ 3.36	$ 3.54	$ 3.51	$ 3.49	$ 3.67	$ 3.87	$ 4.38	$ 3.62
2033	$ 3.67	$ 4.45	$ 3.52	$ 3.30	$ 3.33	$ 3.49	$ 3.68	$ 3.64	$ 3.62	$ 3.80	$ 4.01	$ 4.53	$ 3.75
2034	$ 3.80	$ 4.58	$ 3.65	$ 3.43	$ 3.46	$ 3.63	$ 3.82	$ 3.78	$ 3.76	$ 3.95	$ 4.15	$ 4.68	$ 3.89
2035	$ 3.95	$ 4.72	$ 3.78	$ 3.57	$ 3.60	$ 3.78	$ 3.96	$ 3.92	$ 3.91	$ 4.09	$ 4.30	$ 4.84	$ 4.04

Gas Price Forecast

PG&E CITIGATE PRICES

$/MMBTU

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
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	$ 2.71	$ 2.68	$ 2.88	$ 3.00	$ 3.00	$ 3.32	$ 3.13	$ 3.73	$ 5.01	$ 5.02	$ 3.35
2019	$ 3.68	$ 7.55	$ 4.02	$ 3.23	$ 3.24	$ 2.51	$ 2.54	$ 2.60	$ 3.03	$ 3.15	$ 3.36	$ 3.38	$ 3.52
2020	$ 2.96	$ 2.64	$ 3.27	$ 2.19	$ 2.18	$ 2.42	$ 2.98	$ 3.04	$ 2.65	$ 2.78	$ 3.06	$ 3.68	$ 2.82
2021	$ 3.33	$ 4.18	$ 3.06	$ 2.60	$ 2.53	$ 2.74	$ 3.27	$ 3.31	$ 2.90	$ 3.00	$ 3.22	$ 3.77	$ 3.16
2022	$ 3.44	$ 4.29	$ 3.14	$ 2.67	$ 2.59	$ 2.80	$ 3.33	$ 3.37	$ 2.96	$ 3.06	$ 3.29	$ 3.84	$ 3.23
2023	$ 3.52	$ 4.35	$ 3.20	$ 2.71	$ 2.64	$ 2.85	$ 3.37	$ 3.41	$ 3.01	$ 3.11	$ 3.33	$ 3.90	$ 3.28
2024	$ 3.56	$ 4.40	$ 3.25	$ 2.77	$ 2.69	$ 2.90	$ 3.42	$ 3.45	$ 3.04	$ 3.14	$ 3.35	$ 3.92	$ 3.33
2025	$ 3.59	$ 4.44	$ 3.29	$ 2.81	$ 2.74	$ 2.94	$ 3.45	$ 3.49	$ 3.08	$ 3.19	$ 3.40	$ 3.95	$ 3.36
2026	$ 3.63	$ 4.47	$ 3.33	$ 2.91	$ 2.88	$ 3.13	$ 3.68	$ 3.71	$ 3.33	$ 3.43	$ 3.62	$ 4.20	$ 3.53
2027	$ 3.76	$ 4.57	$ 3.49	$ 3.29	$ 3.28	$ 3.54	$ 4.05	$ 4.02	$ 3.67	$ 3.79	$ 3.91	$ 4.51	$ 3.82
2028	$ 3.96	$ 4.72	$ 3.74	$ 3.64	$ 3.57	$ 3.75	$ 4.18	$ 4.21	$ 3.88	$ 3.94	$ 4.04	$ 4.62	$ 4.02
2029	$ 4.11	$ 4.93	$ 3.87	$ 3.69	$ 3.59	$ 3.77	$ 4.32	$ 4.34	$ 4.01	$ 4.07	$ 4.16	$ 4.80	$ 4.14
2030	$ 4.36	$ 5.13	$ 3.98	$ 3.79	$ 3.65	$ 3.94	$ 4.52	$ 4.53	$ 4.20	$ 4.27	$ 4.37	$ 4.99	$ 4.31
2031	$ 4.52	$ 5.18	$ 4.07	$ 3.83	$ 3.79	$ 4.08	$ 4.65	$ 4.66	$ 4.31	$ 4.43	$ 4.53	$ 5.19	$ 4.44
2032	$ 4.49	$ 5.28	$ 4.19	$ 4.00	$ 4.01	$ 4.29	$ 4.80	$ 4.76	$ 4.42	$ 4.55	$ 4.67	$ 5.32	$ 4.56
2033	$ 4.63	$ 5.41	$ 4.31	$ 4.13	$ 4.14	$ 4.42	$ 4.93	$ 4.89	$ 4.56	$ 4.69	$ 4.81	$ 5.46	$ 4.70
2034	$ 4.76	$ 5.55	$ 4.45	$ 4.26	$ 4.27	$ 4.56	$ 5.07	$ 5.03	$ 4.70	$ 4.83	$ 4.95	$ 5.61	$ 4.84
2035	$ 4.91	$ 5.68	$ 4.58	$ 4.40	$ 4.42	$ 4.71	$ 5.22	$ 5.17	$ 4.85	$ 4.98	$ 5.09	$ 5.77	$ 4.98

Gas Price Forecast

HENRY HUB

$/MMBTU

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
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	$ 3.32	$ 2.83	$ 2.84	$ 3.07	$ 3.13	$ 2.93	$ 2.96	$ 2.87	$ 2.95	$ 2.87	$ 2.97	$ 2.76	$ 2.96
2018	$ 3.72	$ 2.66	$ 2.65	$ 2.76	$ 2.77	$ 2.93	$ 2.80	$ 2.93	$ 2.96	$ 3.23	$ 4.06	$ 3.94	$ 3.12
2019	$ 3.07	$ 2.67	$ 2.90	$ 2.60	$ 2.59	$ 2.34	$ 2.30	$ 2.17	$ 2.52	$ 2.24	$ 2.60	$ 2.19	$ 2.52
2020	$ 2.01	$ 1.85	$ 2.60	$ 1.75	$ 1.80	$ 1.87	$ 1.95	$ 1.99	$ 2.00	$ 2.04	$ 2.18	$ 2.41	$ 2.04
2021	$ 2.51	$ 2.48	$ 2.39	$ 2.17	$ 2.15	$ 2.20	$ 2.24	$ 2.26	$ 2.24	$ 2.26	$ 2.33	$ 2.50	$ 2.31
2022	$ 2.62	$ 2.59	$ 2.47	$ 2.23	$ 2.21	$ 2.25	$ 2.30	$ 2.31	$ 2.30	$ 2.33	$ 2.40	$ 2.57	$ 2.38
2023	$ 2.70	$ 2.66	$ 2.53	$ 2.28	$ 2.26	$ 2.30	$ 2.34	$ 2.36	$ 2.35	$ 2.38	$ 2.45	$ 2.63	$ 2.43
2024	$ 2.74	$ 2.70	$ 2.59	$ 2.34	$ 2.32	$ 2.36	$ 2.39	$ 2.39	$ 2.38	$ 2.41	$ 2.47	$ 2.65	$ 2.48
2025	$ 2.77	$ 2.74	$ 2.63	$ 2.38	$ 2.36	$ 2.39	$ 2.42	$ 2.43	$ 2.42	$ 2.46	$ 2.52	$ 2.68	$ 2.52
2026	$ 2.81	$ 2.77	$ 2.66	$ 2.47	$ 2.51	$ 2.59	$ 2.65	$ 2.66	$ 2.67	$ 2.69	$ 2.73	$ 2.93	$ 2.68
2027	$ 2.94	$ 2.87	$ 2.82	$ 2.86	$ 2.91	$ 3.00	$ 3.01	$ 2.96	$ 3.01	$ 3.06	$ 3.03	$ 3.24	$ 2.98
2028	$ 3.14	$ 3.02	$ 3.07	$ 3.20	$ 3.19	$ 3.20	$ 3.15	$ 3.15	$ 3.23	$ 3.20	$ 3.16	$ 3.34	$ 3.17
2029	$ 3.29	$ 3.23	$ 3.20	$ 3.25	$ 3.21	$ 3.23	$ 3.29	$ 3.28	$ 3.35	$ 3.34	$ 3.28	$ 3.53	$ 3.29
2030	$ 3.54	$ 3.43	$ 3.31	$ 3.36	$ 3.27	$ 3.39	$ 3.49	$ 3.47	$ 3.55	$ 3.53	$ 3.49	$ 3.71	$ 3.46
2031	$ 3.70	$ 3.48	$ 3.40	$ 3.40	$ 3.41	$ 3.54	$ 3.62	$ 3.61	$ 3.65	$ 3.69	$ 3.64	$ 3.92	$ 3.59
2032	$ 3.67	$ 3.58	$ 3.52	$ 3.57	$ 3.63	$ 3.74	$ 3.77	$ 3.70	$ 3.77	$ 3.82	$ 3.78	$ 4.05	$ 3.72
2033	$ 3.81	$ 3.71	$ 3.65	$ 3.70	$ 3.76	$ 3.88	$ 3.90	$ 3.83	$ 3.90	$ 3.95	$ 3.92	$ 4.19	$ 3.85
2034	$ 3.94	$ 3.85	$ 3.78	$ 3.83	$ 3.90	$ 4.02	$ 4.04	$ 3.97	$ 4.04	$ 4.10	$ 4.06	$ 4.34	$ 3.99
2035	$ 4.08	$ 3.98	$ 3.91	$ 3.97	$ 4.04	$ 4.16	$ 4.19	$ 4.11	$ 4.19	$ 4.24	$ 4.21	$ 4.50	$ 4.13

Gas Price Forecast

OPAL

$/MMBTU

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
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	$ 2.15	$ 2.00	$ 1.82	$ 2.22	$ 2.47	$ 2.54	$ 2.29	$ 2.95	$ 4.50	$ 4.74	$ 2.75
2019	$ 3.43	$ 7.27	$ 3.39	$ 2.00	$ 1.90	$ 1.67	$ 1.98	$ 1.86	$ 2.22	$ 2.21	$ 2.80	$ 2.93	$ 2.81
2020	$ 2.18	$ 1.76	$ 2.44	$ 1.32	$ 1.32	$ 1.45	$ 1.69	$ 1.74	$ 1.66	$ 1.85	$ 2.22	$ 2.71	$ 1.86
2021	$ 2.39	$ 3.19	$ 2.22	$ 1.73	$ 1.67	$ 1.78	$ 1.98	$ 2.00	$ 1.91	$ 2.07	$ 2.37	$ 2.81	$ 2.18
2022	$ 2.50	$ 3.30	$ 2.31	$ 1.80	$ 1.73	$ 1.83	$ 2.04	$ 2.06	$ 1.97	$ 2.13	$ 2.44	$ 2.88	$ 2.25
2023	$ 2.57	$ 3.36	$ 2.36	$ 1.85	$ 1.78	$ 1.88	$ 2.08	$ 2.10	$ 2.02	$ 2.18	$ 2.49	$ 2.93	$ 2.30
2024	$ 2.61	$ 3.41	$ 2.42	$ 1.90	$ 1.84	$ 1.93	$ 2.12	$ 2.14	$ 2.05	$ 2.21	$ 2.51	$ 2.95	$ 2.34
2025	$ 2.64	$ 3.44	$ 2.46	$ 1.94	$ 1.88	$ 1.97	$ 2.16	$ 2.18	$ 2.09	$ 2.26	$ 2.55	$ 2.98	$ 2.38
2026	$ 2.68	$ 3.47	$ 2.50	$ 2.04	$ 2.03	$ 2.17	$ 2.39	$ 2.41	$ 2.34	$ 2.50	$ 2.77	$ 3.23	$ 2.54
2027	$ 2.81	$ 3.57	$ 2.65	$ 2.42	$ 2.43	$ 2.58	$ 2.75	$ 2.71	$ 2.68	$ 2.86	$ 3.07	$ 3.54	$ 2.84
2028	$ 3.01	$ 3.73	$ 2.90	$ 2.77	$ 2.71	$ 2.78	$ 2.88	$ 2.90	$ 2.89	$ 3.01	$ 3.19	$ 3.65	$ 3.04
2029	$ 3.16	$ 3.93	$ 3.03	$ 2.82	$ 2.73	$ 2.81	$ 3.02	$ 3.03	$ 3.02	$ 3.14	$ 3.31	$ 3.83	$ 3.15
2030	$ 3.42	$ 4.13	$ 3.14	$ 2.92	$ 2.80	$ 2.97	$ 3.23	$ 3.22	$ 3.21	$ 3.34	$ 3.52	$ 4.02	$ 3.33
2031	$ 3.57	$ 4.19	$ 3.23	$ 2.96	$ 2.93	$ 3.12	$ 3.36	$ 3.36	$ 3.31	$ 3.50	$ 3.68	$ 4.22	$ 3.45
2032	$ 3.55	$ 4.29	$ 3.35	$ 3.13	$ 3.15	$ 3.32	$ 3.50	$ 3.45	$ 3.43	$ 3.62	$ 3.82	$ 4.35	$ 3.58
2033	$ 3.68	$ 4.42	$ 3.48	$ 3.26	$ 3.29	$ 3.46	$ 3.64	$ 3.58	$ 3.57	$ 3.76	$ 3.96	$ 4.50	$ 3.71
2034	$ 3.81	$ 4.55	$ 3.61	$ 3.40	$ 3.42	$ 3.60	$ 3.78	$ 3.72	$ 3.71	$ 3.90	$ 4.10	$ 4.65	$ 3.85
2035	$ 3.96	$ 4.69	$ 3.74	$ 3.53	$ 3.56	$ 3.74	$ 3.92	$ 3.86	$ 3.86	$ 4.05	$ 4.25	$ 4.80	$ 4.00

Gas Price Forecast

SUMAS

$/MMBTU

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average
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	$ 2.09	$ 1.94	$ 1.39	$ 1.48	$ 2.17	$ 2.37	$ 2.30	$ 5.58	$ 13.69	$ 6.16	3.68
2019	$ 3.51	$ 18.17	$ 20.34	$ 2.03	$ 1.78	$ 1.60	$ 2.02	$ 1.86	$ 2.26	$ 3.35	$ 4.12	$ 3.20	5.35
2020	$ 2.27	$ 1.71	$ 2.13	$ 1.18	$ 1.06	$ 1.09	$ 1.37	$ 1.62	$ 1.62	$ 2.42	$ 4.45	$ 3.17	2.01
2021	$ 2.25	$ 2.11	$ 1.92	$ 1.59	$ 1.41	$ 1.41	$ 1.66	$ 1.89	$ 1.87	$ 2.64	$ 4.60	$ 3.27	2.22
2022	$ 2.36	$ 2.22	$ 2.00	$ 1.66	$ 1.47	$ 1.47	$ 1.71	$ 1.94	$ 1.93	$ 2.71	$ 4.67	$ 3.34	2.29
2023	$ 2.43	$ 2.28	$ 2.06	$ 1.71	$ 1.52	$ 1.52	$ 1.76	$ 1.99	$ 1.98	$ 2.75	$ 4.72	$ 3.39	2.34
2024	$ 2.47	$ 2.33	$ 2.11	$ 1.76	$ 1.58	$ 1.57	$ 1.80	$ 2.03	$ 2.01	$ 2.78	$ 4.74	$ 3.41	2.38
2025	$ 2.51	$ 2.36	$ 2.15	$ 1.80	$ 1.62	$ 1.61	$ 1.84	$ 2.06	$ 2.05	$ 2.83	$ 4.79	$ 3.44	2.42
2026	$ 2.54	$ 2.39	$ 2.19	$ 1.90	$ 1.77	$ 1.80	$ 2.07	$ 2.29	$ 2.30	$ 3.07	$ 5.01	$ 3.69	2.59
2027	$ 2.67	$ 2.49	$ 2.34	$ 2.28	$ 2.17	$ 2.21	$ 2.43	$ 2.60	$ 2.64	$ 3.43	$ 5.30	$ 4.00	2.88
2028	$ 2.88	$ 2.65	$ 2.59	$ 2.63	$ 2.46	$ 2.42	$ 2.56	$ 2.79	$ 2.85	$ 3.58	$ 5.43	$ 4.11	3.08
2029	$ 3.02	$ 2.85	$ 2.73	$ 2.68	$ 2.47	$ 2.45	$ 2.70	$ 2.91	$ 2.98	$ 3.72	$ 5.55	$ 4.29	3.20
2030	$ 3.28	$ 3.05	$ 2.84	$ 2.78	$ 2.54	$ 2.61	$ 2.91	$ 3.11	$ 3.17	$ 3.91	$ 5.76	$ 4.48	3.37
2031	$ 3.43	$ 3.11	$ 2.92	$ 2.82	$ 2.67	$ 2.75	$ 3.04	$ 3.24	$ 3.27	$ 4.07	$ 5.91	$ 4.68	3.49
2032	$ 3.41	$ 3.21	$ 3.05	$ 2.99	$ 2.90	$ 2.96	$ 3.18	$ 3.33	$ 3.39	$ 4.19	$ 6.06	$ 4.81	3.62
2033	$ 3.54	$ 3.34	$ 3.17	$ 3.12	$ 3.03	$ 3.09	$ 3.32	$ 3.47	$ 3.53	$ 4.33	$ 6.19	$ 4.95	3.76
2034	$ 3.68	$ 3.47	$ 3.30	$ 3.26	$ 3.16	$ 3.23	$ 3.46	$ 3.60	$ 3.67	$ 4.47	$ 6.34	$ 5.11	3.90
2035	$ 3.82	$ 3.61	$ 3.44	$ 3.39	$ 3.30	$ 3.38	$ 3.60	$ 3.75	$ 3.81	$ 4.62	$ 6.48	$ 5.26	4.04

Gas Price Forecast

STANFIELD

$/MMBTU

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
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	$ 2.10	$ 1.95	$ 1.63	$ 2.05	$ 2.37	$ 2.53	$ 2.30	$ 3.00	$ 4.56	$ 4.73
2019	$ 3.47	$ 7.51	$ 3.47	$ 1.97	$ 1.80	$ 1.58	$ 2.00	$ 1.87	$ 2.25	$ 2.24	$ 2.84	$ 2.93
2020	$ 2.17	$ 1.74	$ 2.80	$ 1.62	$ 1.44	$ 1.51	$ 1.76	$ 1.86	$ 1.83	$ 2.15	$ 2.58	$ 3.07
2021	$ 2.95	$ 3.90	$ 2.58	$ 2.04	$ 1.79	$ 1.84	$ 2.05	$ 2.13	$ 2.08	$ 2.37	$ 2.74	$ 3.16
2022	$ 3.06	$ 4.01	$ 2.67	$ 2.10	$ 1.85	$ 1.90	$ 2.11	$ 2.18	$ 2.14	$ 2.44	$ 2.81	$ 3.23
2023	$ 3.13	$ 4.07	$ 2.72	$ 2.15	$ 1.90	$ 1.94	$ 2.15	$ 2.23	$ 2.19	$ 2.48	$ 2.85	$ 3.29
2024	$ 3.18	$ 4.12	$ 2.78	$ 2.20	$ 1.96	$ 2.00	$ 2.19	$ 2.27	$ 2.22	$ 2.52	$ 2.87	$ 3.31
2025	$ 3.21	$ 4.16	$ 2.82	$ 2.25	$ 2.00	$ 2.04	$ 2.23	$ 2.30	$ 2.26	$ 2.56	$ 2.92	$ 3.34
2026	$ 3.24	$ 4.18	$ 2.86	$ 2.34	$ 2.15	$ 2.23	$ 2.46	$ 2.53	$ 2.51	$ 2.80	$ 3.14	$ 3.59
2027	$ 3.38	$ 4.29	$ 3.01	$ 2.72	$ 2.55	$ 2.64	$ 2.82	$ 2.83	$ 2.85	$ 3.16	$ 3.43	$ 3.90
2028	$ 3.58	$ 4.44	$ 3.26	$ 3.07	$ 2.83	$ 2.85	$ 2.96	$ 3.02	$ 3.06	$ 3.31	$ 3.56	$ 4.01
2029	$ 3.72	$ 4.64	$ 3.39	$ 3.12	$ 2.85	$ 2.87	$ 3.10	$ 3.15	$ 3.19	$ 3.45	$ 3.68	$ 4.19
2030	$ 3.98	$ 4.85	$ 3.50	$ 3.22	$ 2.91	$ 3.04	$ 3.30	$ 3.35	$ 3.38	$ 3.64	$ 3.89	$ 4.38
2031	$ 4.14	$ 4.90	$ 3.59	$ 3.27	$ 3.05	$ 3.18	$ 3.43	$ 3.48	$ 3.49	$ 3.80	$ 4.05	$ 4.58
2032	$ 4.11	$ 5.00	$ 3.71	$ 3.44	$ 3.27	$ 3.39	$ 3.57	$ 3.57	$ 3.60	$ 3.92	$ 4.19	$ 4.71
2033	$ 4.24	$ 5.13	$ 3.84	$ 3.56	$ 3.40	$ 3.52	$ 3.71	$ 3.71	$ 3.74	$ 4.06	$ 4.33	$ 4.85
2034	$ 4.38	$ 5.26	$ 3.97	$ 3.70	$ 3.54	$ 3.66	$ 3.85	$ 3.84	$ 3.88	$ 4.20	$ 4.47	$ 5.00
2035	$ 4.52	$ 5.40	$ 4.10	$ 3.84	$ 3.68	$ 3.81	$ 4.00	$ 3.99	$ 4.03	$ 4.35	$ 4.61	$ 5.16

2020 CALIFORNIA GAS REPORT

SERVICE AREA ECONOMIC FORECAST

SOUTHERN CALIFORNIA GAS COMPANY SERVICE AREA ECONOMIC FORECAST

(based on Global Insight's February 2020 Regional Forecast, adjusted using Global Insight's March 20, 2020 updated interim US Forecast)

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
EMPLOYMENT (1000's)										
Total	9,021.5	9,182.8	9,352.2	9,487.3	9,213.5	9,206.1	9,610.5	9,745.8	9,796.8	9,809.8
Agriculture	241.0	239.6	238.2	242.0	229.3	211.4	218.8	228.1	232.7	234.6
Total Non-farm	8,780.5	8,943.2	9,114.1	9,245.3	8,984.2	8,994.7	9,391.7	9,517.8	9,564.1	9,575.2
Mining	15.2	14.6	15.5	15.7	14.3	13.2	13.8	14.5	15.1	15.3
Construction	391.4	409.3	433.5	445.6	447.7	442.2	454.6	463.9	468.0	472.7
Manufacturing	721.2	713.3	709.9	713.1	688.7	661.3	675.2	676.3	678.0	677.0
Transportation, Information, Utilities	587.0	585.1	598.8	607.9	598.9	582.4	584.5	589.0	586.2	582.7
Trade	1,495.0	1,516.7	1,529.3	1,523.6	1,419.7	1,430.6	1,521.7	1,525.7	1,521.1	1,506.0
Retail	1,010.4	1,016.8	1,015.3	1,006.4	914.5	924.6	1,003.0	994.6	987.1	970.9
Wholesale (including warehousing)	484.6	499.8	514.0	517.2	505.2	506.0	518.7	531.1	534.0	535.1
Restaurants	758.4	782.0	795.3	812.9	738.6	746.8	810.3	803.4	797.4	784.3
Finance, Insurance & Real Estate	437.5	440.5	440.8	438.6	432.0	431.9	446.5	451.3	449.7	446.6
Services	2,868.7	2,944.5	3,029.0	3,104.4	3,038.9	3,075.9	3,262.7	3,358.9	3,400.5	3,428.9
Accomodation	137.5	141.5	143.9	145.7	129.9	139.7	139.0	142.4	143.6	143.7
Personal & Laundry Services	96.7	98.6	101.8	104.1	102.2	102.3	102.9	103.0	101.8	101.2
Professional & Business Services	1,189.2	1,206.1	1,236.2	1,261.1	1,176.0	1,178.5	1,311.4	1,367.9	1,397.4	1,418.9
Health & Social Services	1,196.6	1,247.4	1,290.0	1,333.1	1,375.1	1,399.7	1,452.0	1,488.2	1,503.0	1,512.1
Misc. Services	248.7	250.9	257.1	260.4	255.7	255.7	257.3	257.4	254.6	253.0
Government & Education	1,506.1	1,537.3	1,561.9	1,583.5	1,605.5	1,610.4	1,622.4	1,634.7	1,648.2	1,661.7
OTHER INDICATORS										
Southern California Consumer Inflation*	1.9%	2.8%	3.8%	3.1%	1.2%	2.2%	2.4%	2.7%	2.5%	2.3%
Inflation--US Gross Domestic Product**	1.0%	1.9%	2.4%	1.8%	1.0%	1.0%	1.6%	2.1%	2.3%	2.3%

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

** Chained Price Index--US GDP: from Global Insight's March 20, 2020 updated interim Forecast of the U.S. Economy; beyond 2030 is from their February 2020 Forecast.

SOUTHERN CALIFORNIA GAS COMPANY SERVICE AREA ECONOMIC FORECAST

(based on Global Insight's February 2020 Regional Forecast, adjusted using Global Insight's March 20, 2020 updated interim US Forecast)

	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
EMPLOYMENT (1000's)										
Total	9,816.3	9,845.0	9,891.3	9,936.1	9,971.5	10,009.9	10,071.1	10,129.5	10,176.4	10,219.2
Agriculture	236.0	236.1	235.7	235.5	235.3	235.3	235.8	236.2	236.1	235.6
Total Non-farm	9,580.3	9,608.9	9,655.6	9,700.6	9,736.2	9,774.5	9,835.3	9,893.4	9,940.3	9,983.7
Mining	15.4	15.4	15.3	15.2	15.1	14.9	14.8	14.7	14.6	14.5
Construction	476.3	481.9	491.1	504.5	518.4	530.3	541.2	550.4	558.4	567.1
Manufacturing	673.9	667.5	659.8	653.6	646.5	642.2	641.8	641.4	641.7	641.3
Transportation, Information, Utilities	581.3	577.5	571.1	563.5	554.7	548.7	547.4	546.5	543.9	539.8
Trade	1,491.4	1,485.4	1,480.1	1,476.8	1,472.0	1,470.6	1,473.3	1,477.9	1,479.9	1,481.4
Retail	955.9	948.9	945.9	944.7	943.0	943.4	948.0	954.2	958.0	961.5
Wholesale (including warehousing)	535.4	536.5	534.2	532.0	529.0	527.3	525.3	523.7	521.8	519.9
Restaurants	772.2	766.5	764.1	763.2	761.7	762.0	765.8	770.8	773.9	776.7
Finance, Insurance & Real Estate	442.8	439.7	439.4	438.3	437.9	437.6	438.1	439.4	441.0	442.0
Services	3,452.3	3,487.7	3,536.8	3,577.6	3,607.0	3,637.9	3,670.4	3,698.0	3,720.3	3,741.2
Accomodation	143.7	144.3	145.3	146.8	148.1	149.4	150.6	151.9	152.8	153.9
Personal & Laundry Services	101.0	101.1	101.3	101.3	101.1	101.0	100.9	100.8	100.6	100.3
Professional & Business Services	1,434.2	1,454.0	1,481.7	1,502.3	1,513.7	1,525.6	1,538.2	1,546.7	1,549.1	1,551.5
Health & Social Services	1,520.8	1,535.6	1,555.2	1,573.9	1,591.2	1,609.4	1,628.2	1,646.5	1,666.1	1,684.6
Misc. Services	252.5	252.8	253.4	253.3	252.9	252.5	252.4	252.2	251.6	250.8
Government & Education	1,674.8	1,687.2	1,697.8	1,707.8	1,722.9	1,730.2	1,742.4	1,754.1	1,766.8	1,779.8
OTHER INDICATORS										
Southern California Consumer Inflation*	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.1%	2.2%	2.1%	2.1%
Inflation--US Gross Domestic Product**	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.3%	2.2%	2.2%	2.2%

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

** Chained Price Index--US GDP: from Global Insight's March 20, 2020 updated interim Forecast of the U.S. Economy; beyond 2030 is from their February 2020 Forecast.