2012 California Gas Report
Redacted Workpapers

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The Gas Company

A Sempra Energy utility℠

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2012 CALIFORNIA GAS REPORT

HISTORICAL DATA
JULY 2012

The Gas Company
A Sempra Energy utility℠

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND SENDOUT - MMCF/DAY
RECORDED YEARS 2007 TO 2011

Line	CAPACITY AVAILABLE		2007	2008	2009	2010	2011
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		232	209	216	203	175
	Out-of-State Gas						
11	Other Out-of-State		2,462	2,585	2,397	2,445	2,452
12	Total Out-of-State Gas		2,462	2,585	2,397	2,445	2,452
13	TOTAL SUPPLY TAKEN		2,694	2,794	2,613	2,648	2,627
14	Net Underground Storage Withdrawal		23	(28)	8	(10)	(4)
15	TOTAL THROUGHPUT (1)(2)		2,717	2,766	2,621	2,638	2,623
	DELIVERIES BY END-USE (3)						
16	Core	Residential	673	659	645	673	696
17		Commercial	224	211	210	216	217
18		Industrial	65	64	59	61	61
19		NGV	23	25	26	27	28
20		Subtotal	985	959	940	977	1,002
21	Noncore	Commercial	60	59	56	59	60
22		Industrial	345	341	324	361	363
23		EOR Steaming	39	39	35	30	27
24		Electric Generation	849	907	811	768	726
25		Subtotal	1,293	1,346	1,226	1,218	1,176
26	Wholesale/International		406	422	412	412	407
27	Co. Use & LUAF		33	39	43	31	38
28	SYSTEM TOTAL-THROUGHPUT (1)(2)		2,717	2,766	2,621	2,638	2,623
	TRANSPORTATION AND EXCHANGE						
29	Core	All End Uses	14	17	20	25	29
30	Noncore	Commercial/Industrial	405	400	380	420	423
31		EOR Steaming	39	39	35	30	27
32		Electric Generation	849	907	811	768	726
33		Subtotal-Retail	1,307	1,363	1,246	1,243	1,205
34	Wholesale/International		406	422	412	412	407
35	TOTAL TRANSPORTATION & EXCHANGE		1,713	1,785	1,658	1,655	1,612
	CURTAILMENT (RETAIL & WHOLESALE)						
36		Core					
37		Noncore (4)					
38		TOTAL - Curtailment					
39	REFUSAL						
40		Total BTU Factor (Dth/Mcf)	1.0305	1.0299	1.0273	1.0235	1.0209
	NOTES:						
	(1) Exclude own-source gas supply of procurement by Edison and City of Long Beach.		4	4	2	2	1

(2) Deliveries by end-use includes sales, transportation, and exchange volumes.
(3) Data includes effect of prior period adjustments.
(4) Total 175 mmcf curtailment were reported in 2011.

2012 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS
JULY 2012

The Gas Company

A Sempra Energy utility℠

2012 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS - AVERAGE TEMPERATURE YEAR
JULY 2012

The Gas Company

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TABLE 1-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2012 THRU 2014

AVERAGE TEMPERATURE YEAR

LINE			2012	2013	2014	LINE
	CAPACITY AVAILABLE					
1	California Line 85 Zone (California Producers)		160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	2
	Out-of-State Gas					
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,875	3,875	3,875	7
	GAS SUPPLY TAKEN					
8	California Source Gas		310	310	310	8
9	Out-of-State		2,363	2,337	2,306	9
10	TOTAL SUPPLY TAKEN		2,673	2,647	2,616	10
11	Net Underground Storage Withdrawal		0	0	0	11
12	TOTAL THROUGHPUT 4/		2,673	2,647	2,616	12
	REQUIREMENTS FORECAST BY END-USE 5/					
13	CORE 6/	Residential	638	632	627	13
14		Commercial	213	214	212	14
15		Industrial	60	58	56	15
16		NGV	29	30	31	16
17		Subtotal-CORE	940	934	927	17
18	NONCORE	Commercial	47	46	45	18
19		Industrial	376	374	372	19
20		EOR Steaming	32	41	41	20
21		Electric Generation (EG)	812	804	784	21
22		Subtotal-NONCORE	1,267	1,266	1,241	22
23	WHOLESALE &	Core	183	184	184	23
24	INTERNATIONAL	Noncore Excl. EG	42	43	43	24
25		Electric Generation (EG)	208	190	190	25
26		Subtotal-WHOLESALE & INTL.	434	416	416	26
27		Co. Use & LUAF	32	32	32	27
28	SYSTEM TOTAL THROUGHPUT 4/		2,673	2,647	2,616	28
	TRANSPORTATION AND EXCHANGE					
29	CORE	All End Uses	28	28	28	29
30	NONCORE	Commercial/Industrial	424	420	416	30
31		EOR Steaming	32	41	41	31
32		Electric Generation (EG)	812	804	784	32
33		Subtotal-RETAIL	1,295	1,294	1,269	33
	WHOLESALE &					
34	INTERNATIONAL	All End Uses	434	416	416	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,729	1,710	1,685	35
	CURTAILMENT (RETAIL & WHOLESALE)					
36		Core	0	0	0	36
37		Noncore	0	0	0	37
38		TOTAL - Curtailment	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.

	2012	2013	2014
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1
5/ Requirement forecast by end-use includes sales, transportation, and exchange volumes			
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	931	925	918

TABLE 2-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2015 THRU 2030

AVERAGE TEMPERATURE YEAR

LINE			2015	2020	2025	2030	LINE
	CAPACITY AVAILABLE						
1	California Line 85 Zone (California Producers)		160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	2
	Out-of-State Gas		0	0	0	0	
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,875	3,875	3,875	3,875	7
	GAS SUPPLY TAKEN						
8	California Source Gas		310	310	310	310	8
9	Out-of-State		2,305	2,309	2,289	2,309	9
10	TOTAL SUPPLY TAKEN		2,615	2,619	2,599	2,619	10
11	Net Underground Storage Withdrawal		0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		2,615	2,619	2,599	2,619	12
	REQUIREMENTS FORECAST BY END-USE [5/]						
13	CORE [6/]	Residential	623	620	618	628	13
14		Commercial	211	206	203	207	14
15		Industrial	56	50	43	39	15
16		NGV	33	39	45	51	16
17		Subtotal-CORE	922	915	909	925	17
18	NONCORE	Commercial	43	33	24	23	18
19		Industrial	368	354	341	336	19
20		EOR Steaming	41	41	41	41	20
21		Electric Generation (EG)	790	833	833	832	21
22		Subtotal-NONCORE	1,242	1,261	1,239	1,233	22
23	WHOLESALE &	Core	184	183	187	193	23
24	INTERNATIONAL	Noncore Excl. EG	44	45	46	46	24
25		Electric Generation (EG)	191	183	187	191	25
26		Subtotal-WHOLESALE & INTL.	419	411	420	430	26
27		Co. Use & LUAF	32	32	31	32	27
28	SYSTEM TOTAL THROUGHPUT [4/]		2,615	2,619	2,599	2,619	28
	TRANSPORTATION AND EXCHANGE						
29	CORE	All End Uses	28	27	26	27	29
30	NONCORE	Commercial/Industrial	411	388	365	359	30
31		EOR Steaming	41	41	41	41	31
32		Electric Generation (EG)	790	833	833	832	32
33		Subtotal-RETAIL	1,270	1,288	1,265	1,259	33
	WHOLESALE &						
34	INTERNATIONAL	All End Uses	419	411	420	430	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,689	1,699	1,685	1,689	35
	CURTAILMENT (RETAIL & WHOLESALE)						
36		Core	0	0	0	0	36
37		Noncore	0	0	0	0	37
38		TOTAL - Curtailment	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.

	2015	2020	2025	2030
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1

5/ Requirement forecast by end-use includes sales, transportation, and exchange volume

	2015	2020	2025	2030
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	913	906	901	917

Work Paper: **TABLE 1-SCG**

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2012

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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	310	8
9	Out-of-State		2,769	2,619	2,469	2,314	2,058	2,027	2,347	2,337	2,217	2,012	2,352	2,841	2,363	9
10	TOTAL SUPPLY TAKEN		3,079	2,929	2,779	2,624	2,368	2,337	2,657	2,647	2,527	2,322	2,662	3,151	2,673	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,079	2,929	2,779	2,624	2,368	2,337	2,657	2,647	2,527	2,322	2,662	3,151	2,673	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,060	953	817	676	470	379	348	347	355	438	729	1,096	638	13
14		Commercial	280	276	227	207	193	183	161	157	175	171	246	285	213	14
15		Industrial	63	68	64	60	57	58	53	54	55	58	64	65	60	15
16		NGV	28	27	30	29	29	30	28	30	31	29	29	28	29	16
17		Subtotal-CORE	1,431	1,324	1,138	972	749	649	590	588	615	696	1,068	1,475	940	17
18	NONCORE	Commercial	57	53	50	47	42	40	39	42	49	45	48	56	47	18
19		Industrial	383	373	378	379	377	371	378	394	391	375	365	352	376	19
20		EOR Steaming	29	29	29	29	29	29	34	34	34	34	34	34	32	20
21		Electric Generation (EG)	662	641	690	739	767	856	1,134	1,107	961	793	714	671	812	21
22		Subtotal-NONCORE	1,130	1,097	1,147	1,193	1,216	1,296	1,586	1,576	1,435	1,247	1,160	1,112	1,267	22
23	WHOLESALE &	Core	274	267	226	195	150	124	115	113	118	134	203	283	183	23
24	INTERNATIONAL	Noncore Excl. EG	48	46	41	44	42	43	40	38	41	42	40	45	42	24
25		Electric Generation (EG)	158	160	193	188	183	197	295	300	286	176	158	198	208	25
26		Subtotal-WHOLESALE & INT	480	473	460	427	375	364	450	450	445	351	401	525	434	26
27		Co. Use & LUAF	37	35	34	32	29	28	32	32	31	28	32	38	32	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,079	2,929	2,779	2,624	2,368	2,337	2,657	2,647	2,527	2,322	2,662	3,151	2,673	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	38	37	31	28	25	24	21	21	23	23	33	38	28	29
30	NONCORE	Commercial/Industrial	439	426	428	425	419	411	418	436	441	420	413	407	424	30
31		EOR Steaming	29	29	29	29	29	29	34	34	34	34	34	34	32	31
32		Electric Generation (EG)	662	641	690	739	767	856	1,134	1,107	961	793	714	671	812	32
33		Subtotal-RETAIL	1,168	1,134	1,178	1,221	1,241	1,319	1,607	1,597	1,458	1,270	1,193	1,151	1,295	33
34	WHOLESALE & INTERNATIONAL	All End Uses	480	473	460	427	375	364	450	450	445	351	401	525	434	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,648	1,607	1,638	1,648	1,615	1,683	2,057	2,047	1,903	1,621	1,594	1,676	1,729	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.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,423	1,314	1,130	964	739	639	581	579	605	687	1,057	1,467	931

Work Paper: TABLE 1-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2013

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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	310	8
9	Out-of-State		2,745	2,687	2,384	2,187	1,951	1,978	2,278	2,307	2,224	2,059	2,390	2,876	2,337	9
10	TOTAL SUPPLY TAKEN		3,055	2,997	2,694	2,497	2,261	2,288	2,588	2,617	2,534	2,369	2,700	3,186	2,647	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,055	2,997	2,694	2,497	2,261	2,288	2,588	2,617	2,534	2,369	2,700	3,186	2,647	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,047	974	807	667	464	374	344	343	350	432	719	1,083	632	13
14		Commercial	277	285	227	206	193	183	162	159	176	171	246	285	214	14
15		Industrial	61	68	61	57	55	56	51	52	53	55	62	63	58	15
16		NGV	29	29	31	31	30	31	29	31	32	31	30	29	30	16
17		Subtotal-CORE	1,414	1,356	1,126	961	741	644	586	585	611	690	1,058	1,460	934	17
18	NONCORE	Commercial	55	54	49	46	41	39	38	41	48	44	46	54	46	18
19		Industrial	381	376	374	375	374	368	376	391	389	372	362	349	374	19
20		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	20
21		Electric Generation (EG)	671	662	658	671	716	825	1,072	1,083	970	835	762	715	804	21
22		Subtotal-NONCORE	1,148	1,132	1,122	1,133	1,172	1,273	1,527	1,556	1,448	1,293	1,212	1,159	1,266	22
23	WHOLESALE &	Core	274	275	226	195	150	124	115	113	118	133	202	282	184	23
24	INTERNATIONAL	Noncore Excl. EG	48	48	41	45	42	44	40	38	41	42	40	45	43	24
25		Electric Generation (EG)	134	150	146	133	129	175	289	292	285	182	154	201	190	25
26		Subtotal-WHOLESALE & INT	456	473	413	372	321	343	444	444	444	358	397	528	416	26
27		Co. Use & LUAF	37	36	33	30	27	28	31	32	31	29	33	39	32	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,055	2,997	2,694	2,497	2,261	2,288	2,588	2,617	2,534	2,369	2,700	3,186	2,647	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	37	38	31	27	25	23	21	20	22	23	32	38	28	29
30	NONCORE	Commercial/Industrial	436	429	424	421	415	407	414	432	437	416	409	403	420	30
31		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	31
32		Electric Generation (EG)	671	662	658	671	716	825	1,072	1,083	970	835	762	715	804	32
33		Subtotal-RETAIL	1,185	1,170	1,153	1,161	1,197	1,296	1,548	1,577	1,470	1,315	1,245	1,197	1,294	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	456	473	413	372	321	343	444	444	444	358	397	528	416	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,641	1,643	1,566	1,533	1,518	1,639	1,992	2,020	1,914	1,673	1,641	1,725	1,710	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.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1
5/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.													
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,406	1,346	1,118	953	731	633	577	576	601	681	1,047	1,451	925

Work Paper: TABLE 1-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2014

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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	310	8
9	Out-of-State		2,739	2,685	2,371	2,190	1,931	1,933	2,223	2,242	2,157	1,992	2,384	2,843	2,306	9
10	TOTAL SUPPLY TAKEN		3,049	2,995	2,681	2,500	2,241	2,243	2,533	2,552	2,467	2,302	2,694	3,153	2,616	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,049	2,995	2,681	2,500	2,241	2,243	2,533	2,552	2,467	2,302	2,694	3,153	2,616	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,039	966	800	662	460	371	341	340	347	429	714	1,074	627	13
14		Commercial	276	283	225	205	191	181	160	156	174	170	244	283	212	14
15		Industrial	60	67	60	56	54	54	49	50	52	54	61	61	56	15
16		NGV	30	30	32	32	32	32	30	32	33	32	31	31	31	16
17		Subtotal-CORE	1,404	1,346	1,117	955	736	639	580	579	606	685	1,050	1,449	927	17
18	NONCORE	Commercial	53	52	47	44	40	37	37	39	46	43	45	52	45	18
19		Industrial	378	373	372	373	372	366	373	389	386	370	360	347	372	19
20		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	20
21		Electric Generation (EG)	680	675	659	685	706	796	1,026	1,024	913	780	761	693	784	21
22		Subtotal-NONCORE	1,152	1,141	1,120	1,143	1,159	1,240	1,477	1,493	1,386	1,234	1,207	1,134	1,241	22
23	WHOLESALE &	Core	274	275	226	195	150	124	115	113	118	133	203	283	184	23
24	INTERNATIONAL	Noncore Excl. EG	48	48	42	45	43	44	41	38	41	42	41	45	43	24
25		Electric Generation (EG)	133	149	144	132	127	169	290	297	285	179	160	204	190	25
26		Subtotal-WHOLESALE & INT	456	472	411	372	319	337	445	448	444	355	404	532	416	26
27		Co. Use & LUAF	37	36	32	30	27	27	31	31	30	28	33	38	32	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,049	2,995	2,681	2,500	2,241	2,243	2,533	2,552	2,467	2,302	2,694	3,153	2,616	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	37	38	30	27	25	23	21	20	22	22	32	38	28	29
30	NONCORE	Commercial/Industrial	431	425	419	417	411	403	410	428	432	412	405	400	416	30
31		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	31
32		Electric Generation (EG)	680	675	659	685	706	796	1,026	1,024	913	780	761	693	784	32
33		Subtotal-RETAIL	1,189	1,178	1,150	1,171	1,184	1,263	1,497	1,514	1,409	1,256	1,239	1,172	1,269	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	456	472	411	372	319	337	445	448	444	355	404	532	416	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,645	1,651	1,561	1,543	1,502	1,601	1,942	1,962	1,853	1,612	1,643	1,704	1,685	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.)

Note	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,396	1,336	1,110	947	726	628	571	570	596	677	1,039	1,440	918

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

Work Paper: **TABLE 2-SCG**

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2015

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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	310	8
9	Out-of-State		2,731	2,679	2,369	2,197	1,927	1,928	2,240	2,241	2,164	2,010	2,349	2,840	2,305	9
10	TOTAL SUPPLY TAKEN		3,041	2,989	2,679	2,507	2,237	2,238	2,550	2,551	2,474	2,320	2,659	3,150	2,615	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		3,041	2,989	2,679	2,507	2,237	2,238	2,550	2,551	2,474	2,320	2,659	3,150	2,615	12
	REQUIREMENTS FORECAST BY END-USE [5/]															
13	CORE [6/]	Residential	1,032	960	795	657	457	369	339	338	345	426	709	1,067	623	13
14		Commercial	275	282	224	204	191	180	159	155	174	169	243	282	211	14
15		Industrial	59	66	59	55	53	54	49	50	51	54	60	60	56	15
16		NGV	31	31	34	33	33	34	31	33	34	33	32	32	33	16
17		Subtotal-CORE	1,397	1,339	1,112	950	733	636	578	576	604	682	1,045	1,441	922	17
18	NONCORE	Commercial	51	50	45	42	38	36	35	38	44	41	43	50	43	18
19		Industrial	375	370	369	370	368	363	370	385	383	367	357	344	368	19
20		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	20
21		Electric Generation (EG)	681	679	666	697	708	796	1,047	1,029	924	804	740	699	790	21
22		Subtotal-NONCORE	1,147	1,139	1,121	1,150	1,156	1,236	1,494	1,493	1,392	1,253	1,181	1,135	1,242	22
23	WHOLESALE &	Core	274	275	226	195	150	124	115	113	118	133	203	283	184	23
24	INTERNATIONAL	Noncore Excl. EG	49	49	42	46	43	44	41	39	42	43	41	46	44	24
25		Electric Generation (EG)	136	151	146	136	129	170	292	298	288	181	157	207	191	25
26		Subtotal-WHOLESALE & INT	459	475	415	376	322	339	447	450	448	357	401	536	419	26
27		Co. Use & LUAF	37	36	32	30	27	27	31	31	30	28	32	38	32	27
28	SYSTEM TOTAL THROUGHPUT [4/]		3,041	2,989	2,679	2,507	2,237	2,238	2,550	2,551	2,474	2,320	2,659	3,150	2,615	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	37	38	30	27	25	23	20	20	22	22	32	38	28	29
30	NONCORE	Commercial/Industrial	426	419	414	412	407	398	406	423	427	407	400	395	411	30
31		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	31
32		Electric Generation (EG)	681	679	666	697	708	796	1,047	1,029	924	804	740	699	790	32
33		Subtotal-RETAIL	1,184	1,177	1,151	1,178	1,180	1,259	1,514	1,514	1,414	1,275	1,213	1,172	1,270	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	459	475	415	376	322	339	447	450	448	357	401	536	419	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,644	1,651	1,566	1,554	1,502	1,598	1,961	1,964	1,862	1,632	1,614	1,708	1,689	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,388	1,329	1,104	942	723	626	569	568	594	674	1,034	1,433	913

Work Paper: **TABLE 2-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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	310	8
9	Out-of-State		2,767	2,604	2,371	2,183	1,932	1,945	2,188	2,219	2,141	2,065	2,395	2,899	2,309	9
10	TOTAL SUPPLY TAKEN		3,077	2,914	2,681	2,493	2,242	2,255	2,498	2,529	2,451	2,375	2,705	3,209	2,619	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,077	2,914	2,681	2,493	2,242	2,255	2,498	2,529	2,451	2,375	2,705	3,209	2,619	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,029	925	793	656	456	368	338	337	344	425	707	1,064	620	13
14		Commercial	269	268	219	200	187	177	156	151	170	166	238	276	206	14
15		Industrial	53	57	53	50	48	48	44	45	46	50	55	55	50	15
16		NGV	37	36	40	39	39	40	37	40	41	40	39	38	39	16
17		Subtotal-CORE	1,389	1,285	1,106	945	729	633	575	573	601	680	1,039	1,433	915	17
18	NONCORE	Commercial	40	38	36	33	30	28	28	30	35	32	34	39	33	18
19		Industrial	361	351	355	356	355	349	356	370	368	353	344	332	354	19
20		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	20
21		Electric Generation (EG)	738	695	691	704	732	832	1,074	1,088	982	875	794	774	833	21
22		Subtotal-NONCORE	1,180	1,125	1,122	1,134	1,158	1,251	1,499	1,529	1,426	1,301	1,213	1,187	1,261	22
23	WHOLESALE &	Core	276	267	227	195	149	123	113	112	117	133	203	285	183	23
24	INTERNATIONAL	Noncore Excl. EG	50	49	44	47	44	46	42	40	43	44	42	47	45	24
25		Electric Generation (EG)	144	153	151	142	134	176	238	243	234	188	174	219	183	25
26		Subtotal-WHOLESALE & INT	471	468	421	384	327	344	394	395	393	365	419	550	411	26
27		Co. Use & LUAF	37	35	32	30	27	27	30	31	30	29	33	39	32	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,077	2,914	2,681	2,493	2,242	2,255	2,498	2,529	2,451	2,375	2,705	3,209	2,619	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	36	35	29	27	24	23	20	19	22	22	31	37	27	29
30	NONCORE	Commercial/Industrial	401	389	391	389	385	377	384	400	403	385	378	371	388	30
31		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	31
32		Electric Generation (EG)	738	695	691	704	732	832	1,074	1,088	982	875	794	774	833	32
33		Subtotal-RETAIL	1,216	1,160	1,152	1,160	1,182	1,273	1,519	1,549	1,448	1,323	1,244	1,224	1,288	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	471	468	421	384	327	344	394	395	393	365	419	550	411	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,687	1,629	1,573	1,544	1,509	1,618	1,913	1,944	1,841	1,688	1,664	1,774	1,699	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.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,381	1,276	1,099	938	720	623	567	565	592	672	1,029	1,425	906

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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	310	8
9	Out-of-State		2,738	2,666	2,345	2,158	1,907	1,921	2,165	2,193	2,114	2,041	2,369	2,872	2,289	9
10	TOTAL SUPPLY TAKEN		3,048	2,976	2,655	2,468	2,217	2,231	2,475	2,503	2,424	2,351	2,679	3,182	2,599	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		3,048	2,976	2,655	2,468	2,217	2,231	2,475	2,503	2,424	2,351	2,679	3,182	2,599	12
	REQUIREMENTS FORECAST BY END-USE [5/]															
13	CORE [6/]	Residential	1,024	953	789	652	453	366	336	335	342	423	703	1,058	618	13
14		Commercial	264	272	215	196	183	173	152	148	167	162	233	271	203	14
15		Industrial	45	51	45	43	41	41	37	38	39	44	48	47	43	15
16		NGV	43	43	46	46	46	46	43	46	48	46	45	44	45	16
17		Subtotal-CORE	1,376	1,319	1,095	937	723	626	569	568	596	675	1,030	1,420	909	17
18	NONCORE	Commercial	29	28	26	24	22	20	20	21	25	23	24	28	24	18
19		Industrial	347	342	341	342	341	336	342	356	354	339	332	320	341	19
20		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	20
21		Electric Generation (EG)	737	715	689	702	731	831	1,073	1,086	980	874	793	773	833	21
22		Subtotal-NONCORE	1,153	1,126	1,097	1,109	1,134	1,228	1,476	1,504	1,400	1,277	1,189	1,162	1,239	22
23	WHOLESALE &	Core	283	282	232	199	151	125	115	114	118	135	208	292	187	23
24	INTERNATIONAL	Noncore Excl. EG	51	51	44	48	45	47	43	41	44	45	43	48	46	24
25		Electric Generation (EG)	148	162	154	145	137	179	242	247	237	191	177	222	187	25
26		Subtotal-WHOLESALE & INT	481	495	430	391	333	350	400	401	399	371	428	562	420	26
27		Co. Use & LUAF	37	36	32	30	27	27	30	30	29	28	32	39	31	27
28	SYSTEM TOTAL THROUGHPUT [4/]		3,048	2,976	2,655	2,468	2,217	2,231	2,475	2,503	2,424	2,351	2,679	3,182	2,599	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	35	36	29	26	23	22	19	19	21	21	30	36	26	29
30	NONCORE	Commercial/Industrial	375	370	367	366	363	356	362	377	379	362	356	348	365	30
31		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	31
32		Electric Generation (EG)	737	715	689	702	731	831	1,073	1,086	980	874	793	773	833	32
33		Subtotal-RETAIL	1,188	1,162	1,126	1,135	1,158	1,250	1,495	1,523	1,421	1,298	1,220	1,198	1,265	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	481	495	430	391	333	350	400	401	399	371	428	562	420	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,670	1,657	1,556	1,527	1,491	1,600	1,895	1,924	1,820	1,669	1,648	1,759	1,685	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.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,369	1,310	1,089	930	714	617	562	561	587	667	1,020	1,413	901

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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	310	8
9	Out-of-State		2,767	2,695	2,368	2,178	1,923	1,935	2,176	2,204	2,126	2,057	2,393	2,903	2,309	9
10	TOTAL SUPPLY TAKEN		3,077	3,005	2,678	2,488	2,233	2,245	2,486	2,514	2,436	2,367	2,703	3,213	2,619	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		3,077	3,005	2,678	2,488	2,233	2,245	2,486	2,514	2,436	2,367	2,703	3,213	2,619	12
	REQUIREMENTS FORECAST BY END-USE [5/]															
13	CORE [6/]	Residential	1,040	968	801	662	460	372	342	341	348	429	714	1,075	628	13
14		Commercial	269	278	219	200	187	177	155	151	170	166	238	276	207	14
15		Industrial	41	46	41	39	37	37	34	35	35	41	44	42	39	15
16		NGV	49	49	52	52	51	52	49	52	54	52	51	50	51	16
17		Subtotal-CORE	1,399	1,341	1,113	953	735	638	580	578	607	688	1,047	1,443	925	17
18	NONCORE	Commercial	28	27	25	23	21	19	19	20	24	22	23	27	23	18
19		Industrial	342	337	336	337	336	331	337	350	349	334	327	316	336	19
20		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	20
21		Electric Generation (EG)	736	714	688	701	730	830	1,072	1,086	980	873	792	772	832	21
22		Subtotal-NONCORE	1,146	1,120	1,090	1,103	1,128	1,222	1,469	1,497	1,393	1,270	1,183	1,156	1,233	22
23	WHOLESALE &	Core	292	291	238	204	155	128	118	117	121	139	214	301	193	23
24	INTERNATIONAL	Noncore Excl. EG	52	52	45	48	46	47	43	41	44	45	44	48	46	24
25		Electric Generation (EG)	152	167	159	150	142	183	246	251	241	195	182	226	191	25
26		Subtotal-WHOLESALE & INT	495	509	442	402	342	358	407	409	407	380	439	575	430	26
27		Co. Use & LUAF	37	36	32	30	27	27	30	30	29	29	33	39	32	27
28	SYSTEM TOTAL THROUGHPUT [4/]		3,077	3,005	2,678	2,488	2,233	2,245	2,486	2,514	2,436	2,367	2,703	3,213	2,619	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	36	36	29	26	24	22	20	19	21	21	31	36	27	29
30	NONCORE	Commercial/Industrial	369	364	361	360	357	350	356	371	373	356	350	343	359	30
31		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	31
32		Electric Generation (EG)	736	714	688	701	730	830	1,072	1,086	980	873	792	772	832	32
33		Subtotal-RETAIL	1,182	1,156	1,119	1,129	1,152	1,244	1,489	1,516	1,415	1,292	1,214	1,193	1,259	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	495	509	442	402	342	358	407	409	407	380	439	575	430	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,677	1,665	1,561	1,531	1,494	1,602	1,896	1,925	1,821	1,672	1,653	1,768	1,689	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

NOTES:
1/ Wheeler Ridge Zone: KR & MP at Wheeler Ridge, PG&E at Kern Stn., OEHI at Gosford)
2/ Southern Zone (EPN at Ehrenberg, TGN at Otay Mesa, NBP at Blythe)
3/ Northern Zone (TW at No. Needles, EPN at Topok, QST at No. Needles, KR at Kramer Jct.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1
5/ Requirement forecast by end-use includes sales, transportation, and exchange volumes.													
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,392	1,331	1,107	946	727	628	572	571	598	680	1,038	1,436	917

2012 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS - COLD TEMPERATURE YEAR
JULY 2012

The Gas Company

A Sempra Energy utility℠

TABLE 3-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2012 THRU 2014

COLD TEMPERATURE YEAR & DRY HYDRO YEAR

LINE			2012	2013	2014	LINE
	CAPACITY AVAILABLE					
1	California Line 85 Zone (California Producers)		160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	2
	Out-of-State Gas					
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,875	3,875	3,875	7
	GAS SUPPLY TAKEN					
8	California Source Gas		160	160	160	8
9	Out-of-State		2,603	2,639	2,606	9
10	TOTAL SUPPLY TAKEN		2,763	2,799	2,766	10
11	Net Underground Storage Withdrawal		0	0	0	11
12	TOTAL THROUGHPUT [4/]		2,763	2,799	2,766	12
	REQUIREMENTS FORECAST BY END-USE [5/]					
13	CORE [6/]	Residential	699	692	686	13
14		Commercial	225	225	223	14
15		Industrial	61	59	58	15
16		NGV	29	30	31	16
17		Subtotal-CORE	1,014	1,006	999	17
18	NONCORE	Commercial	48	47	46	18
19		Industrial	376	374	372	19
20		EOR Steaming	32	41	41	20
21		Electric Generation (EG)	812	858	837	21
22		Subtotal-NONCORE	1,268	1,320	1,295	22
23	WHOLESALE &	Core	198	198	198	23
24	INTERNATIONAL	Noncore Excl. EG	42	43	43	24
25		Electric Generation (EG)	208	197	197	25
26		Subtotal-WHOLESALE & INTL.	448	438	439	26
27		Co. Use & LUAF	33	34	33	27
28	SYSTEM TOTAL THROUGHPUT [4/]		2,763	2,799	2,766	28
	TRANSPORTATION AND EXCHANGE					
29	CORE	All End Uses	30	30	29	29
30	NONCORE	Commercial/Industrial	425	421	417	30
31		EOR Steaming	32	41	41	31
32		Electric Generation (EG)	812	858	837	32
33		Subtotal-RETAIL	1,298	1,350	1,325	33
	WHOLESALE &					
34	INTERNATIONAL	All End Uses	448	438	439	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,747	1,788	1,764	35
	CURTAILMENT (RETAIL & WHOLESALE)					
36		Core	0	0	0	36
37		Noncore	0	0	0	37
38		TOTAL - Curtailment	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.

	2012	2013	2014
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1

5/ Requirement forecast by end-use includes sales, transportation, and exchange volumes
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:

	2012	2013	2014
transportation (CAT) in MDth/d:	1,004	997	990

TABLE 4-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2015 THRU 2030

COLD TEMPERATURE YEAR & DRY HYDRO YEAR

LINE			2015	2020	2025	2030	LINE
	CAPACITY AVAILABLE						
1	California Line 85 Zone (California Producers)		160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	2
	Out-of-State Gas		0	0	0	0	
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN						
8	California Source Gas		310	310	310	310	8
9	Out-of-State		2,449	2,463	2,443	2,465	9
10	TOTAL SUPPLY TAKEN		2,759	2,773	2,753	2,775	10
11	Net Underground Storage Withdrawal		0	0	0	0	11
12	TOTAL THROUGHPUT 4/		2,759	2,773	2,753	2,775	12
	REQUIREMENTS FORECAST BY END-USE 5/						
13	CORE 6/	Residential	682	678	677	687	13
14		Commercial	222	217	213	218	14
15		Industrial	57	51	44	40	15
16		NGV	33	39	45	51	16
17		Subtotal-CORE	994	986	979	996	17
18	NONCORE	Commercial	44	35	25	24	18
19		Industrial	368	354	341	336	19
20		EOR Steaming	41	41	41	41	20
21		Electric Generation (EG)	837	890	891	890	21
22		Subtotal-NONCORE	1,290	1,320	1,298	1,292	22
23	WHOLESALE &	Core	198	198	202	208	23
24	INTERNATIONAL	Noncore Excl. EG	44	45	46	46	24
25		Electric Generation (EG)	200	190	194	198	25
26		Subtotal-WHOLESALE & INTL.	442	433	442	453	26
27		Co. Use & LUAF	33	34	33	34	27
28	SYSTEM TOTAL THROUGHPUT 4/		2,759	2,773	2,753	2,775	28
	TRANSPORTATION AND EXCHANGE						
29	CORE	All End Uses	29	29	28	28	29
30	NONCORE	Commercial/Industrial	412	389	366	360	30
31		EOR Steaming	41	41	41	41	31
32		Electric Generation (EG)	837	890	891	890	32
33		Subtotal-RETAIL	1,320	1,349	1,326	1,320	33
	WHOLESALE &						
34	INTERNATIONAL	All End Uses	442	433	442	453	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,762	1,782	1,768	1,773	35
	CURTAILMENT (RETAIL & WHOLESALE)						
36		Core	0	0	0	0	36
37		Noncore	0	0	0	0	37
38		TOTAL - Curtailment	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.

	2015	2020	2025	2030
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1

5/ Requirement forecast by end-use includes sales, transportation, and exchange volume
6/ Core end-use demand exclusive of core aggregation

	2015	2020	2025	2030
transportation (CAT) in MDth/d:	985	977	972	988

Work Paper: **TABLE 3-SCG**

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2012

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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	160	8
9	Out-of-State		2,986	2,809	2,612	2,414	2,099	2,039	2,347	2,342	2,220	2,038	2,474	3,067	2,603	9
10	TOTAL SUPPLY TAKEN		3,296	3,119	2,922	2,724	2,409	2,349	2,657	2,652	2,530	2,348	2,784	3,377	2,763	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,296	3,119	2,922	2,724	2,409	2,349	2,657	2,652	2,530	2,348	2,784	3,377	2,763	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,207	1,080	914	743	495	386	350	348	357	457	807	1,250	699	13
14		Commercial	306	299	243	217	201	187	161	157	178	174	264	313	225	14
15		Industrial	66	71	66	61	58	59	53	54	55	59	67	68	61	15
16		NGV	28	27	30	29	29	30	28	30	31	29	29	28	29	16
17		Subtotal-CORE	1,606	1,476	1,252	1,051	783	662	591	589	620	720	1,167	1,659	1,014	17
18	NONCORE	Commercial	59	56	52	48	43	40	39	42	49	46	49	59	48	18
19		Industrial	383	373	378	379	377	371	378	394	391	375	365	352	376	19
20		EOR Steaming	29	29	29	29	29	29	34	34	34	34	34	34	32	20
21		Electric Generation (EG)	662	641	690	739	767	856	1,134	1,107	961	793	714	671	812	21
22		Subtotal-NONCORE	1,133	1,099	1,149	1,195	1,216	1,296	1,586	1,576	1,435	1,247	1,162	1,115	1,268	22
23	WHOLESALE &	Core	310	299	252	213	156	124	113	117	117	136	223	319	198	23
24	INTERNATIONAL	Noncore Excl. EG	48	46	41	45	42	43	40	38	41	42	40	45	42	24
25		Electric Generation (EG)	158	160	193	188	183	197	295	300	286	176	158	198	208	25
26		Subtotal-WHOLESALE & INT	516	506	486	445	381	364	448	454	444	353	421	562	448	26
27		Co. Use & LUAF	40	38	35	33	29	28	32	32	31	28	34	41	33	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,296	3,119	2,922	2,724	2,409	2,349	2,657	2,652	2,530	2,348	2,784	3,377	2,763	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	41	40	33	29	26	24	21	21	23	23	35	42	30	29
30	NONCORE	Commercial/Industrial	442	429	430	427	420	411	418	436	441	420	414	410	425	30
31		EOR Steaming	29	29	29	29	29	29	34	34	34	34	34	34	32	31
32		Electric Generation (EG)	662	641	690	739	767	856	1,134	1,107	961	793	714	671	812	32
33		Subtotal-RETAIL	1,174	1,139	1,182	1,224	1,242	1,320	1,607	1,597	1,458	1,270	1,197	1,157	1,298	33
34	WHOLESALE & INTERNATIONAL	All End Uses	516	506	486	445	381	364	448	454	444	353	421	562	448	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,691	1,645	1,668	1,669	1,623	1,684	2,055	2,051	1,902	1,624	1,618	1,719	1,747	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.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,598	1,466	1,245	1,043	773	651	582	580	610	711	1,156	1,651	1,004

Work Paper: **TABLE 3-SCG**

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2013

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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	160	8
9	Out-of-State		2,995	2,915	2,559	2,318	2,050	2,068	2,412	2,445	2,315	2,125	2,555	3,128	2,639	9
10	TOTAL SUPPLY TAKEN		3,305	3,225	2,869	2,628	2,360	2,378	2,722	2,755	2,625	2,435	2,865	3,438	2,799	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,305	3,225	2,869	2,628	2,360	2,378	2,722	2,755	2,625	2,435	2,865	3,438	2,799	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,192	1,104	902	734	489	381	345	344	352	451	797	1,235	692	13
14		Commercial	303	309	242	216	200	187	163	159	179	174	264	312	225	14
15		Industrial	63	71	64	58	56	56	51	52	53	56	64	65	59	15
16		NGV	29	29	31	31	30	31	29	31	32	31	30	29	30	16
17		Subtotal-CORE	1,587	1,512	1,239	1,039	776	656	587	586	616	713	1,155	1,642	1,006	17
18	NONCORE	Commercial	58	56	51	47	42	39	38	41	48	44	48	57	47	18
19		Industrial	381	376	374	375	374	368	376	391	389	372	362	349	374	19
20		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	20
21		Electric Generation (EG)	698	687	682	696	754	888	1,203	1,214	1,053	871	795	738	858	21
22		Subtotal-NONCORE	1,178	1,160	1,148	1,159	1,210	1,335	1,658	1,687	1,531	1,328	1,246	1,185	1,320	22
23	WHOLESALE &	Core	310	308	253	213	156	124	113	117	117	135	222	319	198	23
24	INTERNATIONAL	Noncore Excl. EG	48	48	42	45	42	44	40	38	41	42	40	45	43	24
25		Electric Generation (EG)	142	157	154	140	147	189	291	294	288	188	166	206	197	25
26		Subtotal-WHOLESALE & INT	500	513	448	398	345	357	444	449	446	365	428	570	438	26
27		Co. Use & LUAF	40	39	35	32	29	29	33	33	32	29	35	42	34	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,305	3,225	2,869	2,628	2,360	2,378	2,722	2,755	2,625	2,435	2,865	3,438	2,799	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	41	41	33	29	26	24	21	21	23	23	35	42	30	29
30	NONCORE	Commercial/Industrial	438	432	425	422	416	407	414	432	437	416	410	406	421	30
31		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	31
32		Electric Generation (EG)	698	687	682	696	754	888	1,203	1,214	1,053	871	795	738	858	32
33		Subtotal-RETAIL	1,218	1,202	1,181	1,188	1,236	1,359	1,679	1,708	1,554	1,351	1,281	1,227	1,350	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	500	513	448	398	345	357	444	449	446	365	428	570	438	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,718	1,715	1,629	1,586	1,582	1,717	2,123	2,157	1,999	1,716	1,709	1,797	1,788	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.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,579	1,502	1,231	1,031	765	645	578	577	606	704	1,144	1,633	997

Work Paper: TABLE 3-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2014

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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	160	8
9	Out-of-State		2,981	2,905	2,547	2,333	2,028	2,011	2,368	2,361	2,238	2,071	2,554	3,100	2,606	9
10	TOTAL SUPPLY TAKEN		3,291	3,215	2,857	2,643	2,338	2,321	2,678	2,671	2,548	2,381	2,864	3,410	2,766	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,291	3,215	2,857	2,643	2,338	2,321	2,678	2,671	2,548	2,381	2,864	3,410	2,766	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,182	1,095	895	728	485	378	342	341	349	448	791	1,225	686	13
14		Commercial	301	307	240	215	199	185	160	156	177	173	262	310	223	14
15		Industrial	62	69	62	57	54	55	49	51	52	55	63	64	58	15
16		NGV	30	30	32	32	32	32	30	32	33	32	31	31	31	16
17		Subtotal-CORE	1,576	1,501	1,229	1,032	770	651	582	580	611	708	1,147	1,629	999	17
18	NONCORE	Commercial	56	54	49	45	40	37	37	39	46	43	46	55	46	18
19		Industrial	378	373	372	373	372	366	373	389	386	370	360	347	372	19
20		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	20
21		Electric Generation (EG)	705	696	688	724	751	844	1,163	1,134	986	824	793	723	837	21
22		Subtotal-NONCORE	1,179	1,165	1,151	1,183	1,204	1,288	1,614	1,604	1,460	1,278	1,241	1,166	1,295	22
23	WHOLESALE &	Core	310	308	252	213	156	124	113	117	116	136	222	319	198	23
24	INTERNATIONAL	Noncore Excl. EG	49	48	42	45	43	44	41	38	41	43	41	46	43	24
25		Electric Generation (EG)	137	154	148	138	137	186	296	301	289	188	178	209	197	25
26		Subtotal-WHOLESALE & INT	496	510	442	396	336	354	449	455	446	366	441	574	439	26
27		Co. Use & LUAF	40	39	35	32	28	28	32	32	31	29	35	41	33	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,291	3,215	2,857	2,643	2,338	2,321	2,678	2,671	2,548	2,381	2,864	3,410	2,766	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	40	41	32	29	26	24	21	20	23	23	34	42	29	29
30	NONCORE	Commercial/Industrial	434	427	421	418	412	403	410	428	433	413	406	402	417	30
31		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	31
32		Electric Generation (EG)	705	696	688	724	751	844	1,163	1,134	986	824	793	723	837	32
33		Subtotal-RETAIL	1,220	1,206	1,183	1,212	1,229	1,312	1,635	1,624	1,482	1,301	1,275	1,208	1,325	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	496	510	442	396	336	354	449	455	446	366	441	574	439	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,716	1,716	1,625	1,608	1,565	1,666	2,084	2,079	1,929	1,667	1,716	1,782	1,764	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.)

Note	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,567	1,491	1,222	1,024	760	640	573	571	601	700	1,136	1,621	990

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

Work Paper: TABLE 4-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2015

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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	310	8
9	Out-of-State		2,966	2,897	2,548	2,343	2,018	2,008	2,360	2,361	2,237	2,078	2,510	3,092	2,449	9
10	TOTAL SUPPLY TAKEN		3,276	3,207	2,858	2,653	2,328	2,318	2,670	2,671	2,547	2,388	2,820	3,402	2,759	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,276	3,207	2,858	2,653	2,328	2,318	2,670	2,671	2,547	2,388	2,820	3,402	2,759	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,175	1,088	889	723	482	376	340	339	347	445	786	1,217	682	13
14		Commercial	301	306	239	214	198	185	160	155	176	173	261	309	222	14
15		Industrial	61	68	61	56	54	54	49	50	51	55	62	63	57	15
16		NGV	31	31	34	33	33	34	31	33	34	33	32	32	33	16
17		Subtotal-CORE	1,567	1,493	1,223	1,027	767	648	580	577	609	705	1,141	1,621	994	17
18	NONCORE	Commercial	54	52	47	44	39	36	36	38	44	41	44	53	44	18
19		Industrial	375	370	369	370	368	363	370	385	383	367	357	344	368	19
20		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	20
21		Electric Generation (EG)	697	698	694	733	744	847	1,161	1,140	988	837	766	724	837	21
22		Subtotal-NONCORE	1,167	1,161	1,151	1,188	1,192	1,287	1,607	1,604	1,456	1,286	1,209	1,163	1,290	22
23	WHOLESALE &	Core	310	308	252	213	156	124	113	116	116	135	222	319	198	23
24	INTERNATIONAL	Noncore Excl. EG	50	49	43	46	43	44	41	39	42	43	42	46	44	24
25		Electric Generation (EG)	141	156	154	148	142	186	298	302	292	189	171	211	200	25
26		Subtotal-WHOLESALE & INT	501	514	449	407	340	355	451	458	451	368	435	577	442	26
27		Co. Use & LUAF	40	39	35	32	28	28	32	32	31	29	34	41	33	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,276	3,207	2,858	2,653	2,328	2,318	2,670	2,671	2,547	2,388	2,820	3,402	2,759	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	40	41	32	29	26	24	21	20	22	23	34	41	29	29
30	NONCORE	Commercial/Industrial	428	422	416	413	407	399	406	423	427	408	402	398	412	30
31		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	31
32		Electric Generation (EG)	697	698	694	733	744	847	1,161	1,140	988	837	766	724	837	32
33		Subtotal-RETAIL	1,207	1,202	1,184	1,216	1,218	1,311	1,628	1,624	1,479	1,308	1,244	1,205	1,320	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	501	514	449	407	340	355	451	458	451	368	435	577	442	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,709	1,716	1,633	1,623	1,558	1,665	2,079	2,082	1,929	1,677	1,679	1,782	1,762	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.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,559	1,483	1,216	1,019	757	638	571	569	598	697	1,130	1,612	985

Work Paper: TABLE 4-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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	310	8
9	Out-of-State		3,024	2,838	2,562	2,339	2,039	2,023	2,318	2,360	2,221	2,126	2,538	3,163	2,463	9
10	TOTAL SUPPLY TAKEN		3,334	3,148	2,872	2,649	2,349	2,333	2,628	2,670	2,531	2,436	2,848	3,473	2,773	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,334	3,148	2,872	2,649	2,349	2,333	2,628	2,670	2,531	2,436	2,848	3,473	2,773	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,172	1,048	887	722	481	375	339	338	346	444	784	1,214	678	13
14		Commercial	294	290	234	210	194	181	156	151	172	169	256	303	217	14
15		Industrial	55	60	55	51	48	49	44	45	46	51	57	57	51	15
16		NGV	37	36	40	39	39	40	37	40	41	40	39	38	39	16
17		Subtotal-CORE	1,558	1,433	1,216	1,022	763	645	577	574	606	703	1,135	1,611	986	17
18	NONCORE	Commercial	43	40	37	34	30	28	28	30	35	32	35	42	35	18
19		Industrial	361	351	355	356	355	349	356	370	368	353	344	332	354	19
20		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	20
21		Electric Generation (EG)	774	739	735	752	790	887	1,195	1,216	1,053	905	813	812	890	21
22		Subtotal-NONCORE	1,218	1,172	1,168	1,184	1,216	1,305	1,620	1,658	1,498	1,332	1,234	1,227	1,320	22
23	WHOLESALE &	Core	312	299	253	213	155	123	111	115	115	135	223	321	198	23
24	INTERNATIONAL	Noncore Excl. EG	51	49	44	47	44	46	42	40	43	44	43	47	45	24
25		Electric Generation (EG)	154	157	155	152	143	187	246	251	239	193	180	224	190	25
26		Subtotal-WHOLESALE & INT	517	505	452	412	342	355	400	406	397	373	445	592	433	26
27		Co. Use & LUAF	40	38	35	32	28	28	32	32	31	29	34	42	34	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,334	3,148	2,872	2,649	2,349	2,333	2,628	2,670	2,531	2,436	2,848	3,473	2,773	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	39	39	32	28	25	23	20	19	22	22	33	40	29	29
30	NONCORE	Commercial/Industrial	403	391	392	390	385	377	384	400	403	385	379	374	389	30
31		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	31
32		Electric Generation (EG)	774	739	735	752	790	887	1,195	1,216	1,053	905	813	812	890	32
33		Subtotal-RETAIL	1,257	1,210	1,200	1,212	1,241	1,329	1,640	1,677	1,519	1,354	1,267	1,268	1,349	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	517	505	452	412	342	355	400	406	397	373	445	592	433	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,775	1,715	1,652	1,623	1,584	1,684	2,040	2,083	1,917	1,727	1,712	1,860	1,782	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.)

Note	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1

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

Note	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,551	1,424	1,210	1,014	753	635	568	566	596	695	1,125	1,603	977

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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	310	8
9	Out-of-State		2,994	2,908	2,533	2,314	2,015	2,000	2,295	2,335	2,195	2,103	2,513	3,135	2,443	9
10	TOTAL SUPPLY TAKEN		3,304	3,218	2,843	2,624	2,325	2,310	2,605	2,645	2,505	2,413	2,823	3,445	2,753	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,304	3,218	2,843	2,624	2,325	2,310	2,605	2,645	2,505	2,413	2,823	3,445	2,753	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,165	1,080	882	718	478	373	337	336	344	441	780	1,207	677	13
14		Commercial	288	295	229	206	190	177	153	148	169	165	250	296	213	14
15		Industrial	47	53	47	44	41	42	37	39	39	45	50	49	44	15
16		NGV	43	43	46	46	46	46	43	46	48	46	45	44	45	16
17		Subtotal-CORE	1,544	1,470	1,205	1,012	756	638	571	569	600	697	1,124	1,596	979	17
18	NONCORE	Commercial	31	30	27	25	22	20	20	21	25	23	26	31	25	18
19		Industrial	347	342	341	342	341	336	342	356	354	339	332	320	341	19
20		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	20
21		Electric Generation (EG)	772	761	733	751	789	885	1,193	1,215	1,052	904	812	810	891	21
22		Subtotal-NONCORE	1,191	1,175	1,143	1,159	1,193	1,283	1,596	1,633	1,472	1,307	1,210	1,203	1,298	22
23	WHOLESALE &	Core	320	316	259	217	157	125	113	116	117	138	228	329	202	23
24	INTERNATIONAL	Noncore Excl. EG	51	51	45	48	45	47	43	41	44	45	43	48	46	24
25		Electric Generation (EG)	158	167	158	155	146	190	249	254	242	197	183	227	194	25
26		Subtotal-WHOLESALE & INT	529	534	462	420	349	361	405	411	403	379	455	604	442	26
27		Co. Use & LUAF	40	39	34	32	28	28	32	32	30	29	34	42	33	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,304	3,218	2,843	2,624	2,325	2,310	2,605	2,645	2,505	2,413	2,823	3,445	2,753	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	38	39	31	27	24	22	19	19	21	22	33	39	28	29
30	NONCORE	Commercial/Industrial	378	373	369	367	363	356	362	377	379	362	357	351	366	30
31		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	31
32		Electric Generation (EG)	772	761	733	751	789	885	1,193	1,215	1,052	904	812	810	891	32
33		Subtotal-RETAIL	1,230	1,214	1,174	1,186	1,217	1,305	1,616	1,651	1,493	1,329	1,243	1,242	1,326	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	529	534	462	420	349	361	405	411	403	379	455	604	442	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,758	1,748	1,635	1,606	1,566	1,666	2,021	2,063	1,896	1,708	1,697	1,846	1,768	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.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,537	1,461	1,199	1,006	747	629	563	562	591	690	1,115	1,589	972

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)		160	160	160	160	160	160	160	160	160	160	160	160	160	1
2	California Coastal Zone (California Producers)		150	150	150	150	150	150	150	150	150	150	150	150	150	2
	Out-of-State Gas															
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) 1/		765	765	765	765	765	765	765	765	765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) 2/		1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) 3/		1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	3,725	7
	GAS SUPPLY TAKEN															
8	California Source Gas		310	310	310	310	310	310	310	310	310	310	310	310	310	8
9	Out-of-State		3,027	2,940	2,560	2,336	2,031	2,013	2,306	2,346	2,206	2,118	2,538	3,170	2,465	9
10	TOTAL SUPPLY TAKEN		3,337	3,250	2,870	2,646	2,341	2,323	2,616	2,656	2,516	2,428	2,848	3,480	2,775	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,337	3,250	2,870	2,646	2,341	2,323	2,616	2,656	2,516	2,428	2,848	3,480	2,775	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,184	1,096	896	729	486	379	343	341	350	448	792	1,226	687	13
14		Commercial	294	301	234	210	194	181	156	151	172	169	255	302	218	14
15		Industrial	42	48	43	39	37	38	34	35	35	42	46	44	40	15
16		NGV	49	49	52	52	51	52	49	52	54	52	51	50	51	16
17		Subtotal-CORE	1,569	1,494	1,225	1,030	769	650	581	579	611	710	1,143	1,622	996	17
18	NONCORE	Commercial	30	29	26	24	21	19	19	20	24	22	25	30	24	18
19		Industrial	342	337	336	337	336	331	337	350	349	334	327	316	336	19
20		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	20
21		Electric Generation (EG)	771	760	733	750	788	885	1,193	1,214	1,051	903	811	810	890	21
22		Subtotal-NONCORE	1,185	1,168	1,136	1,153	1,186	1,276	1,590	1,626	1,465	1,301	1,204	1,197	1,292	22
23	WHOLESALE &	Core	330	326	267	223	162	128	116	119	120	142	235	339	208	23
24	INTERNATIONAL	Noncore Excl. EG	52	52	45	49	46	47	43	41	44	45	44	49	46	24
25		Electric Generation (EG)	162	171	162	160	150	194	253	258	246	201	187	231	198	25
26		Subtotal-WHOLESALE & INT	543	549	474	431	358	369	413	419	411	388	466	619	453	26
27		Co. Use & LUAF	40	39	35	32	28	28	32	32	30	29	34	42	34	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,337	3,250	2,870	2,646	2,341	2,323	2,616	2,656	2,516	2,428	2,848	3,480	2,775	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	39	40	31	27	25	23	20	19	21	22	33	40	28	29
30	NONCORE	Commercial/Industrial	372	367	363	362	357	351	356	371	373	357	352	346	360	30
31		EOR Steaming	41	41	41	41	41	41	41	41	41	41	41	41	41	31
32		Electric Generation (EG)	771	760	733	750	788	885	1,193	1,214	1,051	903	811	810	890	32
33		Subtotal-RETAIL	1,223	1,207	1,167	1,180	1,211	1,299	1,610	1,645	1,486	1,323	1,237	1,237	1,320	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	543	549	474	431	358	369	413	419	411	388	466	619	453	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,767	1,756	1,641	1,612	1,569	1,668	2,022	2,064	1,897	1,711	1,703	1,856	1,773	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.)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	1	1	1	1	1	1	1	1	1	1	1	1	1

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

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Avg
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,562	1,485	1,218	1,023	760	640	573	572	602	703	1,134	1,615	988

2012 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS
JULY 2012

The Gas Company

A Sempra Energy utility℠

2012 CALIFORNIA GAS REPORT

CUSTOMER FORECAST
JULY 2012

The Gas Company

A Sempra Energy utility℠

SOUTHERN CALIFORNIA GAS COMPANY: CUSTOMER FORECAST
2012 CGR
(annual averages)

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Residential												
Single-Family												
Active	3,585,183	3,603,703	3,625,925	3,655,526	3,696,320	3,743,379	3,791,878	3,840,794	3,889,434	3,937,340	3,984,280	4,030,054
Inactive	77,817	74,675	73,532	74,133	74,961	75,915	76,899	77,891	78,877	79,849	80,800	81,729
Connected	3,662,999	3,678,378	3,699,457	3,729,658	3,771,281	3,819,294	3,868,777	3,918,684	3,968,311	4,017,189	4,065,080	4,111,782
Multi-Family												
Active	1,716,280	1,731,228	1,744,611	1,759,207	1,776,755	1,796,077	1,817,272	1,839,976	1,864,071	1,888,770	1,913,445	1,938,033
Inactive	98,422	91,316	88,881	89,626	90,520	91,505	92,585	93,741	94,969	96,227	97,484	98,737
Connected	1,814,702	1,822,544	1,833,492	1,848,832	1,867,275	1,887,582	1,909,856	1,933,717	1,959,041	1,984,998	2,010,929	2,036,770
Master-Meter												
Active	41,242	41,035	40,829	40,624	40,420	40,216	40,014	39,813	39,613	39,414	39,216	39,019
Inactive	703	699	694	690	686	682	678	674	670	666	662	658
Connected	41,945	41,734	41,523	41,314	41,106	40,899	40,692	40,487	40,283	40,080	39,878	39,677
Total Residential												
Active	5,342,705	5,375,966	5,411,365	5,455,356	5,513,495	5,579,673	5,649,164	5,720,583	5,793,119	5,865,524	5,936,941	6,007,106
Inactive	176,941	166,689	163,107	164,449	166,167	168,102	170,161	172,306	174,516	176,742	178,947	181,123
Connected	5,519,646	5,542,655	5,574,473	5,619,805	5,679,662	5,747,775	5,819,326	5,892,889	5,967,635	6,042,266	6,115,888	6,188,229
Commercial												
Active	187,337	188,086	189,235	189,993	190,924	191,771	192,429	192,849	193,161	193,516	193,814	194,086
Inactive	57,089	57,318	56,892	57,120	57,400	57,655	57,852	57,978	58,071	58,178	58,268	58,349
Connected	244,426	245,404	246,127	247,114	248,325	249,426	250,280	250,827	251,232	251,695	252,082	252,435
Industrial												
Active	19,135	19,282	19,322	19,301	19,291	19,285	19,282	19,280	19,280	19,279	19,279	19,279
Inactive	9,484	9,282	9,188	9,179	9,174	9,171	9,169	9,169	9,168	9,168	9,168	9,168
Connected	28,619	28,564	28,510	28,480	28,464	28,456	28,452	28,449	28,448	28,447	28,447	28,447
TOTAL												
Active	5,549,177	5,583,335	5,619,922	5,664,651	5,723,711	5,790,729	5,860,875	5,932,712	6,005,560	6,078,320	6,150,034	6,220,470
Inactive	243,514	233,289	229,187	230,748	232,741	234,927	237,182	239,453	241,756	244,088	246,382	248,641
Connected	5,792,691	5,816,624	5,849,109	5,895,398	5,956,451	6,025,656	6,098,057	6,172,165	6,247,315	6,322,408	6,396,417	6,469,111
Net Active Gain	32,509	34,157	36,587	44,729	59,060	67,018	70,146	71,838	72,847	72,760	71,715	70,436
Active Meter Growth	0.59%	0.62%	0.66%	0.80%	1.04%	1.17%	1.21%	1.23%	1.23%	1.21%	1.18%	1.15%

SOUTHERN CALIFORNIA GAS COMPANY: CUSTOMER FORECAST
(annual averages)

	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Residential												
Single-Family												
Active	4,074,904	4,120,136	4,166,155	4,212,697	4,258,918	4,303,835	4,347,199	4,389,846	4,432,577	4,475,082	4,517,564	4,560,380
Inactive	82,638	83,555	84,489	85,432	86,370	87,280	88,160	89,025	89,891	90,753	91,614	92,483
Connected	4,157,542	4,203,691	4,250,643	4,298,129	4,345,288	4,391,116	4,435,359	4,478,871	4,522,468	4,565,835	4,609,179	4,652,862
Multi-Family												
Active	1,962,331	1,986,372	2,010,487	2,034,847	2,059,770	2,085,399	2,111,568	2,138,230	2,165,353	2,192,796	2,220,361	2,247,935
Inactive	99,975	101,200	102,428	103,669	104,939	106,245	107,578	108,936	110,318	111,716	113,121	114,526
Connected	2,062,306	2,087,572	2,112,915	2,138,516	2,164,709	2,191,644	2,219,147	2,247,166	2,275,672	2,304,512	2,333,482	2,362,460
Master-Meter												
Active	38,823	38,628	38,434	38,241	38,049	37,858	37,667	37,478	37,290	37,102	36,916	36,730
Inactive	654	650	646	642	638	634	631	627	623	619	615	612
Connected	39,477	39,278	39,080	38,883	38,687	38,492	38,298	38,105	37,913	37,722	37,531	37,342
Total Residential												
Active	6,076,058	6,145,136	6,215,075	6,285,784	6,356,736	6,427,092	6,496,435	6,565,554	6,635,220	6,704,980	6,774,841	6,845,045
Inactive	183,267	185,405	187,563	189,744	191,947	194,160	196,368	198,588	200,832	203,089	205,351	207,620
Connected	6,259,325	6,330,541	6,402,638	6,475,528	6,548,683	6,621,251	6,692,803	6,764,141	6,836,053	6,908,069	6,980,192	7,052,665
Commercial												
Active	194,373	194,749	195,147	195,578	196,041	196,470	196,875	197,288	197,595	197,890	198,161	198,429
Inactive	58,436	58,549	58,669	58,798	58,937	59,066	59,188	59,312	59,404	59,493	59,574	59,655
Connected	252,808	253,298	253,816	254,377	254,978	255,536	256,064	256,600	256,999	257,383	257,735	258,084
Industrial												
Active	19,279	19,279	19,279	19,279	19,279	19,279	19,279	19,279	19,279	19,279	19,279	19,279
Inactive	9,168	9,168	9,168	9,168	9,168	9,168	9,168	9,168	9,168	9,168	9,168	9,168
Connected	28,447	28,447	28,447	28,447	28,447	28,447	28,447	28,447	28,447	28,447	28,447	28,447
TOTAL												
Active	6,289,710	6,359,164	6,429,501	6,500,642	6,572,056	6,642,840	6,712,589	6,782,120	6,852,094	6,922,149	6,992,280	7,062,753
Inactive	250,870	253,122	255,399	257,710	260,052	262,394	264,725	267,068	269,405	271,750	274,093	276,443
Connected	6,540,580	6,612,286	6,684,901	6,758,352	6,832,108	6,905,234	6,977,313	7,049,188	7,121,499	7,193,898	7,266,374	7,339,196
Net Active Gain	69,239	69,454	70,337	71,140	71,414	70,784	69,749	69,532	69,974	70,055	70,132	70,472
Active Meter Growth	1.11%	1.10%	1.11%	1.11%	1.10%	1.08%	1.05%	1.04%	1.03%	1.02%	1.01%	1.01%

2012 CALIFORNIA GAS REPORT

EUFORECASTER
JULY 2012

The Gas Company

A Sempra Energy utility℠

I. Introduction

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

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

End Use Forecaster: An Overview

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

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

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

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

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

Table 1. Alternative Market Segmentation Designs – Utility Industry Example

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

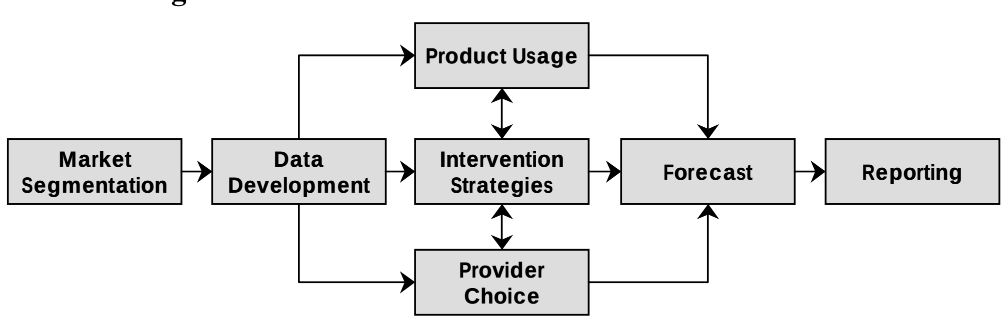
End Use Forecaster has other dimensions that capture factors affecting product demands. Perhaps the most important of these is End Use Forecaster's "vintaging" capability. Vintaging refers to product or service turnover that is a function of either physical lives or contract period. Accurate assessments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

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

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

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

Figure 1. End Use Forecaster Modules and Structure



Interface Design

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

Figure 2. Welcome Screen

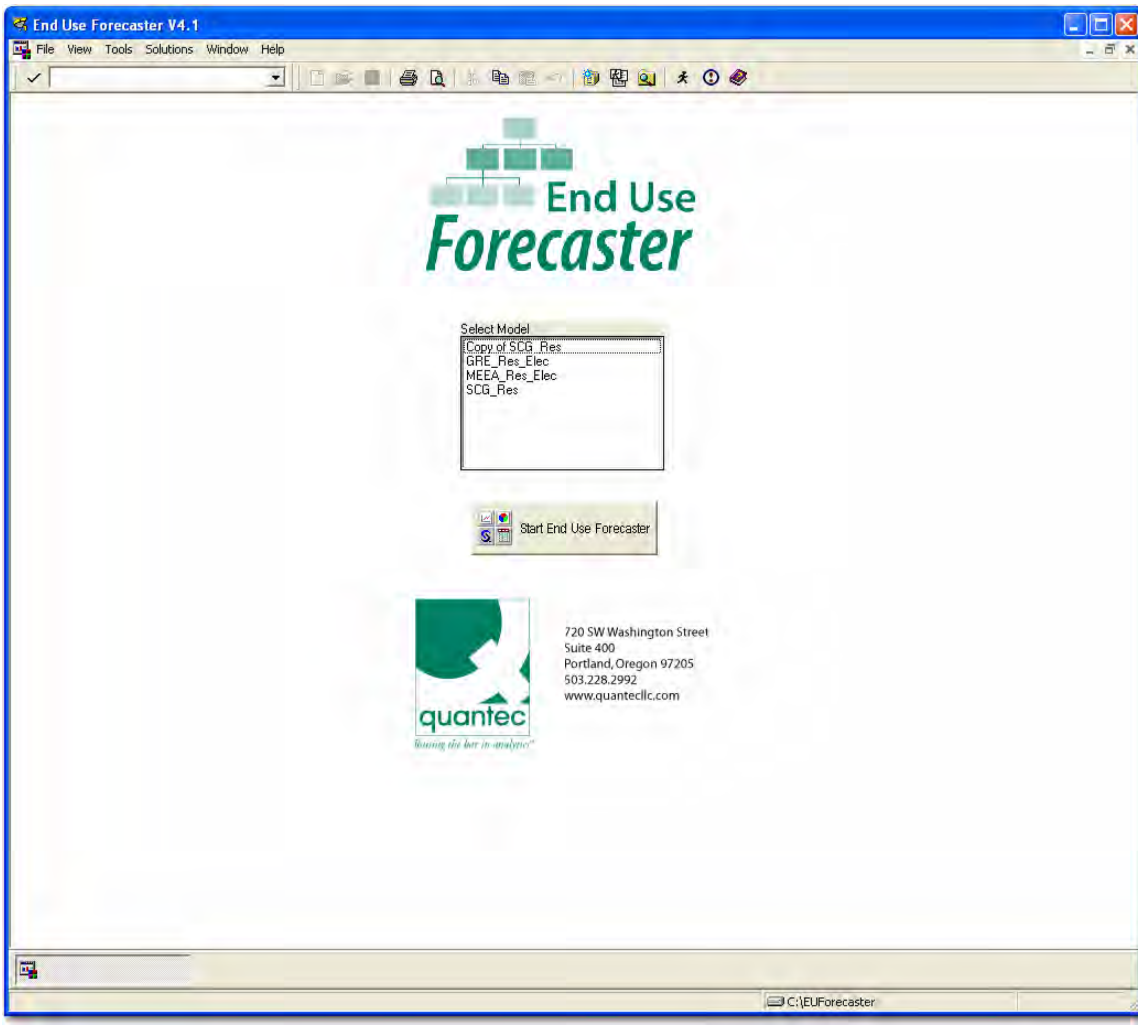
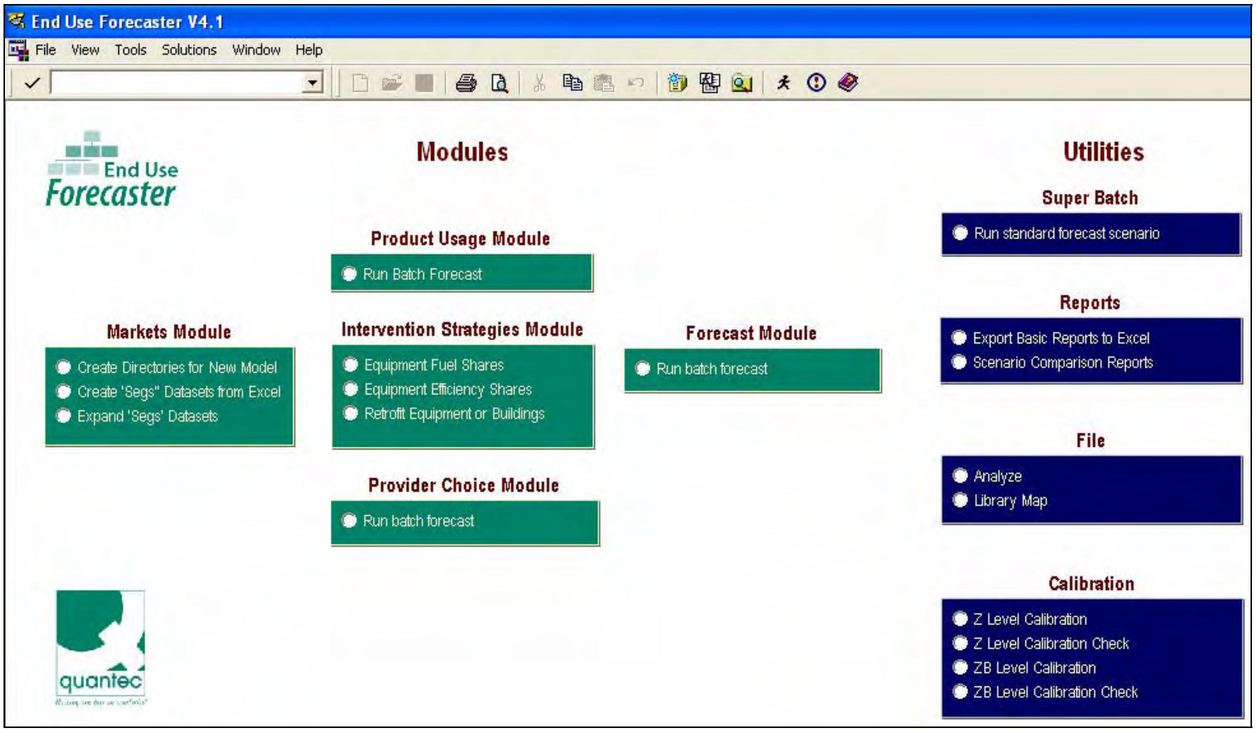


Figure 3. Main Dashboard



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

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

Data Exchange

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

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

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

Market Segmentation

Market Segments

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

Strategic Information Needs

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

Data Development and Entry

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

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

Data Entry Formats

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

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

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

Product Usage Module: Modeling Equipment Consumption

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

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

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

Provider Choice Module: Modeling Customer Service and Purchase Decisions

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

Modes of Choice Modeling

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

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

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

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

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

Average versus Marginal Shares

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

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

Intervention Strategies Module: Analyzing Marketing Scenarios and DSM Potential

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

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

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

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

Forecast Module: Putting It All Together

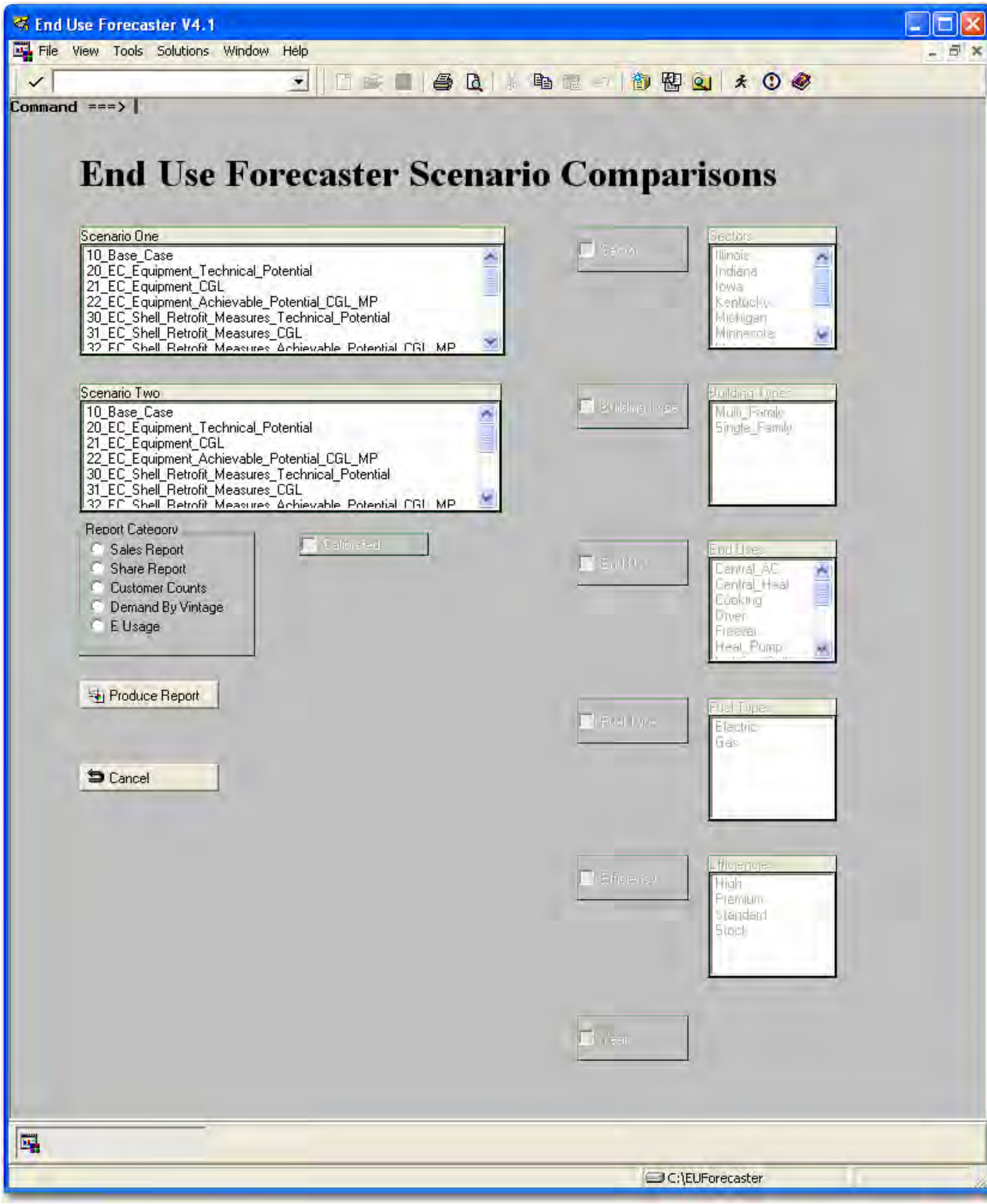
The Forecast Module incorporates all the information compiled from the other modules – Usage, Choice, and Intervention Strategies – related to the overall economic growth of the market segment and equipment lifetime (decay) functions to create the final forecast for a given scenario.

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

Reporting: Getting the Projections Out to Decision-Makers

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

Figure 4. Report Customization



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

II. Application Structure

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

Hardware and Software

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

Hardware

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

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

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

Software

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

- Base SAS

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

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

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

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

Conventions

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

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

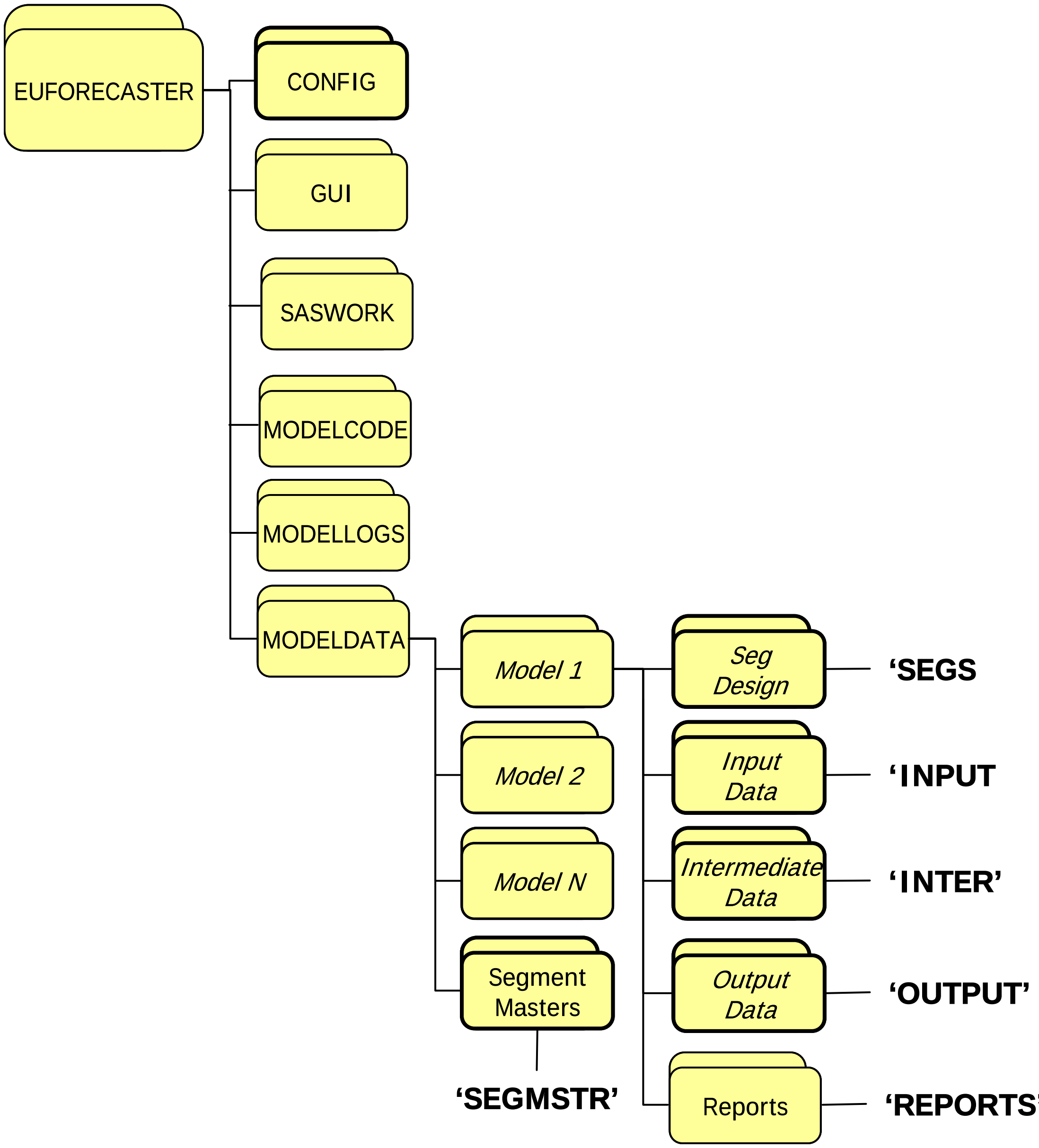
End Use Forecaster's modules run user-specified scenarios. To differentiate among these scenarios, scenario-specific datasets have a numeric suffix, such as **priceForecast_10**. In general cases, where the documentation does not refer to a specific scenario, datasets are referred to with an **"_xx"**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

Model Organization

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

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

Figure 5. End Use Forecaster Folder Structure



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

Table 2. End Use Forecaster Folders

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

III. Market Segmentation and Data Entry Modules

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

Development of Market Segmentation Design

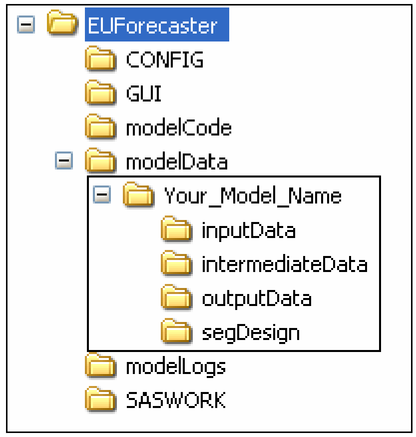
The execution of the first task – creation of a customized market segmentation design – is based on four steps, listed briefly below and then described in greater detail.

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

Creation of Model Data Folders

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

Figure 6. Data Folder Structure



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

Population of Seg_Design_Template.xls

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

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

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

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

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

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

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

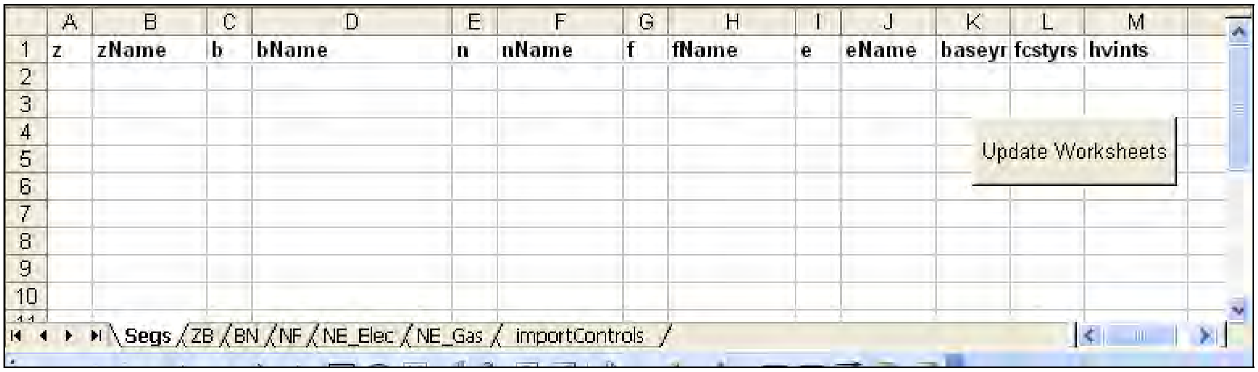
Table 3 summarizes the intended use of each of these dimensions. Note that while the model must include all five dimension, you are not required to use all of them. For example, suppose you want a design with alternative providers at Dimension 4 and do not wish to complicate the model with product/service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

Table 3. End Use Forecaster Dimension Use Summary

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

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

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



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

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

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

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

Update Worksheets

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

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

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

Seg_Design_Template.xls [Read-Only]

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

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

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

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

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

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

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

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

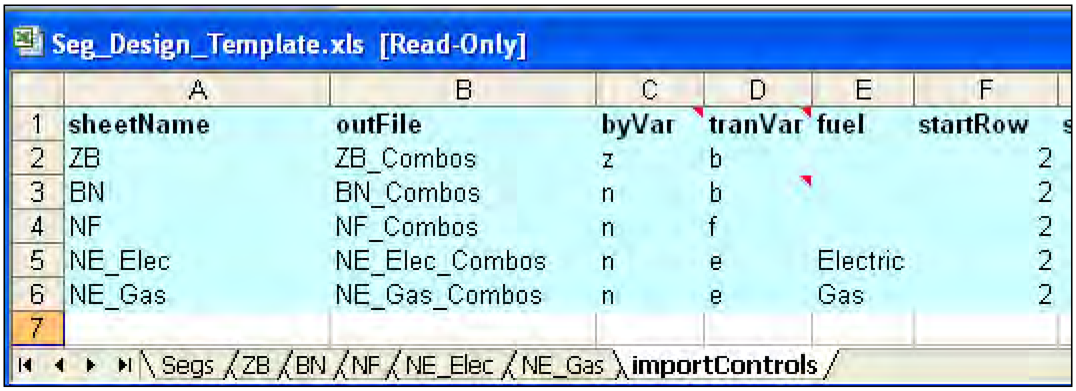
Segs / ZB / BN / NF / NE_Elec / NE_Gas / imp

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

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

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

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



Seg_Design_Template.xls [Read-Only]

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

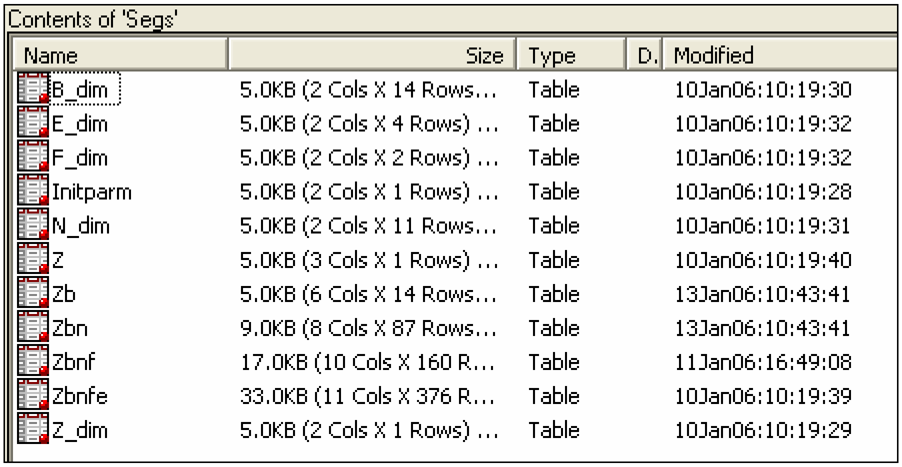
Segs / ZB / BN / NF / NE_Elec / NE_Gas / importControls

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

Creation of the Segs Library Datasets

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

Figure 12. Contents of Segs Library


Contents of 'Segs'

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

Expansion on the Segmentation Design

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

Figure 13. Contents of the Input Library

Contents of 'Input'

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

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

Model Population

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

Table 4. Starting Datasets in INPUT Library

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

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

Batch Control Usage

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

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

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

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

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

Figure 14. Example choiceBatchControl Dataset

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

Scenario 20 pulls a different price scenario.

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

IV. Product Usage Module

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

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

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

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

where:

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

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

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

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

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

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

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

---

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

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

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

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

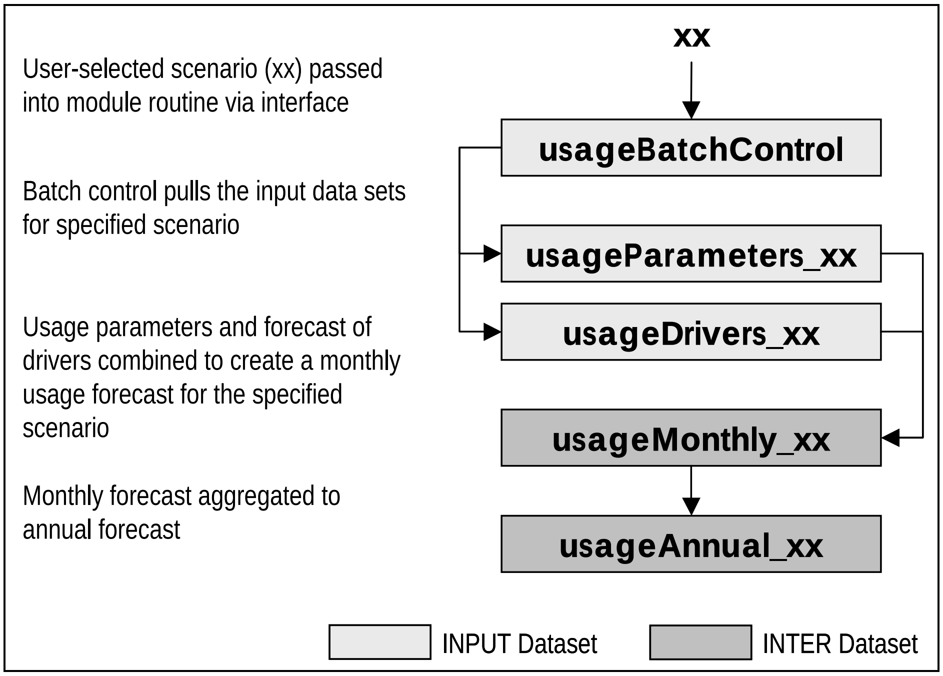


Table 5. Product Usage Module Data Library

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

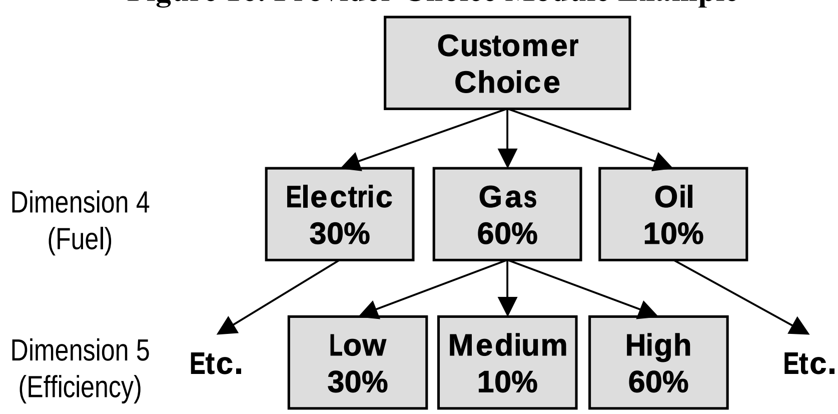
V. Provider Choice Module

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

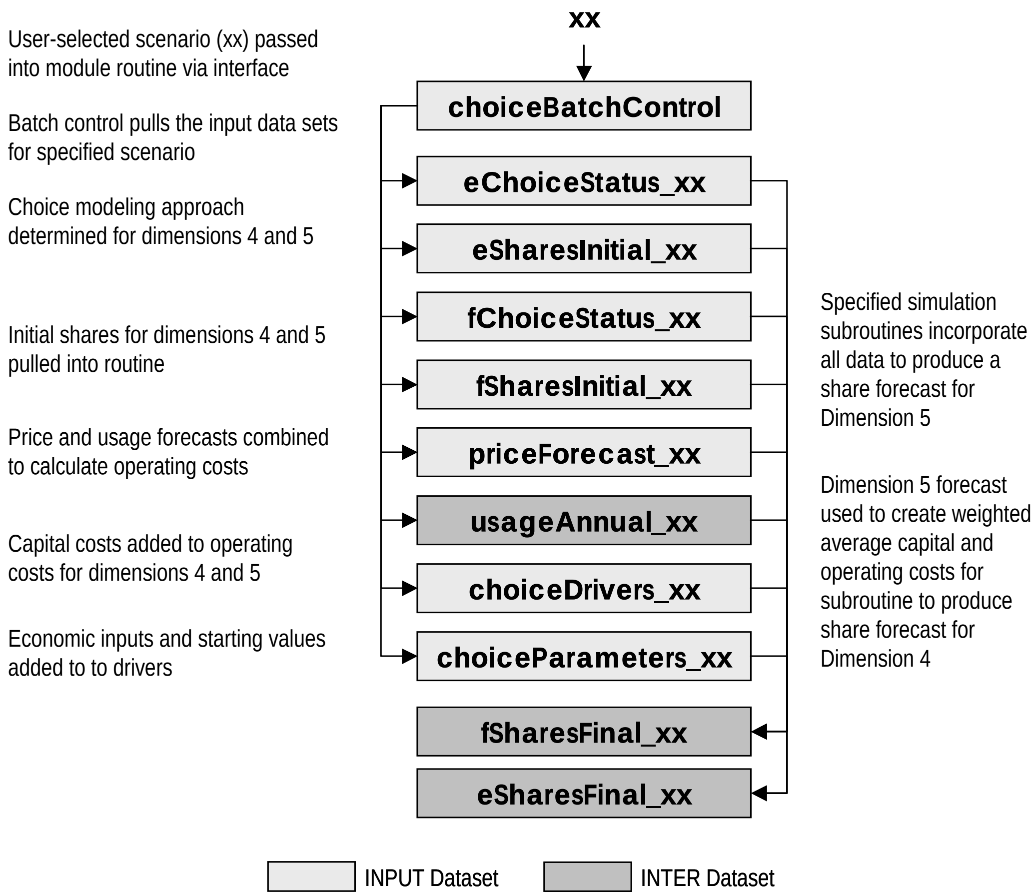
Figure 17 shows the data and analysis flow through the Provider Choice Module.

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**).

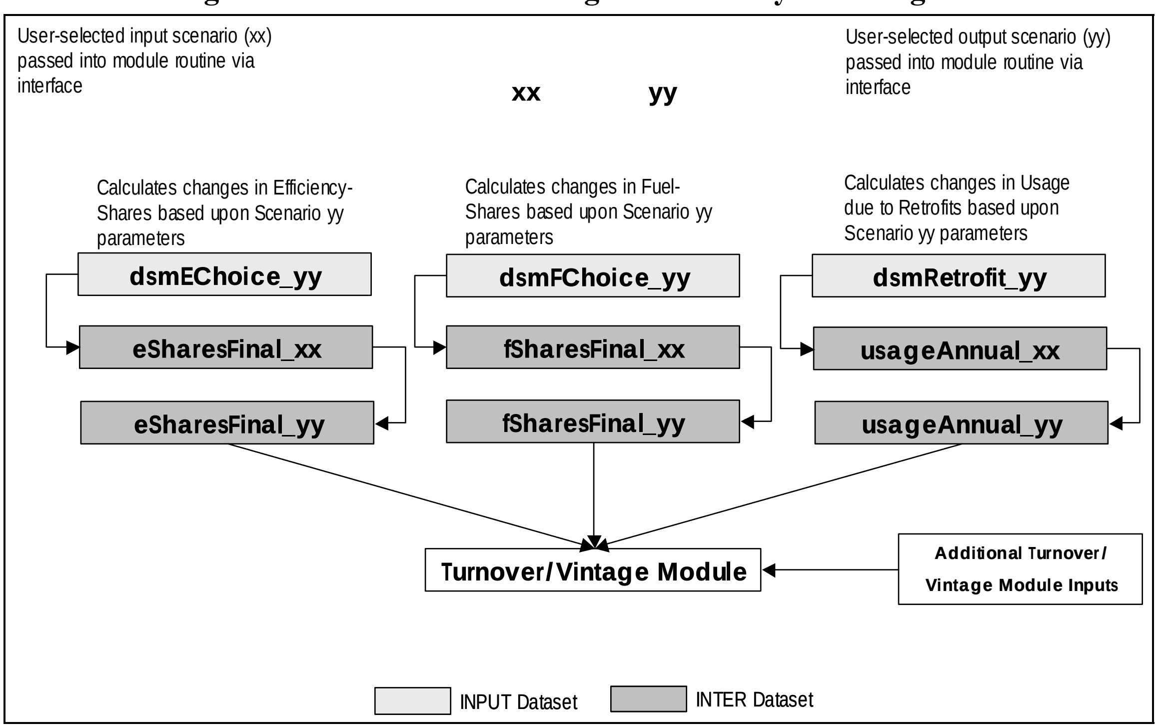
The Market Segmentation module creates base case files ("_10" files) where there is no intervention for each of these program categories. These files serve as templates that allow the user to create different scenarios of interest. To create strategies, you must copy these files to another scenario number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

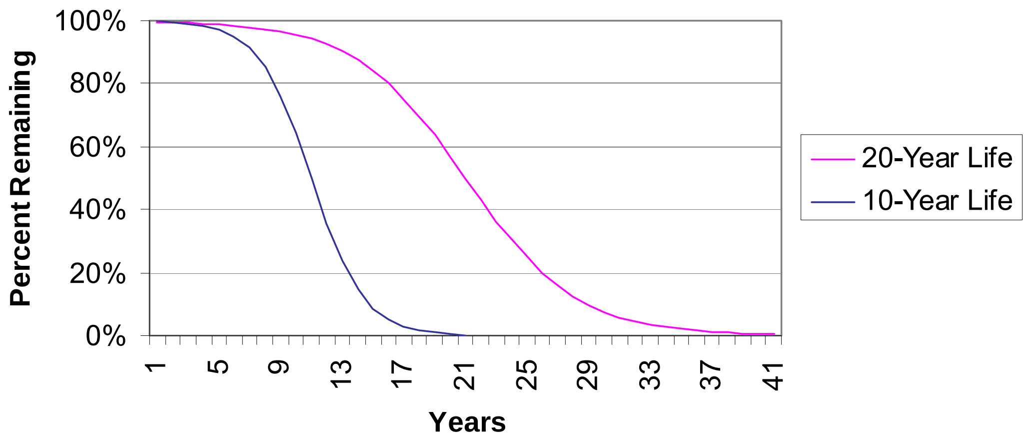
3 These are discrete analogs to the continuous time distributions.

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:

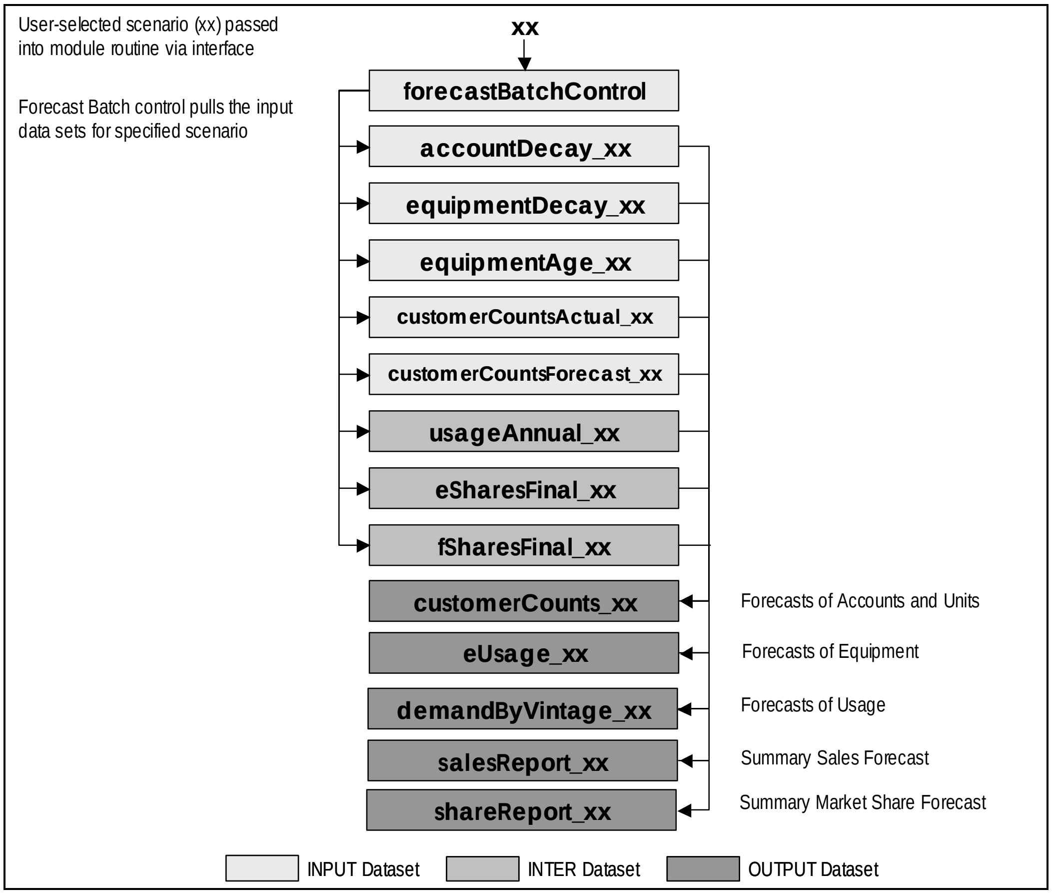
1. Merges all input data across Dimensions 1-3, including:
   - Existing accounts, plus a distribution of accounts across historical building vintages
   - New construction forecast, plus capture rates for new and conversion buildings
   - Dimension 3 saturation, equal to the number of Dimension 2 customers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

2012 CALIFORNIA GAS REPORT

RESIDENTIAL DEMAND FORECAST
JULY 2012

The Gas Company

A Sempra Energy utility℠

Core Residential End-Use Model
2012 California Gas Report

Introduction:

SoCalGas used the End Use Forecaster model to generate annual gas demand forecasts for the residential market from 2012 through 2030. 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 2009 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[1] 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 .

Figures 3-6 illustrate the monthly forecasts for each weather scenario.

Data Sources:

The information used to perform the modeling and to generate the forecast includes historical 2011 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 2011 data is in Figure 7.

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 8 for the meter forecast

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 9 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 10 illustrates the gas price forecasts.

Electric Price Data:

The electricity price inputs consist of average prices (cents/kWh) and marginal prices (cents/kWh). The forecasts for the residential customer class were developed by SDG&E's electricity rate analysis group for 2011 through 2030.

A ratio of the housing type's average gas price to the overall residential gas price was constructed. The weight was then multiplied by the overall average electricity price to derive residential market-specific electricity prices.

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. Figure 11 illustrates the electricity price forecasts.

Price elasticities for each building type were based on the SoCalGas Residential Econometric Demand Forecasting Model. See Figure 7 for price elasticities.

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 12 and 13 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 14 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 15 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 2004 RASS Update. Please see Figures 16-19 for saturations, fuel, and efficiency shares.

AMI:

Benefits estimated by SoCalGas represent approximately 1% of core gas throughput in the post deployment year. The conservation benefits were incorporated in the forecast as a post-model adjustment.

RESIDENTIAL DATA

Southern California Gas Company
2012 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	1	4	4	2	2	2	4	2	0	2	0	1	0	1	1
Multi-Family <= 4 Units	4	1	4	4	2	2	2	4	0	0	0	0	0	0	1	1
Multi-Family > 4 Units	4	1	4	4	2	2	2	4	0	0	0	0	0	0	1	1
Master Meter	4	1	4	4	2	2	2	4	0	0	0	0	0	0	1	1
Sub-Meter	4	1	4	4	2	2	2	4	0	0	0	0	0	0	1	1

				Southern California Gas Company									
				2012 California Gas Report									
				Figure 3: Average Temperature Year Demand Forecast									
YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2011	33877.11	28470.40	26095.08	20883.81	14998.78	11712.71	11132.14	11099.64	10965.37	13983.38	22524.69	35022.48	240,766
2012	33562.35	28205.88	25852.63	20689.77	14859.43	11603.88	11028.71	10996.51	10863.49	13853.46	22315.41	34697.08	238,529
2013	33139.65	27850.64	25527.02	20429.19	14672.28	11457.74	10889.80	10858.02	10726.67	13678.98	22034.36	34260.09	235,524
2014	32873.30	27626.80	25321.86	20265.00	14554.35	11365.65	10802.28	10770.75	10640.46	13569.04	21857.26	33984.73	233,631
2015	32658.43	27446.22	25156.35	20132.54	14459.22	11291.36	10731.67	10700.35	10570.91	13480.35	21714.40	33762.60	232,104
2016	32549.38	27354.57	25072.35	20065.31	14410.94	11253.65	10695.84	10664.62	10535.61	13435.34	21641.89	33649.86	231,329
2017	32555.68	27359.87	25077.20	20069.20	14413.73	11255.84	10697.91	10666.69	10537.65	13437.94	21646.08	33656.38	231,374
2018	32651.44	27440.35	25150.97	20128.23	14456.13	11288.94	10729.38	10698.06	10568.65	13477.47	21709.75	33755.38	232,055
2019	32601.93	27398.74	25112.83	20097.71	14434.21	11271.82	10713.11	10681.84	10552.62	13457.03	21676.83	33704.19	231,703
2020	32577.11	27377.88	25093.71	20082.41	14423.22	11263.24	10704.95	10673.71	10544.59	13446.78	21660.33	33678.53	231,526
2021	32553.05	27357.66	25075.17	20067.58	14412.57	11254.92	10697.04	10665.82	10536.80	13436.85	21644.33	33653.65	231,355
2022	32500.71	27313.67	25034.86	20035.32	14389.39	11236.83	10679.85	10648.67	10519.86	13415.25	21609.53	33599.55	230,984
2023	32449.67	27270.78	24995.54	20003.85	14366.80	11219.18	10663.07	10631.95	10503.34	13394.18	21575.60	33546.78	230,621
2024	32418.89	27244.91	24971.83	19984.87	14353.17	11208.54	10652.96	10621.87	10493.37	13381.47	21555.13	33514.96	230,402
2025	32400.25	27229.25	24957.48	19973.38	14344.92	11202.10	10646.84	10615.76	10487.34	13373.78	21542.74	33495.69	230,270
2026	32392.37	27222.62	24951.40	19968.53	14341.43	11199.37	10644.25	10613.18	10484.79	13370.53	21537.50	33487.54	230,213
2027	32528.90	27337.36	25056.57	20052.69	14401.87	11246.57	10689.11	10657.91	10528.98	13426.88	21628.27	33628.69	231,184
2028	32652.11	27440.91	25151.48	20128.64	14456.42	11289.17	10729.60	10698.28	10568.86	13477.74	21710.20	33756.06	232,059
2029	32779.24	27547.75	25249.40	20207.01	14512.71	11333.13	10771.37	10739.93	10610.01	13530.21	21794.72	33887.49	232,963
2030	32909.50	27657.22	25349.74	20287.31	14570.38	11378.16	10814.18	10782.61	10652.17	13583.98	21881.33	34022.16	233,889

ResCol

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
				Southern California Gas Company									
				2012 California Gas Report									
				Figure 4: Cold Temperature Year Demand Forecast									
2011	38565.50	32265.03	29182.88	22980.37	15827.88	11940.56	11165.01	11124.39	11030.73	14601.24	24962.50	39946.49	263,593
2012	38207.18	31965.25	28911.74	22766.85	15680.82	11829.62	11061.27	11021.03	10928.24	14465.57	24730.57	39575.34	261,143
2013	37725.98	31562.66	28547.61	22480.11	15483.33	11680.63	10921.96	10882.22	10790.60	14283.39	24419.09	39076.91	257,854
2014	37422.77	31308.98	28318.17	22299.44	15358.89	11586.75	10834.18	10794.76	10703.88	14168.59	24222.83	38762.84	255,782
2015	37178.16	31104.34	28133.07	22153.68	15258.50	11511.01	10763.36	10724.20	10633.91	14075.98	24064.51	38509.47	254,110
2016	37054.02	31000.48	28039.13	22079.71	15207.55	11472.58	10727.42	10688.39	10598.41	14028.98	23984.15	38380.89	253,262
2017	37061.20	31006.48	28044.56	22083.98	15210.49	11474.80	10729.50	10690.47	10600.46	14031.69	23988.80	38388.32	253,311
2018	37170.21	31097.69	28127.05	22148.94	15255.23	11508.55	10761.06	10721.91	10631.64	14072.97	24059.36	38501.24	254,056
2019	37113.84	31050.53	28084.40	22115.35	15232.10	11491.10	10744.74	10705.65	10615.52	14051.63	24022.87	38442.85	253,671
2020	37085.59	31026.89	28063.02	22098.52	15220.50	11482.35	10736.56	10697.50	10607.44	14040.93	24004.58	38413.58	253,477
2021	37058.20	31003.97	28042.29	22082.20	15209.26	11473.87	10728.63	10689.60	10599.60	14030.56	23986.86	38385.21	253,290
2022	36998.62	30954.13	27997.21	22046.70	15184.81	11455.42	10711.38	10672.41	10582.56	14008.00	23948.29	38323.50	252,883
2023	36940.51	30905.51	27953.24	22012.07	15160.96	11437.43	10694.56	10655.65	10565.94	13986.00	23910.68	38263.32	252,486
2024	36905.47	30876.20	27926.72	21991.19	15146.58	11426.58	10684.41	10645.55	10555.92	13972.74	23888.00	38227.02	252,246
2025	36884.25	30858.45	27910.67	21978.55	15137.87	11420.02	10678.27	10639.43	10549.85	13964.70	23874.27	38205.04	252,101
2026	36875.28	30850.94	27903.88	21973.20	15134.19	11417.24	10675.67	10636.84	10547.28	13961.31	23868.46	38195.75	252,040
2027	37030.70	30980.97	28021.49	22065.81	15197.98	11465.36	10720.67	10681.67	10591.74	14020.15	23969.06	38356.74	253,102
2028	37170.97	31098.32	28127.63	22149.39	15255.54	11508.79	10761.28	10722.13	10631.86	14073.25	24059.85	38502.02	254,061
2029	37315.69	31219.40	28237.14	22235.63	15314.94	11553.59	10803.18	10763.87	10673.25	14128.05	24153.52	38651.93	255,050
2030	37463.98	31343.46	28349.35	22323.99	15375.80	11599.51	10846.11	10806.65	10715.66	14184.19	24249.51	38805.52	256,064

Southern California Gas Company

2012 California Gas Report

Figure 5: Hot Temperature Year Demand Forecast

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2011	29199.13	24677.70	23000.92	18780.53	14170.69	11493.77	11100.02	11075.65	10884.51	13366.47	20088.41	30108.96	217,947
2012	28927.84	24448.41	22787.21	18606.04	14039.03	11386.98	10996.89	10972.74	10783.38	13242.28	19901.76	29829.21	215,922
2013	28563.50	24140.49	22500.21	18371.70	13862.21	11243.56	10858.38	10834.54	10647.56	13075.50	19651.11	29453.53	213,202
2014	28333.93	23946.47	22319.38	18224.04	13750.80	11153.20	10771.11	10747.47	10561.99	12970.41	19493.17	29216.80	211,489
2015	28148.73	23789.95	22173.49	18104.93	13660.92	11080.30	10700.71	10677.22	10492.95	12885.63	19365.76	29025.83	210,106
2016	28054.74	23710.51	22099.45	18044.47	13615.31	11043.30	10664.98	10641.56	10457.91	12842.60	19301.09	28928.91	209,405
2017	28060.18	23715.11	22103.73	18047.97	13617.94	11045.44	10667.05	10643.63	10459.94	12845.09	19304.83	28934.52	209,445
2018	28142.71	23784.86	22168.75	18101.05	13658.00	11077.93	10698.42	10674.93	10490.71	12882.87	19361.61	29019.62	210,061
2019	28100.03	23748.79	22135.13	18073.60	13637.29	11061.13	10682.20	10658.74	10474.80	12863.34	19332.25	28975.62	209,743
2020	28078.64	23730.71	22118.28	18059.84	13626.91	11052.71	10674.07	10650.63	10466.82	12853.54	19317.54	28953.56	209,583
2021	28057.90	23713.19	22101.94	18046.51	13616.84	11044.54	10666.18	10642.76	10459.09	12844.05	19303.27	28932.17	209,428
2022	28012.80	23675.06	22066.41	18017.49	13594.95	11026.79	10649.03	10625.65	10442.28	12823.40	19272.24	28885.66	209,092
2023	27968.80	23637.88	22031.75	17989.20	13573.60	11009.47	10632.31	10608.97	10425.88	12803.26	19241.97	28840.29	208,763
2024	27942.27	23615.46	22010.85	17972.13	13560.72	10999.03	10622.22	10598.90	10415.99	12791.12	19223.72	28812.94	208,565
2025	27926.21	23601.88	21998.20	17961.80	13552.93	10992.70	10616.12	10592.81	10410.00	12783.76	19212.66	28796.37	208,445
2026	27919.41	23596.14	21992.85	17957.43	13549.63	10990.03	10613.53	10590.23	10407.47	12780.65	19207.99	28789.37	208,395
2027	28037.09	23695.59	22085.54	18033.12	13606.74	11036.35	10658.27	10634.87	10451.33	12834.52	19288.95	28910.71	209,273
2028	28143.28	23785.35	22169.20	18101.42	13658.28	11078.15	10698.64	10675.15	10490.92	12883.14	19362.01	29020.21	210,066
2029	28252.86	23877.95	22255.51	18171.90	13711.46	11121.28	10740.29	10716.71	10531.77	12933.29	19437.39	29133.20	210,884
2030	28365.13	23972.84	22343.95	18244.11	13765.94	11165.48	10782.97	10759.30	10573.62	12984.69	19514.64	29248.97	211,722

Southern California Gas Company
2012 California Gas Report
Figure 6: Base Temperature Year Demand Forecast

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2011	10758.13	9946.50	10837.10	11150.46	10769.44	10434.63	10969.92	10937.90	10553.54	11303.37	10372.64	10816.41	128,850
2012	10658.17	9854.08	10736.41	11046.86	10669.38	10337.67	10868.00	10836.28	10455.49	11198.35	10276.27	10715.91	127,653
2013	10523.94	9729.97	10601.19	10907.73	10535.00	10207.48	10731.12	10699.80	10323.80	11057.31	10146.84	10580.95	126,045
2014	10439.35	9651.77	10515.99	10820.06	10450.33	10125.44	10644.87	10613.80	10240.83	10968.44	10065.29	10495.91	125,032
2015	10371.12	9588.68	10447.25	10749.34	10382.03	10059.25	10575.30	10544.43	10173.89	10896.75	9999.50	10427.30	124,215
2016	10336.49	9556.67	10412.36	10713.44	10347.36	10025.66	10539.98	10509.22	10139.92	10860.36	9966.11	10392.49	123,800
2017	10338.49	9558.52	10414.38	10715.52	10349.36	10027.61	10542.03	10511.26	10141.88	10862.46	9968.04	10394.50	123,824
2018	10368.90	9586.63	10445.02	10747.04	10379.81	10057.10	10573.03	10542.17	10171.72	10894.41	9997.36	10425.07	124,188
2019	10353.18	9572.09	10429.18	10730.74	10364.06	10041.85	10557.00	10526.19	10156.29	10877.89	9982.20	10409.26	124,000
2020	10345.29	9564.81	10421.24	10722.57	10356.17	10034.21	10548.96	10518.17	10148.56	10869.61	9974.60	10401.34	123,906
2021	10337.65	9557.74	10413.54	10714.65	10348.53	10026.80	10541.17	10510.40	10141.06	10861.58	9967.23	10393.66	123,814
2022	10321.03	9542.38	10396.80	10697.43	10331.89	10010.68	10524.23	10493.51	10124.76	10844.12	9951.21	10376.95	123,615
2023	10304.83	9527.39	10380.47	10680.63	10315.66	9994.95	10507.70	10477.03	10108.86	10827.09	9935.58	10360.65	123,421
2024	10295.05	9518.35	10370.62	10670.49	10305.88	9985.47	10497.73	10467.09	10099.27	10816.82	9926.16	10350.82	123,304
2025	10289.13	9512.88	10364.66	10664.36	10299.95	9979.73	10491.69	10461.07	10093.46	10810.60	9920.45	10344.87	123,233
2026	10286.63	9510.57	10362.14	10661.77	10297.45	9977.30	10489.14	10458.53	10091.01	10807.97	9918.04	10342.36	123,203
2027	10329.98	9550.65	10405.81	10706.70	10340.85	10019.36	10533.35	10502.61	10133.54	10853.53	9959.84	10385.95	123,722
2028	10369.11	9586.83	10445.23	10747.26	10380.02	10057.31	10573.25	10542.39	10171.92	10894.64	9997.57	10425.29	124,191
2029	10409.48	9624.15	10485.90	10789.10	10420.43	10096.46	10614.42	10583.43	10211.53	10937.05	10036.49	10465.88	124,674
2030	10450.85	9662.40	10527.57	10831.98	10461.84	10136.59	10656.60	10625.49	10252.11	10980.52	10076.37	10507.47	125,170

Figure 7
Southern California Gas Company
2012 California Gas Report
2011 Historical Data

	Single Family	Multi Family 2-4 Units	Multi Family > 4 units	Master Meter	Sub Meter
Total Therm Sales	1,696,400,201	171,555,368	332,836,588	158,023,166	48,840,685
Meter Count					
Pre 1979 Customers	2,397,045	408,308	703,181	34,315	1,689
1979-2004 Customers	1,208,478	130,740	443,215	4,055	105
2005-2010 Customers	8,743	1,385	1,385	61	1
TOTAL	3,614,267	540,434	1,147,781	38,431	1,794
Use Per Customer (UPC, Therms)					
Pre 1979	501	338	305	3,932	27,501
1979-2004	406	257	266	5,700	31,134
2005-2010	385	222	245	4,900	26,875
Price Elasticity	-0.105	-0.112	-0.071	-0.069	-0.105

Figure 8
Southern California Gas Company
2012 California Gas Report
Meter Count Forecast

Year	Total	Single Family	Multi Family 2-4 Units	Multi Family >4 units	Master Neter	Sub Meter
2010						
2011		3,614,267	540,434	1,147,781	38,431	1,794
2012		3,632,787	545,300	1,157,863	38,431	1,794
2013		3,607,405	563,047	1,166,616	38,431	1,794
2014		3,633,303	568,308	1,177,517	38,431	1,794
2015		3,666,720	573,625	1,188,534	38,431	1,794
2016		3,702,584	578,954	1,199,575	38,431	1,794
2017		3,744,819	585,276	1,212,674	38,431	1,794
2018		3,792,295	592,057	1,226,724	38,431	1,794
2019		3,840,519	599,409	1,241,958	38,431	1,794
2020		3,888,699	606,996	1,257,678	38,431	1,794
2021		3,936,374	614,832	1,273,914	38,431	1,794
2022		3,983,114	622,844	1,290,514	38,431	1,794
2023		4,029,130	630,782	1,306,961	38,431	1,794
2024		4,075,285	638,702	1,323,372	38,431	1,794
2025		4,120,923	646,636	1,339,810	38,431	1,794
2026		4,166,678	654,542	1,356,191	38,431	1,794
2027		4,212,376	662,575	1,372,835	38,431	1,794
2028		4,257,614	670,735	1,389,742	38,431	1,794
2029		4,302,282	679,023	1,406,916	38,431	1,794
2030		4,346,482	687,526	1,424,534	38,431	1,794

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Figure 9: Appliance Unit Energy Consumption (Gas in therms, Electric in Kwh)

		Single Family		Multi-Family 2 - 4 Units		Multi-Family > 4 Units		Master Meter		Sub Meter	
End-Use	**Vintage**	**Gas**	**Electric**	**Gas**	**Electric**	**Gas**	**Electric**	**Gas**	**Electric**	**Gas**	**Electric**
Space Heat	Stock	370	4,110	200	730	200	730	200	730	330	1,340
	Standard	330	3,730	180	670	180	-	180	-	300	-
	High	310	3,450	170	620	170	-	170	-	280	-
	Premium	280	3,170	150	570	150	-	150	-	260	-
Water Heat	Stock	260	2,440	230	2,440	230	2,440	230	2,440	210	2,010
	Standard	240	2,220	210	2,220	210	2,220	210	2,220	190	1,830
	High	230	2,110	200	2,110	200	2,110	200	2,110	180	1,740
	Premium	220	2,050	190	2,050	190	2,050	190	2,050	180	1,690
Cooking	Stock	50	574	34	465	34	465	34	465	45	514
	Standard	42.5	487.9	28.9	395	29	395	29	395	38	437
Drying	Stock	45.1	1442.1	24.2	1442.1	24	1,442	24	1,442	26	873
	Standard	42.8	1369.9	23.0	1370.0	23	1,370	23	1,370	25	830
Pool	Stock	177	3,431	177	3,431	177	3,431	177	3,431	177	3,431
Spa	Stock	146	430	146	430	146	430	146	430	146	430
Fireplace	Stock	21	-	21	-	21	-	21	-	21	-
BBQ	Stock	28	-	28	-	28	-	28	-	28	-

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Figure 10: Average and Marginal Gas Prices

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
2011	100.0	0.4666	0.6177	0.4264	0.6177	0.4304	0.6177	0.4020	0.6177	0.4163	0.6177
2012	101.6	0.4755	0.6327	0.4337	0.6327	0.4379	0.6327	0.4083	0.6327	0.4232	0.6327
2013	103.6	0.5179	0.6751	0.4762	0.6751	0.4803	0.6751	0.4507	0.6751	0.4656	0.6751
2014	105.6	0.5407	0.6979	0.4989	0.6979	0.5031	0.6979	0.4735	0.6979	0.4884	0.6979
2015	107.7	0.5692	0.7264	0.5275	0.7264	0.5316	0.7264	0.5020	0.7264	0.5169	0.7264
2016	109.9	0.5868	0.7440	0.5450	0.7440	0.5492	0.7440	0.5196	0.7440	0.5345	0.7440
2017	112.0	0.5844	0.7416	0.5426	0.7416	0.5468	0.7416	0.5172	0.7416	0.5321	0.7416
2018	114.1	0.5664	0.7236	0.5246	0.7236	0.5288	0.7236	0.4992	0.7236	0.5141	0.7236
2019	116.1	0.5795	0.7367	0.5378	0.7367	0.5419	0.7367	0.5123	0.7367	0.5272	0.7367
2020	118.1	0.5882	0.7454	0.5465	0.7454	0.5506	0.7454	0.5210	0.7454	0.5359	0.7454
2021	120.6	0.6000	0.7571	0.5582	0.7571	0.5623	0.7571	0.5328	0.7571	0.5477	0.7571
2022	123.2	0.6180	0.7752	0.5763	0.7752	0.5804	0.7752	0.5509	0.7752	0.5657	0.7752
2023	125.7	0.6351	0.7923	0.5934	0.7923	0.5975	0.7923	0.5679	0.7923	0.5828	0.7923
2024	128.3	0.6497	0.8069	0.6080	0.8069	0.6121	0.8069	0.5825	0.8069	0.5974	0.8069
2025	131.0	0.6641	0.8213	0.6223	0.8213	0.6265	0.8213	0.5969	0.8213	0.6118	0.8213
2026	133.9	0.6789	0.8361	0.6372	0.8361	0.6413	0.8361	0.6117	0.8361	0.6266	0.8361
2027	136.8	0.6931	0.8503	0.6514	0.8503	0.6555	0.8503	0.6260	0.8503	0.6408	0.8503
2028	139.7	0.7100	0.8671	0.6682	0.8671	0.6723	0.8671	0.6428	0.8671	0.6577	0.8671
2029	142.7	0.7254	0.8826	0.6837	0.8826	0.6878	0.8826	0.6582	0.8826	0.6731	0.8826
2030	145.7	0.7402	0.8973	0.6984	0.8973	0.7025	0.8973	0.6730	0.8973	0.6879	0.8973

Units are cents per KWH

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Figure 11: Marginal And Averge Electric Price Forecast
(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
2011	17.82	26.97	16.29	24.65	16.44	24.88	15.36	15.88	15.90	17.90
2012	17.72	26.81	16.16	24.46	16.32	24.69	15.22	15.74	15.77	17.75
2013	18.23	27.58	16.76	25.36	16.90	25.58	15.86	16.40	16.39	18.44
2014	18.77	28.41	17.32	26.21	17.47	26.43	16.44	17.00	16.96	19.08
2015	19.30	29.21	17.89	27.07	18.03	27.28	17.03	17.61	17.53	19.73
2016	19.88	30.08	18.47	27.94	18.61	28.15	17.60	18.20	18.11	20.38
2017	20.51	31.04	19.05	28.82	19.19	29.04	18.15	18.77	18.67	21.02
2018	21.22	32.11	19.65	29.74	19.81	29.98	18.70	19.34	19.26	21.67
2019	21.84	33.04	20.26	30.66	20.42	30.90	19.31	19.96	19.87	22.36
2020	22.55	34.13	20.95	31.70	21.11	31.94	19.98	20.66	20.55	23.12
2021	23.45	35.48	21.82	33.01	21.98	33.25	20.82	21.53	21.40	24.09
2022	24.37	36.88	22.72	34.39	22.89	34.63	21.72	22.46	22.31	25.10
2023	25.30	38.28	23.64	35.77	23.80	36.01	22.62	23.39	23.22	26.13
2024	26.29	39.78	24.60	37.22	24.76	37.47	23.57	24.37	24.17	27.20
2025	27.33	41.35	25.61	38.75	25.78	39.01	24.56	25.40	25.18	28.33
2026	28.43	43.01	26.68	40.37	26.85	40.63	25.61	26.49	26.24	29.52
2027	29.57	44.74	27.79	42.05	27.96	42.31	26.70	27.61	27.34	30.76
2028	30.75	46.53	28.94	43.79	29.12	44.06	27.84	28.79	28.48	32.05
2029	31.97	48.38	30.13	45.59	30.31	45.87	29.01	30.00	29.66	33.38
2030	33.24	50.30	31.37	47.46	31.55	47.74	30.22	31.25	30.89	34.76

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Figure 12: Gas Appliance Equipment Cost (Nominal $)

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

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Figure 13: Electric Appliance Equipment Cost (Nominal $)

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

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Figure 15: End Use Saturations
(based on 2009 RASS)

End Use	Vintage	Single Family	Multi Family 2-4 Units	Multi Family >4 Units	Master Meter	Sub Meter
Space Heat						
	Pre 1979	0.9847	0.9672	0.9178	0.7296	0.8173
	1979-2004	0.9915	0.9668	0.9424	0.7803	0.8853
	2005-2011	0.9985	0.9691	0.8323	0.8271	N/A
Water Heat						
	Pre 1979	0.9753	0.9064	0.6048	0.9658	0.9835
	1979-2004	0.9831	0.8911	0.6488	0.9935	1
	2005-2011	0.9612	0.8758	0.7649	0.9082	N/A
Cooking						
	Pre 1979	0.8089	0.7929	0.8623	0.5657	0.8728
	1979-2004	0.8606	0.8016	0.791	0.4696	0.866
	2005-2011	0.9465	0.8665	0.8996	0.3434	N/A
Drying						
	Pre 1979	0.6816	0.4894	0.1177	0.1616	0.4546
	1979-2004	0.7246	0.494	0.2484	0.0726	0.4868
	2005-2011	0.764	0.5434	0.4821	0.1922	N/A
Pool						
	Pre 1979	0.0664	0.0521	0.1045	0.1179	0.1179
	1979-2004	0.109	0.1308	0.1941	0.0053	0.0053
	2005-2011	0.0911	0.1308	0.1941	0.0053	N/A
Spa						
	Pre 1979	0.069	0.0526	0.0668	0.1329	0.1329
	1979-2004	0.1486	0.1923	0.2896	0.2012	0.2012
	2005-2011	0.1199	0.1923	0.2896	0.2012	N/A
Fireplace						
	Pre 1979	0.1193	0.2634	0.1519	0.1894	0.1894
	1979-2004	0.1663	0.6261	0.4775	0.4156	0.4156
	2005-2011	0.2179	0.6261	0.4775	0.4156	N/A
Barbecue						
	Pre 1979	0.1286	0.263	0.076	0.1875	0.0554
	1979-2004	0.2416	0.4739	0.0797	0.0797	0.1532
	2005-2011	0.3044	0.4405	0.1759	0.1759	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 Meter
Space Heating	0.9573	0.9399	0.8249	0.961	0.961
Water Heating	0.9876	0.9803	0.9627	0.9614	0.9614
Cooking	0.8075	0.8183	0.8151	0.8744	0.8744
Drying	0.7924	0.7416	0.7445	0.719	0.5657
Pool	0.8247	0.8247	0.8247	0.8247	0.8247
Spa	0.5819	0.5819	0.5819	0.5819	0.5819
Fireplace	0.5816	0.5816	0.5816	0.5816	0.5816
Barbecue	0.2759	0.2663	0.2978	0.1251	0.0364

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Figure 14: Building Lives and Decay Rates

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 15: Gas Appliance Equipment Age (Years)

			Single Family		Multi Family 2-4 Units		Multi Family >4 Units		Master Meter		Sub Meter	
	Vintage	Max	Average	Max	Average	Max	Average	Max	Average	Max	Average	Max
Space Heat												
	Pre 1979	17	17	17	15	15	15	15	16	16	16	16
	1979-2004	17	10	17	12	15	11	15	11	16	11	16
	2005-base Yr	1	3	17	4	15	4	15	4	16	4	16
Water Heat	Pre 1979	7	7	7	7	8	6	8	6	8	6	8
	1979-2004	7	7	7	8	8	8	8	8	8	8	8
	2005-base Yr	7	3	7	2	8	4	8	4	8	4	8
Cooking	Pre 1979	12	10	12	10	10	10	11	14	14	14	14
	1979-2004	12	10	12	9	10	11	11	11	14	11	14
	2005-base Yr	12	2	12	2	10	4	11	3	14	3	14
Drying	Pre 1979	8	8	8	7	9	6	8	8	8	8	8
	1979-2004	8	8	8	9	9	8	8	8	8	8	8
	2005-base Yr	8	6	8	3	9	3	8	4	8	4	8
Pool	Pre 1979	13	13	13	13	13	13	13	13	13	13	13
	1979-2004	13	9	13	9	13	9	13	9	13	9	13
	2005-base Yr	13	3	13	3	13	3	13	3	13	3	13
Spa	Pre 1979	11	11	11	11	11	11	11	11	11	11	11
	1979-2004	11	8	11	8	11	8	11	8	11	8	11
	2005-base Yr	11	3	11	3	11	3	11	3	11	3	11
Fireplace	Pre 1979	15	15	15	15	15	15	15	15	15	15	15
	1979-2004	15	15	15	15	15	15	15	15	15	15	15
	2005-base Yr	15	15	15	15	15	15	15	15	15	15	15
BBQ	Pre 1979	7	7	7	5	6	5	5	5	9	5	9
	1979-2004	7	7	7	6	6	5	5	9	9	9	9
	2005-base Yr	7	5	7	3	6	5	5	2	9	2	9
Other	Pre 1979	15	15	15	15	15	15	15	15	15	15	15
	1979-2004	15	15	15	15	15	15	15	15	15	15	15
	2005-base Yr	15	15	15	15	15	15	15	15	15	15	15

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Figure 18: Gas Efficiency Shares

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

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Figure 19: Electric Efficiency Shares

Electric End-use	Efficiency Level	Single Family Existing	Single Family New	Multi-Family 2 - 4 Units Existing	Multi-Family 2 - 4 Units New	Multi-Family > 4 Units Existing	Multi-Family > 4 Units New	Master Meter Existing	Master Meter New	Sub Meter Existing	Sub Meter New
Space Heat	Stock	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Water Heat	Stock	0.10	0.10	0.22	0.22	0.13	0.13	0.13	0.13	0.10	0.10
	Standard	0.68	0.68	0.61	0.61	0.76	0.76	0.76	0.76	0.68	0.68
	High	0.21	0.21	0.16	0.16	0.10	0.10	0.10	0.10	0.21	0.21
	Premium	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cooking	Stock	0.90	0.90	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
	Standard	0.10	0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Drying	Stock	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
	Standard	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Pool	Stock	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Space Heat	Stock	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fireplace	Stock	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Barbeque	Stock	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

2012 CALIFORNIA GAS REPORT

CORE COMMERCIAL AND INDUSTRIAL DEMAND FORECAST
JULY 2012

The Gas Company

A Sempra Energy utility℠

Core Commercial and Industrial End Use Model
2012 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 2012 through 2030.

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 1,375 for an Average Year. The gas demand forecasts under Cold, Hot and Base temperature were then constructed based on Cold Year (Hdd = 1,656), Hot Year (Hdd=1,094) and Base Year (Hdd=0) annual assumptions.

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

Data Sources

The key set of information used to perform the modeling and to generate the forecast includes historical year 2011 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 2011 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 1,375 average year HDD.

B. Employment Data:

The level of employment in each business type is used as a measure of economic activity in the G-10 commercial and industrial demand forecast models. The employment data series matches the NAICS categories used to develop the historical consumption data. The employment data were compiled and totaled for the 12 counties comprising SoCalGas' service territory. The forecast data comes from Global Insight's Regional forecast released in 2012 and based on Global Insight's latest US Economic Forecast. The historical 2011 data comes from the California Employment Development Department.

Data Sources

The key set of information used to perform the modeling and to generate the forecast includes historical year 2011 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 2011 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 1,375 average year HDD.

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The level of employment in each business type is used as a measure of economic activity in the G-10 commercial and industrial demand forecast models. The employment data series matches the NAICS categories used to develop the historical consumption data. The employment data were compiled and totaled for the 12 counties comprising SoCalGas' service territory. The forecast data is based on Global Insight's Regional forecast.
The historical data through 2011 comes from the California State Employment Development Department.

C. Gas Price Data:

Average and marginal gas prices ($/therm) were calculated from forecasts of the G-10 rate components. We used the underlying detailed consumption data, previously used for our econometric model work on our core C&I G-10 customers, to separate monthly consumption for customers by each business type into the respective G-10 consumption tiers.

For a given business type, we calculated an annual average gas commodity rate for a 12-month period. 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.

D. Electric Price Data:

Both average prices (cents/KWh) and marginal prices (cents/KWh) were developed as electricity price inputs. Forecasts for SCE commercial and industrial customer classes were developed from CEC reports.
The resulting price projections were set equal to the CEC's projections for the commercial and industrial classes. Prices were developed through 2030.

The marginal prices were calculated by multiplying each year's respective average price by a ratio. These ratios, 1.000 for commercial and 0.789 for industrial, were estimated from an analysis of the SCE GS-2 rate schedule posted on their website. (These customers were assumed to be large non-self-generation customers who also were on time-of-use rates.)

To impute each year's average and marginal electricity prices to each core commercial and core industrial business type, we simply calculated the ratio of the average (or marginal) gas price to the overall core commercial or core industrial 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. <u>DSM Forecast</u>:

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

G10 COMMERCIAL DATA TABLES

Southern California Gas Company
2012 California Gas Report- Commercial G10
The Year the Equipment Was Installed by Business Types

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other
Office	1977	1978	1974	1978	1979	1976	1980	1975	1978	1975	1973
Restaurant	1980	1983	1980	1980	1982	1981	1983	1977	1983	1978	1980
Retail	1976	1979	1977	1977	1984	1981	1977	1976	1978	1984	1977
Laundry	1979	1975	1981	1986	1986	1986	1986	1975	1976 .		1975
Warehouse	1977	1977	1975	1981	1979	1979	1939	1975	1983	1981	1978
School	1975	1977	1971	1972	1975	1972	1972	1973	1975	1974	1972
College	1974	1976	1973	1974	1975	1975	1973	1979	1974	1973	1970
Health	1976	1979	1974	1975	1977	1975	1973	1975	1977	1974	1975
Lodging	1974	1981	1975	1979	1983	1979	1984	1975	1980	1975	1981
Misc	1974	1977	1972	1972	1976	1973	1979	1974	1978	1974	1978
Government	1975	1977	1973	1979	1975	1976	1978	1975	1980	1978	1972
TIU	1975	1979	1975	1978	1982	1979	1990	1975	1983	1978	1981
Construction	1977	1977	1972	1974	1975	1974	1953	1973	1980	1975	1976
Agriculture	1982	1980	1973	1979	1980	1979	1970	1976	1971	1987	1985

				Southern California Gas Company											
				2012 California Gas Report											
				Average Gas Prices ($/Therm)											
Year	**Com Price Deflator**	**Agriculture Average Price**	**College Average Price**	**Construction Average Price**	**Government Average Price**	**Health Average Price**	**Laundry Average Price**	**Lodging Average Price**	**Misc Average Price**	**Office Average Price**	**Restaurant Average Price**	**Retail Average Price**	**School Average Price**	**TCU Average Price**	**Warehouse Average Price**
2010	100.00	0.8917	0.8509	0.8784	0.7901	0.8089	0.8110	0.7128	0.7686	0.7710	0.8838	0.7604	0.7485	0.9101	0.6777
2011	101.20	0.8566	0.8154	0.8431	0.7559	0.7755	0.7766	0.6809	0.7352	0.7374	0.8488	0.7274	0.7160	0.8752	0.6466
2012	102.96	0.9181	0.8765	0.9045	0.8182	0.8385	0.8388	0.7451	0.7983	0.8003	0.9103	0.7907	0.7798	0.9370	0.7115
2013	104.98	0.9581	0.9165	0.9445	0.8583	0.8786	0.8788	0.7853	0.8384	0.8404	0.9503	0.8308	0.8199	0.9770	0.7517
2014	107.37	0.9881	0.9464	0.9745	0.8884	0.9089	0.9089	0.8158	0.8687	0.8706	0.9803	0.8611	0.8503	1.0070	0.7824
2015	109.91	1.0937	1.0519	1.0801	0.9942	1.0148	1.0146	0.9220	0.9746	0.9765	1.0859	0.9671	0.9564	1.1127	0.8887
2016	112.45	1.1275	1.0857	1.1139	1.0282	1.0489	1.0486	0.9563	1.0088	1.0106	1.1198	1.0013	0.9907	1.1465	0.9232
2017	115.07	1.1675	1.1260	1.1540	1.0675	1.0876	1.0881	0.9940	1.0474	1.0494	1.1598	1.0397	1.0287	1.1864	0.9602
2018	117.74	1.2063	1.1651	1.1929	1.1056	1.1252	1.1263	1.0304	1.0849	1.0871	1.1985	1.0770	1.0656	1.2250	0.9961
2019	120.39	1.2427	1.2018	1.2293	1.1413	1.1603	1.1622	1.0646	1.1200	1.1224	1.2348	1.1119	1.1001	1.2611	1.0296
2020	122.86	1.2774	1.2368	1.2642	1.1754	1.1939	1.1964	1.0971	1.1534	1.1560	1.2695	1.1452	1.1330	1.2957	1.0616
2021	125.37	1.3122	1.2719	1.2991	1.2095	1.2275	1.2307	1.1296	1.1869	1.1897	1.3043	1.1785	1.1659	1.3303	1.0934
2022	128.01	1.3471	1.3071	1.3340	1.2437	1.2610	1.2651	1.1621	1.2204	1.2234	1.3392	1.2119	1.1988	1.3649	1.1253
2023	130.68	1.3804	1.3407	1.3674	1.2763	1.2931	1.2978	1.1930	1.2524	1.2555	1.3724	1.2436	1.2301	1.3980	1.1557
2024	133.33	1.4624	1.4230	1.4495	1.3575	1.3737	1.3793	1.2725	1.3329	1.3363	1.4544	1.3240	1.3100	1.4798	1.2345
2025	136.18	1.4251	1.3861	1.4123	1.3195	1.3350	1.3414	1.2326	1.2941	1.2977	1.4170	1.2849	1.2705	1.4423	1.1938
2026	139.14	1.4072	1.3686	1.3946	1.3008	1.3157	1.3229	1.2120	1.2747	1.2785	1.3992	1.2653	1.2504	1.4242	1.1725
2027	142.22	1.4128	1.3746	1.4003	1.3056	1.3198	1.3279	1.2148	1.2787	1.2827	1.4047	1.2691	1.2537	1.4296	1.1746
2028	145.43	1.4492	1.4114	1.4368	1.3411	1.3546	1.3636	1.2482	1.3134	1.3177	1.4411	1.3036	1.2876	1.4657	1.2072
2029	148.80	1.4883	1.4509	1.4761	1.3794	1.3920	1.4020	1.2842	1.3508	1.3553	1.4802	1.3407	1.3242	1.5046	1.2425
2030	152.24	1.5333	1.4962	1.5212	1.4234	1.4354	1.4463	1.3262	1.3940	1.3988	1.5251	1.3837	1.3666	1.5493	1.2836

Southern California Gas Company
2012 California Gas Report
Marginal Gas Prices ($/Therm)

Year	Agriculture Marginal Price	College Marginal Price	Construction Marginal Price	Government Marginal Price	Health Marginal Price	Laundry Marginal Price	Lodging Marginal Price	Misc Marginal Price	Office Marginal Price	Restaurant Marginal Price	Retail Marginal Price	School Marginal Price	TCU Marginal Price	Warehouse Marginal Price
2010	0.7552	0.7658	0.7580	0.7305	0.6963	0.7118	0.6462	0.6939	0.6938	0.7527	0.6798	0.6739	0.7505	0.6268
2011	0.7217	0.7319	0.7243	0.6977	0.6645	0.6795	0.6158	0.6622	0.6620	0.7192	0.6485	0.6427	0.7171	0.5970
2012	0.7845	0.7945	0.7871	0.7612	0.7288	0.7435	0.6814	0.7266	0.7264	0.7821	0.7132	0.7076	0.7801	0.6630
2013	0.8246	0.8346	0.8272	0.8013	0.7690	0.7836	0.7215	0.7667	0.7666	0.8222	0.7533	0.7478	0.8202	0.7033
2014	0.8548	0.8648	0.8574	0.8316	0.7995	0.8141	0.7523	0.7972	0.7971	0.8524	0.7840	0.7784	0.8504	0.7341
2015	0.9607	0.9706	0.9633	0.9377	0.9057	0.9202	0.8588	0.9035	0.9033	0.9583	0.8903	0.8848	0.9563	0.8407
2016	0.9948	1.0047	0.9974	0.9719	0.9401	0.9545	0.8934	0.9378	0.9377	0.9925	0.9247	0.9192	0.9905	0.8754
2017	1.0337	1.0437	1.0363	1.0102	0.9777	0.9924	0.9299	0.9754	0.9752	1.0313	0.9619	0.9563	1.0292	0.9115
2018	1.0713	1.0816	1.0740	1.0473	1.0140	1.0291	0.9652	1.0117	1.0116	1.0688	0.9980	0.9922	1.0668	0.9464
2019	1.1066	1.1171	1.1093	1.0821	1.0481	1.0635	0.9983	1.0457	1.0456	1.1041	1.0317	1.0259	1.1019	0.9791
2020	1.1402	1.1509	1.1430	1.1152	1.0806	1.0963	1.0297	1.0781	1.0780	1.1376	1.0638	1.0579	1.1355	1.0101
2021	1.1739	1.1848	1.1767	1.1484	1.1130	1.1290	1.0611	1.1105	1.1104	1.1713	1.0959	1.0898	1.1691	1.0411
2022	1.2076	1.2188	1.2105	1.1815	1.1454	1.1618	1.0924	1.1429	1.1428	1.2049	1.1280	1.1218	1.2027	1.0720
2023	1.2397	1.2511	1.2427	1.2132	1.1763	1.1930	1.1222	1.1737	1.1736	1.2370	1.1585	1.1522	1.2347	1.1014
2024	1.3205	1.3321	1.3235	1.2933	1.2557	1.2728	1.2005	1.2531	1.2529	1.3177	1.2375	1.2310	1.3153	1.1792
2025	1.2819	1.2938	1.2850	1.2541	1.2157	1.2331	1.1593	1.2130	1.2128	1.2790	1.1971	1.1905	1.2766	1.1375
2026	1.2627	1.2748	1.2658	1.2343	1.1950	1.2128	1.1374	1.1923	1.1921	1.2598	1.1760	1.1693	1.2573	1.1151
2027	1.2669	1.2793	1.2701	1.2379	1.1977	1.2159	1.1387	1.1949	1.1947	1.2639	1.1783	1.1714	1.2614	1.1160
2028	1.3018	1.3145	1.3051	1.2722	1.2310	1.2497	1.1707	1.2282	1.2280	1.2988	1.2112	1.2041	1.2962	1.1474
2029	1.3395	1.3525	1.3428	1.3091	1.2670	1.2861	1.2053	1.2641	1.2639	1.3363	1.2467	1.2395	1.3337	1.1815
2030	1.3829	1.3962	1.3864	1.3519	1.3089	1.3284	1.2457	1.3058	1.3057	1.3797	1.2881	1.2807	1.3770	1.2214

File: SCG Core Commercial Average and Marginal Electric prices.xls(Electric ave price)

			Southern California Gas Company											
			2012 California Gas Report											
			Average Electric Prices (Cents/KWh)											
Year	**Agriculture Average Price**	**College Average Price**	**Construction Average Price**	**Government Average Price**	**Health Average Price**	**Laundry Average Price**	**Lodging Average Price**	**Misc Average Price**	**Office Average Price**	**Restaurant Average Price**	**Retail Average Price**	**School Average Price**	**TCU Average Price**	**Warehouse Average Price**
2010	19.36	18.48	19.07	17.16	17.56	17.61	15.48	16.69	16.74	19.19	16.51	16.25	19.76	14.71
2011	19.47	18.53	19.16	17.18	17.63	17.65	15.48	16.71	16.76	19.29	16.53	16.28	19.89	14.70
2012	20.60	19.66	20.29	18.35	18.81	18.82	16.72	17.91	17.95	20.42	17.74	17.49	21.02	15.96
2013	21.35	20.42	21.05	19.13	19.58	19.58	17.50	18.68	18.73	21.18	18.51	18.27	21.77	16.75
2014	21.88	20.96	21.58	19.68	20.13	20.13	18.07	19.24	19.28	21.71	19.07	18.83	22.30	17.33
2015	22.13	21.28	21.85	20.11	20.53	20.53	18.65	19.72	19.76	21.97	19.57	19.35	22.51	17.98
2016	22.52	21.69	22.25	20.54	20.95	20.95	19.10	20.15	20.19	22.37	20.00	19.79	22.90	18.44
2017	22.92	22.10	22.65	20.95	21.35	21.36	19.51	20.56	20.60	22.76	20.41	20.19	23.29	18.85
2018	23.40	22.60	23.14	21.45	21.83	21.85	19.99	21.04	21.09	23.25	20.89	20.67	23.76	19.32
2019	23.95	23.16	23.69	21.99	22.36	22.40	20.51	21.58	21.63	23.80	21.43	21.20	24.30	19.84
2020	24.29	23.52	24.04	22.35	22.70	22.75	20.86	21.93	21.98	24.14	21.78	21.54	24.64	20.19
2021	25.52	24.74	25.27	23.53	23.88	23.94	21.97	23.09	23.14	25.37	22.92	22.68	25.88	21.27
2022	25.97	25.20	25.72	23.98	24.31	24.39	22.40	23.53	23.58	25.82	23.36	23.11	26.31	21.69
2023	26.47	25.71	26.22	24.48	24.80	24.89	22.88	24.02	24.08	26.32	23.85	23.59	26.81	22.16
2024	26.93	26.20	26.69	25.00	25.29	25.40	23.43	24.54	24.61	26.78	24.38	24.12	27.25	22.73
2025	27.54	26.79	27.30	25.50	25.80	25.93	23.82	25.01	25.08	27.39	24.84	24.56	27.88	23.08
2026	28.16	27.39	27.91	26.03	26.33	26.47	24.25	25.51	25.58	28.00	25.32	25.02	28.50	23.46
2027	28.76	27.98	28.50	26.57	26.86	27.03	24.72	26.03	26.11	28.59	25.83	25.52	29.10	23.91
2028	29.33	28.57	29.08	27.15	27.42	27.60	25.26	26.58	26.67	29.17	26.38	26.06	29.67	24.43
2029	29.92	29.16	29.67	27.72	27.98	28.18	25.81	27.15	27.24	29.75	26.95	26.62	30.24	24.97
2030	30.51	29.77	30.27	28.32	28.56	28.78	26.39	27.74	27.83	30.35	27.53	27.19	30.83	25.54

File: SCG Core Commercial Average and Marginal Electric prices.xls(Electric marg price)

Southern California Gas Company
2012 California Gas Report
Marginal Electric Prices (Cents/KWh)

Year	Agriculture Marginal Price	College Marginal Price	Construction Marginal Price	Government Marginal Price	Health Marginal Price	Laundry Marginal Price	Lodging Marginal Price	Misc Marginal Price	Office Marginal Price	Restaurant Marginal Price	Retail Marginal Price	School Marginal Price	TCU Marginal Price	Warehouse Marginal Price
2010	18.59	18.85	18.66	17.98	17.14	17.52	15.91	17.08	17.08	18.53	16.74	16.59	18.48	15.43
2011	18.66	18.93	18.73	18.04	17.19	17.57	15.93	17.13	17.12	18.60	16.77	16.62	18.55	15.44
2012	19.78	20.03	19.85	19.19	18.38	18.75	17.18	18.32	18.32	19.72	17.98	17.84	19.67	16.72
2013	20.54	20.78	20.60	19.96	19.15	19.51	17.97	19.09	19.09	20.48	18.76	18.62	20.43	17.51
2014	21.07	21.31	21.13	20.50	19.70	20.06	18.54	19.65	19.65	21.01	19.32	19.19	20.96	18.09
2015	21.37	21.59	21.43	20.86	20.15	20.47	19.10	20.10	20.09	21.32	19.80	19.68	21.27	18.70
2016	21.77	21.99	21.83	21.27	20.57	20.89	19.55	20.52	20.52	21.72	20.24	20.12	21.68	19.16
2017	22.18	22.40	22.24	21.68	20.98	21.29	19.95	20.93	20.93	22.13	20.64	20.52	22.08	19.56
2018	22.67	22.89	22.73	22.16	21.46	21.78	20.43	21.41	21.41	22.62	21.12	21.00	22.58	20.03
2019	23.22	23.44	23.28	22.71	22.00	22.32	20.95	21.95	21.94	23.17	21.65	21.53	23.13	20.55
2020	23.58	23.80	23.63	23.06	22.34	22.67	21.29	22.29	22.29	23.52	22.00	21.87	23.48	20.89
2021	24.79	25.03	24.85	24.26	23.51	23.85	22.41	23.46	23.45	24.74	23.15	23.02	24.69	21.99
2022	25.25	25.48	25.31	24.70	23.95	24.29	22.84	23.89	23.89	25.19	23.58	23.45	25.14	22.41
2023	25.75	25.99	25.81	25.20	24.43	24.78	23.31	24.38	24.38	25.70	24.06	23.93	25.65	22.88
2024	26.23	26.47	26.29	25.70	24.95	25.29	23.85	24.90	24.89	26.18	24.59	24.46	26.13	23.43
2025	26.82	27.07	26.89	26.24	25.44	25.80	24.26	25.38	25.38	26.76	25.05	24.91	26.71	23.80
2026	27.42	27.68	27.49	26.80	25.95	26.34	24.70	25.89	25.89	27.35	25.54	25.39	27.30	24.21
2027	28.00	28.28	28.08	27.36	26.48	26.88	25.17	26.41	26.41	27.94	26.05	25.89	27.88	24.67
2028	28.59	28.87	28.66	27.94	27.03	27.44	25.71	26.97	26.97	28.52	26.60	26.44	28.46	25.20
2029	29.18	29.46	29.25	28.51	27.60	28.01	26.25	27.53	27.53	29.11	27.15	27.00	29.05	25.73
2030	29.78	30.06	29.85	29.11	28.18	28.60	26.82	28.12	28.12	29.71	27.74	27.58	29.65	26.30

Southern California Gas Company
2012 California Gas Report
2011 Historical Data

Segment	2011 Therm Sales	2011 Meter Count	2011 Meter Count, Existing/Old customers	2011 Meter Count New Customers	Avg Use Per Meter Existing Customers	Avg Use Per Meter New Customers	Price Elasticity	Employment Elasticity
Office	67,510,207	40,460	40,231	229	1,663	232	-0.072000	0.504814
Restaurant	238,060,073	36,898	36,465	433	6,443	439	-0.001000	1.139009
Retail	57,474,501	26,526	26,366	160	2,159	162	-0.032000	0.669961
Laundry	61,488,219	4,550	4,528	22	13,480	22	-0.026000	0.410773
Warehouse	18,010,933	7,813	7,766	47	2,313	48	0.000000	0.541396
School	40,377,064	6,745	6,705	40	5,967	41	-0.103000	0.000000
College	26,842,213	2,602	2,576	26	10,341	26	-0.090000	0.734460
Health	55,928,879	7,868	7,844	24	7,060	24	-0.052000	0.133868
Lodging	56,822,029	4,953	4,926	27	11,458	27	-0.013000	0.429296
Misc	71,566,520	35,042	34,765	277	2,025	281	-0.030000	0.000000
Government	26,217,187	3,720	3,686	34	7,019	34	-0.061000	1.691919
TCU	33,878,691	7,347	735	42	42,413	393	-0.062000	0.723524
Construction	7,235,720	5,852	5,799	53	1,199	54	-0.179000	0.106372
Agriculture	36,235,084	1,557	1,552	5	23,268	5	-0.059000	0.668819
Total	797,647,320	191,933						

Southern California Gas Company
Core Commercial -G10- Average Use Per Meter (therms)
2012 California Gas Report

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other	Total Building
Office	655	272	33	11	8	34	7	11	33	9	653	1,728
Restaurant	462	894	1,491	613	1,178	1,304	317	18	8	0	293	6,579
Retail	515	313	114	19	127	219	135	30	58	5	713	2,247
Laundry	42	665	5	1	1	8	0	1	6,680	0	6,220	13,624
Warehouse	444	129	18	5	44	51	65	51	148	44	1,430	2,429
School	3,504	1,181	200	15	45	367	38	44	7	48	1,026	6,475
College	4,685	2,314	226	67	116	278	64	293	71	100	3,186	11,400
Health	2,316	1,451	233	45	63	179	101	42	319	24	2,449	7,221
Lodging	1,673	3,417	472	115	147	574	283	28	890	1	3,862	11,461
Misc	772	472	95	19	31	78	25	79	31	6	521	2,130
Government	3,078	1,790	157	78	46	129	70	82	42	455	1,206	7,133
TCU	1,015	365	32	8	15	28	19	50	3	1,592	1,683	4,810
Construction	420	131	11	0	2	6	4	12	78	0	619	1,282
Agriculture	3,401	824	140	23	291	647	588	8	858	5,624	11,356	23,761

Southern California Gas Company
Core Commercial Use Per Meter for New Customers (Therms)
2012 California Gas Report

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other	Total Building
Office	310	2	41	210	0	84	15	0	0	0	1,029	1,691
Restaurant	1,117	1,015	1,122	662	783	428	740	15	0	0	1,262	7,143
Retail	618	505	71	17	100	99	460	0	371	1	0	2,241
Laundry	0	29	0	0	0	0	0	0	6,446	0	4,622	11,097
Warehouse	101	151	0	169	0	0	871	0	2,955	0	0	4,248
School	2,364	985	207	1	0	380	11	0	0	0	4,870	8,818
College	2,153	86	0	0	0	0	0	0	0	3,638	0	5,877
Health	807	1,802	189	0	79	75	87	0	89	0	2,990	6,119
Lodging	464	2,725	0	204	269	550	16	0	656	0	19,466	24,350
Misc	390	46	0	2	0	0	39	0	20	0	6,925	7,422
Government	0	0	0	0	0	0	0	0	0	0	0	0
TCU	629	24	0	0	0	0	0	0	0	4,125	4,376	9,154
Construction	0	0	0	0	0	0	0	0	0	0	0	0
Agriculture	545	361	0	0	0	0	0	0	0	5,892	11,349	18,148

Southern California Gas Company

2012 California Gas Report - Commercial 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 Types	End Use	Fuel	Efficiency	uec (therm/SqFt)	Equipment Cost	efficiency shares
Office	Space_Heat	1	1	0.3046	4.3149	0.65
Office	Space_Heat	1	2	0.2742	4.7464	0.3
Office	Space_Heat	1	3	0.2495	5.1779	0.04
Office	Space_Heat	1	4	0.2248	5.6094	0.01
Office	Space_Heat	2	1	6.2481	3.4519	1
Office	Space_Heat	2	2	5.6233	3.7971	0
Office	Space_Heat	2	3	5.1172	4.1423	0
Office	Space_Heat	2	4	4.6111	4.4875	0
Office	Water_Heat	1	1	0.0474	0.6712	0.4
Office	Water_Heat	1	2	0.0427	0.7384	0.5
Office	Water_Heat	1	3	0.0373	0.8055	0.08
Office	Water_Heat	1	4	0.032	0.8726	0.02
Office	Water_Heat	2	1	0.972	0.537	0.4
Office	Water_Heat	2	2	0.8748	0.5907	0.5
Office	Water_Heat	2	3	0.7654	0.6444	0.08
Office	Water_Heat	2	4	0.6561	0.6981	0.02
Office	Cooking	1	1	0.0346	0.4899	0.65
Office	Cooking	1	2	0.0311	0.5389	0.35
Office	Cooking	2	1	0.7094	0.3919	0.65
Office	Cooking	2	2	0.6385	0.4311	0.35
Office	AC_Compressor	1	1	0.1043	1.4773	0.65
Office	AC_Compressor	1	2	0.0939	1.6251	0.35
Office	AC_Compressor	2	1	2.1392	1.1819	0.65
Office	AC_Compressor	2	2	1.9253	1.3	0.35
Office	Other	1	1	0	0	1
Office	Other	2	1	0	0	0
Restaurant	Space_Heat	1	1	0.1177	1.5841	0.65
Restaurant	Space_Heat	1	2	0.1059	1.7425	0.3
Restaurant	Space_Heat	1	3	0.0964	1.9009	0.04
Restaurant	Space_Heat	1	4	0.0868	2.0593	0.01
Restaurant	Space_Heat	2	1	2.4134	1.2673	1
Restaurant	Space_Heat	2	2	2.1721	1.394	0
Restaurant	Space_Heat	2	3	1.9766	1.5207	0
Restaurant	Space_Heat	2	4	1.7811	1.6474	0
Restaurant	Water_Heat	1	1	0.8666	11.666	0.4
Restaurant	Water_Heat	1	2	0.7799	12.8326	0.5
Restaurant	Water_Heat	1	3	0.6824	13.9992	0.08
Restaurant	Water_Heat	1	4	0.5849	15.1658	0.02
Restaurant	Water_Heat	2	1	17.7736	9.3328	0.4
Restaurant	Water_Heat	2	2	15.9962	10.2661	0.5
Restaurant	Water_Heat	2	3	13.9967	11.1994	0.08
Restaurant	Water_Heat	2	4	11.9972	12.1327	0.02
Restaurant	Cook_top	1	1	1.1985	16.1343	0.65

Business Types	End Use	Fuel	Efficiency	(therm/SqFt)	Equipment Cost	efficiency shares
Restaurant	Cook_top	1	2	1.0787	17.7477	0.35
Restaurant	Cook_top	2	1	24.5811	12.9074	0.65
Restaurant	Cook_top	2	2	22.123	14.1981	0.35
Restaurant	Fryer	1	1	1.0791	14.5274	0.65
Restaurant	Fryer	1	2	0.9712	15.9802	0.35
Restaurant	Fryer	2	1	22.133	11.622	0.65
Restaurant	Fryer	2	2	19.9197	12.7841	0.35
Restaurant	Griddle	1	1	0.9107	12.2603	0.65
Restaurant	Griddle	1	2	0.8197	13.4863	0.35
Restaurant	Griddle	2	1	18.6789	9.8082	0.65
Restaurant	Griddle	2	2	16.8111	10.789	0.35
Restaurant	Other_Cooking	1	1	0.9712	13.0747	0.65
Restaurant	Other_Cooking	1	2	0.8741	14.3822	0.35
Restaurant	Other_Cooking	2	1	19.9197	10.4598	0.65
Restaurant	Other_Cooking	2	2	17.9278	11.5057	0.35
Restaurant	AC_Compressor	1	1	0.2028	2.7306	0.65
Restaurant	AC_Compressor	1	2	0.1826	3.0036	0.35
Restaurant	AC_Compressor	2	1	4.1601	2.1844	0.65
Restaurant	AC_Compressor	2	2	3.7441	2.4029	0.35
Restaurant	Other	1	1	0	0	1
Restaurant	Other	2	1	0	0	0
Retail	Space_Heat	1	1	0.2455	3.5122	0.65
Retail	Space_Heat	1	2	0.221	3.8634	0.3
Retail	Space_Heat	1	3	0.2011	4.2146	0.04
Retail	Space_Heat	1	4	0.1812	4.5658	0.01
Retail	Space_Heat	2	1	5.0356	2.8097	1
Retail	Space_Heat	2	2	4.532	3.0907	0
Retail	Space_Heat	2	3	4.1241	3.3717	0
Retail	Space_Heat	2	4	3.7163	3.6527	0
Retail	Water_Heat	1	1	0.1093	1.563	0.4
Retail	Water_Heat	1	2	0.0983	1.7193	0.5
Retail	Water_Heat	1	3	0.086	1.8756	0.08
Retail	Water_Heat	1	4	0.0738	2.0319	0.02
Retail	Water_Heat	2	1	2.2409	1.2504	0.4
Retail	Water_Heat	2	2	2.0168	1.3754	0.5
Retail	Water_Heat	2	3	1.7647	1.5004	0.08
Retail	Water_Heat	2	4	1.5126	1.6255	0.02
Retail	Cooking	1	1	0.3079	4.4039	0.65
Retail	Cooking	1	2	0.2771	4.8443	0.35
Retail	Cooking	2	1	6.3142	3.5231	0.65
Retail	Cooking	2	2	5.683	3.875	0.35
Retail	Other	1	1	0	0	1
Retail	Other	2	1	0	0	0
Laundry	Space_Heat	1	1	0.147	1.836	0.65
Laundry	Space_Heat	1	2	0.132	2.02	0.3
Laundry	Space_Heat	1	3	0.12	2.203	0.04
Laundry	Space_Heat	1	4	0.108	2.387	0.01
Laundry	Space_Heat	2	1	3.012	1.469	1
Laundry	Space_Heat	2	2	2.711	1.616	0
Laundry	Space_Heat	2	3	2.467	1.763	0
Laundry	Space_Heat	2	4	2.223	1.909	0
Laundry	Water_Heat	1	1	2.76	34.512	0.4
Laundry	Water_Heat	1	2	2.484	37.963	0.5
Laundry	Water_Heat	1	3	2.174	41.414	0.08

Business Types	End Use	Fuel	Efficiency	(therm/SqFt)	Equipment Cost	efficiency shares
Laundry	Water_Heat	1	4	1.863	44.865	0.02
Laundry	Water_Heat	2	1	56.617	27.609	0.4
Laundry	Water_Heat	2	2	50.955	30.37	0.5
Laundry	Water_Heat	2	3	44.586	33.131	0.08
Laundry	Water_Heat	2	4	38.216	35.892	0.02
Laundry	Drying	1	1	14.937	186.738	0.65
Laundry	Drying	1	2	13.443	205.412	0.35
Laundry	Drying	2	1	306.348	149.39	0.65
Laundry	Drying	2	2	275.713	164.329	0.35
Laundry	Other	1	1	0	0	1
Laundry	Other	2	1	0	0	0
Warehouse	Space_Heat	1	1	0.621	7.909	0.65
Warehouse	Space_Heat	1	2	0.559	8.7	0.3
Warehouse	Space_Heat	1	3	0.509	9.491	0.04
Warehouse	Space_Heat	1	4	0.458	10.282	0.01
Warehouse	Space_Heat	2	1	12.739	6.327	1
Warehouse	Space_Heat	2	2	11.465	6.96	0
Warehouse	Space_Heat	2	3	10.433	7.593	0
Warehouse	Space_Heat	2	4	9.401	8.225	0
Warehouse	Water_Heat	1	1	0.205	2.608	0.4
Warehouse	Water_Heat	1	2	0.184	2.869	0.5
Warehouse	Water_Heat	1	3	0.161	3.13	0.08
Warehouse	Water_Heat	1	4	0.138	3.39	0.02
Warehouse	Water_Heat	2	1	4.2	2.086	0.4
Warehouse	Water_Heat	2	2	3.78	2.295	0.5
Warehouse	Water_Heat	2	3	3.308	2.504	0.08
Warehouse	Water_Heat	2	4	2.835	2.712	0.02
Warehouse	Engine	1	1	8.884	113.127	0.65
Warehouse	Engine	1	2	7.995	124.44	0.35
Warehouse	Engine	2	1	182.207	90.502	0.65
Warehouse	Engine	2	2	163.986	99.552	0.35
Warehouse	Other	1	1	0	0	1
Warehouse	Other	2	1	0	0	0
School	Space_Heat	1	1	0.092	1.225	0.65
School	Space_Heat	1	2	0.083	1.348	0.3
School	Space_Heat	1	3	0.076	1.471	0.04
School	Space_Heat	1	4	0.068	1.593	0.01
School	Space_Heat	2	1	1.895	0.98	1
School	Space_Heat	2	2	1.705	1.078	0
School	Space_Heat	2	3	1.552	1.176	0
School	Space_Heat	2	4	1.398	1.274	0
School	Water_Heat	1	1	0.123	1.635	0.4
School	Water_Heat	1	2	0.111	1.799	0.5
School	Water_Heat	1	3	0.097	1.962	0.08
School	Water_Heat	1	4	0.083	2.126	0.02
School	Water_Heat	2	1	2.528	1.308	0.4
School	Water_Heat	2	2	2.276	1.439	0.5
School	Water_Heat	2	3	1.991	1.57	0.08
School	Water_Heat	2	4	1.707	1.701	0.02
School	Cook_top	1	1	0.046	0.61	0.65
School	Cook_top	1	2	0.041	0.671	0.35
School	Cook_top	2	1	0.943	0.488	0.65
School	Cook_top	2	2	0.849	0.537	0.35
School	Fryer	1	1	0.046	0.612	0.65

Business Types	End Use	Fuel	Efficiency	(therm/SqFt)	Equipment Cost	efficiency shares
School	Fryer	1	2	0.041	0.673	0.35
School	Fryer	2	1	0.946	0.489	0.65
School	Fryer	2	2	0.851	0.538	0.35
School	Griddle	1	1	0.046	0.612	0.65
School	Griddle	1	2	0.041	0.673	0.35
School	Griddle	2	1	0.946	0.489	0.65
School	Griddle	2	2	0.851	0.538	0.35
School	Other_Cooking	1	1	0.046	0.61	0.65
School	Other_Cooking	1	2	0.041	0.671	0.35
School	Other_Cooking	2	1	0.943	0.488	0.65
School	Other_Cooking	2	2	0.849	0.537	0.35
School	AC_Compressor	1	1	0.065	0.866	0.65
School	AC_Compressor	1	2	0.059	0.953	0.35
School	AC_Compressor	2	1	1.339	0.693	0.65
School	AC_Compressor	2	2	1.205	0.762	0.35
School	Other	1	1	0	0	1
School	Other	2	1	0	0	0
College	Space_Heat	1	1	0.26643	3.14441	0.65
College	Space_Heat	1	2	0.23979	3.45885	0.3
College	Space_Heat	1	3	0.21821	3.77329	0.04
College	Space_Heat	1	4	0.19663	4.08773	0.01
College	Space_Heat	2	1	5.46443	2.51553	1
College	Space_Heat	2	2	4.91799	2.76708	0
College	Space_Heat	2	3	4.47537	3.01863	0
College	Space_Heat	2	4	4.03275	3.27018	0
College	Water_Heat	1	1	0.28715	3.38894	0.4
College	Water_Heat	1	2	0.25844	3.72784	0.5
College	Water_Heat	1	3	0.22613	4.06673	0.08
College	Water_Heat	1	4	0.19383	4.40563	0.02
College	Water_Heat	2	1	5.88939	2.71116	0.4
College	Water_Heat	2	2	5.30045	2.98227	0.5
College	Water_Heat	2	3	4.6379	3.25339	0.08
College	Water_Heat	2	4	3.97534	3.5245	0.02
College	Cook_top	1	1	0.0486	0.57358	0.65
College	Cook_top	1	2	0.04374	0.63093	0.35
College	Cook_top	2	1	0.99678	0.45886	0.65
College	Cook_top	2	2	0.8971	0.50475	0.35
College	Fryer	1	1	0.04857	0.57322	0.65
College	Fryer	1	2	0.04371	0.63055	0.35
College	Fryer	2	1	0.99616	0.45858	0.65
College	Fryer	2	2	0.89655	0.50444	0.35
College	Griddle	1	1	0.04857	0.57322	0.65
College	Griddle	1	2	0.04371	0.63055	0.35
College	Griddle	2	1	0.99616	0.45858	0.65
College	Griddle	2	2	0.89655	0.50444	0.35
College	Other_Cooking	1	1	0.0486	0.57358	0.65
College	Other_Cooking	1	2	0.04374	0.63093	0.35
College	Other_Cooking	2	1	0.99678	0.45886	0.65
College	Other_Cooking	2	2	0.8971	0.50475	0.35
College	AC_Compressor	1	1	0.11819	1.3949	0.65
College	AC_Compressor	1	2	0.10637	1.53439	0.35
College	AC_Compressor	2	1	2.4241	1.11592	0.65
College	AC_Compressor	2	2	2.18169	1.22752	0.35
College	Other	1	1	0	0	1

Business Types	End Use	Fuel	Efficiency	(therm/SqFt)	Equipment Cost	efficiency shares
College	Other	2	1	0	0	0
Health	Space_Heat	1	1	0.06894	0.8825	0.65
Health	Space_Heat	1	2	0.06205	0.97075	0.3
Health	Space_Heat	1	3	0.05646	1.059	0.04
Health	Space_Heat	1	4	0.05088	1.14725	0.01
Health	Space_Heat	2	1	1.41395	0.706	1
Health	Space_Heat	2	2	1.27255	0.7766	0
Health	Space_Heat	2	3	1.15802	0.8472	0
Health	Space_Heat	2	4	1.04349	0.9178	0
Health	Water_Heat	1	1	0.41709	5.33917	0.4
Health	Water_Heat	1	2	0.37538	5.87309	0.5
Health	Water_Heat	1	3	0.32846	6.407	0.08
Health	Water_Heat	1	4	0.28154	6.94092	0.02
Health	Water_Heat	2	1	8.55444	4.27134	0.4
Health	Water_Heat	2	2	7.699	4.69847	0.5
Health	Water_Heat	2	3	6.73662	5.1256	0.08
Health	Water_Heat	2	4	5.77425	5.55274	0.02
Health	Cook_top	1	1	0.26358	3.37409	0.65
Health	Cook_top	1	2	0.23722	3.7115	0.35
Health	Cook_top	2	1	5.40598	2.69927	0.65
Health	Cook_top	2	2	4.86538	2.9692	0.35
Health	Fryer	1	1	0.26358	3.37409	0.65
Health	Fryer	1	2	0.23722	3.7115	0.35
Health	Fryer	2	1	5.40598	2.69927	0.65
Health	Fryer	2	2	4.86538	2.9692	0.35
Health	Griddle	1	1	0.26358	3.37409	0.65
Health	Griddle	1	2	0.23722	3.7115	0.35
Health	Griddle	2	1	5.40598	2.69927	0.65
Health	Griddle	2	2	4.86538	2.9692	0.35
Health	Other_Cooking	1	1	0.02636	0.33743	0.65
Health	Other_Cooking	1	2	0.02372	0.37118	0.35
Health	Other_Cooking	2	1	0.54064	0.26995	0.65
Health	Other_Cooking	2	2	0.48657	0.29694	0.35
Health	Drying	1	1	0.14598	1.86871	0.65
Health	Drying	1	2	0.13138	2.05558	0.35
Health	Drying	2	1	2.99405	1.49497	0.65
Health	Drying	2	2	2.69465	1.64446	0.35
Health	AC_Compressor	1	1	0.11386	1.45749	0.65
Health	AC_Compressor	1	2	0.10247	1.60324	0.35
Health	AC_Compressor	2	1	2.3352	1.16599	0.65
Health	AC_Compressor	2	2	2.10168	1.28259	0.35
Health	Other	1	1	0	0	1
Health	Other	2	1	0	0	0
Lodging	Space_Heat	1	1	0.38698	4.85892	0.65
Lodging	Space_Heat	1	2	0.3483	5.3448	0.3
Lodging	Space_Heat	1	3	0.3169	5.8307	0.04
Lodging	Space_Heat	1	4	0.2856	6.3166	0.01
Lodging	Space_Heat	2	1	7.9369	3.8871	1
Lodging	Space_Heat	2	2	7.1432	4.2759	
Lodging	Space_Heat	2	3	6.5003	4.6646	
Lodging	Space_Heat	2	4	5.8574	5.0533	
Lodging	Water_Heat	1	1	0.6901	8.6651	0.4
Lodging	Water_Heat	1	2	0.6211	9.5317	0.5
Lodging	Water_Heat	1	3	0.5435	10.3982	0.08

Business Types	End Use	Fuel	Efficiency	(therm/SqFt)	Equipment Cost	efficiency shares
Lodging	Water_Heat	1	4	0.4658	11.2647	0.02
Lodging	Water_Heat	2	1	14.1542	6.9321	0.4
Lodging	Water_Heat	2	2	12.7388	7.6253	0.5
Lodging	Water_Heat	2	3	11.1465	8.3185	0.08
Lodging	Water_Heat	2	4	9.5541	9.0118	0.02
Lodging	Cook_top	1	1	0.321	4.0305	0.65
Lodging	Cook_top	1	2	0.2889	4.4335	0.35
Lodging	Cook_top	2	1	6.5837	3.2244	0.65
Lodging	Cook_top	2	2	5.9253	3.5468	0.35
Lodging	Fryer	1	1	0.4183	5.2524	0.65
Lodging	Fryer	1	2	0.3765	5.7777	0.35
Lodging	Fryer	2	1	8.5797	4.2019	0.65
Lodging	Fryer	2	2	7.7217	4.6221	0.35
Lodging	Griddle	1	1	0.4183	5.2524	0.65
Lodging	Griddle	1	2	0.3765	5.7777	0.35
Lodging	Griddle	2	1	8.5797	4.2019	0.65
Lodging	Griddle	2	2	7.7217	4.6221	0.35
Lodging	Other_Cooking	1	1	0.041	0.5148	0.65
Lodging	Other_Cooking	1	2	0.0369	0.5663	0.35
Lodging	Other_Cooking	2	1	0.8409	0.4118	0.65
Lodging	Other_Cooking	2	2	0.7568	0.453	0.35
Lodging	Drying	1	1	0.1725	2.1663	0.65
Lodging	Drying	1	2	0.1553	2.3829	0.35
Lodging	Drying	2	1	3.5386	1.733	0.65
Lodging	Drying	2	2	3.1847	1.9063	0.35
Lodging	AC_Compressor	1	1	0.057	0.7157	0.65
Lodging	AC_Compressor	1	2	0.0513	0.7872	0.35
Lodging	AC_Compressor	2	1	1.169	0.5725	0.65
Lodging	AC_Compressor	2	2	1.0521	0.6298	0.35
Lodging	Other	1	1	0	0	1
Lodging	Other	2	1	0	0	0
Misc	Space_Heat	1	1	0.1469	2.1455	0.65
Misc	Space_Heat	1	2	0.1322	2.36	0.3
Misc	Space_Heat	1	3	0.1203	2.5746	0.04
Misc	Space_Heat	1	4	0.1084	2.7891	0.01
Misc	Space_Heat	2	1	3.0121	1.7164	1
Misc	Space_Heat	2	2	2.7109	1.888	0
Misc	Space_Heat	2	3	2.4669	2.0597	0
Misc	Space_Heat	2	4	2.2229	2.2313	0
Misc	Water_Heat	1	1	0.2013	2.9412	0.4
Misc	Water_Heat	1	2	0.1812	3.2354	0.5
Misc	Water_Heat	1	3	0.1585	3.5295	0.08
Misc	Water_Heat	1	4	0.1359	3.8236	0.02
Misc	Water_Heat	2	1	4.1292	2.353	0.4
Misc	Water_Heat	2	2	3.7163	2.5883	0.5
Misc	Water_Heat	2	3	3.2518	2.8236	0.08
Misc	Water_Heat	2	4	2.7872	3.0589	0.02
Misc	Cook_top	1	1	0.043	0.6282	0.65
Misc	Cook_top	1	2	0.0387	0.691	0.35
Misc	Cook_top	2	1	0.8819	0.5025	0.65
Misc	Cook_top	2	2	0.7937	0.5528	0.35
Misc	Fryer	1	1	0.043	0.6285	0.65
Misc	Fryer	1	2	0.0387	0.6913	0.35
Misc	Fryer	2	1	0.8823	0.5028	0.65

Business Types	End Use	Fuel	Efficiency		(therm/SqFt)	Equipment Cost	efficiency shares
Misc	Fryer	2		2	0.7941	0.5531	0.35
Misc	Griddle	1		1	0.043	0.6285	0.65
Misc	Griddle	1		2	0.0387	0.6913	0.35
Misc	Griddle	2		1	0.8823	0.5028	0.65
Misc	Griddle	2		2	0.7941	0.5531	0.35
Misc	Other_Cooking	1		1	0.043	0.6282	0.65
Misc	Other_Cooking	1		2	0.0387	0.691	0.35
Misc	Other_Cooking	2		1	0.8819	0.5025	0.65
Misc	Other_Cooking	2		2	0.7937	0.5528	0.35
Misc	AC_Compressor	1		1	0.1322	1.9306	0.65
Misc	AC_Compressor	1		2	0.1189	2.1237	0.35
Misc	AC_Compressor	2		1	2.7104	1.5445	0.65
Misc	AC_Compressor	2		2	2.4394	1.6989	0.35
Misc	Other	1		1	0	0	1
Misc	Other	2		1	0	0	0
Government	Space_Heat	1		1	0.3046	3.815	0.65
Government	Space_Heat	1		2	0.2742	4.1965	0.3
Government	Space_Heat	1		3	0.2495	4.578	0.04
Government	Space_Heat	1		4	0.2248	4.9595	0.01
Government	Space_Heat	2		1	6.2481	3.052	1
Government	Space_Heat	2		2	5.6233	3.3572	0
Government	Space_Heat	2		3	5.1172	3.6624	0
Government	Space_Heat	2		4	4.6111	3.9676	0
Government	Water_Heat	1		1	0.0474	0.5935	0.4
Government	Water_Heat	1		2	0.0427	0.6528	0.5
Government	Water_Heat	1		3	0.0373	0.7122	0.08
Government	Water_Heat	1		4	0.032	0.7715	0.02
Government	Water_Heat	2		1	0.972	0.4748	0.4
Government	Water_Heat	2		2	0.8748	0.5222	0.5
Government	Water_Heat	2		3	0.7654	0.5697	0.08
Government	Water_Heat	2		4	0.6561	0.6172	0.02
Government	Cook_top	1		1	0.0346	0.4333	0.65
Government	Cook_top	1		2	0.0311	0.4766	0.35
Government	Cook_top	2		1	0.7096	0.3466	0.65
Government	Cook_top	2		2	0.6387	0.3813	0.35
Government	Fryer	1		1	0.0346	0.4332	0.65
Government	Fryer	1		2	0.0311	0.4765	0.35
Government	Fryer	2		1	0.7094	0.3465	0.65
Government	Fryer	2		2	0.6385	0.3812	0.35
Government	Griddle	1		1	0.0346	0.4332	0.65
Government	Griddle	1		2	0.0311	0.4765	0.35
Government	Griddle	2		1	0.7094	0.3465	0.65
Government	Griddle	2		2	0.6385	0.3812	0.35
Government	Other_Cooking	1		1	0.0346	0.4333	0.65
Government	Other_Cooking	1		2	0.0311	0.4766	0.35
Government	Other_Cooking	2		1	0.7096	0.3466	0.65
Government	Other_Cooking	2		2	0.6387	0.3813	0.35
Government	AC_Compressor	1		1	0.1043	1.3062	0.65
Government	AC_Compressor	1		2	0.0939	1.4368	0.35
Government	AC_Compressor	2		1	2.1392	1.0449	0.65
Government	AC_Compressor	2		2	1.9253	1.1494	0.35
Government	Other	1		1	0	0	1
Government	Other	2		1	0	0	0
TCU	Space_Heat	1		1	0.1469	1.8457	0.65

Business Types	End Use	Fuel	Efficiency	(therm/SqFt)	Equipment Cost	efficiency shares
TCU	Space_Heat	1	2	0.1322	2.0303	0.3
TCU	Space_Heat	1	3	0.1203	2.2149	0.04
TCU	Space_Heat	1	4	0.1084	2.3995	0.01
TCU	Space_Heat	2	1	3.0121	1.4766	1
TCU	Space_Heat	2	2	2.7109	1.6242	0
TCU	Space_Heat	2	3	2.4669	1.7719	0
TCU	Space_Heat	2	4	2.2229	1.9196	0
TCU	Water_Heat	1	1	0.2013	2.5303	0.4
TCU	Water_Heat	1	2	0.1812	2.7833	0.5
TCU	Water_Heat	1	3	0.1585	3.0364	0.08
TCU	Water_Heat	1	4	0.1359	3.2894	0.02
TCU	Water_Heat	2	1	4.1292	2.0243	0.4
TCU	Water_Heat	2	2	3.7163	2.2267	0.5
TCU	Water_Heat	2	3	3.2518	2.4291	0.08
TCU	Water_Heat	2	4	2.7872	2.6315	0.02
TCU	Engine	1	1	2.4409	30.6768	0.65
TCU	Engine	1	2	2.1968	33.7445	0.35
TCU	Engine	2	1	50.0617	24.5415	0.65
TCU	Engine	2	2	45.0556	26.9956	0.35
TCU	Other	1	1	0	0	1
TCU	Other	2	1	0	0	0
Construction	Space_Heat	1	1	0.1469	2.2951	0.65
Construction	Space_Heat	1	2	0.1322	2.5246	0.3
Construction	Space_Heat	1	3	0.1203	2.7542	0.04
Construction	Space_Heat	1	4	0.1084	2.9837	0.01
Construction	Space_Heat	2	1	3.0121	1.8361	1
Construction	Space_Heat	2	2	2.7109	2.0197	0
Construction	Space_Heat	2	3	2.4669	2.2033	0
Construction	Space_Heat	2	4	2.2229	2.3869	0
Construction	Water_Heat	1	1	0.2013	3.1464	0.4
Construction	Water_Heat	1	2	0.1812	3.461	0.5
Construction	Water_Heat	1	3	0.1585	3.7757	0.08
Construction	Water_Heat	1	4	0.1359	4.0903	0.02
Construction	Water_Heat	2	1	4.1292	2.5171	0.4
Construction	Water_Heat	2	2	3.7163	2.7688	0.5
Construction	Water_Heat	2	3	3.2518	3.0205	0.08
Construction	Water_Heat	2	4	2.7872	3.2722	0.02
Construction	Other	1	1	0	0	1
Construction	Other	2	1	0	0	0
Agriculture	Space_Heat	1	1	0.1469	1.6583	0.65
Agriculture	Space_Heat	1	2	0.1322	1.8242	0.3
Agriculture	Space_Heat	1	3	0.1203	1.99	0.04
Agriculture	Space_Heat	1	4	0.1084	2.1558	0.01
Agriculture	Space_Heat	2	1	3.0121	1.3267	1
Agriculture	Space_Heat	2	2	2.7109	1.4593	0
Agriculture	Space_Heat	2	3	2.4669	1.592	0
Agriculture	Space_Heat	2	4	2.2229	1.7247	0
Agriculture	Water_Heat	1	1	0.2013	2.2734	0.4
Agriculture	Water_Heat	1	2	0.1812	2.5008	0.5
Agriculture	Water_Heat	1	3	0.1585	2.7281	0.08
Agriculture	Water_Heat	1	4	0.1359	2.9554	0.02
Agriculture	Water_Heat	2	1	4.1292	1.8187	0.4
Agriculture	Water_Heat	2	2	3.7163	2.0006	0.5
Agriculture	Water_Heat	2	3	3.2518	2.1825	0.08

Business Types	End Use	Fuel	Efficiency	(therm/SqFt)	Equipment Cost	efficiency shares
Agriculture	Water_Heat	2	4	2.7872	2.3644	0.02
Agriculture	Drying	1	1	0.2013	2.2734	0.65
Agriculture	Drying	1	2	0.1812	2.5008	0.35
Agriculture	Drying	2	1	4.1292	1.8187	0.65
Agriculture	Drying	2	2	3.7163	2.0006	0.35
Agriculture	Engine	1	1	0.8657	9.7757	0.65
Agriculture	Engine	1	2	0.7791	10.7533	0.35
Agriculture	Engine	2	1	17.7557	7.8206	0.65
Agriculture	Engine	2	2	15.9802	8.6026	0.35
Agriculture	Other	1	1	0	0	1
Agriculture	Other	2	1	0	0	0

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Fuel Market Share

Where Fuel = 1 (gas) and 2 (electric)

Business Types	End Use	Fuel	Share
Office	Space_Heat	1	0.8555
Office	Space_Heat	2	0.1445
Office	Water_Heat	1	0.16581
Office	Water_Heat	2	0.83419
Office	Cooking	1	0.02069
Office	Cooking	2	0.97931
Office	AC_Compressor	1	0.06
Office	AC_Compressor	2	0.94
Office	Other	1	1
Restaurant	Space_Heat	1	0.59046
Restaurant	Space_Heat	2	0.40954
Restaurant	Water_Heat	1	0.90204
Restaurant	Water_Heat	2	0.09796
Restaurant	Cook_top	1	0.97733
Restaurant	Cook_top	2	0.02267
Restaurant	Fryer	1	0.90535
Restaurant	Fryer	2	0.09465
Restaurant	Griddle	1	0.97038
Restaurant	Griddle	2	0.02962
Restaurant	Other_Cooking	1	0.66
Restaurant	Other_Cooking	2	0.34
Restaurant	AC_Compressor	1	0.06
Restaurant	AC_Compressor	2	0.94
Restaurant	Other	1	1
Retail	Space_Heat	1	0.51751
Retail	Space_Heat	2	0.48249
Retail	Water_Heat	1	0.31008
Retail	Water_Heat	2	0.68992
Retail	Cooking	1	0.09367
Retail	Cooking	2	0.90633
Retail	Other	1	1
Laundry	Space_Heat	1	0.57692
Laundry	Space_Heat	2	0.42308
Laundry	Water_Heat	1	0.67647
Laundry	Water_Heat	2	0.32353
Laundry	Drying	1	0.6
Laundry	Drying	2	0.4
Laundry	Other	1	1
Warehouse	Space_Heat	1	0.43723
Warehouse	Space_Heat	2	0.56277
Warehouse	Water_Heat	1	0.07159
Warehouse	Water_Heat	2	0.92841
Warehouse	Engine	1	0.06

Business Types	End Use	Fuel	Share
Warehouse	Engine	2	0.94
Warehouse	Other	1	1
School	Space_Heat	1	0.75284
School	Space_Heat	2	0.24716
School	Water_Heat	1	0.75843
School	Water_Heat	2	0.24157
School	Cook_top	1	0.42857
School	Cook_top	2	0.57143
School	Fryer	1	0.42857
School	Fryer	2	0.57143
School	Griddle	1	0.42857
School	Griddle	2	0.57143
School	Other_Cooking	1	0.42857
School	Other_Cooking	2	0.57143
School	AC_Compressor	1	0.06
School	AC_Compressor	2	0.94
School	Other	1	1
College	Space_Heat	1	0.33028
College	Space_Heat	2	0.66972
College	Water_Heat	1	0.81675
College	Water_Heat	2	0.18325
College	Cook_top	1	0.04801
College	Cook_top	2	0.95199
College	Fryer	1	0.04801
College	Fryer	2	0.95199
College	Griddle	1	0.04801
College	Griddle	2	0.95199
College	Other_Cooking	1	0.04801
College	Other_Cooking	2	0.95199
College	AC_Compressor	1	0.06
College	AC_Compressor	2	0.94
College	Other	1	1
Health	Space_Heat	1	0.66026
Health	Space_Heat	2	0.33974
Health	Water_Heat	1	0.8242
Health	Water_Heat	2	0.1758
Health	Cook_top	1	0.09487
Health	Cook_top	2	0.90513
Health	Fryer	1	0.09487
Health	Fryer	2	0.90513
Health	Griddle	1	0.09487
Health	Griddle	2	0.90513
Health	Other_Cooking	1	0.66
Health	Other_Cooking	2	0.34
Health	Drying	1	0.6
Health	Drying	2	0.4
Health	AC_Compressor	1	0.06
Health	AC_Compressor	2	0.94
Health	Other	1	1
Lodging	Space_Heat	1	0.27151
Lodging	Space_Heat	2	0.72849
Lodging	Water_Heat	1	0.98948

Business Types	End Use	Fuel	Share
Lodging	Water_Heat	2	0.01052
Lodging	Cook_top	1	0.44958
Lodging	Cook_top	2	0.55042
Lodging	Fryer	1	0.44958
Lodging	Fryer	2	0.55042
Lodging	Griddle	1	0.44958
Lodging	Griddle	2	0.55042
Lodging	Other_Cooking	1	0.44958
Lodging	Other_Cooking	2	0.55042
Lodging	Drying	1	0.6
Lodging	Drying	2	0.4
Lodging	AC_Compressor	1	0.06
Lodging	AC_Compressor	2	0.94
Lodging	Other	1	1
Misc	Space_Heat	1	0.54964
Misc	Space_Heat	2	0.45036
Misc	Water_Heat	1	0.55691
Misc	Water_Heat	2	0.44309
Misc	Cook_top	1	0.97733
Misc	Cook_top	2	0.02267
Misc	Fryer	1	0.90535
Misc	Fryer	2	0.09465
Misc	Griddle	1	0.97038
Misc	Griddle	2	0.02962
Misc	Other_Cooking	1	0.66
Misc	Other_Cooking	2	0.34
Misc	AC_Compressor	1	0.06
Misc	AC_Compressor	2	0.94
Misc	Other	1	1
Government	Space_Heat	1	0.8555
Government	Space_Heat	2	0.1445
Government	Water_Heat	1	0.16581
Government	Water_Heat	2	0.83419
Government	Cook_top	1	0.97733
Government	Cook_top	2	0.02267
Government	Fryer	1	0.90535
Government	Fryer	2	0.09465
Government	Griddle	1	0.97038
Government	Griddle	2	0.02962
Government	Other_Cooking	1	0.66
Government	Other_Cooking	2	0.34
Government	AC_Compressor	1	0.06
Government	AC_Compressor	2	0.94
Government	Other	1	1
TCU	Space_Heat	1	0.57692
TCU	Space_Heat	2	0.42308
TCU	Water_Heat	1	0.67647
TCU	Water_Heat	2	0.32353
TCU	Engine	1	0.06
TCU	Engine	2	0.94
TCU	Other	1	1
Construction	Space_Heat	1	0.57692

Business Types	End Use	Fuel	Share
Construction	Space_Heat	2	0.42308
Construction	Water_Heat	1	0.67647
Construction	Water_Heat	2	0.32353
Construction	Other	1	1
Agriculture	Space_Heat	1	0.57692
Agriculture	Space_Heat	2	0.42308
Agriculture	Water_Heat	1	0.67647
Agriculture	Water_Heat	2	0.32353
Agriculture	Drying	1	1
Agriculture	Drying	2	0
Agriculture	Engine	1	0.06
Agriculture	Engine	2	0.94
Agriculture	Other	1	1
Grocery	Space_Heat	1	0.74652
Grocery	Space_Heat	2	0.25348
Grocery	Water_Heat	1	0.70846
Grocery	Water_Heat	2	0.29154
Grocery	Cook_top	1	0.35627
Grocery	Cook_top	2	0.64373
Grocery	Fryer	1	0.35627
Grocery	Fryer	2	0.64373
Grocery	Griddle	1	0.35627
Grocery	Griddle	2	0.64373
Grocery	Other_Cooking	1	0.35627
Grocery	Other_Cooking	2	0.64373
Grocery	AC_Compressor	1	0.06
Grocery	AC_Compressor	2	0.94
Grocery	Other	1	1

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Efficiency Shares

bname	nname	fname	Stock	Standard	High	Premium
Agriculture	Drying	Electric	0.65	0.35	N/A	N/A
Agriculture	Drying	Natural_Gas	0.65	0.35	N/A	N/A
Agriculture	Engine	Electric	0.65	0.35	N/A	N/A
Agriculture	Engine	Natural_Gas	0.65	0.35	N/A	N/A
Agriculture	Other	Natural_Gas	1	N/A	N/A	N/A
Agriculture	Space_Heat	Electric	1	N/A	N/A	N/A
Agriculture	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
Agriculture	Water_Heat	Electric	0.4	0.5	0.08	0.02
Agriculture	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
College	AC_Compressor	Electric	0.65	0.35	N/A	N/A
College	AC_Compressor	Natural_Gas	0.65	0.35	N/A	N/A
College	Cook_top	Electric	0.65	0.35	N/A	N/A
College	Cook_top	Natural_Gas	0.65	0.35	N/A	N/A
College	Fryer	Electric	0.65	0.35	N/A	N/A
College	Fryer	Natural_Gas	0.65	0.35	N/A	N/A
College	Griddle	Electric	0.65	0.35	N/A	N/A
College	Griddle	Natural_Gas	0.65	0.35	N/A	N/A
College	Other	Natural_Gas	1	N/A	N/A	N/A
College	Other_Cooking	Electric	0.65	0.35	N/A	N/A
College	Other_Cooking	Natural_Gas	0.65	0.35	N/A	N/A
College	Space_Heat	Electric	1	N/A	N/A	N/A
College	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
College	Water_Heat	Electric	0.4	0.5	0.08	0.02
College	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
Construction	Other	Natural_Gas	1	N/A	N/A	N/A
Construction	Space_Heat	Electric	1	N/A	N/A	N/A
Construction	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
Construction	Water_Heat	Electric	0.4	0.5	0.08	0.02
Construction	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
Government	AC_Compressor	Electric	0.65	0.35	N/A	N/A
Government	AC_Compressor	Natural_Gas	0.65	0.35	N/A	N/A
Government	Cook_top	Electric	0.65	0.35	N/A	N/A

bname	nname	fname	Stock	Standard	High	Premium
Government	Cook_top	Natural_Gas	0.65	0.35	N/A	N/A
Government	Fryer	Electric	0.65	0.35	N/A	N/A
Government	Fryer	Natural_Gas	0.65	0.35	N/A	N/A
Government	Griddle	Electric	0.65	0.35	N/A	N/A
Government	Griddle	Natural_Gas	0.65	0.35	N/A	N/A
Government	Other	Natural_Gas	1	N/A	N/A	N/A
Government	Other_Cooking	Electric	0.65	0.35	N/A	N/A
Government	Other_Cooking	Natural_Gas	0.65	0.35	N/A	N/A
Government	Space_Heat	Electric	1	N/A	N/A	N/A
Government	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
Government	Water_Heat	Electric	0.4	0.5	0.08	0.02
Government	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
Grocery	AC_Compressor	Electric	0.65	0.35	N/A	N/A
Grocery	AC_Compressor	Natural_Gas	0.65	0.35	N/A	N/A
Grocery	Cook_top	Electric	0.65	0.35	N/A	N/A
Grocery	Cook_top	Natural_Gas	0.65	0.35	N/A	N/A
Grocery	Fryer	Electric	0.65	0.35	N/A	N/A
Grocery	Fryer	Natural_Gas	0.65	0.35	N/A	N/A
Grocery	Griddle	Electric	0.65	0.35	N/A	N/A
Grocery	Griddle	Natural_Gas	0.65	0.35	N/A	N/A
Grocery	Other	Natural_Gas	1	N/A	N/A	N/A
Grocery	Other_Cooking	Electric	0.65	0.35	N/A	N/A
Grocery	Other_Cooking	Natural_Gas	0.65	0.35	N/A	N/A
Grocery	Space_Heat	Electric	1	N/A	N/A	N/A
Grocery	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
Grocery	Water_Heat	Electric	0.4	0.5	0.08	0.02
Grocery	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
Health	AC_Compressor	Electric	0.65	0.35	N/A	N/A
Health	AC_Compressor	Natural_Gas	0.65	0.35	N/A	N/A
Health	Cook_top	Electric	0.65	0.35	N/A	N/A
Health	Cook_top	Natural_Gas	0.65	0.35	N/A	N/A
Health	Drying	Electric	0.65	0.35	N/A	N/A
Health	Drying	Natural_Gas	0.65	0.35	N/A	N/A
Health	Fryer	Electric	0.65	0.35	N/A	N/A
Health	Fryer	Natural_Gas	0.65	0.35	N/A	N/A
Health	Griddle	Electric	0.65	0.35	N/A	N/A

bname	nname	fname	Stock	Standard	High	Premium
Health	Griddle	Natural_Gas	0.65	0.35	N/A	N/A
Health	Other	Natural_Gas	1	N/A	N/A	N/A
Health	Other_Cooking	Electric	0.65	0.35	N/A	N/A
Health	Other_Cooking	Natural_Gas	0.65	0.35	N/A	N/A
Health	Space_Heat	Electric	1	N/A	N/A	N/A
Health	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
Health	Water_Heat	Electric	0.4	0.5	0.08	0.02
Health	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
Laundry	Drying	Electric	0.65	0.35	N/A	N/A
Laundry	Drying	Natural_Gas	0.65	0.35	N/A	N/A
Laundry	Other	Natural_Gas	1	N/A	N/A	N/A
Laundry	Space_Heat	Electric	1	N/A	N/A	N/A
Laundry	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
Laundry	Water_Heat	Electric	0.4	0.5	0.08	0.02
Laundry	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
Lodging	AC_Compressor	Electric	0.65	0.35	N/A	N/A
Lodging	AC_Compressor	Natural_Gas	0.65	0.35	N/A	N/A
Lodging	Cook_top	Electric	0.65	0.35	N/A	N/A
Lodging	Cook_top	Natural_Gas	0.65	0.35	N/A	N/A
Lodging	Drying	Electric	0.65	0.35	N/A	N/A
Lodging	Drying	Natural_Gas	0.65	0.35	N/A	N/A
Lodging	Fryer	Electric	0.65	0.35	N/A	N/A
Lodging	Fryer	Natural_Gas	0.65	0.35	N/A	N/A
Lodging	Griddle	Electric	0.65	0.35	N/A	N/A
Lodging	Griddle	Natural_Gas	0.65	0.35	N/A	N/A
Lodging	Other	Natural_Gas	1	N/A	N/A	N/A
Lodging	Other_Cooking	Electric	0.65	0.35	N/A	N/A
Lodging	Other_Cooking	Natural_Gas	0.65	0.35	N/A	N/A
Lodging	Space_Heat	Electric	1	N/A	N/A	N/A
Lodging	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
Lodging	Water_Heat	Electric	0.4	0.5	0.08	0.02
Lodging	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
Misc	AC_Compressor	Electric	0.65	0.35	N/A	N/A
Misc	AC_Compressor	Natural_Gas	0.65	0.35	N/A	N/A
Misc	Cook_top	Electric	0.65	0.35	N/A	N/A
Misc	Cook_top	Natural_Gas	0.65	0.35	N/A	N/A

bname	nname	fname	Stock	Standard	High	Premium
Misc	Fryer	Electric	0.65	0.35	N/A	N/A
Misc	Fryer	Natural_Gas	0.65	0.35	N/A	N/A
Misc	Griddle	Electric	0.65	0.35	N/A	N/A
Misc	Griddle	Natural_Gas	0.65	0.35	N/A	N/A
Misc	Other	Natural_Gas	1	N/A	N/A	N/A
Misc	Other_Cooking	Electric	0.65	0.35	N/A	N/A
Misc	Other_Cooking	Natural_Gas	0.65	0.35	N/A	N/A
Misc	Space_Heat	Electric	1	N/A	N/A	N/A
Misc	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
Misc	Water_Heat	Electric	0.4	0.5	0.08	0.02
Misc	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
Office	AC_Compressor	Electric	0.65	0.35	N/A	N/A
Office	AC_Compressor	Natural_Gas	0.65	0.35	N/A	N/A
Office	Cooking	Electric	0.65	0.35	N/A	N/A
Office	Cooking	Natural_Gas	0.65	0.35	N/A	N/A
Office	Other	Natural_Gas	1	N/A	N/A	N/A
Office	Space_Heat	Electric	1	N/A	N/A	N/A
Office	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
Office	Water_Heat	Electric	0.4	0.5	0.08	0.02
Office	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
Restaurant	AC_Compressor	Electric	0.65	0.35	N/A	N/A
Restaurant	AC_Compressor	Natural_Gas	0.65	0.35	N/A	N/A
Restaurant	Cook_top	Electric	0.65	0.35	N/A	N/A
Restaurant	Cook_top	Natural_Gas	0.65	0.35	N/A	N/A
Restaurant	Fryer	Electric	0.65	0.35	N/A	N/A
Restaurant	Fryer	Natural_Gas	0.65	0.35	N/A	N/A
Restaurant	Griddle	Electric	0.65	0.35	N/A	N/A
Restaurant	Griddle	Natural_Gas	0.65	0.35	N/A	N/A
Restaurant	Other	Natural_Gas	1	N/A	N/A	N/A
Restaurant	Other_Cooking	Electric	0.65	0.35	N/A	N/A
Restaurant	Other_Cooking	Natural_Gas	0.65	0.35	N/A	N/A
Restaurant	Space_Heat	Electric	1	N/A	N/A	N/A
Restaurant	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
Restaurant	Water_Heat	Electric	0.4	0.5	0.08	0.02
Restaurant	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
Retail	Cooking	Electric	0.65	0.35	N/A	N/A

bname	nname	fname	Stock	Standard	High	Premium
Retail	Cooking	Natural_Gas	0.65	0.35	N/A	N/A
Retail	Other	Natural_Gas	1	N/A	N/A	N/A
Retail	Space_Heat	Electric	1	N/A	N/A	N/A
Retail	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
Retail	Water_Heat	Electric	0.4	0.5	0.08	0.02
Retail	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
School	AC_Compressor	Electric	0.65	0.35	N/A	N/A
School	AC_Compressor	Natural_Gas	0.65	0.35	N/A	N/A
School	Cook_top	Electric	0.65	0.35	N/A	N/A
School	Cook_top	Natural_Gas	0.65	0.35	N/A	N/A
School	Fryer	Electric	0.65	0.35	N/A	N/A
School	Fryer	Natural_Gas	0.65	0.35	N/A	N/A
School	Griddle	Electric	0.65	0.35	N/A	N/A
School	Griddle	Natural_Gas	0.65	0.35	N/A	N/A
School	Other	Natural_Gas	1	N/A	N/A	N/A
School	Other_Cooking	Electric	0.65	0.35	N/A	N/A
School	Other_Cooking	Natural_Gas	0.65	0.35	N/A	N/A
School	Space_Heat	Electric	1	N/A	N/A	N/A
School	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
School	Water_Heat	Electric	0.4	0.5	0.08	0.02
School	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
TCU	Engine	Electric	0.65	0.35	N/A	N/A
TCU	Engine	Natural_Gas	0.65	0.35	N/A	N/A
TCU	Other	Natural_Gas	1	N/A	N/A	N/A
TCU	Space_Heat	Electric	1	N/A	N/A	N/A
TCU	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
TCU	Water_Heat	Electric	0.4	0.5	0.08	0.02
TCU	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02
Warehouse	Engine	Electric	0.65	0.35	N/A	N/A
Warehouse	Engine	Natural_Gas	0.65	0.35	N/A	N/A
Warehouse	Other	Natural_Gas	1	N/A	N/A	N/A
Warehouse	Space_Heat	Electric	1	N/A	N/A	N/A
Warehouse	Space_Heat	Natural_Gas	0.65	0.3	0.04	0.01
Warehouse	Water_Heat	Electric	0.4	0.5	0.08	0.02
Warehouse	Water_Heat	Natural_Gas	0.4	0.5	0.08	0.02

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Saturation Rate

Where Fuel = 1 (gas) and 2 (electric), and

Business Type	End Use	saturation
Office	Space_Heat	0.872
Office	Water_Heat	0.7
Office	Cooking	0.082
Office	AC_Compressor	0.931
Office	Other	1
Restaurant	Space_Heat	0.818
Restaurant	Water_Heat	0.96
Restaurant	Cook_top	0.75
Restaurant	Fryer	0.729
Restaurant	Griddle	0.574
Restaurant	Other_Cooking	0.9
Restaurant	AC_Compressor	0.871
Restaurant	Other	1
Retail	Space_Heat	0.771
Retail	Water_Heat	0.62
Retail	Cooking	0.245
Retail	Other	1
Laundry	Space_Heat	0.72
Laundry	Water_Heat	1
Laundry	Drying	1
Laundry	Other	1
Warehouse	Space_Heat	0.231
Warehouse	Water_Heat	0.88
Warehouse	Engine	0.25
Warehouse	Other	1
School	Space_Heat	0.967
School	Water_Heat	0.9
School	Cook_top	0.147
School	Fryer	0.147
School	Griddle	0.147
School	Other_Cooking	0.147
School	AC_Compressor	0.885
School	Other	1
College	Space_Heat	0.763
College	Water_Heat	0.955
College	Cook_top	0.147
College	Fryer	0.147
College	Griddle	0.147
College	Other_Cooking	0.147
College	AC_Compressor	0.885
College	Other	1
Health	Space_Heat	0.936
Health	Water_Heat	1
Health	Cook_top	0.102
Health	Fryer	0.102
Health	Griddle	0.102
Health	Other_Cooking	0.102
Health	Drying	0.82
Health	AC_Compressor	0.792
Health	Other	1
Lodging	Space_Heat	0.895
Lodging	Water_Heat	1
Lodging	Cook_top	0.084
Lodging	Fryer	0.084
Lodging	Griddle	0.084
Lodging	Other_Cooking	0.084
Lodging	Drying	0.82
Lodging	AC_Compressor	0.795
Lodging	Other	1
Misc	Space_Heat	0.695
Misc	Water_Heat	0.69
Misc	Cook_top	0.021
Misc	Fryer	0.021
Misc	Griddle	0.021
Misc	Other_Cooking	0.021

Misc	AC_Compressor	0.731
Misc	Other	1
Government	Space_Heat	0.872
Government	Water_Heat	0.7
Government	Cook_top	0.196
Government	Fryer	0.196
Government	Griddle	0.196
Government	Other_Cooking	0.196
Government	AC_Compressor	0.888
Government	Other	1
TCU	Space_Heat	0.72
TCU	Water_Heat	0.69
TCU	Engine	0.5
TCU	Other	1
Construction	Space_Heat	0.72
Construction	Water_Heat	0.69
Construction	Other	1
Agriculture	Space_Heat	0.72
Agriculture	Water_Heat	0.69
Agriculture	Drying	1
Agriculture	Engine	0.5
Agriculture	Other	1
Grocery	Space_Heat	0.647
Grocery	Water_Heat	0.93
Grocery	Cook_top	0.245
Grocery	Fryer	0.245
Grocery	Griddle	0.245
Grocery	Other_Cooking	0.245
Grocery	AC_Compressor	0.856
Grocery	Other	1

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Equipment Cost Data

b	n	f	e	bname	nname	EQcost
1	1	1	1	Office	Space_Heat	4.3149
1	1	1	2	Office	Space_Heat	4.7464
1	1	1	3	Office	Space_Heat	5.1779
1	1	1	4	Office	Space_Heat	5.6094
1	1	2	1	Office	Space_Heat	3.4519
1	1	2	2	Office	Space_Heat	3.7971
1	1	2	3	Office	Space_Heat	4.1423
1	1	2	4	Office	Space_Heat	4.4875
1	2	1	1	Office	Water_Heat	0.6712
1	2	1	2	Office	Water_Heat	0.7384
1	2	1	3	Office	Water_Heat	0.8055
1	2	1	4	Office	Water_Heat	0.8726
1	2	2	1	Office	Water_Heat	0.537
1	2	2	2	Office	Water_Heat	0.5907
1	2	2	3	Office	Water_Heat	0.6444
1	2	2	4	Office	Water_Heat	0.6981
1	3	1	1	Office	Cooking	0.4899
1	3	1	2	Office	Cooking	0.5389
1	3	2	1	Office	Cooking	0.3919
1	3	2	2	Office	Cooking	0.4311
1	10	1	1	Office	AC_Compressor	1.4773
1	10	1	2	Office	AC_Compressor	1.6251
1	10	2	1	Office	AC_Compressor	1.1819
1	10	2	2	Office	AC_Compressor	1.3
1	11	1	1	Office	Other	0
1	11	2	1	Office	Other	0
2	1	1	1	Restaurant	Space_Heat	1.5841
2	1	1	2	Restaurant	Space_Heat	1.7425
2	1	1	3	Restaurant	Space_Heat	1.9009
2	1	1	4	Restaurant	Space_Heat	2.0593
2	1	2	1	Restaurant	Space_Heat	1.2673
2	1	2	2	Restaurant	Space_Heat	1.394
2	1	2	3	Restaurant	Space_Heat	1.5207
2	1	2	4	Restaurant	Space_Heat	1.6474
2	2	1	1	Restaurant	Water_Heat	11.666
2	2	1	2	Restaurant	Water_Heat	12.8326
2	2	1	3	Restaurant	Water_Heat	13.9992
2	2	1	4	Restaurant	Water_Heat	15.1658
2	2	2	1	Restaurant	Water_Heat	9.3328
2	2	2	2	Restaurant	Water_Heat	10.2661
2	2	2	3	Restaurant	Water_Heat	11.1994
2	2	2	4	Restaurant	Water_Heat	12.1327
2	4	1	1	Restaurant	Cook_top	16.1343
2	4	1	2	Restaurant	Cook_top	17.7477
2	4	2	1	Restaurant	Cook_top	12.9074
2	4	2	2	Restaurant	Cook_top	14.1981
2	5	1	1	Restaurant	Fryer	14.5274
2	5	1	2	Restaurant	Fryer	15.9802
2	5	2	1	Restaurant	Fryer	11.622
2	5	2	2	Restaurant	Fryer	12.7841
2	6	1	1	Restaurant	Griddle	12.2603
2	6	1	2	Restaurant	Griddle	13.4863
2	6	2	1	Restaurant	Griddle	9.8082
2	6	2	2	Restaurant	Griddle	10.789
2	7	1	1	Restaurant	Other_Cooking	13.0747
2	7	1	2	Restaurant	Other_Cooking	14.3822
2	7	2	1	Restaurant	Other_Cooking	10.4598
2	7	2	2	Restaurant	Other_Cooking	11.5057
2	10	1	1	Restaurant	AC_Compressor	2.7306
2	10	1	2	Restaurant	AC_Compressor	3.0036
2	10	2	1	Restaurant	AC_Compressor	2.1844
2	10	2	2	Restaurant	AC_Compressor	2.4029
2	11	1	1	Restaurant	Other	0
2	11	2	1	Restaurant	Other	0
3	1	1	1	Retail	Space_Heat	3.5122
3	1	1	2	Retail	Space_Heat	3.8634
3	1	1	3	Retail	Space_Heat	4.2146
3	1	1	4	Retail	Space_Heat	4.5658
3	1	2	1	Retail	Space_Heat	2.8097
3	1	2	2	Retail	Space_Heat	3.0907

b	n	f	e	bname	mname	EQcost
3	1	2	3	Retail	Space_Heat	3.3717
3	1	2	4	Retail	Space_Heat	3.6527
3	2	1	1	Retail	Water_Heat	1.563
3	2	1	2	Retail	Water_Heat	1.7193
3	2	1	3	Retail	Water_Heat	1.8756
3	2	1	4	Retail	Water_Heat	2.0319
3	2	2	1	Retail	Water_Heat	1.2504
3	2	2	2	Retail	Water_Heat	1.3754
3	2	2	3	Retail	Water_Heat	1.5004
3	2	2	4	Retail	Water_Heat	1.6255
3	3	1	1	Retail	Cooking	4.4039
3	3	1	2	Retail	Cooking	4.8443
3	3	2	1	Retail	Cooking	3.5231
3	3	2	2	Retail	Cooking	3.875
3	11	1	1	Retail	Other	0
3	11	2	1	Retail	Other	0
4	1	1	1	Laundry	Space_Heat	1.836
4	1	1	2	Laundry	Space_Heat	2.02
4	1	1	3	Laundry	Space_Heat	2.203
4	1	1	4	Laundry	Space_Heat	2.387
4	1	2	1	Laundry	Space_Heat	1.469
4	1	2	2	Laundry	Space_Heat	1.616
4	1	2	3	Laundry	Space_Heat	1.763
4	1	2	4	Laundry	Space_Heat	1.909
4	2	1	1	Laundry	Water_Heat	34.512
4	2	1	2	Laundry	Water_Heat	37.963
4	2	1	3	Laundry	Water_Heat	41.414
4	2	1	4	Laundry	Water_Heat	44.865
4	2	2	1	Laundry	Water_Heat	27.609
4	2	2	2	Laundry	Water_Heat	30.37
4	2	2	3	Laundry	Water_Heat	33.131
4	2	2	4	Laundry	Water_Heat	35.892
4	8	1	1	Laundry	Drying	186.738
4	8	1	2	Laundry	Drying	205.412
4	8	2	1	Laundry	Drying	149.39
4	8	2	2	Laundry	Drying	164.329
4	11	1	1	Laundry	Other	0
4	11	2	1	Laundry	Other	0
5	1	1	1	Warehouse	Space_Heat	7.909
5	1	1	2	Warehouse	Space_Heat	8.7
5	1	1	3	Warehouse	Space_Heat	9.491
5	1	1	4	Warehouse	Space_Heat	10.282
5	1	2	1	Warehouse	Space_Heat	6.327
5	1	2	2	Warehouse	Space_Heat	6.96
5	1	2	3	Warehouse	Space_Heat	7.593
5	1	2	4	Warehouse	Space_Heat	8.225
5	2	1	1	Warehouse	Water_Heat	2.608
5	2	1	2	Warehouse	Water_Heat	2.869
5	2	1	3	Warehouse	Water_Heat	3.13
5	2	1	4	Warehouse	Water_Heat	3.39
5	2	2	1	Warehouse	Water_Heat	2.086
5	2	2	2	Warehouse	Water_Heat	2.295
5	2	2	3	Warehouse	Water_Heat	2.504
5	2	2	4	Warehouse	Water_Heat	2.712
5	9	1	1	Warehouse	Engine	113.127
5	9	1	2	Warehouse	Engine	124.44
5	9	2	1	Warehouse	Engine	90.502
5	9	2	2	Warehouse	Engine	99.552
5	11	1	1	Warehouse	Other	0
5	11	2	1	Warehouse	Other	0
6	1	1	1	School	Space_Heat	1.225
6	1	1	2	School	Space_Heat	1.348
6	1	1	3	School	Space_Heat	1.471
6	1	1	4	School	Space_Heat	1.593
6	1	2	1	School	Space_Heat	0.98
6	1	2	2	School	Space_Heat	1.078
6	1	2	3	School	Space_Heat	1.176
6	1	2	4	School	Space_Heat	1.274
6	2	1	1	School	Water_Heat	1.635
6	2	1	2	School	Water_Heat	1.799
6	2	1	3	School	Water_Heat	1.962
6	2	1	4	School	Water_Heat	2.126
6	2	2	1	School	Water_Heat	1.308
6	2	2	2	School	Water_Heat	1.439
6	2	2	3	School	Water_Heat	1.57
6	2	2	4	School	Water_Heat	1.701
6	4	1	1	School	Cook_top	0.61
6	4	1	2	School	Cook_top	0.671

b	e	f	c	bname	ename	EQcost
6	4	2	1	School	Cook_top	0.488
6	4	2	2	School	Cook_top	0.537
6	5	1	1	School	Fryer	0.612
6	5	1	2	School	Fryer	0.673
6	5	2	1	School	Fryer	0.489
6	5	2	2	School	Fryer	0.538
6	6	1	1	School	Griddle	0.612
6	6	1	2	School	Griddle	0.673
6	6	2	1	School	Griddle	0.489
6	6	2	2	School	Griddle	0.538
6	7	1	1	School	Other_Cooking	0.61
6	7	1	2	School	Other_Cooking	0.671
6	7	2	1	School	Other_Cooking	0.488
6	7	2	2	School	Other_Cooking	0.537
6	10	1	1	School	AC_Compressor	0.866
6	10	1	2	School	AC_Compressor	0.953
6	10	2	1	School	AC_Compressor	0.693
6	10	2	2	School	AC_Compressor	0.762
6	11	1	1	School	Other	0
6	11	2	1	School	Other	0
7	1	1	1	College	Space_Heat	3.14441
7	1	1	2	College	Space_Heat	3.45885
7	1	1	3	College	Space_Heat	3.77329
7	1	1	4	College	Space_Heat	4.08773
7	1	2	1	College	Space_Heat	2.51553
7	1	2	2	College	Space_Heat	2.76708
7	1	2	3	College	Space_Heat	3.01863
7	1	2	4	College	Space_Heat	3.27018
7	2	1	1	College	Water_Heat	3.38894
7	2	1	2	College	Water_Heat	3.72784
7	2	1	3	College	Water_Heat	4.06673
7	2	1	4	College	Water_Heat	4.40563
7	2	2	1	College	Water_Heat	2.71116
7	2	2	2	College	Water_Heat	2.98227
7	2	2	3	College	Water_Heat	3.25339
7	2	2	4	College	Water_Heat	3.5245
7	4	1	1	College	Cook_top	0.57358
7	4	1	2	College	Cook_top	0.63093
7	4	2	1	College	Cook_top	0.45886
7	4	2	2	College	Cook_top	0.50475
7	5	1	1	College	Fryer	0.57322
7	5	1	2	College	Fryer	0.63055
7	5	2	1	College	Fryer	0.45858
7	5	2	2	College	Fryer	0.50444
7	6	1	1	College	Griddle	0.57322
7	6	1	2	College	Griddle	0.63055
7	6	2	1	College	Griddle	0.45858
7	6	2	2	College	Griddle	0.50444
7	7	1	1	College	Other_Cooking	0.57358
7	7	1	2	College	Other_Cooking	0.63093
7	7	2	1	College	Other_Cooking	0.45886
7	7	2	2	College	Other_Cooking	0.50475
7	10	1	1	College	AC_Compressor	1.3949
7	10	1	2	College	AC_Compressor	1.53439
7	10	2	1	College	AC_Compressor	1.11592
7	10	2	2	College	AC_Compressor	1.22752
7	11	1	1	College	Other	0
7	11	2	1	College	Other	0
8	1	1	1	Health	Space_Heat	0.8825
8	1	1	2	Health	Space_Heat	0.97075
8	1	1	3	Health	Space_Heat	1.059
8	1	1	4	Health	Space_Heat	1.14725
8	1	2	1	Health	Space_Heat	0.706
8	1	2	2	Health	Space_Heat	0.7766
8	1	2	3	Health	Space_Heat	0.8472
8	1	2	4	Health	Space_Heat	0.9178
8	2	1	1	Health	Water_Heat	5.33917
8	2	1	2	Health	Water_Heat	5.87309
8	2	1	3	Health	Water_Heat	6.407
8	2	1	4	Health	Water_Heat	6.94092
8	2	2	1	Health	Water_Heat	4.27134
8	2	2	2	Health	Water_Heat	4.69847
8	2	2	3	Health	Water_Heat	5.1256
8	2	2	4	Health	Water_Heat	5.55274
8	4	1	1	Health	Cook_top	3.37409
8	4	1	2	Health	Cook_top	3.7115
8	4	2	1	Health	Cook_top	2.69927
8	4	2	2	Health	Cook_top	2.9692

b	n	f	e	bname	nname	EQcost
8	5	1	1	Health	Fryer	3.37409
8	5	1	2	Health	Fryer	3.7115
8	5	2	1	Health	Fryer	2.69927
8	5	2	2	Health	Fryer	2.9692
8	6	1	1	Health	Griddle	3.37409
8	6	1	2	Health	Griddle	3.7115
8	6	2	1	Health	Griddle	2.69927
8	6	2	2	Health	Griddle	2.9692
8	7	1	1	Health	Other_Cooking	0.33743
8	7	1	2	Health	Other_Cooking	0.37118
8	7	2	1	Health	Other_Cooking	0.26995
8	7	2	2	Health	Other_Cooking	0.29694
8	8	1	1	Health	Drying	1.86871
8	8	1	2	Health	Drying	2.05558
8	8	2	1	Health	Drying	1.49497
8	8	2	2	Health	Drying	1.64446
8	10	1	1	Health	AC_Compressor	1.45749
8	10	1	2	Health	AC_Compressor	1.60324
8	10	2	1	Health	AC_Compressor	1.16599
8	10	2	2	Health	AC_Compressor	1.28259
8	11	1	1	Health	Other	0
8	11	2	1	Health	Other	0
9	1	1	1	Lodging	Space_Heat	4.85892
9	1	1	2	Lodging	Space_Heat	5.3448
9	1	1	3	Lodging	Space_Heat	5.8307
9	1	1	4	Lodging	Space_Heat	6.3166
9	1	2	1	Lodging	Space_Heat	3.8871
9	1	2	2	Lodging	Space_Heat	4.2759
9	1	2	3	Lodging	Space_Heat	4.6646
9	1	2	4	Lodging	Space_Heat	5.0533
9	2	1	1	Lodging	Water_Heat	8.6651
9	2	1	2	Lodging	Water_Heat	9.5317
9	2	1	3	Lodging	Water_Heat	10.3982
9	2	1	4	Lodging	Water_Heat	11.2647
9	2	2	1	Lodging	Water_Heat	6.9321
9	2	2	2	Lodging	Water_Heat	7.6253
9	2	2	3	Lodging	Water_Heat	8.3185
9	2	2	4	Lodging	Water_Heat	9.0118
9	4	1	1	Lodging	Cook_top	4.0305
9	4	1	2	Lodging	Cook_top	4.4335
9	4	2	1	Lodging	Cook_top	3.2244
9	4	2	2	Lodging	Cook_top	3.5468
9	5	1	1	Lodging	Fryer	5.2524
9	5	1	2	Lodging	Fryer	5.7777
9	5	2	1	Lodging	Fryer	4.2019
9	5	2	2	Lodging	Fryer	4.6221
9	6	1	1	Lodging	Griddle	5.2524
9	6	1	2	Lodging	Griddle	5.7777
9	6	2	1	Lodging	Griddle	4.2019
9	6	2	2	Lodging	Griddle	4.6221
9	7	1	1	Lodging	Other_Cooking	0.5148
9	7	1	2	Lodging	Other_Cooking	0.5663
9	7	2	1	Lodging	Other_Cooking	0.4118
9	7	2	2	Lodging	Other_Cooking	0.453
9	8	1	1	Lodging	Drying	2.1663
9	8	1	2	Lodging	Drying	2.3829
9	8	2	1	Lodging	Drying	1.733
9	8	2	2	Lodging	Drying	1.9063
9	10	1	1	Lodging	AC_Compressor	0.7157
9	10	1	2	Lodging	AC_Compressor	0.7872
9	10	2	1	Lodging	AC_Compressor	0.5725
9	10	2	2	Lodging	AC_Compressor	0.6298
9	11	1	1	Lodging	Other	0
9	11	2	1	Lodging	Other	0
10	1	1	1	Misc	Space_Heat	2.1455
10	1	1	2	Misc	Space_Heat	2.36
10	1	1	3	Misc	Space_Heat	2.5746
10	1	1	4	Misc	Space_Heat	2.7891
10	1	2	1	Misc	Space_Heat	1.7164
10	1	2	2	Misc	Space_Heat	1.888
10	1	2	3	Misc	Space_Heat	2.0597
10	1	2	4	Misc	Space_Heat	2.2313
10	2	1	1	Misc	Water_Heat	2.9412
10	2	1	2	Misc	Water_Heat	3.2354
10	2	1	3	Misc	Water_Heat	3.5295
10	2	1	4	Misc	Water_Heat	3.8236
10	2	2	1	Misc	Water_Heat	2.353
10	2	2	2	Misc	Water_Heat	2.5883

b	n	f	e	bname	nname	EQcost
10	2	2	3	Misc	Water_Heat	2.8236
10	2	2	4	Misc	Water_Heat	3.0589
10	4	1	1	Misc	Cook_top	0.6282
10	4	1	2	Misc	Cook_top	0.691
10	4	2	1	Misc	Cook_top	0.5025
10	4	2	2	Misc	Cook_top	0.5528
10	5	1	1	Misc	Fryer	0.6285
10	5	1	2	Misc	Fryer	0.6913
10	5	2	1	Misc	Fryer	0.5028
10	5	2	2	Misc	Fryer	0.5531
10	6	1	1	Misc	Griddle	0.6285
10	6	1	2	Misc	Griddle	0.6913
10	6	2	1	Misc	Griddle	0.5028
10	6	2	2	Misc	Griddle	0.5531
10	7	1	1	Misc	Other_Cooking	0.6282
10	7	1	2	Misc	Other_Cooking	0.691
10	7	2	1	Misc	Other_Cooking	0.5025
10	7	2	2	Misc	Other_Cooking	0.5528
10	10	1	1	Misc	AC_Compressor	1.9306
10	10	1	2	Misc	AC_Compressor	2.1237
10	10	2	1	Misc	AC_Compressor	1.5445
10	10	2	2	Misc	AC_Compressor	1.6989
10	11	1	1	Misc	Other	0
10	11	2	1	Misc	Other	0
11	1	1	1	Government	Space_Heat	3.815
11	1	1	2	Government	Space_Heat	4.1965
11	1	1	3	Government	Space_Heat	4.578
11	1	1	4	Government	Space_Heat	4.9595
11	1	2	1	Government	Space_Heat	3.052
11	1	2	2	Government	Space_Heat	3.3572
11	1	2	3	Government	Space_Heat	3.6624
11	1	2	4	Government	Space_Heat	3.9676
11	2	1	1	Government	Water_Heat	0.5935
11	2	1	2	Government	Water_Heat	0.6528
11	2	1	3	Government	Water_Heat	0.7122
11	2	1	4	Government	Water_Heat	0.7715
11	2	2	1	Government	Water_Heat	0.4748
11	2	2	2	Government	Water_Heat	0.5222
11	2	2	3	Government	Water_Heat	0.5697
11	2	2	4	Government	Water_Heat	0.6172
11	4	1	1	Government	Cook_top	0.4333
11	4	1	2	Government	Cook_top	0.4766
11	4	2	1	Government	Cook_top	0.3466
11	4	2	2	Government	Cook_top	0.3813
11	5	1	1	Government	Fryer	0.4332
11	5	1	2	Government	Fryer	0.4765
11	5	2	1	Government	Fryer	0.3465
11	5	2	2	Government	Fryer	0.3812
11	6	1	1	Government	Griddle	0.4332
11	6	1	2	Government	Griddle	0.4765
11	6	2	1	Government	Griddle	0.3465
11	6	2	2	Government	Griddle	0.3812
11	7	1	1	Government	Other_Cooking	0.4333
11	7	1	2	Government	Other_Cooking	0.4766
11	7	2	1	Government	Other_Cooking	0.3466
11	7	2	2	Government	Other_Cooking	0.3813
11	10	1	1	Government	AC_Compressor	1.3062
11	10	1	2	Government	AC_Compressor	1.4368
11	10	2	1	Government	AC_Compressor	1.0449
11	10	2	2	Government	AC_Compressor	1.1494
11	11	1	1	Government	Other	0
11	11	2	1	Government	Other	0
12	1	1	1	TCU	Space_Heat	1.8457
12	1	1	2	TCU	Space_Heat	2.0303
12	1	1	3	TCU	Space_Heat	2.2149
12	1	1	4	TCU	Space_Heat	2.3995
12	1	2	1	TCU	Space_Heat	1.4766
12	1	2	2	TCU	Space_Heat	1.6242
12	1	2	3	TCU	Space_Heat	1.7719
12	1	2	4	TCU	Space_Heat	1.9196
12	2	1	1	TCU	Water_Heat	2.5303
12	2	1	2	TCU	Water_Heat	2.7833
12	2	1	3	TCU	Water_Heat	3.0364
12	2	1	4	TCU	Water_Heat	3.2894
12	2	2	1	TCU	Water_Heat	2.0243
12	2	2	2	TCU	Water_Heat	2.2267
12	2	2	3	TCU	Water_Heat	2.4291
12	2	2	4	TCU	Water_Heat	2.6315

b	n	f	e	bname	nname	EQcost
12	9	1	1	TCU	Engine	30.6768
12	9	1	2	TCU	Engine	33.7445
12	9	2	1	TCU	Engine	24.5415
12	9	2	2	TCU	Engine	26.9956
12	11	1	1	TCU	Other	0
12	11	2	1	TCU	Other	0
13	1	1	1	Construction	Space_Heat	2.2951
13	1	1	2	Construction	Space_Heat	2.5246
13	1	1	3	Construction	Space_Heat	2.7542
13	1	1	4	Construction	Space_Heat	2.9837
13	1	2	1	Construction	Space_Heat	1.8361
13	1	2	2	Construction	Space_Heat	2.0197
13	1	2	3	Construction	Space_Heat	2.2033
13	1	2	4	Construction	Space_Heat	2.3869
13	2	1	1	Construction	Water_Heat	3.1464
13	2	1	2	Construction	Water_Heat	3.461
13	2	1	3	Construction	Water_Heat	3.7757
13	2	1	4	Construction	Water_Heat	4.0903
13	2	2	1	Construction	Water_Heat	2.5171
13	2	2	2	Construction	Water_Heat	2.7688
13	2	2	3	Construction	Water_Heat	3.0205
13	2	2	4	Construction	Water_Heat	3.2722
13	11	1	1	Construction	Other	0
13	11	2	1	Construction	Other	0
14	1	1	1	Agriculture	Space_Heat	1.6583
14	1	1	2	Agriculture	Space_Heat	1.8242
14	1	1	3	Agriculture	Space_Heat	1.99
14	1	1	4	Agriculture	Space_Heat	2.1558
14	1	2	1	Agriculture	Space_Heat	1.3267
14	1	2	2	Agriculture	Space_Heat	1.4593
14	1	2	3	Agriculture	Space_Heat	1.592
14	1	2	4	Agriculture	Space_Heat	1.7247
14	2	1	1	Agriculture	Water_Heat	2.2734
14	2	1	2	Agriculture	Water_Heat	2.5008
14	2	1	3	Agriculture	Water_Heat	2.7281
14	2	1	4	Agriculture	Water_Heat	2.9554
14	2	2	1	Agriculture	Water_Heat	1.8187
14	2	2	2	Agriculture	Water_Heat	2.0006
14	2	2	3	Agriculture	Water_Heat	2.1825
14	2	2	4	Agriculture	Water_Heat	2.3644
14	8	1	1	Agriculture	Drying	2.2734
14	8	1	2	Agriculture	Drying	2.5008
14	8	2	1	Agriculture	Drying	1.8187
14	8	2	2	Agriculture	Drying	2.0006
14	9	1	1	Agriculture	Engine	9.7757
14	9	1	2	Agriculture	Engine	10.7533
14	9	2	1	Agriculture	Engine	7.8206
14	9	2	2	Agriculture	Engine	8.6026
14	11	1	1	Agriculture	Other	0
14	11	2	1	Agriculture	Other	0

Southern California Gas Company
2012 California Gas Report
Employment (in millions)

YEAR	Office	Restaurant	Retail	Laundry	Warehouse		College	Health	Lodging	Misc	Government	TCU	Construction	Agriculture	Total
2010	1.02739	0.55081	0.90206	0.08063	0.41260	0.59274	0.1975809	0.78668	0.12470	0.22299	0.61751	0.53804	0.28656	0.22063	6.75201
2011	1.05411	0.56062	0.91814	0.08098	0.42209	0.58854	0.1961796	0.80272	0.12603	0.22396	0.61062	0.56205	0.29524	0.21994	6.85999
2012	1.09329	0.56772	0.92977	0.08123	0.43139	0.59369	0.1978956	0.81621	0.12695	0.22467	0.61154	0.57479	0.32578	0.21853	7.00935
2013	1.14864	0.57261	0.93778	0.08136	0.44087	0.60233	0.200777	0.83039	0.12751	0.22502	0.61582	0.58365	0.35219	0.21845	7.15590
2014	1.18848	0.57623	0.94371	0.08123	0.45041	0.60808	0.2026933	0.84565	0.12758	0.22466	0.61839	0.60071	0.38131	0.21890	7.28219
2015	1.21909	0.57914	0.94847	0.08128	0.45975	0.61508	0.2050255	0.86726	0.12763	0.22481	0.62280	0.61306	0.40280	0.21838	7.39330
2016	1.24542	0.58358	0.95574	0.08133	0.46376	0.62413	0.2080418	0.88398	0.12798	0.22494	0.62969	0.62431	0.41715	0.22216	7.49347
2017	1.27066	0.58846	0.96374	0.08125	0.46449	0.63247	0.2108219	0.89921	0.12860	0.22472	0.63622	0.63389	0.42858	0.22831	7.58363
2018	1.30148	0.59147	0.96866	0.08106	0.46512	0.63996	0.2133186	0.91236	0.12930	0.22420	0.64203	0.63790	0.43940	0.23386	7.66626
2019	1.33616	0.59430	0.97330	0.08105	0.46396	0.64732	0.2157739	0.92345	0.12994	0.22417	0.65432	0.64041	0.45254	0.23838	7.75874
2020	1.36775	0.59727	0.97817	0.08113	0.45994	0.65547	0.2184899	0.93363	0.13055	0.22439	0.65569	0.64410	0.46434	0.24297	7.83404
2021	1.39627	0.60093	0.98415	0.08148	0.45863	0.66291	0.2209686	0.94446	0.13131	0.22535	0.66186	0.65140	0.47399	0.24745	7.91743
2022	1.42606	0.60444	0.98990	0.08211	0.45735	0.67006	0.2233544	0.95473	0.13240	0.22709	0.66744	0.66003	0.48515	0.25196	8.00681
2023	1.45640	0.60854	0.99662	0.08271	0.45636	0.67606	0.2253527	0.96500	0.13354	0.22875	0.67200	0.67054	0.49840	0.25683	8.09847
2024	1.48570	0.61386	1.00533	0.08334	0.45516	0.68171	0.2272383	0.97579	0.13463	0.23048	0.67631	0.68046	0.51107	0.26185	8.19065
2025	1.51293	0.61911	1.01393	0.08398	0.45264	0.68744	0.2291477	0.98721	0.13570	0.23228	0.68064	0.69030	0.52264	0.26697	8.27936
2026	1.53887	0.62521	1.02392	0.08459	0.45137	0.69306	0.2310188	0.99971	0.13681	0.23394	0.68487	0.69798	0.53494	0.27259	8.37044
2027	1.56408	0.63176	1.03465	0.08524	0.44908	0.69847	0.2328236	1.01316	0.13799	0.23576	0.68892	0.70568	0.54537	0.27818	8.46021
2028	1.58928	0.63805	1.04495	0.08585	0.44791	0.70391	0.2346364	1.02678	0.13919	0.23744	0.69299	0.71391	0.55444	0.28370	8.55004
2029	1.61674	0.64386	1.05446	0.08645	0.44590	0.70884	0.2362789	1.03965	0.14042	0.23909	0.70271	0.72119	0.56295	0.28953	8.64309
2030	1.64440	0.64998	1.06448	0.08692	0.44445	0.71348	0.2378276	1.05081	0.14158	0.24039	0.70083	0.72668	0.57034	0.29509	8.72088

SOUTHERN CALIFORNIA GAS COMPANY
2012 CALIFORNIA GAS REPORT
GAS ENGINE FORECASTED LOAD

Mdth

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2,012.0	38.4	41.9	70.6	109.0	140.4	164.2	185.2	175.4	181.4	122.4	76.7	55.5	1,361.1
2,013.0	44.9	65.4	94.9	117.0	168.9	218.0	266.0	289.9	254.5	155.2	110.2	89.2	1,874.3
2,014.0	44.7	48.7	82.1	126.7	163.3	191.0	215.4	204.0	211.0	142.3	89.2	64.5	1,583.0
2,015.0	44.5	48.5	81.7	126.1	162.5	190.0	214.3	203.0	209.9	141.6	88.8	64.2	1,575.1
2,016.0	44.3	48.2	81.3	125.4	161.7	189.0	213.2	202.0	208.8	140.9	88.3	63.9	1,567.2
2,017.0	44.0	48.0	80.9	124.8	160.9	188.1	212.2	201.0	207.8	140.2	87.9	63.6	1,559.4
2,018.0	43.8	47.8	80.5	124.2	160.1	187.2	211.1	200.0	206.8	139.5	87.4	63.3	1,551.6
2,019.0	43.6	47.5	80.1	123.6	159.3	186.2	210.1	199.0	205.7	138.8	87.0	62.9	1,543.8
2,020.0	43.4	47.3	79.7	123.0	158.5	185.3	209.0	198.0	204.7	138.1	86.6	62.6	1,536.1
2,021.0	43.2	47.0	79.3	122.3	157.7	184.4	208.0	197.0	203.7	137.4	86.1	62.3	1,528.4
2,022.0	42.9	46.8	78.9	121.7	156.9	183.4	206.9	196.0	202.7	136.8	85.7	62.0	1,520.8
2,023.0	42.7	46.6	78.5	121.1	156.1	182.5	205.9	195.0	201.6	136.1	85.3	61.7	1,513.2
2,024.0	42.5	46.3	78.1	120.5	155.4	181.6	204.9	194.0	200.6	135.4	84.8	61.4	1,505.6
2,025.0	42.3	46.1	77.7	119.9	154.6	180.7	203.8	193.1	199.6	134.7	84.4	61.1	1,498.1
2,026.0	42.1	45.9	77.3	119.3	153.8	179.8	202.8	192.1	198.6	134.0	84.0	60.8	1,490.6
2,027.0	41.9	45.6	76.9	118.7	153.0	178.9	201.8	191.1	197.6	133.4	83.6	60.5	1,483.1
2,028.0	41.7	45.4	76.5	118.1	152.3	178.0	200.8	190.2	196.7	132.7	83.2	60.2	1,475.7
2,029.0	41.5	45.2	76.2	117.5	151.5	177.1	199.8	189.2	195.7	132.0	82.7	59.9	1,468.3
2,030.0	41.3	45.0	75.8	116.9	150.8	176.2	198.8	188.3	194.7	131.4	82.3	59.6	1,461.0

SOUTHERN CALIFORNIA GAS COMPANY
2012 CALIFORNIA GAS REPORT
GAS AC FORECASTED LOAD

Mdth

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2012	4.6	8.5	3.9	4.1	9.4	4.9	8.9	10.7	9.7	9.5	7.4	5.0	86.4
2013	4.6	8.5	3.9	4.1	9.4	4.9	8.9	10.7	9.7	9.5	7.4	5.0	86.4
2014	4.1	6.0	3.5	5.7	6.2	6.5	8.6	10.3	9.7	8.4	6.9	4.7	80.5
2015	4.1	6.0	3.5	5.7	6.2	6.5	8.6	10.3	9.7	8.4	6.9	4.7	80.5
2016	4.2	7.8	3.5	3.8	8.7	4.5	8.1	9.8	8.8	8.7	6.8	4.6	79.2
2017	4.2	7.8	3.5	3.8	8.7	4.5	8.1	9.8	8.8	8.7	6.8	4.6	79.2
2018	3.8	7.0	3.2	3.4	7.9	4.1	7.4	8.9	8.0	7.9	6.2	4.1	72.0
2019	3.8	7.0	3.2	3.4	7.9	4.1	7.4	8.9	8.0	7.9	6.2	4.1	72.0
2020	3.8	7.0	3.2	3.4	7.9	4.1	7.4	8.9	8.0	7.9	6.2	4.1	72.0
2021	3.8	7.0	3.2	3.4	7.9	4.1	7.4	8.9	8.0	7.9	6.2	4.1	72.0
2022	3.8	7.0	3.2	3.4	7.9	4.1	7.4	8.9	8.0	7.9	6.2	4.1	72.0
2023	3.4	6.3	2.9	3.1	7.1	3.7	6.6	8.0	7.2	7.2	5.6	3.7	64.8
2024	3.4	6.3	2.9	3.1	7.1	3.7	6.6	8.0	7.2	7.2	5.6	3.7	64.8
2025	3.4	6.3	2.9	3.1	7.1	3.7	6.6	8.0	7.2	7.2	5.6	3.7	64.8
2026	3.4	6.3	2.9	3.1	7.1	3.7	6.6	8.0	7.2	7.2	5.6	3.7	64.8
2027	3.4	6.3	2.9	3.1	7.1	3.7	6.6	8.0	7.2	7.2	5.6	3.7	64.8
2028	3.4	6.3	2.9	3.1	7.1	3.7	6.6	8.0	7.2	7.2	5.6	3.7	64.8
2029	3.4	6.3	2.9	3.1	7.1	3.7	6.6	8.0	7.2	7.2	5.6	3.7	64.8
2030	3.1	5.6	2.6	2.8	6.3	3.2	5.9	7.1	6.4	6.4	4.9	3.3	57.6

				Southern California Gas Company									
				2012 California Gas Report									
				Average Year G10 Load Forecast (Mdth)									
YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2012	8,810.4	8,111.9	7,122.7	6,237.6	5,954.5	5,422.7	4,894.1	4,780.4	5,169.2	5,288.6	7,461.9	8,973.8	78,638.7
2013	8,721.0	8,065.5	7,073.2	6,187.0	5,914.0	5,379.8	4,855.4	4,742.1	5,139.5	5,257.4	7,419.6	8,924.5	77,679.0
2014	8,681.3	8,030.5	7,034.8	6,149.9	5,882.5	5,347.5	4,825.8	4,711.7	5,114.6	5,231.3	7,384.9	8,884.6	77,279.4
2015	8,652.6	8,007.2	7,008.4	6,126.3	5,860.7	5,326.0	4,805.4	4,690.0	5,095.3	5,211.1	7,359.0	8,855.5	76,997.4
2016	8,639.5	7,998.5	6,995.4	6,115.1	5,849.9	5,315.1	4,794.5	4,677.4	5,084.9	5,200.1	7,346.0	8,842.1	76,858.5
2017	8,606.0	7,971.8	6,967.6	6,092.3	5,828.0	5,295.1	4,776.0	4,657.5	5,065.6	5,179.9	7,316.9	8,807.6	76,564.3
2018	8,563.8	7,937.1	6,932.9	6,063.7	5,800.3	5,269.9	4,752.9	4,633.1	5,041.1	5,154.4	7,280.3	8,764.2	76,193.9
2019	8,517.6	7,898.6	6,895.0	6,032.2	5,769.9	5,242.1	4,727.5	4,606.5	5,014.3	5,126.5	7,240.3	8,716.7	75,787.3
2020	8,478.6	7,866.8	6,862.9	6,005.9	5,744.4	5,218.9	4,706.2	4,583.8	4,991.7	5,102.9	7,206.5	8,676.6	75,445.5
2021	8,434.6	7,830.4	6,826.7	5,976.0	5,715.5	5,192.6	4,682.1	4,558.3	4,966.2	5,076.3	7,168.3	8,631.3	75,058.1
2022	8,390.2	7,793.6	6,790.2	5,945.8	5,686.3	5,166.0	4,657.7	4,532.7	4,940.4	5,049.4	7,129.9	8,585.6	74,667.8
2023	8,354.2	7,764.6	6,760.6	5,921.6	5,662.9	5,144.6	4,638.1	4,511.7	4,919.6	5,027.7	7,098.6	8,548.6	74,352.6
2024	8,327.5	7,744.3	6,738.6	5,904.1	5,645.8	5,129.1	4,623.6	4,495.7	4,904.3	5,011.5	7,075.2	8,521.1	74,120.8
2025	8,307.4	7,729.9	6,721.9	5,891.2	5,633.1	5,117.5	4,612.8	4,483.4	4,892.8	4,999.3	7,057.4	8,500.2	73,946.8
2026	8,296.6	7,724.3	6,712.8	5,885.1	5,626.8	5,111.8	4,607.3	4,476.1	4,886.8	4,992.7	7,047.5	8,489.0	73,856.8
2027	8,342.3	7,770.9	6,749.6	5,919.2	5,658.9	5,141.1	4,633.4	4,499.7	4,914.1	5,020.2	7,085.7	8,535.4	74,270.4
2028	8,388.3	7,817.7	6,786.7	5,953.6	5,691.2	5,170.6	4,659.6	4,523.5	4,941.6	5,047.8	7,124.1	8,582.2	74,687.1
2029	8,434.0	7,864.3	6,823.5	5,987.8	5,723.3	5,199.9	4,685.7	4,547.1	4,968.9	5,075.3	7,162.2	8,628.7	75,100.7
2030	8,478.2	7,909.6	6,859.2	6,020.9	5,754.4	5,228.4	4,711.0	4,569.9	4,995.3	5,101.8	7,199.2	8,673.7	75,501.6

				Southern California Gas Company									
				2012 California Gas Report									
				Cold Year G10 Load Forecast (Mdth)									
YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2012	9,627.0	8,793.3	7,602.7	6,539.0	6,195.7	5,556.6	4,916.2	4,780.4	5,246.8	5,389.2	8,008.9	9,831.7	82,898.6
2013	9,535.1	8,744.8	7,551.7	6,487.4	6,154.3	5,513.4	4,877.4	4,742.1	5,216.9	5,357.7	7,964.9	9,779.7	81,925.4
2014	9,492.7	8,707.7	7,511.8	6,449.3	6,122.1	5,480.7	4,847.7	4,711.7	5,191.7	5,331.2	7,928.5	9,737.1	81,512.3
2015	9,461.9	8,682.5	7,484.1	6,424.9	6,099.6	5,458.8	4,827.3	4,690.0	5,172.2	5,310.8	7,901.1	9,705.7	81,218.8
2016	9,447.8	8,673.0	7,470.5	6,413.4	6,088.5	5,447.7	4,816.3	4,677.4	5,161.7	5,299.7	7,887.5	9,691.3	81,074.8
2017	9,410.6	8,643.2	7,440.5	6,389.2	6,065.6	5,427.0	4,797.8	4,657.5	5,142.1	5,279.0	7,855.9	9,652.9	80,761.4
2018	9,363.9	8,604.7	7,403.2	6,359.0	6,036.6	5,401.1	4,774.6	4,633.1	5,117.2	5,253.0	7,816.3	9,604.8	80,367.4
2019	9,312.8	8,562.1	7,362.4	6,325.7	6,004.7	5,372.6	4,749.0	4,606.5	5,089.9	5,224.4	7,773.0	9,552.1	79,935.1
2020	9,269.6	8,526.8	7,327.8	6,297.8	5,978.0	5,348.7	4,727.6	4,583.8	5,066.9	5,200.3	7,736.3	9,507.6	79,571.2
2021	9,220.8	8,486.4	7,288.8	6,266.1	5,947.6	5,321.5	4,703.3	4,558.3	5,040.9	5,173.1	7,695.0	9,457.3	79,159.3
2022	9,171.6	8,445.7	7,249.6	6,234.2	5,917.1	5,294.2	4,678.8	4,532.7	5,014.7	5,145.7	7,653.4	9,406.6	78,744.3
2023	9,131.7	8,413.4	7,217.6	6,208.5	5,892.4	5,272.2	4,659.1	4,511.7	4,993.5	5,123.5	7,619.4	9,365.4	78,408.5
2024	9,102.0	8,390.5	7,193.8	6,189.9	5,874.4	5,256.1	4,644.6	4,495.7	4,977.9	5,106.9	7,594.0	9,334.7	78,160.6
2025	9,079.3	8,374.1	7,175.6	6,176.1	5,861.0	5,244.1	4,633.7	4,483.4	4,966.2	5,094.4	7,574.5	9,311.2	77,973.5
2026	9,066.9	8,367.1	7,165.5	6,169.3	5,854.2	5,238.2	4,628.2	4,476.1	4,960.1	5,087.6	7,563.6	9,298.3	77,875.1
2027	9,116.2	8,416.7	7,204.5	6,204.8	5,887.4	5,268.1	4,654.3	4,499.7	4,987.7	5,115.5	7,604.1	9,348.5	78,307.5
2028	9,165.9	8,466.6	7,243.7	6,240.6	5,920.8	5,298.2	4,680.7	4,523.5	5,015.5	5,143.6	7,645.0	9,399.2	78,743.2
2029	9,215.2	8,516.2	7,282.7	6,276.1	5,953.9	5,328.1	4,706.8	4,547.1	5,043.1	5,171.5	7,685.6	9,449.4	79,175.7
2030	9,262.9	8,564.4	7,320.4	6,310.5	5,986.1	5,357.1	4,732.2	4,569.9	5,069.9	5,198.5	7,724.8	9,498.1	79,594.8

Southern California Gas Company
2012 California Gas Report
Hot Year G10 Load Forecast (Mdth)

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2012	7,995.2	7,430.4	6,641.4	5,935.1	5,713.4	5,293.5	4,872.0	4,780.4	5,091.5	5,188.0	6,914.8	8,117.2	74,384.0
2013	7,908.4	7,386.2	6,593.5	5,885.5	5,673.6	5,251.1	4,833.4	4,742.1	5,062.0	5,157.1	6,874.3	8,070.6	73,437.8
2014	7,871.2	7,353.4	6,556.6	5,849.3	5,642.9	5,219.2	4,803.8	4,711.7	5,037.4	5,131.3	6,841.3	8,033.4	73,051.5
2015	7,844.8	7,331.9	6,531.5	5,826.5	5,621.7	5,198.0	4,783.5	4,690.0	5,018.3	5,111.4	6,816.8	8,006.7	72,781.2
2016	7,832.6	7,324.1	6,519.1	5,815.7	5,611.2	5,187.3	4,772.6	4,677.4	5,008.0	5,100.6	6,804.6	7,994.3	72,647.4
2017	7,802.8	7,300.4	6,493.4	5,794.3	5,590.4	5,167.8	4,754.3	4,657.5	4,989.1	5,080.8	6,777.9	7,963.7	72,372.4
2018	7,765.2	7,269.4	6,461.5	5,767.4	5,564.1	5,143.3	4,731.3	4,633.1	4,965.0	5,055.9	6,744.4	7,925.1	72,025.6
2019	7,723.8	7,235.1	6,426.4	5,737.7	5,535.1	5,116.4	4,706.0	4,606.5	4,938.7	5,028.5	6,707.6	7,882.7	71,644.5
2020	7,689.1	7,206.9	6,396.8	5,712.9	5,510.9	5,093.8	4,684.8	4,583.8	4,916.5	5,005.5	6,676.6	7,847.0	71,324.8
2021	7,649.7	7,174.3	6,363.4	5,684.7	5,483.3	5,068.2	4,660.8	4,558.3	4,891.4	4,979.4	6,641.6	7,806.6	70,961.9
2022	7,610.0	7,141.5	6,329.7	5,656.3	5,455.6	5,042.4	4,636.6	4,532.7	4,866.1	4,953.2	6,606.3	7,765.9	70,596.3
2023	7,578.0	7,115.8	6,302.4	5,633.6	5,433.3	5,021.6	4,617.0	4,511.7	4,845.7	4,931.9	6,577.7	7,733.1	70,301.7
2024	7,554.5	7,098.0	6,282.2	5,617.2	5,417.1	5,006.5	4,602.7	4,495.7	4,830.6	4,916.1	6,556.4	7,708.8	70,086.0
2025	7,536.8	7,085.8	6,266.9	5,605.3	5,405.2	4,995.4	4,592.0	4,483.4	4,819.4	4,904.2	6,540.2	7,690.5	69,925.0
2026	7,527.6	7,081.5	6,258.8	5,599.7	5,399.3	4,989.9	4,586.5	4,476.1	4,813.6	4,897.9	6,531.5	7,681.0	69,843.4
2027	7,569.7	7,125.0	6,293.5	5,632.5	5,430.4	5,018.7	4,612.5	4,499.7	4,840.5	4,924.8	6,567.2	7,723.7	70,238.2
2028	7,612.1	7,168.9	6,328.5	5,665.6	5,461.6	5,047.6	4,638.6	4,523.5	4,867.6	4,952.0	6,603.2	7,766.6	70,635.8
2029	7,654.1	7,212.5	6,363.2	5,698.4	5,492.6	5,076.4	4,664.6	4,547.1	4,894.6	4,979.0	6,638.9	7,809.3	71,030.6
2030	7,694.9	7,254.8	6,396.8	5,730.3	5,522.7	5,104.2	4,689.8	4,569.9	4,920.7	5,005.2	6,673.5	7,850.7	71,413.4

Southern California Gas Company
2012 California Gas Report
Base Year G10 Load Forecast (Mdth)

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2012	4,817.8	4,776.1	4,769.4	4,760.1	4,779.6	4,772.0	4,778.1	4,780.4	4,798.2	4,796.3	4,786.7	4,780.2	57,805.8
2013	4,741.1	4,740.4	4,727.4	4,714.2	4,742.8	4,731.2	4,739.8	4,742.1	4,769.6	4,766.6	4,752.9	4,744.2	56,912.3
2014	4,713.9	4,715.9	4,696.4	4,681.7	4,715.1	4,701.0	4,710.5	4,711.7	4,745.9	4,742.0	4,726.6	4,717.5	56,578.1
2015	4,696.2	4,701.7	4,676.5	4,662.1	4,696.4	4,681.2	4,690.5	4,690.0	4,727.6	4,723.2	4,708.0	4,699.9	56,353.2
2016	4,687.8	4,697.0	4,666.2	4,652.7	4,687.0	4,671.1	4,679.7	4,677.4	4,717.6	4,712.8	4,698.3	4,691.5	56,239.1
2017	4,672.3	4,685.3	4,649.1	4,636.6	4,670.4	4,654.0	4,661.8	4,657.5	4,700.0	4,694.8	4,681.2	4,675.9	56,038.8
2018	4,652.3	4,669.1	4,627.4	4,616.2	4,649.3	4,632.4	4,639.3	4,633.1	4,677.6	4,672.0	4,659.5	4,655.8	55,784.0
2019	4,630.0	4,650.6	4,603.6	4,593.6	4,625.9	4,608.6	4,614.6	4,606.5	4,653.0	4,647.0	4,635.5	4,633.5	55,502.5
2020	4,611.8	4,636.2	4,583.8	4,574.9	4,606.5	4,588.7	4,593.9	4,583.8	4,632.4	4,626.0	4,615.6	4,615.1	55,268.8
2021	4,590.7	4,618.9	4,561.1	4,553.5	4,584.4	4,566.1	4,570.4	4,558.3	4,609.0	4,602.2	4,592.8	4,594.0	55,001.4
2022	4,569.5	4,601.5	4,538.3	4,531.9	4,562.0	4,543.3	4,546.7	4,532.7	4,585.3	4,578.3	4,569.9	4,572.6	54,732.0
2023	4,552.8	4,588.7	4,520.1	4,514.8	4,544.3	4,525.1	4,527.7	4,511.7	4,566.3	4,558.9	4,551.5	4,555.9	54,517.8
2024	4,541.3	4,581.0	4,507.0	4,502.9	4,531.6	4,512.0	4,513.7	4,495.7	4,552.4	4,544.6	4,538.3	4,544.3	54,364.8
2025	4,533.3	4,576.8	4,497.4	4,494.6	4,522.5	4,502.4	4,503.2	4,483.4	4,542.1	4,533.9	4,528.6	4,536.2	54,254.3
2026	4,530.5	4,577.8	4,493.0	4,491.3	4,518.5	4,498.0	4,497.9	4,476.1	4,536.9	4,528.3	4,524.1	4,533.2	54,205.6
2027	4,558.4	4,609.6	4,519.4	4,518.9	4,545.4	4,524.4	4,523.5	4,499.7	4,562.5	4,553.5	4,550.4	4,561.1	54,526.9
2028	4,586.6	4,641.6	4,546.0	4,546.8	4,572.5	4,551.1	4,549.2	4,523.5	4,588.3	4,579.0	4,576.8	4,589.2	54,850.6
2029	4,614.6	4,673.4	4,572.4	4,574.4	4,599.4	4,577.5	4,574.8	4,547.1	4,613.9	4,604.2	4,603.1	4,617.1	55,172.0
2030	4,641.9	4,704.4	4,598.0	4,601.2	4,625.5	4,603.2	4,599.6	4,569.9	4,638.8	4,628.7	4,628.7	4,644.3	55,484.1

G10 Industrial DATA TABLES

Southern California Gas Company
2012 CGR - 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	1981	1974	1978	1978	1968	1980	1973	1980	1975
Food	1980	1982	1975	1978	1976	1983	1970	1987	1977
Textile	1985	1979	1977	1978	1981	1976	1976 .		1979
Wood_Paper	1979	1975	1975	1976	1976	1976	1976 .		1980
Chemical	1980	1980	1976	1977	1967	1976	1974	1980	1979
Petroleum	1980	1981	1974	1977	1975	1979 .		1972	1978
Stone	1980	1973	1975	1977	1980	1978	1982 .		1977
Primary_Metal	1986	1979	1975	1976	1976	1977	1978 .		1974
Fabricated_Metal	1982	1981	1976	1977	1979	1979	1976	1972	1976
Transport	1980	1978	1976	1976	1980	1980	1974	1988	1976
Misc	1979	1980	1976	1976	1978	1978	1976	1979	1977

Southern California Gas Company
2012 CGR - 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
2011	11.00	11.22	10.99	11.30	11.50	10.68	12.07	11.62	12.13	11.97	12.88
2012	10.93	11.13	10.92	11.20	11.38	10.64	11.89	11.49	11.94	11.81	12.62
2013	11.38	11.59	11.37	11.67	11.87	11.07	12.42	11.98	12.47	12.33	13.20
2014	11.66	11.90	11.65	11.99	12.21	11.31	12.84	12.34	12.90	12.74	13.75
2015	12.12	12.33	12.11	12.42	12.62	11.80	13.19	12.73	13.25	13.10	14.02
2016	12.54	12.74	12.52	12.82	13.02	12.23	13.57	13.13	13.62	13.48	14.36
2017	12.98	13.18	12.96	13.26	13.44	12.67	13.98	13.55	14.03	13.90	14.75
2018	13.42	13.62	13.41	13.71	13.90	13.11	14.44	14.00	14.50	14.36	15.24
2019	13.87	14.07	13.85	14.15	14.35	13.55	14.90	14.46	14.95	14.82	15.70
2020	14.36	14.57	14.35	14.66	14.85	14.05	15.41	14.97	15.47	15.33	16.22
2021	14.92	15.13	14.91	15.21	15.42	14.60	15.98	15.53	16.04	15.89	16.80
2022	15.49	15.70	15.47	15.78	15.99	15.16	16.57	16.11	16.62	16.47	17.39
2023	16.13	16.36	16.12	16.44	16.65	15.80	17.24	16.77	17.30	17.14	18.08
2024	16.81	17.04	16.80	17.13	17.35	16.47	17.95	17.47	18.01	17.84	18.80
2025	17.50	17.73	17.49	17.82	18.04	17.15	18.66	18.17	18.72	18.54	19.53
2026	18.22	18.46	18.21	18.54	18.78	17.86	19.41	18.91	19.47	19.29	20.29
2027	18.97	19.22	18.96	19.31	19.55	18.61	20.20	19.69	20.26	20.07	21.11
2028	19.77	20.03	19.76	20.11	20.37	19.39	21.04	20.51	21.11	20.90	21.97
2029	20.59	20.86	20.58	20.95	21.21	20.20	21.91	21.37	21.98	21.77	22.87
2030	21.44	21.73	21.44	21.82	22.09	21.04	22.81	22.26	22.89	22.66	23.81

(b) Marginal Price Forecasat

Year	Chemical	Fab_Metal	Food	Mining	Petroleum	Prim_Metal	Stone	Textile	Transport	Wood_Paper	Misc
2011	8.91	9.01	8.88	9.01	9.10	8.70	9.32	9.06	9.33	9.36	9.78
2012	8.83	8.92	8.81	8.92	9.00	8.64	9.20	8.96	9.21	9.23	9.61
2013	9.22	9.31	9.19	9.30	9.39	9.02	9.59	9.35	9.60	9.63	10.02
2014	9.46	9.56	9.42	9.56	9.66	9.22	9.90	9.62	9.92	9.95	10.42
2015	9.80	9.89	9.77	9.89	9.98	9.59	10.20	9.94	10.21	10.24	10.66
2016	10.12	10.21	10.09	10.21	10.29	9.92	10.50	10.26	10.52	10.54	10.94
2017	10.46	10.55	10.43	10.55	10.63	10.27	10.83	10.59	10.84	10.87	11.25
2018	10.82	10.91	10.79	10.90	10.99	10.62	11.19	10.95	11.21	11.23	11.62
2019	11.17	11.26	11.14	11.26	11.34	10.97	11.55	11.31	11.56	11.59	11.99
2020	11.57	11.66	11.54	11.66	11.74	11.36	11.95	11.70	11.97	11.99	12.40
2021	12.01	12.10	11.98	12.10	12.18	11.80	12.40	12.15	12.41	12.44	12.85
2022	12.46	12.55	12.43	12.55	12.64	12.25	12.85	12.60	12.87	12.90	13.31
2023	12.97	13.07	12.94	13.07	13.16	12.76	13.38	13.12	13.40	13.42	13.85
2024	13.52	13.62	13.48	13.61	13.71	13.30	13.93	13.67	13.95	13.98	14.41
2025	14.06	14.16	14.03	14.16	14.26	13.83	14.49	14.21	14.51	14.54	14.98
2026	14.63	14.74	14.60	14.73	14.83	14.40	15.07	14.79	15.09	15.12	15.58
2027	15.24	15.35	15.20	15.34	15.44	15.00	15.69	15.40	15.71	15.74	16.21
2028	15.87	15.98	15.84	15.98	16.09	15.62	16.34	16.04	16.36	16.40	16.89
2029	16.53	16.65	16.49	16.64	16.75	16.27	17.02	16.71	17.04	17.08	17.59
2030	17.21	17.34	17.18	17.33	17.45	16.95	17.73	17.40	17.75	17.78	18.31

Southern California Gas Company
2012 CGR - 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
2011	100.00	0.6324	0.6439	0.6318	0.6482	0.6594	0.6151	0.6898	0.6657	0.6929	0.6846	0.7334
2012	101.56	0.5431	0.5540	0.5424	0.5583	0.5687	0.5265	0.5979	0.5746	0.6009	0.5933	0.6401
2013	103.59	0.6128	0.6236	0.6121	0.6278	0.6380	0.5964	0.6669	0.6438	0.6698	0.6624	0.7086
2014	105.59	0.6505	0.6611	0.6498	0.6654	0.6754	0.6343	0.7039	0.6810	0.7067	0.6995	0.7451
2015	107.71	0.6827	0.6932	0.6820	0.6974	0.7072	0.6667	0.7353	0.7127	0.7381	0.7312	0.7762
2016	109.89	0.6828	0.6931	0.6821	0.6973	0.7070	0.6670	0.7347	0.7124	0.7375	0.7307	0.7752
2017	111.97	0.7111	0.7216	0.7104	0.7259	0.7358	0.6950	0.7641	0.7414	0.7669	0.7598	0.8052
2018	114.07	0.7402	0.7510	0.7395	0.7552	0.7655	0.7238	0.7943	0.7712	0.7972	0.7898	0.8360
2019	116.09	0.7740	0.7850	0.7733	0.7893	0.7998	0.7573	0.8291	0.8057	0.8321	0.8244	0.8714
2020	118.11	0.8064	0.8177	0.8058	0.8220	0.8328	0.7895	0.8627	0.8389	0.8657	0.8577	0.9056
2021	120.62	0.8406	0.8522	0.8400	0.8565	0.8676	0.8233	0.8981	0.8739	0.9012	0.8929	0.9418
2022	123.23	0.8754	0.8873	0.8748	0.8916	0.9031	0.8577	0.9343	0.9096	0.9375	0.9288	0.9787
2023	125.72	0.9094	0.9216	0.9089	0.9259	0.9378	0.8914	0.9696	0.9445	0.9728	0.9638	1.0148
2024	128.32	0.9426	0.9551	0.9421	0.9595	0.9717	0.9242	1.0042	0.9787	1.0075	0.9981	1.0501
2025	131.04	0.9760	0.9889	0.9755	0.9932	1.0058	0.9572	1.0390	1.0130	1.0424	1.0326	1.0857
2026	133.89	1.0029	1.0161	1.0024	1.0205	1.0334	0.9837	1.0673	1.0409	1.0708	1.0606	1.1149
2027	136.78	1.0304	1.0439	1.0300	1.0483	1.0617	1.0108	1.0963	1.0694	1.0999	1.0893	1.1448
2028	139.73	1.0589	1.0728	1.0585	1.0773	1.0910	1.0390	1.1264	1.0990	1.1301	1.1190	1.1757
2029	142.69	1.0880	1.1023	1.0877	1.1067	1.1209	1.0676	1.1570	1.1291	1.1608	1.1493	1.2073
2030	145.70	1.1177	1.1324	1.1174	1.1369	1.1515	1.0970	1.1884	1.1599	1.1922	1.1803	1.2395

(b) Marginal Price Forecasat

Year	Price Deflator	Chemical	Fabricated Metal	Food	Mining	Petroleum	Primary Metal	Stone	Textile	Transport	Wood_Paper	Misc
2011	100.00	0.6198	0.6258	0.6179	0.6256	0.6313	0.6066	0.6449	0.6288	0.6460	0.6477	0.6739
2012	101.56	0.5061	0.5118	0.5043	0.5116	0.5169	0.4935	0.5299	0.5146	0.5309	0.5325	0.5574
2013	103.59	0.5762	0.5818	0.5744	0.5817	0.5869	0.5639	0.5997	0.5846	0.6007	0.6023	0.6267
2014	105.59	0.6144	0.6200	0.6127	0.6198	0.6250	0.6023	0.6375	0.6227	0.6385	0.6400	0.6641
2015	107.71	0.6471	0.6526	0.6454	0.6524	0.6575	0.6352	0.6698	0.6553	0.6708	0.6723	0.6960
2016	109.89	0.6476	0.6530	0.6459	0.6528	0.6578	0.6358	0.6700	0.6556	0.6709	0.6725	0.6958
2017	111.97	0.6752	0.6807	0.6735	0.6805	0.6857	0.6631	0.6981	0.6834	0.6991	0.7006	0.7246
2018	114.07	0.7036	0.7093	0.7019	0.7091	0.7144	0.6913	0.7271	0.7121	0.7281	0.7297	0.7542
2019	116.09	0.7367	0.7425	0.7349	0.7423	0.7477	0.7241	0.7607	0.7454	0.7617	0.7634	0.7884
2020	118.11	0.7685	0.7744	0.7667	0.7742	0.7797	0.7557	0.7930	0.7773	0.7941	0.7957	0.8213
2021	120.62	0.8019	0.8079	0.8000	0.8077	0.8134	0.7887	0.8271	0.8109	0.8281	0.8298	0.8561
2022	123.23	0.8358	0.8420	0.8339	0.8418	0.8476	0.8223	0.8617	0.8451	0.8627	0.8645	0.8915
2023	125.72	0.8690	0.8754	0.8670	0.8752	0.8811	0.8551	0.8955	0.8785	0.8966	0.8984	0.9260
2024	128.32	0.9014	0.9079	0.8994	0.9077	0.9138	0.8871	0.9285	0.9111	0.9297	0.9315	0.9598
2025	131.04	0.9339	0.9406	0.9318	0.9404	0.9466	0.9193	0.9617	0.9439	0.9629	0.9648	0.9938
2026	133.89	0.9598	0.9667	0.9577	0.9665	0.9729	0.9448	0.9884	0.9701	0.9896	0.9916	1.0214
2027	136.78	0.9864	0.9934	0.9842	0.9932	0.9998	0.9710	1.0157	0.9969	1.0169	1.0189	1.0495
2028	139.73	1.0140	1.0212	1.0117	1.0210	1.0277	0.9982	1.0440	1.0248	1.0453	1.0474	1.0787
2029	142.69	1.0421	1.0495	1.0398	1.0492	1.0562	1.0259	1.0729	1.0532	1.0742	1.0763	1.1085
2030	145.70	1.0708	1.0784	1.0685	1.0782	1.0853	1.0542	1.1025	1.0822	1.1038	1.1059	1.1389

Southern California Gas Company
2012 CGR - Industrial G10
Historical Throughput and Customer Counts

Business Type	therms_ 2011	meters_ 2011	meters_ 2011_ ExCust	meters_ 2011_ NewCust	avgUse_ 2011_ ExCust	avgUse_ 2011_ NewCust	Price Elasticity	Employment Elasticity
Mining	7,370,372	235	229	6	25,849	241,834	0.000000	0.321451
Food	69,250,409	2816	2,772	44	24,861	7,660	-0.190795	1.242506
Textile	16,913,072	605	604	1	28,000	1,032	0.000000	0.033325
Wood_Paper	8,133,594	540	538	2	15,104	3,951	0.000000	0.508272
Chemical	20,429,880	1012	1,004	8	20,081	33,536	-0.080517	0.650067
Petroleum	8,757,313	142	140	2	62,545	500	-0.180563	0.084537
Stone	5,294,137	506	503	3	10,517	1,288	0.000000	0.416909
Prim_Metal	10,336,902	383	381	2	27,072	11,217	0.000000	0.956685
Fab_Metal	25,967,096	2295	2,289	6	11,340	1,470	-0.137441	1.023881
Transport	15,342,631	1952	1,945	7	7,876	3,368	0.000000	0.402505
Misc	41,069,430	8102	8,077	25	5,064	6,860	-0.108307	0.879307
Total	228,864,835	18,588						

Southern California Gas Company
2012 CGR - Industrial G10
Average Use Per Meter

therm

Business Type	Fire_ Tube_ Boiler	Water_ Tube_ Boiler	Space_ Heat	Water_ Heat	Dryer	Furnace_ Oven_ Kiln	AC	Engine	Other	Total
Mining	4366.6	42.6	491.8	121.7	1553.1	1535.6	11.0	1218.1	4169.3	13509.8
Food	16172.7	3829.2	1397.9	549.5	1970.7	4751.6	95.4	397.2	3383.0	32547.2
Textile	13453.1	3495.6	435.2	874.1	8247.0	1773.6	282.9	0.0	904.9	29466.4
Wood_Paper	4003.5	1313.9	895.2	91.2	727.6	1271.4	12.3	0.0	1333.4	9648.5
Chemical	5933.3	3338.2	757.4	575.4	49.0	1093.9	6.3	0.3	3051.2	14805.0
Petroleum	7748.0	1953.7	342.9	449.8	25523.9	112.3	0.0	34.5	10240.9	46406.0
Stone	1797.2	357.2	697.5	675.5	3176.5	6897.1	127.4	0.0	1204.3	14932.7
Prim_Metal	442.0	1396.6	1205.0	287.3	59.1	25647.9	237.4	0.0	2342.9	31618.2
Fab_Metal	1535.4	1498.7	1207.0	266.6	133.7	3842.0	20.7	0.0	2434.7	10938.7
Transport	387.3	225.6	666.8	192.0	424.5	723.0	5.7	2.5	373.0	3000.4
Misc	750.9	528.1	496.4	138.2	336.2	1853.1	33.0	6.0	952.2	5094.1

Southern California Gas Company
2012 CGR - 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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	35872.2	0.0	35872.2
Food	13791.7	2.8	205.1	225.3	0.0	0.0	0.0	0.0	0.0	14224.8
Textile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wood_Paper	.	.	.	.	.	.	.	.	.	0.0
Chemical	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17866.6	17866.6
Petroleum	0.0	0.0	0.0	0.0	140409.4	0.0	0.0	0.0	0.0	140409.4
Stone	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prim_Metal	0.0	0.0	0.0	891.7	0.0	14986.1	0.0	0.0	4995.4	20873.2
Fab_Metal	0.0	0.0	558.2	0.0	0.0	3041.6	0.0	0.0	8110.9	11710.8
Transport	0.0	0.0	0.0	0.0	0.0	2306.4	0.0	0.0	331.4	2637.8
Misc	612.3	0.0	0.0	5.0	2182.2	1428.8	0.0	0.0	983.8	5212.0

Southern California Gas Company
2012 CGR - 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	.
Food	992080	234899	77958	15939	1062552	781260	24817	1163891	.
Textile	1428304	371125	20797	30369	3811277	1069238	74615	0	.
Wood_Paper	11051345	3626956	48301	2915	523062	985476	3282	0	.
Chemical	1169880	658201	34723	19440	26417	593554	1620	738	.
Petroleum	1527674	385215	15711	15192	13761553	60935	0	101154	.
Stone	4960873	985989	31975	22824	6850607	6237158	37820	0	.
Primary_Metal	174313	550730	55233	9317	25494	13916258	66288	0	.
Fabricated_Metal	605450	591011	55315	8658	57653	2084618	5763	0	.
Transportation	76358	44486	30560	6490	228869	392291	1456	7240	.
Miscellaneous	148060	104128	22745	4673	181266	1005453	8471	17618	.

Southern California Gas Company
2012 CGR - 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	587697	5728	1099	281	163309	67709	159	140010	4169
Food	48371	11453	3801	1088	51807	38092	1210	56748	3383
Textile	69640	18095	1014	2073	185827	52133	3638	0	905
Wood_Paper	538832	176840	2355	199	25503	48049	160	0	1333
Chemical	57040	32092	1693	1327	1288	28940	79	36	3051
Petroleum	74485	18782	766	1037	670974	2971	0	4932	10241
Stone	241878	48074	1559	1558	334016	304106	1844	0	1204
Primary_Metal	8499	26852	2693	636	1243	678517	3232	0	2343
Fabricated_Metal	29520	28816	2697	591	2811	101640	281	0	2435
Transportation	3723	2169	1490	443	11159	19127	71	353	373
Miscellaneous	7219	5077	1109	319	8838	49023	413	859	952

Southern California Gas Company
2012 CGR - 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	0.74	0.74	0.61	0.59	0.32	0.38	0.11	0.01	1
Fabricated_Metal	0.74	0.74	0.61	0.59	0.32	0.38	0.11	0.01	1
Food	0.74	0.74	0.61	0.59	0.32	0.38	0.11	0.01	1
Mining	0.74	0.74	0.61	0.59	0.32	0.38	0.11	0.01	1
Miscllaneous	0.74	0.74	0.61	0.59	0.32	0.38	0.11	0.01	1
Petroleum	0.74	0.74	0.61	0.59	0.32	0.38	0.11	0.01	1
Primary_Metal	0.74	0.74	0.61	0.59	0.32	0.38	0.11	0.01	1
Stone	0.74	0.74	0.61	0.59	0.32	0.38	0.11	0.01	1
Textile	0.74	0.74	0.61	0.59	0.32	0.38	0.11	0.01	1
Transportation	0.74	0.74	0.61	0.59	0.32	0.38	0.11	0.01	1
Wood_Paper	0.74	0.74	0.61	0.59	0.32	0.38	0.11	0.01	1

Southern California Gas Company
2012 CGR - 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
2012 CGR - 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
2012 CGR - Industrial G10
Employment Forecast (in thousands)

YEAR	Mining	Food	Textile	Wood_Paper	Chemical	Petroleum	Stone	Primary_Metal	Fabricated_Metal	Transportation	Miscellaneous	Total
2011	19.5425	113.0150	38.6067	18.1200	33.8808	5.6617	15.7833	7.4125	76.8867	68.6383	334.8800	732.4258
2012	19.5358	113.4717	36.9317	17.8458	34.1350	5.7750	15.6767	7.6133	77.2317	71.4567	338.6392	738.3108
2013	19.5192	113.5775	36.0558	18.6975	34.1458	5.7042	15.8867	7.6933	80.0225	76.5250	344.3583	752.1833
2014	19.4508	114.0483	35.1475	20.2783	34.3050	5.5050	16.6133	7.7267	84.5917	80.2617	342.4575	760.3850
2015	18.7733	114.8950	34.1075	21.8150	34.6358	5.3208	17.0958	7.8942	88.7833	82.5667	342.2658	768.1517
2016	18.2308	116.1042	32.9525	22.7925	35.0392	5.1692	17.3108	8.0258	91.8467	81.2625	342.4325	771.1667
2017	17.8067	117.4117	32.0308	23.3617	35.3575	5.0375	17.3383	8.0617	92.4108	78.7392	343.8317	771.3917
2018	17.2142	118.1067	31.2350	23.7300	35.3275	4.9150	17.3383	8.0142	91.7583	77.2867	344.5625	769.4883
2019	16.4883	118.0942	30.3217	23.8550	35.0717	4.7700	17.2950	8.0258	92.2350	76.5475	344.3508	767.0558
2020	15.7800	117.8658	29.2333	23.8892	34.8308	4.6167	17.1600	8.0558	92.8067	75.5950	343.5683	763.4033
2021	15.2308	117.7758	28.1458	23.7933	34.5775	4.4942	17.0467	8.0900	93.8775	74.7867	344.2650	762.0842
2022	14.9592	117.5575	27.0267	23.5708	34.2558	4.4233	16.9217	8.0833	95.0425	74.0050	344.4867	760.3317
2023	14.7667	116.9442	26.2317	23.5575	34.0700	4.3617	16.7983	7.9825	95.1317	73.2158	342.1750	755.2342
2024	14.5550	116.2342	25.7500	23.6842	33.9933	4.2842	16.6467	7.7608	94.2550	72.4992	339.6900	749.3467
2025	14.3767	115.6425	25.4425	23.7942	33.8733	4.1867	16.4825	7.4783	92.5475	71.7075	336.4292	741.9608
2026	14.3167	115.1558	25.2200	23.8517	33.6900	4.0642	16.3017	7.2300	90.4517	70.8592	332.1075	733.2542
2027	14.2942	114.7392	25.1775	23.7058	33.4283	3.9617	16.0750	7.0067	88.5425	70.0708	327.7467	724.7475
2028	14.2125	114.3483	25.1150	23.3317	33.1183	3.8717	15.8442	6.7950	86.6842	69.2733	323.4650	716.0592
2029	14.1283	113.9367	24.7767	22.9475	32.7925	3.7683	15.6733	6.5975	84.9967	68.4392	319.5617	707.6150
2030	14.0300	113.4308	24.4967	22.7275	32.4625	3.6667	15.5408	6.4042	83.3450	67.6042	316.3225	700.0308

Southern California Gas Company
2012 CGR - 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
2011	22,886.5	0.0	0.0	0.0	0.0	0.0	22,886.5
2012	23,459.1	348.7	15.1	0.0	0.0	735.9	22,389.7
2013	23,442.0	697.4	39.3	69.2	2.1	1,194.6	21,517.9
2014	23,563.8	1,046.1	69.4	138.3	6.0	1,424.0	21,018.8
2015	23,751.6	1,394.8	99.6	207.5	10.0	1,500.7	20,738.2
2016	24,011.2	1,743.5	129.8	276.7	14.2	1,577.4	20,529.3
2017	24,073.0	2,092.2	160.0	276.7	18.2	1,654.1	20,191.9
2018	24,022.6	2,440.9	190.2	276.7	20.0	1,730.8	19,744.4
2019	23,932.8	2,789.6	220.4	276.7	19.9	1,807.5	19,259.5
2020	23,831.8	3,138.3	250.6	276.7	19.9	1,884.2	18,763.4
2021	23,787.2	3,487.0	280.8	276.7	19.8	1,960.9	18,323.6
2022	23,729.5	3,835.6	311.0	276.7	19.8	2,037.6	17,870.8
2023	23,580.7	4,184.3	341.2	276.7	19.7	2,114.3	17,326.9
2024	23,391.5	4,533.0	371.4	276.7	19.5	2,191.0	16,742.7
2025	23,171.9	4,881.7	401.6	276.7	19.3	2,267.7	16,128.0
2026	22,964.2	5,230.4	431.8	276.7	19.1	2,344.4	15,525.3
2027	22,769.9	5,230.4	462.0	276.7	19.0	2,421.1	15,284.7
2028	22,579.4	5,230.4	492.2	276.7	18.8	2,497.8	15,047.8
2029	22,403.5	5,230.4	522.3	276.7	18.7	2,574.5	14,825.5
2030	22,238.8	5,230.4	552.5	276.7	18.5	2,651.2	14,614.5

Southern California Gas Company
2012 CGR - Industrial G10
Core Industrial Demand Forecast (Mdth)
Cold Temperature

Cold | Model Output

YEAR	G10-Ind	EE/DSM	AB980	City of Vernon	AMI	C2NC Migration	Final
2011	23,386.4	0.0	0.0	0.0	0.0	0.0	23,386.4
2012	23,971.5	356.3	15.1	0.0	0.0	735.9	22,894.5
2013	23,954.0	712.6	39.3	69.2	2.1	1,194.6	22,014.7
2014	24,078.5	1,068.9	69.4	138.3	6.2	1,424.0	21,510.5
2015	24,270.4	1,425.2	99.6	207.5	10.3	1,500.7	21,226.3
2016	24,535.7	1,781.6	129.8	276.7	14.5	1,577.4	21,015.4
2017	24,598.8	2,137.9	160.0	276.7	18.6	1,654.1	20,671.6
2018	24,547.3	2,494.2	190.2	276.7	20.5	1,730.8	20,215.4
2019	24,455.6	2,850.5	220.4	276.7	20.4	1,807.5	19,720.9
2020	24,352.3	3,206.8	250.6	276.7	20.3	1,884.2	19,214.9
2021	24,306.8	3,563.1	280.8	276.7	20.3	1,960.9	18,766.6
2022	24,247.8	3,919.4	311.0	276.7	20.2	2,037.6	18,304.9
2023	24,095.7	4,275.7	341.2	276.7	20.1	2,114.3	17,750.1
2024	23,902.4	4,632.1	371.4	276.7	19.9	2,191.0	17,154.2
2025	23,678.0	4,988.4	401.6	276.7	19.7	2,267.7	16,527.1
2026	23,465.8	5,344.7	431.8	276.7	19.6	2,344.4	15,912.3
2027	23,267.2	5,344.7	462.0	276.7	19.4	2,421.1	15,667.4
2028	23,072.6	5,344.7	492.2	276.7	19.2	2,497.8	15,426.3
2029	22,892.8	5,344.7	522.3	276.7	19.1	2,574.5	15,200.3
2030	22,724.6	5,344.7	552.5	276.7	18.9	2,651.2	14,985.6

Southern California Gas Company
2012 CGR - 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
2011	22386.6	0.0	0.00	0.00	0.00	0.00	22,386.6
2012	22946.7	341.1	15.10	0.00	0.00	735.87	21,884.9
2013	22929.9	682.2	39.25	69.17	2.06	1194.64	21,021.2
2014	23049.1	1023.2	69.45	138.33	5.91	1424.02	20,527.1
2015	23232.7	1364.3	99.64	207.50	9.83	1500.72	20,250.0
2016	23486.7	1705.4	129.83	276.67	13.85	1577.42	20,043.2
2017	23547.2	2046.5	160.03	276.67	17.81	1654.12	19,712.2
2018	23497.9	2387.5	190.22	276.67	19.58	1730.82	19,273.5
2019	23410.1	2728.6	220.41	276.67	19.51	1807.52	18,798.1
2020	23311.2	3069.7	250.61	276.67	19.43	1884.22	18,311.8
2021	23267.6	3410.8	280.80	276.67	19.39	1960.92	17,880.7
2022	23211.2	3751.9	310.99	276.67	19.34	2037.62	17,436.7
2023	23065.6	4092.9	341.19	276.67	19.22	2114.32	16,903.6
2024	22880.6	4434.0	371.38	276.67	19.07	2191.02	16,331.2
2025	22665.7	4775.1	401.57	276.67	18.89	2267.72	15,728.9
2026	22462.6	5116.2	431.77	276.67	18.72	2344.42	15,138.4
2027	22272.5	5116.2	461.96	276.67	18.56	2421.12	14,902.0
2028	22086.2	5116.2	492.16	276.67	18.41	2497.82	14,669.2
2029	21914.1	5116.2	522.35	276.67	18.26	2574.52	14,450.8
2030	21753.1	5116.2	552.54	276.67	18.13	2651.22	14,243.4

Southern California Gas Company
2012 CGR - 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
2011	20,440.3	0.0	0.0	0.0	0.0	0.0	20,440.3
2012	20,951.7	311.4	15.1	0.0	0.0	735.9	19,919.5
2013	20,936.4	622.9	39.3	69.2	1.9	1,194.6	19,087.1
2014	21,045.2	934.3	69.4	138.3	5.4	1,424.0	18,612.7
2015	21,212.9	1,245.7	99.6	207.5	9.0	1,500.7	18,349.7
2016	21,444.8	1,557.1	129.8	276.7	12.7	1,577.4	18,150.8
2017	21,500.0	1,868.6	160.0	276.7	16.3	1,654.1	17,844.4
2018	21,455.0	2,180.0	190.2	276.7	17.9	1,730.8	17,439.9
2019	21,374.8	2,491.4	220.4	276.7	17.8	1,807.5	17,001.8
2020	21,284.6	2,802.8	250.6	276.7	17.7	1,884.2	16,553.7
2021	21,244.8	3,114.3	280.8	276.7	17.7	1,960.9	16,156.0
2022	21,193.2	3,425.7	311.0	276.7	17.7	2,037.6	15,746.6
2023	21,060.3	3,737.1	341.2	276.7	17.6	2,114.3	15,255.8
2024	20,891.4	4,048.5	371.4	276.7	17.4	2,191.0	14,729.1
2025	20,695.2	4,360.0	401.6	276.7	17.2	2,267.7	14,175.2
2026	20,509.7	4,671.4	431.8	276.7	17.1	2,344.4	13,631.9
2027	20,336.2	4,671.4	462.0	276.7	16.9	2,421.1	13,412.0
2028	20,166.0	4,671.4	492.2	276.7	16.8	2,497.8	13,195.5
2029	20,008.9	4,671.4	522.3	276.7	16.7	2,574.5	12,992.0
2030	19,861.9	4,671.4	552.5	276.7	16.6	2,651.2	12,798.6

2012 CALIFORNIA GAS REPORT

NONCORE COMMERCIAL AND INDUSTRIAL DEMAND FORECAST
JULY 2012

The Gas Company

A Sempra Energy utility℠

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 usage for the commercial and industrial markets were obtained from SoCalGas' billing records for 2011. 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 an 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 2011. The average rate is calculated from the weighted average rate at each tier for each customer; whereas the marginal rate is calculated as the rate that applies to the last unit of gas consumed for each customer.

C. Electricity Price Data

Both average prices (cents/kWh) and marginal prices (cents/kWh) were developed as electricity price inputs. Forecasts for the SCE industrial customer class were developed by SDG&E's electric rate design group through 2030. These were the average electricity prices for the noncore commercial & industrial market, overall.

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

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

D. Employment

Employment, as a measure of economic activity, is used to drive the noncore commercial and industrial demand forecast models. The employment forecast through 2030 is based on Global Insight's February 2012 Regional forecast (released February 28th, 2012). Global Insight prepares regular regional employment forecast for California and the aggregated six largest counties' Metropolitan Statistical Area (MSA) in SoCalGas' service area. (The six counties – Kern, Los Angeles, Orange, Riverside, San Bernardino, and Ventura – account for 85% of the service area's total population and employment). The historical employment data used was derived from the California Employment Development Department (EDD) for the 12 counties served by SoCalGas. The monthly employment used in the model was generally by summing the weighted employment data over the commercial and industrial NAICS codes.

E. Post-Model Adjustment

Once the EuForecaster end-use model forecast was generated, post-model adjustments were made to account for effects the model is not designed to simulate. Energy savings goals that were authorized by the CPUC in decision D.04-09-060 and expected load leaving 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

Sum of totalUsage	
year	Total from EUForeaster (Therms)
2011	177,810,103
2012	180,394,829
2013	180,743,338
2014	181,348,479
2015	181,938,411
2016	182,914,060
2017	183,556,000
2018	184,180,510
2019	184,692,057
2020	185,102,276
2021	185,493,296
2022	186,063,442
2023	186,704,253
2024	187,369,686
2025	188,033,111
2026	188,802,382
2027	189,609,372
2028	190,396,494
2029	191,113,901
2030	**191,834,011**

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

Year	Total
2011	17,781
2012	18,039
2013	18,074
2014	18,135
2015	18,194
2016	18,291
2017	18,356
2018	18,418
2019	18,469
2020	18,510
2021	18,549
2022	18,606
2023	18,670
2024	18,737
2025	18,803
2026	18,880
2027	18,961
2028	19,040
2029	19,111
2030	19,183

Noncore Industrial Demand Forecast

Sum of totalUsage

year	Total from EUForeaster (Therms)
2011	514,672,342
2012	525,542,649
2013	524,452,520
2014	523,418,190
2015	520,647,881
2016	519,448,547
2017	517,056,122
2018	514,582,195
2019	511,876,650
2020	508,802,912
2021	505,887,061
2022	502,721,266
2023	499,367,145
2024	496,310,748
2025	493,492,987
2026	491,239,011
2027	489,159,769
2028	486,966,854
2029	484,880,355
2030	**482,802,796**

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

Year	Total
2011	51,467
2012	52,554
2013	52,445
2014	52,342
2015	52,065
2016	51,945
2017	51,706
2018	51,458
2019	51,188
2020	50,880
2021	50,589
2022	50,272
2023	49,937
2024	49,631
2025	49,349
2026	49,124
2027	48,916
2028	48,697
2029	48,488
2030	48,280

Noncore Commercial Demand Forecast (MDth)

Load per HDD: 14,773 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-11	1,800	0	0	0	1,800	58	1,885	0	0	0	1,885
Feb-11	1,583	0	0	0	1,583	47	1,652	0	0	0	1,652
Mar-11	1,604	0	0	0	1,604	38	1,660	0	0	0	1,660
Apr-11	1,443	0	0	0	1,443	26	1,481	0	0	0	1,481
May-11	1,348	0	0	0	1,348	10	1,363	0	0	0	1,363
Jun-11	1,219	0	0	0	1,219	3	1,223	0	0	0	1,223
Nov-11	1,468	0	0	0	1,468	30	1,512	0	0	0	1,512
Dec-11	1,772	0	0	0	1,772	61	1,861	0	0	0	1,861
Jan-12	1,826	78	0	42	1,791	58	1,912	78	0	42	1,876
Feb-12	1,606	68	0	37	1,575	47	1,675	68	0	37	1,644
Mar-12	1,627	69	0	37	1,595	38	1,683	69	0	37	1,651
Apr-12	1,464	62	0	34	1,435	26	1,502	62	0	34	1,473
May-12	1,368	58	0	31	1,341	10	1,383	58	0	31	1,356
Jun-12	1,237	52	0	28	1,213	3	1,241	52	0	28	1,217
Jul-12	1,270	54	0	29	1,245	0	1,271	54	0	29	1,246
Aug-12	1,355	57	0	31	1,328	0	1,355	57	0	31	1,329
Sep-12	1,536	65	0	35	1,506	1	1,538	65	0	35	1,508
Oct-12	1,463	62	0	34	1,435	8	1,475	62	0	34	1,446
Nov-12	1,489	63	0	34	1,460	30	1,534	63	0	34	1,505
Dec-12	1,798	76	0	41	1,762	61	1,887	76	0	41	1,852
Jan-13	1,830	155	1	68	1,742	58	1,915	155	1	68	1,827
Feb-13	1,610	136	1	60	1,532	47	1,679	136	1	60	1,601
Mar-13	1,630	138	1	61	1,552	38	1,686	138	1	61	1,608
Apr-13	1,467	124	1	55	1,396	26	1,505	124	1	55	1,434
May-13	1,370	116	1	51	1,305	10	1,385	116	1	51	1,320
Jun-13	1,239	105	0	46	1,180	3	1,243	105	0	46	1,184
Jul-13	1,272	108	0	47	1,211	0	1,273	108	0	47	1,212
Aug-13	1,357	115	1	50	1,292	0	1,358	115	1	50	1,293
Sep-13	1,539	130	1	57	1,466	1	1,541	130	1	57	1,467
Oct-13	1,466	124	1	55	1,396	8	1,478	124	1	55	1,407
Nov-13	1,492	126	1	55	1,421	30	1,537	126	1	55	1,465
Dec-13	1,801	153	1	67	1,715	61	1,890	153	1	67	1,804
Jan-14	1,836	233	1	81	1,683	58	1,921	233	1	81	1,768
Feb-14	1,615	205	1	71	1,480	47	1,684	205	1	71	1,549
Mar-14	1,636	207	1	72	1,499	38	1,692	207	1	72	1,556
Apr-14	1,471	186	1	65	1,349	26	1,510	186	1	65	1,387
May-14	1,375	174	1	61	1,261	10	1,390	174	1	61	1,276
Jun-14	1,243	157	1	55	1,140	3	1,248	157	1	55	1,144
Jul-14	1,277	162	1	56	1,170	0	1,277	162	1	56	1,171
Aug-14	1,362	172	1	60	1,248	0	1,362	172	1	60	1,249
Sep-14	1,544	196	1	68	1,416	1	1,546	196	1	68	1,417
Oct-14	1,471	186	1	65	1,349	8	1,482	186	1	65	1,360
Nov-14	1,497	190	1	66	1,373	30	1,542	190	1	66	1,417
Dec-14	1,807	229	1	80	1,657	61	1,896	229	1	80	1,746
Jan-15	1,842	310	2	85	1,615	58	1,927	310	2	85	1,701
Feb-15	1,620	273	2	75	1,421	47	1,689	273	2	75	1,490
Mar-15	1,641	276	2	76	1,439	38	1,697	276	2	76	1,495
Apr-15	1,476	248	2	68	1,295	26	1,514	248	2	68	1,333
May-15	1,380	232	2	64	1,210	10	1,395	232	2	64	1,225
Jun-15	1,247	210	1	58	1,094	3	1,252	210	1	58	1,098
Jul-15	1,281	216	1	59	1,123	0	1,281	216	1	59	1,124
Aug-15	1,366	230	2	63	1,198	0	1,367	230	2	63	1,199
Sep-15	1,549	261	2	72	1,359	1	1,551	261	2	72	1,360
Oct-15	1,476	248	2	68	1,294	8	1,487	248	2	68	1,306
Nov-15	1,502	253	2	70	1,317	30	1,546	253	2	70	1,362
Dec-15	1,813	305	2	84	1,590	61	1,902	305	2	84	1,679

Noncore Commercial Demand Forecast (MDth)

Load per HDD: 14,773 Therm/HDD

Date	Commercial Average Year: End-Use Fcst @AvgYr HDD	DSM	Vernon	Migr: g10--> g30	AvgYr Adj (MDth)	Commercial Cold Year: Cold Yr less Avg Yr HDD Load Incr.	End-Use Fcst @ColdYr HDD	DSM	Vernon	Migr: g10--> g30	ColdYr Adj (MDth)
Jan-16	1,852	388	3	88	1,549	58	1,937	388	3	88	1,634
Feb-16	1,629	341	3	77	1,363	47	1,698	341	3	77	1,432
Mar-16	1,650	345	3	78	1,380	38	1,706	345	3	78	1,436
Apr-16	1,484	311	2	70	1,241	26	1,522	311	2	70	1,280
May-16	1,387	290	2	66	1,160	10	1,402	290	2	66	1,175
Jun-16	1,254	262	2	59	1,049	3	1,258	262	2	59	1,053
Jul-16	1,288	269	2	61	1,077	0	1,288	269	2	61	1,078
Aug-16	1,374	287	2	65	1,149	0	1,374	287	2	65	1,149
Sep-16	1,558	326	2	74	1,303	1	1,559	326	2	74	1,304
Oct-16	1,484	311	2	70	1,241	8	1,495	311	2	70	1,253
Nov-16	1,510	316	2	71	1,263	30	1,554	316	2	71	1,308
Dec-16	1,823	381	3	86	1,525	61	1,912	381	3	86	1,614
Jan-17	1,858	465	3	89	1,479	58	1,944	465	3	89	1,564
Feb-17	1,635	409	3	78	1,301	47	1,704	409	3	78	1,370
Mar-17	1,655	414	3	79	1,318	38	1,712	414	3	79	1,374
Apr-17	1,489	373	2	71	1,185	26	1,528	373	2	71	1,224
May-17	1,392	348	2	66	1,108	10	1,407	348	2	66	1,123
Jun-17	1,259	315	2	60	1,002	3	1,263	315	2	60	1,006
Jul-17	1,292	323	2	62	1,029	0	1,293	323	2	62	1,029
Aug-17	1,378	345	2	66	1,097	0	1,379	345	2	66	1,098
Sep-17	1,563	391	2	75	1,244	1	1,565	391	2	75	1,246
Oct-17	1,489	373	2	71	1,185	8	1,500	373	2	71	1,197
Nov-17	1,515	379	2	72	1,206	30	1,560	379	2	72	1,251
Dec-17	1,829	458	3	87	1,456	61	1,918	458	3	87	1,545
Jan-18	1,865	543	3	89	1,409	58	1,950	543	3	89	1,494
Feb-18	1,640	477	3	79	1,239	47	1,709	477	3	79	1,308
Mar-18	1,661	483	3	80	1,255	38	1,717	483	3	80	1,311
Apr-18	1,494	435	2	72	1,129	26	1,533	435	2	72	1,167
May-18	1,397	406	2	67	1,055	10	1,412	406	2	67	1,070
Jun-18	1,263	367	2	60	954	3	1,267	367	2	60	958
Jul-18	1,297	377	2	62	979	0	1,297	377	2	62	980
Aug-18	1,383	402	2	66	1,045	0	1,384	402	2	66	1,045
Sep-18	1,569	456	2	75	1,185	1	1,570	456	2	75	1,186
Oct-18	1,494	435	2	72	1,129	8	1,505	435	2	72	1,140
Nov-18	1,521	442	2	73	1,149	30	1,565	442	2	73	1,193
Dec-18	1,835	534	3	88	1,386	61	1,925	534	3	88	1,476
Jan-19	1,870	620	3	90	1,337	58	1,955	620	3	90	1,422
Feb-19	1,645	545	3	79	1,176	47	1,714	545	3	79	1,245
Mar-19	1,666	552	3	80	1,191	38	1,722	552	3	80	1,247
Apr-19	1,499	497	2	72	1,071	26	1,537	497	2	72	1,109
May-19	1,400	464	2	67	1,001	10	1,415	464	2	67	1,016
Jun-19	1,266	420	2	61	905	3	1,270	420	2	61	909
Jul-19	1,300	431	2	62	930	0	1,301	431	2	62	930
Aug-19	1,387	460	2	67	991	0	1,387	460	2	67	992
Sep-19	1,573	522	2	76	1,124	1	1,574	522	2	76	1,126
Oct-19	1,498	497	2	72	1,071	8	1,510	497	2	72	1,082
Nov-19	1,525	506	2	73	1,090	30	1,569	506	2	73	1,134
Dec-19	1,840	610	3	88	1,316	61	1,930	610	3	88	1,405
Jan-20	1,874	698	3	90	1,264	58	1,959	698	3	90	1,349
Feb-20	1,648	614	3	79	1,112	47	1,717	614	3	79	1,181
Mar-20	1,669	621	3	81	1,126	38	1,726	621	3	81	1,182
Apr-20	1,502	559	2	72	1,013	26	1,540	559	2	72	1,051
May-20	1,404	522	2	68	947	10	1,419	522	2	68	962
Jun-20	1,269	472	2	61	856	3	1,273	472	2	61	860
Jul-20	1,303	485	2	63	879	0	1,304	485	2	63	880
Aug-20	1,390	517	2	67	937	0	1,390	517	2	67	938
Sep-20	1,576	587	2	76	1,063	1	1,578	587	2	76	1,065
Oct-20	1,502	559	2	72	1,013	8	1,513	559	2	72	1,024
Nov-20	1,528	569	2	74	1,031	30	1,573	569	2	74	1,075
Dec-20	1,844	687	3	89	1,244	61	1,934	687	3	89	1,333

Noncore Commercial Demand Forecast (MDth)

Load per HDD: 14,773 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-21	1,878	775	3	91	1,191	58	1,963	775	3	91	1,276
Feb-21	1,652	682	3	80	1,048	47	1,721	682	3	80	1,117
Mar-21	1,673	690	3	81	1,061	38	1,729	690	3	81	1,117
Apr-21	1,505	621	2	73	954	26	1,543	621	2	73	993
May-21	1,406	580	2	68	892	10	1,421	580	2	68	907
Jun-21	1,272	525	2	62	807	3	1,276	525	2	62	811
Jul-21	1,306	539	2	63	828	0	1,307	539	2	63	829
Aug-21	1,393	575	2	67	883	0	1,393	575	2	67	884
Sep-21	1,580	652	2	76	1,002	1	1,581	652	2	76	1,003
Oct-21	1,505	621	2	73	954	8	1,516	621	2	73	966
Nov-21	1,531	632	2	74	971	30	1,576	632	2	74	1,016
Dec-21	1,848	763	3	89	1,172	61	1,938	763	3	89	1,262
Jan-22	1,884	853	3	91	1,120	58	1,969	853	3	91	1,205
Feb-22	1,657	750	3	80	985	47	1,726	750	3	80	1,054
Mar-22	1,678	759	3	81	997	38	1,734	759	3	81	1,054
Apr-22	1,510	683	2	73	897	26	1,548	683	2	73	936
May-22	1,411	639	2	69	839	10	1,426	639	2	69	854
Jun-22	1,276	577	2	62	758	3	1,280	577	2	62	762
Jul-22	1,310	593	2	64	779	0	1,311	593	2	64	779
Aug-22	1,397	632	2	68	831	0	1,398	632	2	68	831
Sep-22	1,585	717	2	77	942	1	1,586	717	2	77	943
Oct-22	1,509	683	2	73	897	8	1,521	683	2	73	908
Nov-22	1,536	695	2	75	913	30	1,580	695	2	75	957
Dec-22	1,854	839	3	90	1,102	61	1,943	839	3	90	1,192
Jan-23	1,890	930	3	92	1,049	58	1,976	930	3	92	1,135
Feb-23	1,663	818	3	81	923	47	1,732	818	3	81	992
Mar-23	1,684	829	3	82	935	38	1,740	829	3	82	991
Apr-23	1,515	745	2	74	841	26	1,553	745	2	74	879
May-23	1,416	697	2	69	786	10	1,431	697	2	69	801
Jun-23	1,280	630	2	62	711	3	1,284	630	2	62	715
Jul-23	1,314	647	2	64	730	0	1,315	647	2	64	730
Aug-23	1,402	690	2	68	778	0	1,403	690	2	68	779
Sep-23	1,590	782	2	77	883	1	1,591	782	2	77	884
Oct-23	1,515	745	2	74	841	8	1,526	745	2	74	852
Nov-23	1,541	758	2	75	856	30	1,586	758	2	75	900
Dec-23	1,860	915	3	91	1,033	61	1,950	915	3	91	1,122
Jan-24	1,897	1,008	3	93	979	58	1,982	1,008	3	93	1,064
Feb-24	1,669	886	3	81	861	47	1,738	886	3	81	930
Mar-24	1,690	898	3	82	872	38	1,746	898	3	82	928
Apr-24	1,520	808	2	74	785	26	1,558	808	2	74	823
May-24	1,421	755	2	69	733	10	1,436	755	2	69	748
Jun-24	1,285	682	2	63	663	3	1,289	682	2	63	667
Jul-24	1,319	701	2	64	681	0	1,320	701	2	64	681
Aug-24	1,407	747	2	69	726	0	1,408	747	2	69	727
Sep-24	1,596	848	2	78	824	1	1,597	848	2	78	825
Oct-24	1,520	807	2	74	785	8	1,531	807	2	74	796
Nov-24	1,547	822	2	75	798	30	1,591	822	2	75	843
Dec-24	1,867	992	3	91	964	61	1,956	992	3	91	1,053
Jan-25	1,904	1,085	3	93	909	58	1,989	1,085	3	93	994
Feb-25	1,674	954	3	82	799	47	1,743	954	3	82	868
Mar-25	1,696	967	3	83	810	38	1,752	967	3	83	866
Apr-25	1,526	870	2	75	728	26	1,564	870	2	75	767
May-25	1,426	813	2	70	681	10	1,441	813	2	70	696
Jun-25	1,289	735	2	63	615	3	1,293	735	2	63	620
Jul-25	1,324	755	2	65	632	0	1,324	755	2	65	633
Aug-25	1,412	805	2	69	674	0	1,412	805	2	69	675
Sep-25	1,601	913	2	78	764	1	1,603	913	2	78	766
Oct-25	1,525	870	2	75	728	8	1,537	870	2	75	739
Nov-25	1,552	885	2	76	741	30	1,597	885	2	76	785
Dec-25	1,874	1,068	3	92	894	61	1,963	1,068	3	92	984

Noncore Commercial Demand Forecast (MDth)

Load per HDD: 14,773 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-26	1,912	1,163	3	94	840	58	1,997	1,163	3	94	925
Feb-26	1,681	1,023	3	82	739	47	1,750	1,023	3	82	808
Mar-26	1,703	1,036	3	83	748	38	1,759	1,036	3	83	804
Apr-26	1,532	932	2	75	673	26	1,570	932	2	75	711
May-26	1,432	871	2	70	629	10	1,447	871	2	70	644
Jun-26	1,294	787	2	63	569	3	1,299	787	2	63	573
Jul-26	1,329	808	2	65	584	0	1,330	808	2	65	584
Aug-26	1,418	862	2	69	623	0	1,418	862	2	69	623
Sep-26	1,608	978	2	79	706	1	1,609	978	2	79	708
Oct-26	1,532	932	2	75	673	8	1,543	932	2	75	684
Nov-26	1,559	948	2	76	685	30	1,603	948	2	76	729
Dec-26	1,881	1,144	3	92	826	61	1,971	1,144	3	92	916
Jan-27	1,920	1,163	3	94	848	58	2,005	1,163	3	94	934
Feb-27	1,688	1,023	3	83	746	47	1,757	1,023	3	83	815
Mar-27	1,710	1,036	3	84	756	38	1,766	1,036	3	84	812
Apr-27	1,538	932	2	75	680	26	1,577	932	2	75	718
May-27	1,438	871	2	71	635	10	1,453	871	2	71	650
Jun-27	1,300	787	2	64	575	3	1,304	787	2	64	579
Jul-27	1,335	808	2	66	590	0	1,336	808	2	66	591
Aug-27	1,424	862	2	70	629	0	1,424	862	2	70	630
Sep-27	1,615	978	2	79	714	1	1,616	978	2	79	715
Oct-27	1,538	932	2	75	680	8	1,549	932	2	75	691
Nov-27	1,565	948	2	77	692	30	1,610	948	2	77	736
Dec-27	1,889	1,144	3	93	835	61	1,979	1,144	3	93	924
Jan-28	1,928	1,163	3	95	857	58	2,013	1,163	3	95	942
Feb-28	1,695	1,023	3	83	754	47	1,764	1,023	3	83	823
Mar-28	1,717	1,036	3	84	763	38	1,773	1,036	3	84	820
Apr-28	1,545	932	2	76	687	26	1,583	932	2	76	725
May-28	1,444	871	2	71	642	10	1,459	871	2	71	657
Jun-28	1,305	787	2	64	580	3	1,310	787	2	64	584
Jul-28	1,340	808	2	66	596	0	1,341	808	2	66	596
Aug-28	1,430	862	2	70	636	0	1,430	862	2	70	636
Sep-28	1,622	978	2	80	721	1	1,623	978	2	80	722
Oct-28	1,545	932	2	76	687	8	1,556	932	2	76	698
Nov-28	1,572	948	2	77	699	30	1,616	948	2	77	743
Dec-28	1,897	1,144	3	93	843	61	1,987	1,144	3	93	933
Jan-29	1,935	1,163	3	95	865	58	2,020	1,163	3	95	950
Feb-29	1,702	1,023	3	84	761	47	1,771	1,023	3	84	830
Mar-29	1,724	1,036	3	85	770	38	1,780	1,036	3	85	826
Apr-29	1,551	932	2	76	693	26	1,589	932	2	76	731
May-29	1,449	871	2	71	648	10	1,464	871	2	71	663
Jun-29	1,310	787	2	65	586	3	1,314	787	2	65	590
Jul-29	1,345	808	2	66	601	0	1,346	808	2	66	602
Aug-29	1,435	862	2	71	641	0	1,436	862	2	71	642
Sep-29	1,628	978	2	80	727	1	1,629	978	2	80	729
Oct-29	1,550	932	2	76	693	8	1,562	932	2	76	704
Nov-29	1,578	948	2	78	705	30	1,622	948	2	78	749
Dec-29	1,904	1,144	3	94	851	61	1,994	1,144	3	94	940
Jan-30	1,942	1,163	3	96	873	58	2,027	1,163	3	96	958
Feb-30	1,708	1,023	3	84	767	47	1,777	1,023	3	84	836
Mar-30	1,730	1,036	3	85	777	38	1,786	1,036	3	85	833
Apr-30	1,556	932	2	77	699	26	1,595	932	2	77	737
May-30	1,455	871	2	72	653	10	1,470	871	2	72	668
Jun-30	1,315	787	2	65	591	3	1,319	787	2	65	595
Jul-30	1,351	808	2	67	607	0	1,351	808	2	67	607
Aug-30	1,441	862	2	71	647	0	1,441	862	2	71	648
Sep-30	1,634	978	2	81	734	1	1,635	978	2	81	735
Oct-30	1,556	932	2	77	699	8	1,567	932	2	77	710
Nov-30	1,584	948	2	78	712	30	1,628	948	2	78	756
Dec-30	1,912	1,144	3	94	859	61	2,001	1,144	3	94	948

Noncore Industrial Demand Forecast (MDth)

	Industrial - All Temperature Years				
Date	IndModel	DSM	Vernon	Migr: g10-- > g30	Ind-All
Jan-11	4,415	0	0	0	4,415
Feb-11	4,011	0	0	0	4,011
Mar-11	4,506	0	0	0	4,506
Apr-11	4,287	0	0	0	4,287
May-11	4,374	0	0	0	4,374
Jun-11	4,112	0	0	0	4,112
Nov-11	3,692	0	0	0	3,692
Dec-11	3,407	0	0	0	3,407
Jan-12	4,508	26	0	63	4,546
Feb-12	4,096	23	0	57	4,130
Mar-12	4,601	26	0	64	4,639
Apr-12	4,377	25	0	61	4,413
May-12	4,466	26	0	63	4,503
Jun-12	4,199	24	0	59	4,234
Jul-12	4,653	27	0	65	4,691
Aug-12	5,166	30	0	72	5,209
Sep-12	4,797	27	0	67	4,837
Oct-12	4,442	25	0	62	4,479
Nov-12	3,770	22	0	53	3,801
Dec-12	3,479	20	0	49	3,508
Jan-13	4,499	52	12	102	4,537
Feb-13	4,087	47	11	93	4,123
Mar-13	4,591	53	12	105	4,631
Apr-13	4,368	50	12	100	4,406
May-13	4,457	51	12	102	4,495
Jun-13	4,190	48	11	95	4,226
Jul-13	4,643	53	13	106	4,683
Aug-13	5,155	59	14	117	5,200
Sep-13	4,787	55	13	109	4,828
Oct-13	4,433	51	12	101	4,471
Nov-13	3,762	43	10	86	3,794
Dec-13	3,472	40	9	79	3,501
Jan-14	4,490	77	24	122	4,510
Feb-14	4,079	70	22	111	4,098
Mar-14	4,582	79	25	125	4,603
Apr-14	4,360	75	24	119	4,379
May-14	4,448	77	24	121	4,468
Jun-14	4,182	72	23	114	4,201
Jul-14	4,634	80	25	126	4,655
Aug-14	5,145	89	28	140	5,168
Sep-14	4,778	82	26	130	4,799
Oct-14	4,424	76	24	120	4,444
Nov-14	3,754	65	20	102	3,771
Dec-14	3,465	60	19	94	3,480
Jan-15	4,466	103	37	129	4,455
Feb-15	4,058	94	33	117	4,048
Mar-15	4,558	105	37	131	4,547
Apr-15	4,336	100	36	125	4,326
May-15	4,425	102	36	128	4,414
Jun-15	4,160	96	34	120	4,150
Jul-15	4,609	107	38	133	4,598
Aug-15	5,118	118	42	148	5,105
Sep-15	4,753	110	39	137	4,741
Oct-15	4,400	102	36	127	4,389
Nov-15	3,735	86	31	108	3,725
Dec-15	3,446	80	28	99	3,438

Noncore Industrial Demand Forecast (MDth)

	Industrial - All Temperature Years				
Date	IndModel	DSM	Vernon	Migr: g10-->g30	Ind-All
Jan-16	4,456	129	49	132	4,410
Feb-16	4,048	117	45	120	4,007
Mar-16	4,548	132	50	135	4,501
Apr-16	4,326	125	48	128	4,282
May-16	4,415	128	49	131	4,369
Jun-16	4,150	120	46	123	4,108
Jul-16	4,599	133	51	136	4,551
Aug-16	5,106	148	56	151	5,053
Sep-16	4,742	137	52	140	4,693
Oct-16	4,390	127	48	130	4,345
Nov-16	3,726	108	41	110	3,687
Dec-16	3,438	100	38	102	3,403
Jan-17	4,435	155	49	134	4,365
Feb-17	4,030	141	45	121	3,966
Mar-17	4,527	158	50	136	4,455
Apr-17	4,307	150	48	130	4,238
May-17	4,394	153	49	132	4,325
Jun-17	4,131	144	46	125	4,066
Jul-17	4,577	160	51	138	4,505
Aug-17	5,083	177	56	153	5,002
Sep-17	4,720	165	52	142	4,645
Oct-17	4,370	153	48	132	4,301
Nov-17	3,709	130	41	112	3,650
Dec-17	3,423	120	38	103	3,368
Jan-18	4,414	181	49	134	4,319
Feb-18	4,011	164	45	122	3,924
Mar-18	4,505	184	50	137	4,408
Apr-18	4,286	175	48	131	4,193
May-18	4,373	179	49	133	4,279
Jun-18	4,112	168	46	125	4,023
Jul-18	4,556	186	51	139	4,457
Aug-18	5,058	207	56	154	4,949
Sep-18	4,697	192	52	143	4,596
Oct-18	4,349	178	48	133	4,255
Nov-18	3,691	151	41	112	3,611
Dec-18	3,406	139	38	104	3,333
Jan-19	4,391	206	49	135	4,271
Feb-19	3,989	188	45	123	3,880
Mar-19	4,481	211	50	138	4,359
Apr-19	4,263	200	48	131	4,147
May-19	4,350	205	49	134	4,231
Jun-19	4,090	192	46	126	3,978
Jul-19	4,532	213	51	140	4,408
Aug-19	5,032	237	56	155	4,894
Sep-19	4,673	220	52	144	4,545
Oct-19	4,326	203	48	133	4,208
Nov-19	3,672	173	41	113	3,571
Dec-19	3,388	159	38	104	3,296
Jan-20	4,365	232	49	136	4,219
Feb-20	3,966	211	45	124	3,834
Mar-20	4,454	237	50	139	4,306
Apr-20	4,238	226	48	132	4,097
May-20	4,324	230	49	135	4,180
Jun-20	4,065	216	46	127	3,930
Jul-20	4,504	240	51	140	4,355
Aug-20	5,001	266	56	156	4,835
Sep-20	4,645	247	52	145	4,490
Oct-20	4,300	229	48	134	4,157
Nov-20	3,650	194	41	114	3,528
Dec-20	3,368	179	38	105	3,256

Noncore Industrial Demand Forecast (MDth)

	Industrial - All Temperature Years				
Date	IndModel	DSM	Vernon	Migr: g10--> g30	Ind-All
Jan-21	4,340	258	49	137	4,169
Feb-21	3,943	235	45	124	3,788
Mar-21	4,429	263	50	140	4,255
Apr-21	4,213	251	48	133	4,048
May-21	4,299	256	49	136	4,131
Jun-21	4,042	240	46	128	3,884
Jul-21	4,479	266	51	141	4,303
Aug-21	4,973	296	56	157	4,778
Sep-21	4,618	275	52	146	4,437
Oct-21	4,276	254	48	135	4,108
Nov-21	3,629	216	41	115	3,486
Dec-21	3,349	199	38	106	3,217
Jan-22	4,312	284	49	138	4,117
Feb-22	3,918	258	45	125	3,741
Mar-22	4,401	290	50	141	4,202
Apr-22	4,187	276	48	134	3,998
May-22	4,273	281	49	137	4,079
Jun-22	4,017	264	46	128	3,835
Jul-22	4,451	293	51	142	4,249
Aug-22	4,942	325	56	158	4,718
Sep-22	4,589	302	52	147	4,381
Oct-22	4,249	280	48	136	4,057
Nov-22	3,606	237	41	115	3,443
Dec-22	3,328	219	38	106	3,177
Jan-23	4,284	310	49	139	4,064
Feb-23	3,892	281	45	126	3,692
Mar-23	4,372	316	50	141	4,147
Apr-23	4,159	301	48	135	3,945
May-23	4,244	307	49	137	4,026
Jun-23	3,990	289	46	129	3,785
Jul-23	4,421	320	51	143	4,194
Aug-23	4,909	355	56	159	4,656
Sep-23	4,558	330	52	147	4,324
Oct-23	4,221	305	48	137	4,004
Nov-23	3,582	259	41	116	3,398
Dec-23	3,306	239	38	107	3,136
Jan-24	4,257	336	49	139	4,012
Feb-24	3,868	305	45	127	3,645
Mar-24	4,345	342	50	142	4,095
Apr-24	4,134	326	48	135	3,896
May-24	4,218	332	49	138	3,975
Jun-24	3,966	313	46	130	3,737
Jul-24	4,394	346	51	144	4,141
Aug-24	4,879	385	56	160	4,598
Sep-24	4,531	357	52	148	4,270
Oct-24	4,195	331	48	137	3,953
Nov-24	3,560	281	41	117	3,355
Dec-24	3,285	259	38	108	3,096
Jan-25	4,233	361	49	140	3,963
Feb-25	3,846	328	45	127	3,601
Mar-25	4,320	369	50	143	4,045
Apr-25	4,110	351	48	136	3,848
May-25	4,194	358	49	139	3,927
Jun-25	3,943	337	46	131	3,691
Jul-25	4,369	373	51	145	4,090
Aug-25	4,851	414	56	161	4,541
Sep-25	4,505	385	52	149	4,217
Oct-25	4,171	356	48	138	3,905
Nov-25	3,540	302	41	117	3,314
Dec-25	3,267	279	38	108	3,058

Noncore Industrial Demand Forecast (MDth)

	Industrial - All Temperature Years				
Date	IndModel	DSM	Vernon	Migr: g10-- > g30	Ind-All
Jan-26	4,214	387	49	141	3,919
Feb-26	3,829	352	45	128	3,561
Mar-26	4,301	395	50	144	3,999
Apr-26	4,091	376	48	137	3,805
May-26	4,175	384	49	140	3,883
Jun-26	3,925	361	46	131	3,650
Jul-26	4,349	400	51	146	4,044
Aug-26	4,829	444	56	162	4,491
Sep-26	4,484	412	52	150	4,170
Oct-26	4,152	381	48	139	3,861
Nov-26	3,524	324	41	118	3,277
Dec-26	3,252	299	38	109	3,024
Jan-27	4,196	387	49	142	3,902
Feb-27	3,812	352	45	129	3,545
Mar-27	4,282	395	50	145	3,982
Apr-27	4,074	376	48	138	3,788
May-27	4,157	384	49	141	3,866
Jun-27	3,908	361	46	132	3,634
Jul-27	4,330	400	51	146	4,027
Aug-27	4,808	444	56	163	4,471
Sep-27	4,465	412	52	151	4,152
Oct-27	4,134	381	48	140	3,844
Nov-27	3,509	324	41	119	3,263
Dec-27	3,238	299	38	109	3,011
Jan-28	4,177	387	49	143	3,884
Feb-28	3,795	352	45	130	3,529
Mar-28	4,263	395	50	146	3,964
Apr-28	4,056	376	48	139	3,771
May-28	4,139	384	49	141	3,848
Jun-28	3,891	361	46	133	3,618
Jul-28	4,311	400	51	147	4,008
Aug-28	4,787	444	56	164	4,451
Sep-28	4,445	412	52	152	4,133
Oct-28	4,116	381	48	141	3,827
Nov-28	3,493	324	41	119	3,248
Dec-28	3,223	299	38	110	2,997
Jan-29	4,159	387	49	144	3,867
Feb-29	3,779	352	45	130	3,513
Mar-29	4,245	395	50	146	3,946
Apr-29	4,039	376	48	139	3,754
May-29	4,121	384	49	142	3,831
Jun-29	3,874	361	46	134	3,602
Jul-29	4,293	400	51	148	3,991
Aug-29	4,766	444	56	164	4,431
Sep-29	4,426	412	52	153	4,115
Oct-29	4,098	381	48	141	3,810
Nov-29	3,478	324	41	120	3,233
Dec-29	3,210	299	38	111	2,984
Jan-30	4,142	387	49	144	3,850
Feb-30	3,763	352	45	131	3,498
Mar-30	4,227	395	50	147	3,929
Apr-30	4,021	376	48	140	3,738
May-30	4,103	384	49	143	3,814
Jun-30	3,858	361	46	134	3,586
Jul-30	4,274	400	51	149	3,973
Aug-30	4,746	444	56	165	4,411
Sep-30	4,407	412	52	154	4,097
Oct-30	4,081	381	48	142	3,793
Nov-30	3,463	324	41	121	3,219
Dec-30	3,196	299	38	111	2,971

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

Month	2009 Forecast	Yr-2009 ["B4" DSM/COV/ Migr(g10-->g30)] for 2009 BCAP Pred G30-Com at 2010 Cgr Avg Hdd (MThm)	Weather Adj. Share of Ann. Total
1	Jan-09	21,598	10.125%
2	Feb-09	18,996	8.905%
3	Mar-09	19,238	9.019%
4	Apr-09	17,308	8.114%
5	May-09	16,175	7.582%
6	Jun-09	14,626	6.856%
7	Jul-09	15,018	7.040%
8	Aug-09	16,018	7.509%
9	Sep-09	18,167	8.516%
10	Oct-09	17,306	8.113%
11	Nov-09	17,612	8.256%
12	Dec-09	21,256	9.964%
		213,317	100.000%

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	3,710	8.58%
2	3,371	7.79%
3	3,786	8.75%
4	3,602	8.33%
5	3,676	8.50%
6	3,456	7.99%
7	3,829	8.85%
8	4,251	9.83%
9	3,948	9.13%
10	3,655	8.45%
11	3,102	7.17%
12	2,863	6.62%
	43,250	100.00%

Natural Gas Rates/Prices

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
2011	100.00	100.00	6.0232	5.9726	5.8203	5.9438
2012	101.56	101.56	5.1254	5.0745	5.1424	5.2518
2013	103.59	103.59	5.8604	5.8095	6.0171	6.1299
2014	105.59	105.59	6.2747	6.2239	6.4908	6.6071
2015	107.71	107.71	6.6208	6.5700	6.8964	7.0162
2016	109.89	109.89	6.6701	6.6194	7.0107	7.1343
2017	111.97	111.97	6.9774	6.9268	7.3834	7.5106
2018	114.07	114.07	7.3135	7.2629	7.7908	7.9216
2019	116.09	116.09	7.6562	7.6057	8.2057	8.3400
2020	118.11	118.11	7.9917	7.9412	8.6195	8.7572
2021	120.62	120.62	8.3397	8.2894	8.9879	9.1300
2022	123.23	123.23	8.6866	8.6363	9.3557	9.5023
2023	125.72	125.72	9.0262	8.9759	9.7171	9.8680
2024	128.32	128.32	9.3616	9.3115	10.0751	10.2305
2025	131.04	131.04	9.7002	9.6501	10.4367	10.5969
2026	133.89	133.89	9.9739	9.9239	10.7341	10.8992
2027	136.78	136.78	10.2549	10.2049	11.0396	11.2096
2028	139.73	139.73	10.5436	10.4937	11.3536	11.5287
2029	142.69	142.69	10.8395	10.7898	11.6758	11.8560
2030	145.70	145.70	11.1435	11.0939	12.0069	12.1923

Prices in Nominal $/Therm

Electricity Rates/Prices

Year	C Non Core Average Price	C Non Core Marginal Price	I Non Core Average Price	I Non Core Marginal Price
2011	9.05	6.38	9.05	6.38
2016	9.33	6.58	9.33	6.58
2017	9.44	6.66	9.44	6.66
2018	9.57	6.74	9.57	6.74
2019	9.69	6.83	9.69	6.83
2020	9.85	6.94	9.85	6.94
2021	10.04	7.08	10.04	7.08
2022	10.23	7.21	10.23	7.21
2023	10.43	7.35	10.43	7.35
2024	10.64	7.50	10.64	7.50
2025	10.84	7.64	10.84	7.64
2026	11.06	7.79	11.06	7.79
2027	11.27	7.94	11.27	7.94
2028	11.49	8.10	11.49	8.10
2029	11.71	8.26	11.71	8.26
2030	11.94	8.42	11.94	8.42

Prices in Nominal ¢/Kwh

Alternative Fuel (Propane) Prices

Year	C Non Core Average Price	C Non Core Marginal Price	I Non Core Average Price	I Non Core Marginal Price
2011	1.7954	1.7954	1.7954	1.7954
2012	1.9685	1.9685	2.2042	2.2042
2013	2.1737	2.1737	2.5760	2.5760
2014	2.2715	2.2715	2.7474	2.7474
2015	2.3585	2.3585	2.9081	2.9081
2016	2.4279	2.4279	3.0580	3.0580
2017	2.4971	2.4971	3.2078	3.2078
2018	2.5554	2.5554	3.3539	3.3539
2019	2.6159	2.6159	3.5028	3.5028
2020	2.6792	2.6792	3.6615	3.6615
2021	2.7379	2.7379	3.7496	3.7496
2022	2.7988	2.7988	3.8409	3.8409
2023	2.8608	2.8608	3.9342	3.9342
2024	2.9251	2.9251	4.0307	4.0307
2025	2.9903	2.9903	4.1290	4.1290
2026	3.0571	3.0571	4.2301	4.2301
2027	3.1249	3.1249	4.3330	4.3330
2028	3.1934	3.1934	4.4377	4.4377
2029	3.2634	3.2634	4.5451	4.5451
2030	3.3349	3.3349	4.6550	4.6550

Prices in Nominal $/Therm

Annual G30 Noncore C&I Gas Rates

						Nominal Dollars					Constant 2011 Dollars			
Year	Com Trsp Average ¢/Therm	Com Trsp Marginal ¢/Therm	Ind Trsp Average ¢/Therm	Ind Trsp Marginal ¢/Therm	CBSP ¢/Therm	Com B/T Average $/Dth	Com B/T Marginal $/Dth	Ind B/T Average $/Dth	Ind B/T Marginal $/Dth	CPI (Yr-2011 = 1.0000)	Com B/T Average 2011-$ /Dth	Com B/T Marginal 2011-$ /Dth	Ind B/T Average 2011-$ /Dth	Ind B/T Marginal 2011-$ /Dth
2011	**19.245**	**18.738**	**17.216**	**18.451**	**40.988**	**6.023**	**5.973**	**5.820**	**5.944**	**1.0000**	**6.023**	**5.973**	**5.820**	**5.944**
2012	18.117	17.608	16.254	17.347	32.972	5.109	5.058	4.923	5.032	1.0156	5.030	4.980	4.847	4.955
2013	18.747	18.239	16.843	17.972	39.574	5.832	5.781	5.642	5.755	1.0359	5.630	5.581	5.446	5.555
2014	18.926	18.418	16.981	18.144	43.487	6.241	6.191	6.047	6.163	1.0559	5.911	5.863	5.727	5.837
2015	19.414	18.907	17.429	18.626	46.408	6.582	6.531	6.384	6.503	1.0771	6.111	6.064	5.927	6.038
2016	19.851	19.344	17.822	19.057	46.408	6.626	6.575	6.423	6.547	1.0989	6.030	5.984	5.845	5.958
2017	20.285	19.779	18.214	19.485	48.990	6.928	6.877	6.720	6.848	1.1197	6.187	6.142	6.002	6.115
2018	20.724	20.219	18.610	19.918	51.850	7.257	7.207	7.046	7.177	1.1407	6.362	6.318	6.177	6.292
2019	21.148	20.643	18.993	20.336	54.791	7.594	7.543	7.378	7.513	1.1609	6.541	6.498	6.356	6.471
2020	21.571	21.067	19.375	20.753	57.657	7.923	7.872	7.703	7.841	1.1811	6.708	6.665	6.522	6.639
2021	22.095	21.591	19.848	21.269	60.592	8.269	8.218	8.044	8.186	1.2062	6.855	6.813	6.669	6.787
2022	22.639	22.136	20.339	21.805	63.497	8.614	8.563	8.384	8.530	1.2323	6.990	6.949	6.803	6.922
2023	23.156	22.654	20.806	22.315	66.352	8.951	8.901	8.716	8.867	1.2572	7.120	7.080	6.933	7.053
2024	23.697	23.195	21.294	22.848	69.144	9.284	9.234	9.044	9.199	1.2832	7.235	7.196	7.048	7.169
2025	24.262	23.761	21.804	23.405	71.941	9.620	9.570	9.374	9.535	1.3104	7.341	7.303	7.154	7.276
2026	24.850	24.350	22.334	23.984	74.066	9.892	9.842	9.640	9.805	1.3389	7.388	7.350	7.200	7.323
2027	25.446	24.947	22.871	24.572	76.255	10.170	10.120	9.913	10.083	1.3678	7.435	7.399	7.247	7.371
2028	26.053	25.555	23.419	25.170	78.510	10.456	10.406	10.193	10.368	1.3973	7.483	7.448	7.295	7.420
2029	26.664	26.167	23.970	25.773	80.832	10.750	10.700	10.480	10.660	1.4269	7.534	7.499	7.345	7.471
2030	27.286	26.789	24.530	26.385	83.224	11.051	11.001	10.775	10.961	1.4570	7.585	7.551	7.396	7.523
						Avg-Ann Growth Rate (2011 through 2030):					**1.2%**	**1.3%**	**1.4%**	**1.3%**

2011 G30 C&I Weight of Usage by Tier, BMW

	Service	Tier	Both	Com	Ind
Average	D	1	D1	88.29%	62.30%
Average	D	2	D2	11.71%	37.70%
Average	D	3	D3	0.00%	0.00%
Average	D	4	D4	0.00%	0.00%
Average	T	1	T1	99.12%	36.67%
Average	T	2	T2	0.88%	63.33%
Marginal	D	1	D1	88.74%	88.74%
Marginal	D	2	D2	11.26%	11.26%
Marginal	D	3	D3	0.00%	0.00%
Marginal	D	4	D4	0.00%	0.00%
Marginal	T	1	T1	98.19%	18.06%
Marginal	T	2	T2	1.81%	81.94%

2011 Volume (Therms)			Percent
Com&Ind	D&T	695,525,742	100.00%
Com&Ind	D	657,584,332	94.54%
Com&Ind	T	37,941,410	5.46%
Com	D&T	180,853,400	26.00%
Ind	D&T	514,672,342	74.00%
Com	D	172,463,798	95.36%
Com	T	8,389,602	4.64%
Ind	D	485,120,534	94.26%
Ind	T	29,551,808	5.74%

Obs	seg	service	_TYPE_	("Cust Cnt") _FREQ_	G-30 C&I (Non-Refinery) Therms	Prop/Pct.	Annual Therms/"Cust"
1			0	609	695,525,742	100.0%	1,142,078
2		D	1	583	657,584,332	94.5%	1,127,932
3		T	1	26	37,941,410	5.5%	1,459,285
4	COM		2	243	180,853,400	26.0%	744,253
5	IND		2	366	514,672,342	74.0%	1,406,209
6	COM	D	3	229	172,463,798	95.4%	753,117
7	COM	T	3	14	8,389,602	4.6%	599,257
8	IND	D	3	354	485,120,534	94.3%	1,370,397
9	IND	T	3	12	29,551,808	5.7%	2,462,651

Gas Transp. Forecast from Rate Design (Nominal Cents per Therm)

Year	PPP (¢/Thm)	Dcharge ($/mo /mtr)	D1 (¢/Thm)	D2 (¢/Thm)	D3 (¢/Thm)	D4 (¢/Thm)	Trans Option: "Class Averge" Tcharge ($/mo /mtr)	T1 (¢/Thm)	T2 (¢/Thm)	Trans Option: "Reservation" Tcharge (¢/Thm/day per Mtr)	T1 (¢/Thm)	T2 (¢/Thm)	CPI	CBSP $/Dth
2011	3.476	$350	19.429	13.040	8.884	6.495	$0	5.759	5.680	1.355	3.901	3.901	1.000	4.10
2012	3.52	$350	18.23	12.44	8.66	6.55	$0	5.30	5.30	0.84	4.07	4.07	1.016	3.30
2013	3.59	$350	18.88	12.94	9.07	6.88	$0	5.64	5.64	0.88	4.35	4.35	1.036	3.96
2014	3.66	$350	19.08	12.99	9.03	6.78	$0	5.53	5.53	0.91	4.20	4.20	1.056	4.35
2015	3.73	$350	19.58	13.35	9.29	6.98	$0	5.74	5.74	0.93	4.37	4.37	1.077	4.64
2016	3.81	$350	20.04	13.65	9.49	7.10	$0	5.86	5.86	0.97	4.45	4.45	1.099	4.64
2017	3.88	$350	20.49	13.95	9.69	7.23	$0	6.00	6.00	1.00	4.53	4.53	1.120	4.90
2018	3.95	$350	20.94	14.25	9.90	7.37	$0	6.13	6.13	1.03	4.63	4.63	1.141	5.19
2019	4.02	$350	21.38	14.54	10.10	7.50	$0	6.27	6.27	1.06	4.71	4.71	1.161	5.48
2020	4.09	$350	21.82	14.84	10.30	7.64	$0	6.40	6.40	1.09	4.80	4.80	1.181	5.77
2021	4.18	$350	22.37	15.20	10.54	7.80	$0	6.56	6.56	1.13	4.91	4.91	1.206	6.06
2022	4.27	$350	22.93	15.57	10.80	7.97	$0	6.73	6.73	1.17	5.02	5.02	1.232	6.35
2023	4.36	$350	23.47	15.93	11.04	8.13	$0	6.89	6.89	1.21	5.12	5.12	1.257	6.64
2024	4.45	$350	24.03	16.30	11.29	8.29	$0	7.06	7.06	1.25	5.23	5.23	1.283	6.91
2025	4.54	$350	24.62	16.69	11.56	8.47	$0	7.23	7.23	1.29	5.35	5.35	1.310	7.19
2026	4.64	$350	25.23	17.10	11.83	8.64	$0	7.41	7.41	1.34	5.46	5.46	1.339	7.41
2027	4.74	$350	25.85	17.51	12.11	8.83	$0	7.59	7.59	1.38	5.57	5.57	1.368	7.63
2028	4.84	$350	26.48	17.93	12.39	9.01	$0	7.77	7.77	1.43	5.69	5.69	1.397	7.85
2029	4.95	$350	27.12	18.35	12.67	9.19	$0	7.96	7.96	1.47	5.81	5.81	1.427	8.08
2030	5.05	$350	27.76	18.77	12.96	9.38	$0	8.14	8.14	1.52	5.93	5.93	1.457	8.32

Example of Calculations: 2015 Noncore Industrial *Average* Gas Price:

Transportation Charge (¢/Thm):	17.429	=	+ (94.3% Ind Dist of total Ind) * { [(100 ¢/$ *12 Mo/Yr)*($350.00 /mo/mtr)/(1,370,397 Thm/Mtr Ind Dist)]
			+ (62.30%* 19.58 ¢/Thm + 37.70%* 13.35 ¢/Thm + 0.00%* 9.29 ¢/Thm + 0.00%* 6.98 ¢/Thm) }
			+ (5.7% Ind Trans of total Ind) * { [(100 ¢/$ *12 Mo/Yr)*($0.00 /mo/mtr)/(2,462,651 Thm/Mtr Ind Trans)]
			+ (36.67%* 19.58 ¢/Thm+63.33%* 13.35¢/Thm) }
Gas Commodity Price (¢/Thm):	46.408	=	("CBSP", market price of gas at the SoCalGas City Gate)
Gas Transp + Cmdty (¢/Thm):	63.837	=	(at "GasPrices" worksheet AVERAGE price)
GHG "Adder" (¢/Thm):	5.127	=	(36.03% of 2011 Noncore Ind Mkt "Self-Pay" * $26.84 CO2/ MT Nat Gas * 0.05302 Emissions MT/ Dth * 1 Dth/ 10 Th)
Customer's "Burner-Tip" Price:	68.964	=	(46.408 + 18.626 + 5.127) ¢/Thm

Example of Calculations: 2015 Noncore Industrial *Marginal* Gas Price:

Transportation Charge (¢/Thm):	18.626	=	+ (94.3% Ind Dist of total Ind) * { (88.74%* 19.58 ¢/Thm + 11.26%* 13.35 ¢/Thm + 0.00%* 9.29 ¢/Thm + 0.00%* 6.98 ¢/Thm) }
			+ (5.7% Ind Trans of total Ind) * { (18.06%* 19.58¢/Thm+81.94%* 13.35¢/Thm) }
Gas Commodity Price (¢/Thm):	46.408	=	("CBSP", market price of gas at the SoCalGas City Gate)
Gas Transp + Cmdty (¢/Thm):	65.035	=	(at "GasPrices" worksheet MARGINAL price)
GHG "Adder" (¢/Thm):	5.127	=	(36.03% of 2011 Noncore Ind Mkt "Self-Pay" * $26.84 CO2/ MT Nat Gas * 0.05302 Emissions MT/ Dth * 1 Dth/ 10 Th)
Customer's "Burner-Tip" Price:	70.162	=	(46.408 + 18.626 + 5.127) ¢/Thm

WP_Com_NCore_11_Source_Data(Linked_11May2012)_Part2.xls - CGR_Employment_Data

YEAR	Office	Restaurant	Retail	Laundry	Warehouse	School	College	Health	Lodging	Misc	Governmen	TCU	Constructic	Agriculture	EMPLTOT
2011	1.59961	0.59239	0.96663	0.08271	0.42381	0.60835	0.20278	0.78130	0.09882	0.23835	0.62439	0.55625	0.30718	0.23030	7.31288
2012	1.66626	0.60572	0.98837	0.08270	0.43261	0.61709	0.20570	0.79637	0.09983	0.23833	0.62954	0.57380	0.34232	0.23742	7.51606
2013	1.72189	0.61243	0.99933	0.08296	0.43825	0.63302	0.21101	0.80657	0.10116	0.23908	0.64154	0.58678	0.38346	0.24306	7.70056
2014	1.74677	0.61798	1.00839	0.08346	0.44242	0.64466	0.21489	0.81736	0.10204	0.24051	0.65049	0.59805	0.40684	0.24721	7.82109
2015	1.75801	0.62354	1.01745	0.08360	0.44494	0.65112	0.21704	0.82973	0.10263	0.24091	0.65519	0.60842	0.42270	0.25199	7.90727
2016	1.77985	0.62680	1.02276	0.08357	0.44727	0.65514	0.21838	0.84419	0.10319	0.24083	0.65796	0.61736	0.43275	0.25722	7.98726
2017	1.80134	0.63120	1.02995	0.08355	0.44965	0.65932	0.21977	0.85802	0.10378	0.24076	0.66099	0.62711	0.44173	0.26239	8.06956
2018	1.82773	0.63535	1.03671	0.08346	0.45253	0.66451	0.22150	0.87226	0.10439	0.24052	0.66492	0.63477	0.45149	0.26744	8.15760
2019	1.86435	0.63822	1.04140	0.08342	0.45566	0.67006	0.22335	0.88520	0.10520	0.24038	0.66911	0.63866	0.46247	0.27200	8.24948
2020	1.90313	0.64177	1.04720	0.08355	0.45719	0.67613	0.22538	0.89528	0.10598	0.24077	0.67588	0.64124	0.47542	0.27508	8.34400
2021	1.94117	0.64676	1.05534	0.08401	0.45766	0.68248	0.22749	0.90524	0.10677	0.24209	0.67450	0.64760	0.48883	0.27843	8.43840
2022	1.97379	0.65149	1.06306	0.08453	0.46112	0.68880	0.22960	0.91469	0.10769	0.24359	0.67935	0.65665	0.50082	0.28198	8.53716
2023	2.00865	0.65606	1.07051	0.08501	0.46439	0.69475	0.23158	0.92540	0.10865	0.24499	0.68391	0.66668	0.51164	0.28571	8.63792
2024	2.04505	0.65996	1.07688	0.08550	0.46780	0.70015	0.23338	0.93644	0.10956	0.24640	0.68797	0.67704	0.52199	0.28949	8.73762
2025	2.08219	0.66428	1.08392	0.08603	0.47103	0.70574	0.23525	0.94717	0.11048	0.24793	0.69221	0.68658	0.53183	0.29326	8.83791
2026	2.11871	0.66878	1.09127	0.08661	0.47213	0.71150	0.23717	0.95856	0.11145	0.24958	0.69656	0.69502	0.54156	0.29707	8.93596
2027	2.15501	0.67399	1.09977	0.08714	0.47350	0.71680	0.23893	0.97110	0.11250	0.25113	0.70051	0.70291	0.55258	0.30128	9.03714
2028	2.19132	0.67951	1.10878	0.08767	0.47481	0.72192	0.24064	0.98354	0.11356	0.25265	0.70431	0.71012	0.56153	0.30543	9.13579
2029	2.23006	0.68475	1.11733	0.08818	0.47583	0.72677	0.24226	0.99627	0.11468	0.25410	0.70787	0.71349	0.56853	0.30936	9.22947
2030	2.27129	0.68935	1.12484	0.08865	0.47592	0.73114	0.24371	1.00824	0.11574	0.25546	0.71540	0.71556	0.57434	0.31341	9.32307
AvgAnn Gwth (2011-2030)	1.9%	0.8%	0.8%	0.4%	0.6%	1.0%	1.0%	1.4%	0.8%	0.4%	0.7%	1.3%	3.3%	1.6%	1.3%

WP_Com_NCore_11_Source_Data(Linked_11May2012)_Part2.xls - saturations

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

WP_Com_NCore_11_Source_Data(Linked_11May2012)_Part2.xls - saturations

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

WP_Com_NCore_11_Source_Data(Linked_11May2012)_Part2.xls - ComNCoreAvgEQAge

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

Year Equipment Installed

WP_Com_NCore_11_Source_Data(Linked_11May2012)_Part2.xls ComNCoreUsePerMeterAvg

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other	Total Building
Office	235374	97723	11919	3962	3023	12329	2645	4034	11733	3352	234685	620778
Restaurant	0	0	0	0	0	0	0	0	0	0	0	0
Retail	108029	65616	23891	3979	26611	45873	28368	6294	12096	966	149693	471417
Laundry	1819	28923	237	37	59	344	2	55	290547	0	270542	592563
Warehouse	97917	28446	4047	1128	9753	11215	14337	11142	32562	9673	315072	535291
School	0	0	0	0	0	0	0	0	0	0	0	0
College	521608	257644	25169	7425	12908	30982	7161	32603	7907	11080	354753	1269242
Health	270373	169416	27153	5259	7376	20881	11810	4894	37193	2773	285868	842997
Lodging	86498	176677	24386	5952	7621	29696	14616	1429	46028	30	199688	592622
Misc	183131	111846	22645	4521	7452	18613	5949	18856	7240	1389	123598	505242
Government	338926	197037	17317	8534	5066	14254	7732	9048	4571	50058	132811	785352
TCU	96317	34626	3050	758	1438	2671	1824	4705	297	151118	159761	456564
Construction	15311	4785	384	2	57	213	131	454	2863	10	22588	46799
Agriculture	107193	25971	4411	736	9174	20399	18546	252	27034	177249	357898	748861

WP_Com_NCore_11_Source_Data(Linked_11May2012)_Part2.xls - 2011_Historical_Data_Agg .

Segment	2011 Therm Sales	2011 Meter Count	2011 Meter Count, Existing/Old customers	2011 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	11,637,192	20	20	0	1684759	0	-0.046000	0.474000	6881366
Warehouse + School + College	21,378,455	18	18	0	1804533	0	-0.046000	0.474000	10064926
Health	69,968,765	83	83	0	842997	0	-0.046000	0.474000	1707720
Lodging + Misc	11,677,675	20	20	0	1097863	0	-0.046000	0.474000	14736871
Government	25,916,620	33	33	0	785352	0	-0.046000	0.474000	3533422
TCU	21,458,511	47	47	0	456564	0	-0.046000	0.474000	2992940
Construction + Agriculture	15,772,886	22	22	0	795660	0	-0.046000	0.474000	2571346
Total	177,810,104	301							

Adjustment for Normal Year Year

Normal Year HDD	**1,375**	HDD
Actual **2011** HDD	**1,581**	HDD
HDD Difference	-206	HDD
Load per HDD	14,773	Therm/HDD
Temperature Adj.	-3,043,296	Therms

	Actual 2011	Ratio
Office + Restaurant + Retail + Laundry	11,836,368	6.54%
Warehouse + School + College	21,744,356	12.02%
Health	71,166,310	39.35%
Lodging + Misc	11,877,543	6.57%
Government	26,360,194	14.58%
TCU	21,825,783	12.07%
Construction + Agriculture	16,042,846	
G30 Commercial	180,853,400	177,810,104

WP_Ind_NCore_11_Source_Data(Linked_11May2012)_Part3.xls - IndNonCoreEmpFcast

YEAR	Mining	Food	Textile	Wood_Pap	Chemical	Petroleum	Stone	Prim_Metal	Fab_Metal	Transport	Misc	EMPLTOT
2011	18.11392	112.62725	31.65325	21.41867	37.30008	5.81367	18.60783	10.03800	77.63467	70.13008	373.48392	776.82133
2012	18.36375	113.49117	32.52200	23.00783	38.26833	5.72292	19.84883	10.42392	83.70442	72.48267	382.24042	800.07625
2013	18.66175	113.45300	32.74733	23.64008	38.89692	5.59358	21.04642	10.40458	91.85175	74.37975	390.00217	820.67733
2014	18.53900	113.07783	32.47308	23.70558	39.25650	5.44425	21.46233	10.39700	98.47558	75.45025	390.37883	828.66025
2015	18.17350	112.21217	31.97708	23.61508	39.70992	5.28783	21.38658	10.30717	102.03750	75.26717	389.87108	829.84508
2016	17.73067	111.68408	31.58025	23.80300	40.24192	5.17833	21.29317	10.20825	103.38583	73.80408	389.79617	828.70575
2017	17.28917	111.32850	31.36208	23.92183	40.83867	5.07292	21.35808	10.18417	103.69242	72.65500	389.41425	827.11708
2018	16.74083	110.90050	31.21142	24.11508	41.47475	4.96800	21.54025	10.18933	103.31425	72.07717	389.21858	825.75017
2019	16.18800	110.24725	31.09658	24.25367	42.02417	4.83800	21.63892	10.19642	103.53508	71.65050	386.78392	822.45250
2020	15.82233	109.51767	31.02500	24.32667	42.41983	4.68833	21.57175	10.17708	103.40483	71.03467	382.56267	816.55083
2021	15.53958	108.78767	30.88217	24.28100	42.79708	4.53950	21.45192	10.10958	102.97583	70.27425	378.78950	810.42808
2022	15.25325	107.98342	30.73925	24.15183	43.08750	4.45825	21.29317	9.96325	102.15942	69.54200	374.67692	803.30825
2023	14.99542	107.15958	30.73942	23.98917	43.33950	4.42767	21.11517	9.75533	100.72450	68.82708	370.16383	795.23667
2024	14.74092	106.38242	30.79892	23.81775	43.56175	4.41117	20.93450	9.55442	99.57450	68.12975	366.71550	788.62158
2025	14.53325	105.60192	30.98958	23.76783	43.68525	4.38917	20.87958	9.35242	98.32825	67.54867	363.14033	782.21625
2026	14.41250	104.82308	31.18400	23.76458	43.85192	4.34717	20.89117	9.16600	97.27458	67.12050	358.34992	775.18542
2027	14.33992	104.16933	31.38250	23.60617	44.09583	4.30017	20.86775	9.01008	96.45550	66.76758	353.67950	768.67433
2028	14.29200	103.60167	31.51717	23.33000	44.39767	4.24808	20.79617	8.84792	95.34708	66.38200	349.91208	762.67183
2029	14.25092	103.11108	31.53717	23.11633	44.68458	4.17992	20.76292	8.69592	94.31133	66.00708	346.72775	757.38500
2030	14.20108	102.64883	31.63242	23.16450	44.93683	4.11225	20.82125	8.48050	93.32925	65.71267	344.00317	753.04275
AvgAnn Gwth (2011-2030)	-1.3%	-0.5%	0.0%	0.4%	1.0%	-1.8%	0.6%	-0.9%	1.0%	-0.3%	-0.4%	-0.2%

WP_Ind_NCore_11_Source_Data(Linked_11May2012)_Part3.xls - IndNonCoreUsePerMeterAvg

Segment	Fire_Tube_Boil	Wat_Tube_Boil	Space_Heat	Water_Heat	Dryer	Furnace_Oven_ Kiln	AC	Engine	Misc_Other	Total
Mining	135657	537020	6980	4158	360483	944728	0	39180	18833	2047039
Food	879689	238082	9519	12401	327015	80205	905	2641	62989	1613447
Textile	533786	73459	4407	14020	244111	77342	0	8085	32935	988145
Wood_Paper	218654	549084	93	383	81642	46918	0	0	34146	930921
Chemical	603418	188849	4238	2946	0	29203	9705	0	352151	1190511
Petroleum	48039	0	21561	1663	182000	579199	0	0	59953	892415
Stone	63110	0	9783	1771	39738	1645150	0	0	79347	1838900
Prim_Metal	55328	198573	6235	717	65539	2448870	224	0	236403	3011888
Fab_Metal	134040	14080	18231	1892	2963	800019	61	1114	158536	1130935
Transport	98180	147220	29900	3131	1746	822283	231	0	144190	1246880
Misc	237685	78773	9643	10086	17667	163770	3	0	151577	669206

WP_Ind_NCore_11_Source_Data(Linked_11May2012)_Part3.xls - IndNonCoreSat

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

WP_Ind_NCore_11_Source_Data(Linked_11May2012)_Part3.xls - IndNonCoreGasShare

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

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

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

WP_Ind_NCore_11_Source_Data(Linked_11May2012)_Part3.xls - IndNonCoreElecUec

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

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

WP_Ind_NCore_11_Source_Data(Linked_11May2012)_Part3.xls - IndNonCoreAvgEQAge

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

WP_Ind_NCore_11_Source_Data(Linked_11May2012)_Part3.xls - 2011_Historical_Data_Agg

Segment	2011 Therm Sales	2011 Meter Count	2011 Meter Count, Existing/Old customers	2011 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	24,564,473	12	12	0	2047039	.	-0.071000	0.474000	13.2900	177.2025	8539
Food	188,279,857	108	108	0	1613447	.	-0.071000	0.474000	12.7700	116.3474	2356
Textile	21,739,179	22	22	0	988145	.	-0.071000	0.474000	13.0200	271.4589	11002
Wood_Paper	33,513,141	36	36	0	930921	.	-0.071000	0.474000	8.3700	11.8754	3237
Chemical	34,524,814	29	29	0	1190511	.	-0.071000	0.474000	17.2700	728.2737	17662
Petroleum	33,019,367	37	37	0	892415	.	-0.071000	0.474000	3.7300	0.3081	47145
Stone	29,422,395	16	16	0	1838900	.	-0.071000	0.474000	6.2300	40.1230	42397
Prim_Metal	66,261,544	22	22	0	3011888	.	-0.071000	0.474000	20.0200	184.5367	15764
Fab_Metal	45,237,385	40	40	0	1130935	.	-0.071000	0.474000	9.0100	16.8171	21333
Transport	18,703,202	15	15	0	1246880	.	-0.071000	0.474000	7.9900	966.3551	6969
Misc	19,406,985	29	29	0	669206	.	-0.071000	0.474000	9.4800	226.5333	17929
Total	514,672,342	366									

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

Weather Sensitivity Factor (MTherm)

	Date	Actual G30 Industrial (Non-refinery)	Calendar HDD	Yr_06	Yr_07	Yr_08	M_01	M_02	M_03	M_04	M_05	M_06	M_07	M_09	M_10	M_11	M_12	M_08
2006	Jan-06	5,293	271	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
2006	Feb-06	4,953	203	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
2006	Mar-06	5,646	341	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
2006	Apr-06	5,388	161	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
2006	May-06	5,523	32	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
2006	Jun-06	5,216	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
2006	Jul-06	5,367	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
2006	Aug-06	6,110	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2006	Sep-06	5,579	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2006	Oct-06	5,274	39	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
2006	Nov-06	4,819	103	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2006	Dec-06	4,532	272	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
2007	Jan-07	5,079	345	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
2007	Feb-07	4,652	213	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
2007	Mar-07	5,212	131	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
2007	Apr-07	5,029	122	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
2007	May-07	5,149	52	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0
2007	Jun-07	4,831	15	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0
2007	Jul-07	5,300	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
2007	Aug-07	5,702	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2007	Sep-07	5,365	11	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
2007	Oct-07	5,166	40	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0
2007	Nov-07	4,461	124	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
2007	Dec-07	4,137	351	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
2008	Jan-08	4,542	346	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
2008	Feb-08	4,205	263	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
2008	Mar-08	4,328	153	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
2008	Apr-08	4,252	124	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0
2008	May-08	4,143	81	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0
2008	Jun-08	3,859	6	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
2008	Jul-08	4,237	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0
2008	Aug-08	4,448	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
2008	Sep-08	4,285	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
2008	Oct-08	3,976	23	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
2008	Nov-08	3,359	74	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0
2008	Dec-08	3,123	334	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0
2009	Jan-09	3,491	191	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
2009	Feb-09	3,238	259	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
2009	Mar-09	3,525	197	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
2009	Apr-09	3,306	135	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
2009	May-09	3,453	21	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
2009	Jun-09	3,483	14	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
2009	Jul-09	3,978	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
2009	Aug-09	4,311	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2009	Sep-09	4,129	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
2009	Oct-09	3,772	41	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
2009	Nov-09	3,336	116	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
2009	Dec-09	3,226	316	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

2006	63,701	1,422		
2007	60,082	1,404	-3.6	-5.7%
2008	48,757	1,404	-11.3	-18.8%
2009	**43,249.8318**	1,291	-5.5	-11.3%

WP_g30-g50_LoadWeatherSensitivity_Part4.xls(G30Com-Reg#2(w_Hdd))

SUMMARY OUTPUT

Regression Statistics		
Multiple R	0.94757333	
R Square	0.89789521	
Adjusted R Square	0.85003359	
Standard Error	95.673709	
Observations	48	**(Jan-2006 through Dec-2009)**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	2575815.39	171721.026	18.7602341	9.91636E-12
Residual	32	292910.675	9153.45859		
Total	47	2868726.07			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept (Yr_09, M_08)	1599.9	53.6	29.86	6.1023E-25	1490.8	1709.0
Calendar HDD	**1.5**	**0.4**	**3.57**	0.00115413	0.6	2.3
Yr_06	71.9	39.3	1.83	0.07691218	-8.2	152.0
Yr_07	-64.5	39.3	-1.64	0.110096	-144.5	15.4
Yr_08	18.3	39.3	0.47	0.64480173	-61.7	98.2
M_01	140.0	137.2	1.02	0.31491605	-139.3	419.4
M_02	-43.8	118.3	-0.37	0.7137674	-284.8	197.2
M_03	46.4	108.7	0.43	0.67249061	-175.0	267.7
M_04	-49.3	87.9	-0.56	0.57904086	-228.3	129.7
M_05	-54.8	70.3	-0.78	0.44200569	-198.0	88.5
M_06	-157.4	67.7	-2.32	0.02671451	-295.4	-19.4
M_07	-100.7	67.7	-1.49	0.1463124	-238.5	37.1
M_09	211.3	67.7	3.12	0.00378129	73.5	349.2
M_10	78.1	69.3	1.13	0.26807701	-63.0	219.1
M_11	-49.3	80.2	-0.61	0.54349618	-212.7	114.2
M_12	80.8	148.1	0.55	0.58907236	-220.8	382.4

RESIDUAL OUTPUT

Observation	*Predicted Y-ComReg#2(w Hdd)*	*Residuals-ComReg#2(w Hdd)*	*Standard Residuals*	*Date*
1	2212.2	16.2	0.205	**Jan-06**
2	1927.9	43.6	0.552	**Feb-06**
3	2221.9	66.1	0.837	**Mar-06**
4	1860.4	74.8	0.948	**Apr-06**
5	1664.3	38.4	0.486	**May-06**
6	1514.4	-18.6	-0.236	**Jun-06**
7	1571.1	-79.8	-1.011	**Jul-06**
8	1671.8	-136.2	-1.725	**Aug-06**
9	1883.1	-226.9	-2.875	**Sep-06**
10	1807.5	121.5	1.539	**Oct-06**
11	1774.7	9.0	0.113	**Nov-06**
12	2154.4	92.1	1.167	**Dec-06**
13	2185.1	101.4	1.284	**Jan-07**
14	1806.3	51.8	0.656	**Feb-07**
15	1775.3	57.5	0.729	**Mar-07**
16	1666.4	57.6	0.729	**Apr-07**
17	1557.5	53.0	0.671	**May-07**
18	1400.2	42.4	0.537	**Jun-07**
19	1434.7	-70.2	-0.890	**Jul-07**
20	1535.4	-84.4	-1.070	**Aug-07**
21	1763.0	-62.7	-0.794	**Sep-07**
22	1672.6	-76.5	-0.969	**Oct-07**
23	1669.3	-30.4	-0.385	**Nov-07**
24	2134.8	-39.4	-0.499	**Dec-07**
25	2269.4	-105.2	-1.332	**Jan-08**
26	1962.9	-33.0	-0.419	**Feb-08**
27	1890.6	-89.1	-1.129	**Mar-08**
28	1752.1	-74.3	-0.941	**Apr-08**
29	1683.1	-40.1	-0.508	**May-08**
30	1469.7	4.6	0.059	**Jun-08**
31	1517.5	131.1	1.661	**Jul-08**
32	1618.2	105.4	1.335	**Aug-08**
33	1829.5	156.2	1.979	**Sep-08**
34	1730.2	-65.4	-0.828	**Oct-08**
35	1678.2	32.4	0.411	**Nov-08**
36	2192.4	-22.7	-0.288	**Dec-08**
37	2022.1	-12.4	-0.157	**Jan-09**
38	1938.8	-62.3	-0.790	**Feb-09**
39	1937.3	-34.5	-0.437	**Mar-09**
40	1750.1	-58.1	-0.736	**Apr-09**
41	1576.2	-51.2	-0.649	**May-09**
42	1463.2	-28.4	-0.359	**Jun-09**
43	1500.7	19.0	0.240	**Jul-09**
44	1599.9	115.2	1.459	**Aug-09**
45	1811.2	133.4	1.690	**Sep-09**
46	1738.5	20.4	0.259	**Oct-09**
47	1722.0	-11.0	-0.139	**Nov-09**
48	2147.6	-30.0	-0.380	**Dec-09**

2012 CALIFORNIA GAS REPORT

NATURAL GAS VEHICLES
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The Gas Company

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Table of Content

A:SoCalGas compressed and uncompressed throughput forecast 2012 through 2030 in MDTH

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL	RATE	NGVTYPE
	4%	4%													
2011	13	12	14	13	13	13	12	13	13	8	12	12	148	GNV	C
2012	13	12	15	14	14	14	12	13	13	8	13	13	154	GNV	C
2013	14	13	15	14	15	14	13	14	14	9	13	13	161	GNV	C
2014	14	13	16	15	15	15	13	15	14	9	14	14	167	GNV	C
2015	15	14	17	16	16	16	14	15	15	10	14	14	174	GNV	C
2016	15	14	17	16	16	16	14	16	15	10	15	15	181	GNV	C
2017	16	15	18	17	17	17	15	16	16	10	15	15	187	GNV	C
2018	17	16	19	17	18	17	15	17	16	11	16	16	194	GNV	C
2019	17	16	19	18	18	18	16	18	17	11	16	16	201	GNV	C
2020	18	17	20	19	19	19	16	18	18	11	17	17	207	GNV	C
2021	18	17	20	19	19	19	17	19	18	12	18	18	214	GNV	C
2022	19	18	21	20	20	20	17	19	19	12	18	18	220	GNV	C
2023	19	18	22	20	21	20	18	20	19	12	19	19	227	GNV	C
2024	20	19	22	21	21	21	18	20	20	13	19	19	233	GNV	C
2025	20	19	23	21	22	22	19	21	20	13	20	20	240	GNV	C
2026	21	20	24	22	22	22	19	22	21	14	20	20	246	GNV	C
2027	22	20	24	23	23	23	20	22	21	14	21	21	253	GNV	C
2028	22	21	25	23	24	23	20	23	22	14	21	21	259	GNV	C
2029	23	21	25	24	24	24	21	23	22	15	22	22	265	GNV	C
2030	23	22	26	24	25	24	21	24	23	15	22	22	271	GNV	C
2011	826	746	888	846	873	859	829	886	883	883	832	842	10,193	GNV	U
2012	863	779	927	883	912	897	866	925	922	922	869	879	10,644	GNV	U
2013	899	812	967	921	950	935	903	965	961	961	906	917	11,098	GNV	U
2014	936	846	1,007	959	990	974	940	1,004	1,001	1,001	943	954	11,554	GNV	U
2015	973	879	1,047	997	1,029	1,012	977	1,044	1,041	1,041	981	992	12,012	GNV	U
2016	1,011	913	1,087	1,035	1,068	1,051	1,014	1,084	1,080	1,080	1,018	1,030	12,472	GNV	U
2017	1,048	946	1,127	1,073	1,108	1,090	1,052	1,124	1,120	1,120	1,056	1,068	12,932	GNV	U
2018	1,085	980	1,167	1,112	1,147	1,129	1,089	1,164	1,160	1,160	1,093	1,106	13,393	GNV	U
2019	1,123	1,014	1,207	1,150	1,186	1,167	1,127	1,204	1,200	1,200	1,131	1,144	13,852	GNV	U
2020	1,160	1,047	1,247	1,188	1,226	1,206	1,164	1,244	1,240	1,240	1,168	1,182	14,311	GNV	U
2021	1,197	1,081	1,287	1,226	1,265	1,245	1,201	1,284	1,279	1,279	1,205	1,220	14,768	GNV	U
2022	1,234	1,114	1,326	1,263	1,304	1,283	1,238	1,323	1,319	1,319	1,243	1,257	15,223	GNV	U
2023	1,270	1,147	1,366	1,301	1,343	1,321	1,275	1,363	1,358	1,358	1,279	1,295	15,675	GNV	U
2024	1,307	1,180	1,405	1,338	1,381	1,359	1,311	1,402	1,397	1,397	1,316	1,332	16,124	GNV	U
2025	1,343	1,213	1,444	1,375	1,419	1,396	1,348	1,440	1,435	1,435	1,353	1,369	16,570	GNV	U
2026	1,379	1,245	1,482	1,412	1,457	1,434	1,384	1,479	1,474	1,474	1,389	1,405	17,012	GNV	U
2027	1,414	1,277	1,520	1,448	1,494	1,470	1,419	1,517	1,512	1,512	1,424	1,441	17,449	GNV	U
2028	1,449	1,309	1,558	1,484	1,532	1,507	1,454	1,554	1,549	1,549	1,460	1,477	17,882	GNV	U
2029	1,484	1,340	1,595	1,520	1,568	1,543	1,489	1,591	1,586	1,586	1,494	1,512	18,309	GNV	U
2030	1,518	1,371	1,632	1,555	1,604	1,579	1,523	1,628	1,623	1,623	1,529	1,547	18,732	GNV	U

B:SoCalGas station growth 2012 through 2030

Station forecast	No. of stations	Stations added per year	Average Stations per Year	Station growth Rate
2011	256	21		9.34%
2012	277	20		8.18%
2013	297	19		7.17%
2014	315	17		6.28%
2015	333	16		5.50%
2016	349	15		4.82%
2017	364	13		4.23%
2018	377	12		3.70%
2019	389	11		3.24%
2020	400	10		2.84%
2021	410	9		2.49%
2022	419	8		2.18%
2023	427	7		1.91%
2024	434	6		1.68%
2025	441	6		1.47%
2026	447	5		1.29%
2027	452	4		1.13%
2028	456	4		0.99%
2029	460	3		0.87%
2030	463	n/a	11	0.76%

(0)

A:SoCalGas throughput forecast methodoloy.

Years	Total Volume	Transit Customer	Total Volume Less Transit		Yearly growth	Average Yearly growth
			Total	Volume Increase		
	MM CCF	MM CCF	MM CCF	MM CCF	%	%
End 2011	100.77	69.77	31	4.596	4.64	4.42%
End 2010	99.054	72.65	26.404	4.927	5.18	
End 2009	95.14	73.663	21.477	3	3.45	
End 2008	87.067	68.59	18.477	n/a	n/a	

B:Station count forecast methodology.

SoCalGas NGV Station Count Growth						
Year	Historical station count	Private stations	yearly change	% change	Average % change	CAGR
2011	256	182	22	9.40		-0.1238
2010	234	166	14	6.36	9.34%	
2009	220	155	24	12.24		
2008	196	137	n/a			
Station Count Forecast						
2011	256		21		9.3%	
2012	277		20		8.2%	
2013	297		19		7.2%	
2014	315		17		6.3%	
2015	333		16		5.5%	
2016	349		15		4.8%	
2017	364		13		4.2%	
2018	377		12		3.7%	
2019	389		11		3.2%	
2020	400		10		2.8%	
2021	410		9		2.5%	
2022	419		8		2.2%	
2023	427		7		1.9%	
2024	434		6		1.7%	
2025	441		6		1.5%	
2026	447		5		1.3%	
2027	452		4		1.1%	
2028	456		4		1.0%	
2029	460		3		0.9%	
2030	463		n/a	11	0.8%	

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ENERGY EFFICIENCY
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The Gas Company

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SOUTHERN CALIFORNIA GAS COMPANY
2012 CALIFORNIA GAS REPORT
ENERGY EFFICIENCY SAVINGS FORECAST

	Reported 2011 Therms	Forecast 2012 Therms	Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020
SoCalGas EE Program TOTAL	**37,233,416**	**38,527,092**								
PUC Goal	**30,000,000**	**32,000,000**	32,000,000	32,000,000	32,000,000	32,000,000	32,000,000	32,000,000	32,000,000	32,000,000
Difference	**7,233,416**	**6,527,092**								

SoCalGas	**2011 therms**	**2012 therms**
Core Residential	12,564,473	11,890,291
Core Commercial	10,030,218	5,574,605
Core Industrial	3,051,276	4,198,190
NonCore Commercial	1,431,391	9,217,247
NonCore Industrial retail	3,339,913	3,622,801
NonCore Industrial refinery	6,816,146	4,023,958
Total	**37,233,416**	**38,527,092**

Proportionally scale it down or up to match PUC Goals for 2011 - 2012

ANNUAL NET SAVINGS	**2011 Mdth**	**2012 Mdth**	**2013 Mdth**	**2014 Mdth**	**2015 Mdth**	**2016 Mdth**	**2017 Mdth**	**2018 Mdth**	**2019 Mdth**	**2020 Mdth**
Core Residential	1,012	988	988	988	988	988	988	988	988	988
Core Commercial	808	463	463	463	463	463	463	463	463	463
Core Industrial	246	349	349	349	349	349	349	349	349	349
NonCore Commercial	115	766	766	766	766	766	766	766	766	766
NonCore Industrial retail	269	301	301	301	301	301	301	301	301	301
NonCore Industrial refinery	549	334	334	334	334	334	334	334	334	334
Total	**3,000**	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**

Cumulative Savings Mdth	**2012 Mdth**	**2013 Mdth**	**2014 Mdth**	**2015 Mdth**	**2016 Mdth**	**2017 Mdth**	**2018 Mdth**	**2019 Mdth**	**2020 Mdth**
Core Residential	**988**	**1,975**	**2,963**	**3,950**	**4,938**	**5,926**	**6,913**	**7,901**	**8,888**
Core Commercial	**463**	**926**	**1,389**	**1,852**	**2,315**	**2,778**	**3,241**	**3,704**	**4,167**
Core Industrial	**349**	**697**	**1,046**	**1,395**	**1,743**	**2,092**	**2,441**	**2,790**	**3,138**
NonCore Commercial	**766**	**1,531**	**2,297**	**3,062**	**3,828**	**4,593**	**5,359**	**6,125**	**6,890**
NonCore Industrial regular	**301**	**602**	**903**	**1,204**	**1,505**	**1,805**	**2,106**	**2,407**	**2,708**
NonCore Industrial refinery	**334**	**668**	**1,003**	**1,337**	**1,671**	**2,005**	**2,340**	**2,674**	**3,008**
Total Load Impacts	**3,200**	**6,400**	**9,600**	**12,800**	**16,000**	**19,200**	**22,400**	**25,600**	**28,800**

MMCF factor: **1.0209**

Cumulative Savings MMCF	**2012 mmcf**	**2013 mmcf**	**2014 mmcf**	**2015 mmcf**	**2016 mmcf**	**2017 mmcf**	**2018 mmcf**	**2019 mmcf**	**2020 mmcf**
Core Residential	967	1,935	2,902	3,869	4,837	5,804	6,772	7,739	8,706
Core Commercial	454	907	1,361	1,814	2,268	2,721	3,175	3,628	4,082
Core Industrial	342	683	1,025	1,366	1,708	2,049	2,391	2,732	3,074
Core Commercial and Industrial	795	1,590	2,385	3,180	3,975	4,771	5,566	6,361	7,156
NonCore Commercial	750	1,500	2,250	3,000	3,749	4,499	5,249	5,999	6,749
NonCore Industrial regular	295	589	884	1,179	1,474	1,768	2,063	2,358	2,653
Noncore Commercial and Industrial	1,045	2,089	3,134	4,179	5,223	6,268	7,312	8,357	9,402
NonCore Industrial refinery	327	655	982	1,310	1,637	1,964	2,292	2,619	2,946
Total Cumulative Load	**4,974**	**9,948**	**14,923**	**19,897**	**24,871**	**29,845**	**34,820**	**39,794**	**44,768**

NOTES:
2011 Reported data is preliminary pending CPUC review.

SOUTHERN CALIFORNIA GAS COMPANY
2012 CALIFORNIA GAS REPORT
ENERGY EFFICIENCY SAVINGS FORECAST

	Forecast 2021	Forecast 2022	Forecast 2023	Forecast 2024	Forecast 2025	Forecast 2026	Forecast 2027	Forecast 2028	Forecast 2029	Forecast 2030
SoCalGas EE Program TOTAL										
PUC Goal	32,000,000	32,000,000	32,000,000	32,000,000	32,000,000	32,000,000	32,000,000	32,000,000	32,000,000	32,000,000
Difference										

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

Proportionally scale it down or up to match PUC Goals for 2011 - 2012

ANNUAL NET SAVINGS	2021 Mdth	2022 Mdth	2023 Mdth	2024 Mdth	2025 Mdth	2026 Mdth	2027 Mdth	2028 Mdth	2029 Mdth	2030 Mdth
Core Residential	988	988	988	988	988	988	988	988	988	988
Core Commercial	463	463	463	463	463	463	463	463	463	463
Core Industrial	349	349	349	349	349	349	349	349	349	349
NonCore Commercial	766	766	766	766	766	766	766	766	766	766
NonCore Industrial retail	301	301	301	301	301	301	301	301	301	301
NonCore Industrial refinery	334	334	334	334	334	334	334	334	334	334
Total	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**

Cumulative Savings Mdth	2021 Mdth	2022 Mdth	2023 Mdth	2024 Mdth	2025 Mdth	2026 Mdth	2027 Mdth	2028 Mdth	2029 Mdth	2030 Mdth
Core Residential	**9,876**	**10,863**	**11,851**	**12,839**	**13,826**	**14,814**	**14,814**	**14,814**	**14,814**	**14,814**
Core Commercial	**4,630**	**5,093**	**5,556**	**6,019**	**6,482**	**6,945**	**6,945**	**6,945**	**6,945**	**6,945**
Core Industrial	**3,487**	**3,836**	**4,184**	**4,533**	**4,882**	**5,230**	**5,230**	**5,230**	**5,230**	**5,230**
NonCore Commercial	**7,656**	**8,421**	**9,187**	**9,952**	**10,718**	**11,484**	**11,484**	**11,484**	**11,484**	**11,484**
NonCore Industrial regular	**3,009**	**3,310**	**3,611**	**3,912**	**4,213**	**4,514**	**4,514**	**4,514**	**4,514**	**4,514**
NonCore Industrial refinery	**3,342**	**3,676**	**4,011**	**4,345**	**4,679**	**5,013**	**5,013**	**5,013**	**5,013**	**5,013**
Total Load Impacts	**32,000**	**35,200**	**38,400**	**41,600**	**44,800**	**48,000**	**48,000**	**48,000**	**48,000**	**48,000**

Cumulative Savings MMCF	2021 mmcf	2022 mmcf	2023 mmcf	2024 mmcf	2025 mmcf	2026 mmcf	2027 mmcf	2028 mmcf	2029 mmcf	2030 mmcf
Core Residential	9,674	10,641	11,608	12,576	13,543	14,511	14,511	14,511	14,511	14,511
Core Commercial	4,535	4,989	5,442	5,896	6,350	6,803	6,803	6,803	6,803	6,803
Core Industrial	3,416	3,757	4,099	4,440	4,782	5,123	5,123	5,123	5,123	5,123
Core Commercial and Industrial	7,951	8,746	9,541	10,336	11,131	11,926	11,926	11,926	11,926	11,926
NonCore Commercial	7,499	8,249	8,999	9,749	10,499	11,248	11,248	11,248	11,248	11,248
NonCore Industrial regular	2,947	3,242	3,537	3,832	4,126	4,421	4,421	4,421	4,421	4,421
Noncore Commercial and Industrial	10,446	11,491	12,536	13,580	14,625	15,670	15,670	15,670	15,670	15,670
NonCore Industrial refinery	3,274	3,601	3,929	4,256	4,583	4,911	4,911	4,911	4,911	4,911
Total Cumulative Load	**49,762**	**54,738**	**59,714**	**64,690**	**69,666**	**74,642**	**74,642**	**74,642**	**74,642**	**74,642**

NOTES:

2012 CALIFORNIA GAS REPORT

EXCHANGE DEMAND FORECAST
JULY 2012

The Gas Company

A Sempra Energy utility℠

2012 California Gas Report
Gas Exchange Demand Forecast

Overview

An interutility gas exchange agreement allows each utility to fulfill gas demand from gas provided by the other utility company. In the case of Pacific Gas and Electric Company (PG&E) and Southern California Gas Company (SCG) such an exchange agreement is contained in the Master Exchange Agreement (MEA).

Interutility Exchange Demand Forecasts

The exchange of gas between SCG and PG&E has been in practice since 1949. With the termination of the General Service Mutual Assistance Agreement between the two companies in May 5, 1988, the CPUC ordered the two companies to renegotiate a uniform procedure for exchanging gas. This instrument is now called the Master Exchange Agreement, which the CPUC approved on February 7, 1990.

The primary purpose of the MEA exchange forecast is to establish the net revenues/costs resulting from the services mutually provided by PG&E and SoCalGas. Monthly gas load under the MEA from 2009 to 2010 formed the forecasts for the exchange gas load. Exchange load is expected to remain stable as has been in the past years. Table 1 summarizes the forecast for SCG gas deliveries under the Master Exchange Agreement. Note the table shows unilateral flows and not the net transactions.

Southern California Gas Company
2012 California Gas Report
Exchange Forecast

RATE	YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
G40	2012	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2012	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2013	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2013	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2014	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2014	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2015	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2015	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2016	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2016	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2017	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2017	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2018	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2018	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2019	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2019	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2020	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2020	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2021	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2021	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2022	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2022	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2023	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2023	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2024	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2024	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2025	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2025	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2026	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2026	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2027	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2027	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2028	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2028	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2029	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2029	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
G40	2030	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
G30	2030	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00

2012 CALIFORNIA GAS REPORT

EOR STEAMING
JULY 2012

The Gas Company

A Sempra Energy utility℠

ENHANCED OIL RECOVERY - STEAMING

FORECAST METHODOLOGY FOR THE 2012 CALIFORNIA GAS REPORT

Southern California Gas' ("SoCalGas") forecast of enhanced oil recovery ("EOR") steaming gas requirements as reported in the *2012 California Gas Report* ("CGR") is based on customer-specific historical data and market analysis. The major steps in developing this forecast are outlined below and described in detail in the following pages.

- Analyze Historical Gas Demand
- Evaluate Market Potential
- Calculate Effect of Bypass

A. Analyze Historical Gas Demand

Historical customer gas demand data for the period 2009 through 2011 were analyzed in order to determine typical throughput volumes over the past few years.

B. Evaluate Market Potential

Potential EOR gas demand was determined by considering market information given the following assumptions:

1. Oil prices will be high enough for EOR production to be economically desirable.
2. SoCalGas has no capacity or supply constraints.
3. Air quality regulations will continue to either require or encourage the use of gas, rather than oil, in all areas.

Since the CGR oil price scenario is favorable for EOR production, the historical gas demand was combined with potential gas demand to become the base load for the EOR forecast. The early years of the EOR steaming forecast include some additional load expected to come on line as a result of the expansion of oil production operations in existing fields that are not already interconnected with non-utility gas pipelines. However, the forecast assumes that as time goes on any new production will be offset by declining production in wells that will be depleted during the forecast period.

C. Calculate Effect of Bypass

Kern/Mojave began operating in February, 1992. At that time, many of SoCalGas' customers began taking service directly from the pipelines, thereby bypassing SoCalGas' distribution system.

Several factors were taken into consideration in order to forecast future bypass volumes. These factors were: the customer's geographical location, the amount of natural gas a customer has contracted to move on Kern/Mojave, the amount of Kern/Mojave gas available from marketers who have no designated end-users, and the amount of gas currently bypassing SoCalGas' distribution system.

Based on these considerations, the following assumptions were made:

1. EOR gas demand for customers located in the Los Angeles Basin, Santa Barbara and Ventura areas will not bypass SoCalGas' distribution system.
2. Customers in the San Joaquin Valley who have already bypassed SoCalGas' system will continue to bypass at their historical levels.

The forecast of gas demand for EOR steaming is shown in the following table.

2012 CALIFORNIA GAS REPORT - EOR STEAMING FORECAST (2012 - 2030)
(MMCFD)

	HISTORICAL			FORECAST																		
SOCALGAS DELIVERIES	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Long-Term Contract Customers	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Short-Term Contract Customers	27	27	27	31	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
Total Deliveries	35	27	27	31	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40

2012 CALIFORNIA GAS REPORT

REFINERIES
JULY 2012

The Gas Company

A Sempra Energy utility℠

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 2011 monthly proportions of each rate class.

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

Year	GHG $/Mmbtu (Natural Gas)	GHG $/Mmbtu (Normal Butane)
2012	0.61	0.75
2013	1.04	1.28
2014	1.23	1.51
2015	1.42	1.75
2016	1.63	2.00
2017	1.84	2.26
2018	2.07	2.54
2019	2.30	2.82
2020	2.54	3.13
2021	2.62	3.22
2022	2.70	3.32
2023	2.78	3.42
2024	2.86	3.52
2025	2.95	3.62
2026	3.04	3.73
2027	3.13	3.84
2028	3.22	3.96
2029	3.32	4.08
2030	3.42	4.20

For the cogeneration load component, there is an “out-of-model” adjustment to reflect expected additional cogeneration load from installation of new equipment 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 + GHG price adder) relative to the 2-month average of butane prices. The second component of the forecast equation is a constant term.

The base forecast equation is shown below:

LN(Ref_MDth/d) = 5.61257 + LN(G/B) x (-0.12918 + (6.259782) x 0.01112),
LN(Ref_MDth/d) = 5.61257 + LN(G/B) x (-0.0595712),

where

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

The coefficient of the "LN(G/B)" term is a combination of the parameters used to estimate the coefficient used in the 2013 TCAP model (based on recorded monthly data through 2010) and a factor that calibrates this coefficient to the recorded 2011 data. For 2011 our observed natural gas burner-tip prices achieved unprecedented low values given our set of historical data used for our econometric work.

The coefficient of the "LN(G/B)" term that was employed to forecast the 2013 TCAP refinery gas demand was:

LN(G/B), 2013 TCAP forecast, = (-0.12918 + 0.01112) = (-0.11806).

For our 2012 CGR refinery forecast, it was observed that this value for the "fuel-switching" behavior lead to much higher gas demand than was recorded for 2011 along with Jan-Apr 2012. To "control" the effect this parameter was having on the forecast to the historically low natural gas prices, a calibration factor was calculated in the following formula for the "LN(G/B)" coefficient:

LN(G/B), 2012 CGR forecast, = (-0.12918 + (G/B-Fuel-SW) x 0.01112),

where

G/B-Fuel-SW = (6.2597820413128).

This value was calculated to make the total 2011 error of total monthly forecasts of refinery load compared to observed load over 2011 equal to zero. Using this value in the equation above yields:

LN(G/B), 2012 CGR forecast, = (-0.12918 + (G/B-Fuel-SW) x 0.01112),
= (-0.12918 + 0.0696088),
= (-0.0595712).

To check the performance of this calibrated "LN(G/B)" coefficient, the monthly forecasts calculated for Jan-Apr of 2012, using this coefficient, were compared with the recorded data for those months. The table ("**2012 Recorded vs. Forecast**") below shows the results.

2012 Recorded vs. Forecast

	(Recorded - Forecast)			Recorded			Forecast		
	Combined Refinery: (MDth)	G-30 (MDth)	G-50 (MDth)	Combined Refinery: (MDth)	G-30 (MDth)	G-50 (MDth)	Combined Refinery: (MDth)	G-30 (MDth)	G-50 (MDth)
Jan-12	-443	-211	-232	8,910	7,307	1,603	9,353	7,518	1,835
Feb-12	-661	-416	-245	8,066	6,479	1,587	8,727	6,895	1,832
Mar-12	267	379	-111	9,569	7,680	1,889	9,302	7,301	2,001
Apr-12	107	180	-73	9,062	7,364	1,698	8,955	7,184	1,771

The four monthly values of "Recorded – Forecast" for the combined g30/g50 load provide evidence that the calibration of the fuel-switching coefficient appears reasonable.

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 2014 are as follows:

LN[Ref_MDth/d] = 5.61257 + LN[((6.119+6.136)/2) / ((21.9757+22.3221/2)]
x (-0.0595712),
LN[Ref_MDth/d] = 5.68913

(9,164.7 MDth) = (31) x (EXP[5.68913]) = (31) x (295.636 MDth/d)

This total refinery gas demand was "split" between G-30 and G-50 load using the 2011 monthly proportions that the G-30 load represented relative to the total refinery load. The table below provides these proportions.

	2011 Mos. %G-30 of Total Ref.
Jan-11	80.380%
Feb-11	79.010%
Mar-11	78.491%
Apr-11	80.226%
May-11	80.503%
Jun-11	79.833%
Jul-11	78.889%
Aug-11	78.608%
Sep-11	79.908%
Oct-11	79.478%
Nov-11	81.564%
Dec-11	81.090%

Based on the August 2014 example above, the total refinery gas demand is split into G-30 and G-50 values:

Ref_G-30 = (7,204.2 MDth) = (9,164.7 MDth) x (0.78608), and
Reg_G-50 = (1,960.5 MDth) = (9,164.7 MDth) x (0.21392).

The table below show 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 (2010-2015)

	2012 CGR Ref g-30 Mdth	2012 CGR Ref g-50 (CoGen) Mdth	#Days per Month	Total Ref Mdth	Total Ref Mdth/Day	ln(mdtd)	ln(G/B)	ln(G)	Total Ref Burner tip Burner tip Gas $/dth	Butane $/dth
Jan-10	7,377	1,494	31	8,871	286	5.6566	-0.8690	1.8307	6.492	12.5900
Feb-10	6,914	1,613	28	8,528	305	5.7189	-0.6415	1.8504	6.232	11.5780
Mar-10	6,948	1,874	31	8,822	285	5.6510	-0.5729	1.8096	5.984	10.0879
Apr-10	6,637	1,624	30	8,262	275	5.6182	-0.4984	1.7872	5.961	9.5753
May-10	7,059	1,694	31	8,753	282	5.6431	-0.4804	1.7881	5.995	9.7556
Jun-10	6,912	1,730	30	8,642	288	5.6632	-0.4903	1.8026	6.136	10.0525
Jul-10	7,210	1,790	31	9,000	290	5.6710	-0.4896	1.8285	6.313	10.2612
Aug-10	7,259	1,676	31	8,935	288	5.6637	-0.4878	1.8490	6.394	10.4349
Sep-10	7,552	1,783	30	9,335	311	5.7403	-0.5147	1.8508	6.335	10.8634
Oct-10	7,911	2,055	31	9,966	321	5.7730	-0.5831	1.8455	6.328	11.8225
Nov-10	7,178	1,808	30	8,986	300	5.7022	-0.6649	1.8660	6.596	13.3055
Dec-10	7,278	1,760	31	9,038	292	5.6752	-0.6996	1.9115	6.930	13.9215
Jan-11	7,260	1,772	31	9,032	291	5.6746	-1.0533	1.7799	4.928	20.0788
Feb-11	6,109	1,623	28	7,732	276	5.6209	-1.3771	1.5815	4.797	18.4648
Mar-11	6,505	1,783	31	8,287	267	5.5885	-1.3159	1.5334	4.472	16.0884
Apr-11	7,680	1,893	30	9,572	319	5.7654	-1.2182	1.5341	4.803	15.2709
May-11	7,772	1,882	31	9,655	311	5.7412	-1.1627	1.5726	4.835	15.5585
Jun-11	7,377	1,864	30	9,241	308	5.7302	-1.1558	1.6039	5.109	16.0319
Jul-11	7,124	1,906	31	9,030	291	5.6743	-1.1661	1.6189	4.985	16.3648
Aug-11	6,951	1,892	31	8,843	285	5.6533	-1.2226	1.5810	4.735	16.6418
Sep-11	7,287	1,832	30	9,120	304	5.7170	-1.2839	1.5484	4.673	17.3252
Oct-11	7,147	1,846	31	8,993	290	5.6702	-1.4262	1.4691	4.018	18.8548
Nov-11	6,917	1,563	30	8,480	283	5.6443	-1.6044	1.3932	4.038	21.2199
Dec-11	8,149	1,900	31	10,050	324	5.7813	-1.6694	1.4084	4.141	22.2023
Jan-12	7517.9	1835.1	31	9353.0	301.7	5.7095	-1.6263	1.4843	4.684	22.6680
Feb-12	6895.1	1831.8	29	8726.9	300.9	5.7069	-1.5828	1.4985	4.266	20.9061
Mar-12	7301.4	2000.8	31	9302.2	300.1	5.7040	-1.5350	1.4410	4.184	18.3121
Apr-12	7184.0	1770.6	30	8954.6	298.5	5.6987	-1.4462	1.4367	4.230	17.4196
May-12	7435.2	1800.7	31	9235.9	297.9	5.6969	-1.4149	1.4517	4.310	17.7336
Jun-12	7138.3	1803.2	30	8941.6	298.1	5.6973	-1.4217	1.4683	4.373	18.2504
Jul-12	7293.5	1951.8	31	9245.3	298.2	5.6979	-1.4320	1.4820	4.431	18.6138
Aug-12	7271.1	1978.7	31	9249.8	298.4	5.6984	-1.4402	1.4918	4.459	18.9162
Sep-12	7162.8	1801.0	30	8963.8	298.8	5.6998	-1.4634	1.4962	4.470	19.6622
Oct-12	7385.8	1907.1	31	9293.0	299.8	5.7030	-1.5183	1.5020	4.511	21.3319
Nov-12	7368.8	1665.6	30	9034.4	301.1	5.7076	-1.5950	1.5240	4.670	23.9137
Dec-12	7583.9	1768.6	31	9352.5	301.7	5.7094	-1.6254	1.5712	4.955	24.9861
Jan-13	7491.4	1828.6	31	9320.1	300.6	5.7059	-1.5671	1.6585	5.547	25.3522
Feb-13	6617.1	1757.9	28	8375.0	299.1	5.7008	-1.4809	1.7130	5.544	23.4172
Mar-13	7234.6	1982.5	31	9217.0	297.3	5.6948	-1.3806	1.7102	5.516	20.5682
Apr-13	7119.8	1754.8	30	8874.6	295.8	5.6898	-1.2956	1.7041	5.477	19.5881
May-13	7376.1	1786.4	31	9162.5	295.6	5.6889	-1.2810	1.7027	5.501	19.9329
Jun-13	7086.3	1790.1	30	8876.5	295.9	5.6900	-1.2990	1.7075	5.530	20.5005
Jul-13	7243.4	1938.4	31	9181.8	296.2	5.6910	-1.3163	1.7138	5.570	20.8996
Aug-13	7222.9	1965.6	31	9188.6	296.4	5.6917	-1.3287	1.7190	5.587	21.2317
Sep-13	7116.1	1789.3	30	8905.3	296.8	5.6932	-1.3535	1.7211	5.594	22.0510
Oct-13	7337.9	1894.8	31	9232.7	297.8	5.6965	-1.4091	1.7250	5.631	23.8847
Nov-13	7324.7	1655.6	30	8980.3	299.3	5.7016	-1.4942	1.7367	5.726	26.7203
Dec-13	7547.2	1760.0	31	9307.2	300.2	5.7046	-1.5440	1.7633	5.937	27.8981
Jan-14	7461.7	1821.3	31	9283.0	299.5	5.7020	-1.5003	1.8051	6.224	26.6195
Feb-14	6591.6	1751.1	28	8342.8	298.0	5.6969	-1.4162	1.8268	6.204	24.6014
Mar-14	7208.3	1975.3	31	9183.6	296.2	5.6912	-1.3195	1.8210	6.152	21.6301
Apr-14	7097.2	1749.3	30	8846.4	294.9	5.6866	-1.2421	1.8081	6.045	20.6079
May-14	7355.4	1781.4	31	9136.8	294.7	5.6861	-1.2338	1.8005	6.061	20.9675
Jun-14	7067.0	1785.2	30	8852.3	295.1	5.6872	-1.2532	1.8038	6.085	21.5594
Jul-14	7224.2	1933.3	31	9157.5	295.4	5.6883	-1.2719	1.8086	6.119	21.9757
Aug-14	7204.2	1960.5	31	9164.7	295.6	5.68913	-1.2851	1.8127	6.136	22.3221
Sep-14	7097.6	1784.6	30	8882.2	296.1	5.6906	-1.3098	1.8147	6.143	23.1765
Oct-14	7319.0	1889.9	31	9208.8	297.1	5.6939	-1.3656	1.8180	6.176	25.0890
Nov-14	7306.2	1651.4	30	8957.7	298.6	5.6991	-1.4519	1.8278	6.265	28.0462
Dec-14	7529.6	1755.9	31	9285.5	299.5	5.7022	-1.5048	1.8507	6.464	29.2746
Jan-15	7441.4	1816.4	31	9257.8	298.6	5.6992	-1.4547	1.8959	6.853	27.7646
Feb-15	6571.6	1745.8	28	8317.4	297.1	5.6939	-1.3652	1.9202	6.791	25.6733
Mar-15	7189.1	1970.0	31	9159.1	295.5	5.6885	-1.2748	1.9088	6.699	22.5942
Apr-15	7081.4	1745.4	30	8826.7	294.2	5.6843	-1.2047	1.8893	6.530	21.5349
May-15	7341.0	1777.9	31	9118.9	294.2	5.6841	-1.2010	1.8773	6.541	21.9076
Jun-15	7053.4	1781.8	30	8835.2	294.5	5.6853	-1.2208	1.8800	6.565	22.5210
Jul-15	7210.4	1929.6	31	9140.0	294.8	5.6864	-1.2397	1.8843	6.598	22.9524
Aug-15	7190.5	1956.8	31	9147.3	295.1	5.6872	-1.2532	1.8880	6.615	23.3113
Sep-15	7084.0	1781.2	30	8865.3	295.5	5.6887	-1.2779	1.8899	6.623	24.1967
Oct-15	7304.9	1886.2	31	9191.1	296.5	5.6920	-1.3334	1.8930	6.655	26.1786
Nov-15	7292.2	1648.3	30	8940.5	298.0	5.6972	-1.4197	1.9021	6.745	29.2431
Dec-15	7515.5	1752.6	31	9268.1	299.0	5.7004	-1.4734	1.9238	6.949	30.5160

Base Forecast of Refinery Gas Demand (2016-2020)

	2012 CGR Ref g-30 Mdth	2012 CGR Ref g-50 (CoGen) Mdth	#Days per Month	Total Ref Mdth	Total Ref Mdth/Day	ln(mdtd)	ln(G/B)	ln(G)	Total Ref Burner tip Burner tip Gas $/dth	Butane $/dth
Jan-16	7438.0	1815.6	31	9253.6	298.5	5.6988	-1.4470	1.9415	6.989	28.7275
Feb-16	6815.6	1810.6	29	8626.2	297.5	5.6953	-1.3881	1.9317	6.813	26.5794
Mar-16	7202.0	1973.5	31	9175.5	296.0	5.6903	-1.3048	1.9140	6.748	23.4167
Apr-16	7089.4	1747.3	30	8836.8	294.6	5.6855	-1.2238	1.9062	6.707	22.3286
May-16	7344.0	1778.6	31	9122.6	294.3	5.6845	-1.2077	1.9067	6.755	22.7114
Jun-16	7054.3	1782.0	30	8836.3	294.5	5.6854	-1.2229	1.9137	6.802	23.3415
Jul-16	7209.9	1929.5	31	9139.4	294.8	5.6864	-1.2386	1.9211	6.855	23.7846
Aug-16	7189.1	1956.4	31	9145.5	295.0	5.6870	-1.2499	1.9269	6.880	24.1533
Sep-16	7082.3	1780.8	30	8863.1	295.4	5.6885	-1.2737	1.9294	6.890	25.0627
Oct-16	7302.5	1885.6	31	9188.1	296.4	5.6917	-1.3279	1.9333	6.935	27.0985
Nov-16	7287.9	1647.3	30	8935.1	297.8	5.6966	-1.4096	1.9463	7.071	30.2462
Dec-16	7507.4	1750.7	31	9258.1	298.6	5.6993	-1.4551	1.9756	7.351	31.5537
Jan-17	7425.3	1812.5	31	9237.7	298.0	5.6971	-1.4182	2.0034	7.478	29.6879
Feb-17	6567.0	1744.6	28	8311.6	296.8	5.6932	-1.3535	1.9994	7.292	27.4832
Mar-17	7187.4	1969.5	31	9156.9	295.4	5.6883	-1.2707	1.9820	7.223	24.2372
Apr-17	7075.3	1743.9	30	8819.2	294.0	5.6835	-1.1903	1.9742	7.180	23.1205
May-17	7329.4	1775.1	31	9104.5	293.7	5.6825	-1.1744	1.9748	7.230	23.5133
Jun-17	7040.3	1778.5	30	8818.8	294.0	5.6834	-1.1896	1.9817	7.280	24.1600
Jul-17	7195.6	1925.6	31	9121.2	294.2	5.6844	-1.2051	1.9890	7.337	24.6148
Aug-17	7174.8	1952.5	31	9127.3	294.4	5.6850	-1.2163	1.9947	7.363	24.9931
Sep-17	7068.1	1777.2	30	8845.3	294.8	5.6864	-1.2400	1.9971	7.373	25.9266
Oct-17	7287.7	1881.8	31	9169.5	295.8	5.6896	-1.2937	2.0010	7.420	28.0159
Nov-17	7272.8	1643.9	30	8916.7	297.2	5.6945	-1.3750	2.0139	7.564	31.2465
Dec-17	7491.8	1747.1	31	9238.9	298.0	5.6972	-1.4203	2.0428	7.860	32.5885
Jan-18	7408.6	1808.4	31	9217.0	297.3	5.6948	-1.3805	2.0715	8.014	30.5427
Feb-18	6551.1	1740.4	28	8291.5	296.1	5.6908	-1.3128	2.0688	7.816	28.2917
Mar-18	7170.2	1964.8	31	9135.1	294.7	5.6859	-1.2307	2.0516	7.744	24.9776
Apr-18	7058.8	1739.8	30	8798.5	293.3	5.6811	-1.1510	2.0439	7.697	23.8374
May-18	7312.3	1771.0	31	9083.3	293.0	5.6802	-1.1353	2.0444	7.751	24.2385
Jun-18	7023.8	1774.3	30	8798.1	293.3	5.6811	-1.1503	2.0512	7.804	24.8988
Jul-18	7178.7	1921.1	31	9099.8	293.5	5.6820	-1.1656	2.0585	7.864	25.3631
Aug-18	7157.9	1947.9	31	9105.8	293.7	5.6827	-1.1768	2.0641	7.892	25.7494
Sep-18	7051.4	1773.0	30	8824.4	294.1	5.6841	-1.2002	2.0665	7.902	26.7024
Oct-18	7270.3	1877.3	31	9147.5	295.1	5.6873	-1.2536	2.0704	7.953	28.8356
Nov-18	7255.2	1639.9	30	8895.1	296.5	5.6921	-1.3342	2.0830	8.105	32.1341
Dec-18	7473.6	1742.8	31	9216.4	297.3	5.6947	-1.3794	2.1116	8.419	33.5042
Jan-19	7391.3	1804.2	31	9195.5	296.6	5.6925	-1.3413	2.1388	8.560	31.4230
Feb-19	6536.6	1736.5	28	8273.1	295.5	5.6886	-1.2755	2.1348	8.351	29.1238
Mar-19	7154.6	1960.5	31	9115.1	294.0	5.6837	-1.1939	2.1178	8.274	25.7388
Apr-19	7043.6	1736.0	30	8779.7	292.7	5.6790	-1.1150	2.1102	8.225	24.5742
May-19	7296.7	1767.2	31	9063.9	292.4	5.6781	-1.0994	2.1106	8.282	24.9839
Jun-19	7008.8	1770.5	30	8779.3	292.6	5.6790	-1.1142	2.1174	8.337	25.6583
Jul-19	7163.2	1917.0	31	9080.2	292.9	5.6799	-1.1295	2.1246	8.402	26.1326
Aug-19	7142.4	1943.7	31	9086.1	293.1	5.6805	-1.1405	2.1302	8.431	26.5271
Sep-19	7036.1	1769.2	30	8805.2	293.5	5.6819	-1.1638	2.1326	8.442	27.5006
Oct-19	7254.3	1873.2	31	9127.5	294.4	5.6851	-1.2167	2.1364	8.495	29.6794
Nov-19	7239.0	1636.3	30	8875.3	295.8	5.6898	-1.2967	2.1489	8.656	33.0484
Dec-19	7456.8	1738.9	31	9195.7	296.6	5.6925	-1.3417	2.1772	8.988	34.4478
Jan-20	7375.6	1800.3	31	9175.9	296.0	5.6904	-1.3056	2.2030	9.116	32.3508
Feb-20	6756.4	1794.9	29	8551.4	294.9	5.6866	-1.2418	2.1979	8.896	30.0014
Mar-20	7140.5	1956.7	31	9097.1	293.5	5.6817	-1.1608	2.1811	8.815	26.5426
Apr-20	7030.0	1732.7	30	8762.7	292.1	5.6771	-1.0825	2.1735	8.763	25.3526
May-20	7282.7	1763.8	31	9046.5	291.8	5.6761	-1.0671	2.1740	8.823	25.7712
Jun-20	6995.3	1767.1	30	8762.4	292.1	5.6770	-1.0819	2.1807	8.882	26.4603
Jul-20	7149.4	1913.2	31	9062.6	292.3	5.6779	-1.0970	2.1878	8.949	26.9449
Aug-20	7128.6	1939.9	31	9068.5	292.5	5.6786	-1.1079	2.1933	8.981	27.3481
Sep-20	7022.3	1765.7	30	8788.0	292.9	5.6799	-1.1310	2.1957	8.992	28.3427
Oct-20	7240.0	1869.5	31	9109.4	293.9	5.6831	-1.1835	2.1994	9.048	30.5691
Nov-20	7224.4	1633.0	30	8857.4	295.2	5.6878	-1.2629	2.2118	9.217	34.0117
Dec-20	7441.7	1735.4	31	9177.1	296.0	5.6905	-1.3077	2.2398	9.567	35.4416

Base Forecast of Refinery Gas Demand (2021-2025)

	2012 CGR Ref g-30 Mdth	2012 CGR Ref g-50 (CoGen) Mdth	#Days per Month	Total Ref Mdth	Total Ref Mdth/Day	ln(mdtd)	ln(G/B)	ln(G)	Total Ref Burner tip Burner tip Gas $/dth	Butane $/dth
Jan-21	7363.8	1797.4	31	9161.2	295.5	5.6887	-1.2786	2.2554	9.511	33.0776
Feb-21	6515.7	1731.0	28	8246.6	294.5	5.6854	-1.2217	2.2402	9.280	30.6774
Mar-21	7132.0	1954.4	31	9086.4	293.1	5.6805	-1.1409	2.2233	9.195	27.1436
Apr-21	7021.8	1730.7	30	8752.4	291.7	5.6759	-1.0628	2.2157	9.140	25.9279
May-21	7274.2	1761.7	31	9035.9	291.5	5.6750	-1.0474	2.2161	9.203	26.3556
Jun-21	6987.0	1765.0	30	8752.0	291.7	5.6758	-1.0621	2.2229	9.265	27.0596
Jul-21	7140.9	1911.0	31	9051.9	292.0	5.6767	-1.0771	2.2301	9.336	27.5547
Aug-21	7120.1	1937.6	31	9057.7	292.2	5.6774	-1.0879	2.2357	9.369	27.9666
Sep-21	7014.0	1763.6	30	8777.6	292.6	5.6788	-1.1110	2.2380	9.381	28.9828
Oct-21	7231.3	1867.2	31	9098.5	293.5	5.6819	-1.1634	2.2418	9.440	31.2574
Nov-21	7215.7	1631.0	30	8846.7	294.9	5.6866	-1.2427	2.2543	9.617	34.7746
Dec-21	7432.6	1733.3	31	9165.9	295.7	5.6893	-1.2872	2.2825	9.985	36.2355
Jan-22	7355.3	1795.4	31	9150.6	295.2	5.6876	-1.2592	2.2971	9.905	33.8311
Feb-22	6508.7	1729.1	28	8237.8	294.2	5.6843	-1.2036	2.2808	9.664	31.3781
Mar-22	7124.4	1952.3	31	9076.7	292.8	5.6795	-1.1231	2.2638	9.575	27.7666
Apr-22	7014.4	1728.8	30	8743.2	291.4	5.6748	-1.0451	2.2561	9.517	26.5240
May-22	7266.5	1759.9	31	9026.4	291.2	5.6739	-1.0297	2.2565	9.582	26.9612
Jun-22	6979.6	1763.2	30	8742.8	291.4	5.6748	-1.0443	2.2633	9.648	27.6807
Jul-22	7133.3	1908.9	31	9042.3	291.7	5.6757	-1.0592	2.2706	9.723	28.1867
Aug-22	7112.5	1935.6	31	9048.1	291.9	5.6763	-1.0701	2.2762	9.757	28.6076
Sep-22	7006.5	1761.7	30	8768.2	292.3	5.6777	-1.0930	2.2786	9.769	29.6462
Oct-22	7223.6	1865.2	31	9088.8	293.2	5.6808	-1.1454	2.2824	9.831	31.9708
Nov-22	7207.9	1629.2	30	8837.2	294.6	5.6855	-1.2245	2.2950	10.017	35.5654
Dec-22	7424.5	1731.4	31	9155.8	295.3	5.6882	-1.2688	2.3234	10.403	37.0584
Jan-23	7347.6	1793.5	31	9141.1	294.9	5.6866	-1.2418	2.3370	10.297	34.5996
Feb-23	6502.4	1727.4	28	8229.8	293.9	5.6833	-1.1875	2.3195	10.044	32.0928
Mar-23	7117.6	1950.4	31	9068.1	292.5	5.6785	-1.1071	2.3023	9.951	28.4021
Apr-23	7007.7	1727.2	30	8734.9	291.2	5.6739	-1.0292	2.2946	9.890	27.1323
May-23	7259.7	1758.2	31	9017.9	290.9	5.6730	-1.0139	2.2950	9.959	27.5790
Jun-23	6973.0	1761.5	30	8734.5	291.2	5.6738	-1.0284	2.3019	10.027	28.3143
Jul-23	7126.5	1907.1	31	9033.6	291.4	5.6747	-1.0432	2.3092	10.106	28.8314
Aug-23	7105.7	1933.7	31	9039.4	291.6	5.6754	-1.0540	2.3149	10.142	29.2616
Sep-23	6999.8	1760.0	30	8759.8	292.0	5.6767	-1.0770	2.3173	10.154	30.3230
Oct-23	7216.6	1863.4	31	9080.0	292.9	5.6798	-1.1292	2.3211	10.219	32.6986
Nov-23	7200.9	1627.6	30	8828.6	294.3	5.6846	-1.2083	2.3337	10.413	36.3719
Dec-23	7417.2	1729.7	31	9146.8	295.1	5.6872	-1.2523	2.3623	10.817	37.8977
Jan-24	7340.9	1791.9	31	9132.7	294.6	5.6856	-1.2263	2.3750	10.685	35.3959
Feb-24	6728.9	1787.6	29	8516.6	293.7	5.6825	-1.1733	2.3564	10.421	32.8333
Mar-24	7111.7	1948.8	31	9060.5	292.3	5.6777	-1.0931	2.3392	10.324	29.0605
Apr-24	7002.0	1725.8	30	8727.7	290.9	5.6731	-1.0154	2.3314	10.261	27.7625
May-24	7253.7	1756.8	31	9010.4	290.7	5.6722	-1.0001	2.3318	10.332	28.2191
Jun-24	6967.3	1760.0	30	8727.3	290.9	5.6730	-1.0145	2.3387	10.403	28.9707
Jul-24	7120.6	1905.5	31	9026.1	291.2	5.6739	-1.0293	2.3461	10.485	29.4993
Aug-24	7099.8	1932.1	31	9031.9	291.4	5.6745	-1.0400	2.3518	10.523	29.9391
Sep-24	6993.9	1758.6	30	8752.5	291.7	5.6759	-1.0629	2.3542	10.536	31.0241
Oct-24	7210.6	1861.9	31	9072.4	292.7	5.6790	-1.1151	2.3580	10.604	33.4525
Nov-24	7194.9	1626.3	30	8821.1	294.0	5.6837	-1.1940	2.3707	10.806	37.2076
Dec-24	7410.8	1728.2	31	9139.0	294.8	5.6863	-1.2379	2.3994	11.227	38.7673
Jan-25	7334.8	1790.4	31	9125.1	294.4	5.6848	-1.2124	2.4116	11.076	36.2034
Feb-25	6491.7	1724.6	28	8216.4	293.4	5.6817	-1.1600	2.3923	10.802	33.5844
Mar-25	7106.1	1947.3	31	9053.4	292.0	5.6769	-1.0799	2.3750	10.701	29.7284
Apr-25	6996.5	1724.4	30	8720.9	290.7	5.6723	-1.0023	2.3672	10.635	28.4019
May-25	7248.0	1755.4	31	9003.4	290.4	5.6714	-0.9870	2.3676	10.709	28.8686
Jun-25	6961.8	1758.7	30	8720.5	290.7	5.6722	-1.0014	2.3746	10.783	29.6367
Jul-25	7115.0	1904.0	31	9019.1	290.9	5.6731	-1.0161	2.3820	10.869	30.1770
Aug-25	7094.2	1930.6	31	9024.8	291.1	5.6737	-1.0268	2.3877	10.908	30.6264
Sep-25	6988.4	1757.2	30	8745.6	291.5	5.6751	-1.0497	2.3901	10.921	31.7353
Oct-25	7204.8	1860.4	31	9065.2	292.4	5.6782	-1.1018	2.3939	10.992	34.2172
Nov-25	7189.1	1625.0	30	8814.1	293.8	5.6829	-1.1806	2.4067	11.202	38.0550
Dec-25	7404.8	1726.8	31	9131.6	294.6	5.6855	-1.2243	2.4355	11.641	39.6490

Base Forecast of Refinery Gas Demand (2026-2030)

	2012 CGR Ref g-30 Mdth	2012 CGR Ref g-50 (CoGen) Mdth	#Days per Month	Total Ref Mdth	Total Ref Mdth/Day	ln(mdtd)	ln(G/B)	ln(G)	Total Ref Burner tip Burner tip Gas $/dth	Butane $/dth
Jan-26	7330.4	1789.3	31	9119.7	294.2	5.6842	-1.2024	2.4441	11.401	37.0327
Feb-26	6489.3	1724.0	28	8213.3	293.3	5.6813	-1.1538	2.4212	11.118	34.3558
Mar-26	7103.5	1946.6	31	9050.1	291.9	5.6765	-1.0738	2.4039	11.014	30.4146
Apr-26	6994.0	1723.8	30	8717.8	290.6	5.6719	-0.9963	2.3961	10.946	29.0586
May-26	7245.4	1754.8	31	9000.2	290.3	5.6710	-0.9810	2.3965	11.023	29.5356
Jun-26	6959.3	1758.0	30	8717.3	290.6	5.6719	-0.9954	2.4034	11.099	30.3208
Jul-26	7112.4	1903.4	31	9015.8	290.8	5.6727	-1.0101	2.4108	11.187	30.8730
Aug-26	7091.6	1929.9	31	9021.5	291.0	5.6734	-1.0207	2.4166	11.228	31.3324
Sep-26	6985.9	1756.6	30	8742.4	291.4	5.6747	-1.0436	2.4190	11.241	32.4658
Oct-26	7202.2	1859.7	31	9061.9	292.3	5.6778	-1.0957	2.4228	11.314	35.0026
Nov-26	7186.4	1624.4	30	8810.8	293.7	5.6825	-1.1744	2.4356	11.531	38.9252
Dec-26	7402.0	1726.1	31	9128.2	294.5	5.6851	-1.2179	2.4644	11.982	40.5546
Jan-27	7327.6	1788.6	31	9116.2	294.1	5.6838	-1.1960	2.4731	11.735	37.8740
Feb-27	6486.9	1723.3	28	8210.2	293.2	5.6809	-1.1474	2.4501	11.444	35.1385
Mar-27	7100.9	1945.8	31	9046.7	291.8	5.6762	-1.0675	2.4328	11.337	31.1109
Apr-27	6991.4	1723.2	30	8714.6	290.5	5.6716	-0.9901	2.4250	11.267	29.7253
May-27	7242.8	1754.1	31	8996.9	290.2	5.6706	-0.9748	2.4254	11.346	30.2128
Jun-27	6956.7	1757.4	30	8714.1	290.5	5.6715	-0.9891	2.4323	11.424	31.0152
Jul-27	7109.8	1902.7	31	9012.4	290.7	5.6724	-1.0038	2.4397	11.515	31.5794
Aug-27	7089.0	1929.2	31	9018.1	290.9	5.6730	-1.0144	2.4455	11.557	32.0489
Sep-27	6983.2	1755.9	30	8739.1	291.3	5.6744	-1.0373	2.4479	11.571	33.2071
Oct-27	7199.5	1859.0	31	9058.5	292.2	5.6775	-1.0893	2.4517	11.646	35.7995
Nov-27	7183.7	1623.7	30	8807.4	293.6	5.6822	-1.1679	2.4645	11.869	39.8080
Dec-27	7399.2	1725.5	31	9124.6	294.3	5.6847	-1.2114	2.4933	12.334	41.4731
Jan-28	7324.7	1787.9	31	9112.6	294.0	5.6834	-1.1894	2.5020	12.079	38.7266
Feb-28	6715.9	1784.2	29	8500.1	293.1	5.6805	-1.1408	2.4790	11.780	35.9318
Mar-28	7098.1	1945.1	31	9043.2	291.7	5.6758	-1.0610	2.4617	11.669	31.8170
Apr-28	6988.7	1722.5	30	8711.2	290.4	5.6712	-0.9837	2.4538	11.597	30.4013
May-28	7240.0	1753.4	31	8993.5	290.1	5.6703	-0.9684	2.4542	11.678	30.8994
Jun-28	6954.1	1756.7	30	8710.8	290.4	5.6711	-0.9827	2.4612	11.759	31.7191
Jul-28	7107.1	1901.9	31	9009.0	290.6	5.6720	-0.9974	2.4686	11.853	32.2956
Aug-28	7086.2	1928.4	31	9014.7	290.8	5.6726	-1.0080	2.4744	11.896	32.7753
Sep-28	6980.5	1755.2	30	8735.7	291.2	5.6740	-1.0308	2.4768	11.910	33.9585
Oct-28	7196.7	1858.3	31	9054.9	292.1	5.6771	-1.0828	2.4806	11.987	36.6071
Nov-28	7180.8	1623.1	30	8803.9	293.5	5.6818	-1.1613	2.4934	12.217	40.7025
Dec-28	7396.2	1724.8	31	9121.0	294.2	5.6843	-1.2047	2.5222	12.696	42.4036
Jan-29	7321.8	1787.2	31	9109.0	293.8	5.6830	-1.1827	2.5309	12.433	39.5984
Feb-29	6481.8	1722.0	28	8203.7	293.0	5.6801	-1.1342	2.5079	12.125	36.7430
Mar-29	7095.4	1944.3	31	9039.7	291.6	5.6754	-1.0545	2.4905	12.011	32.5391
Apr-29	6986.1	1721.9	30	8707.9	290.3	5.6708	-0.9773	2.4827	11.936	31.0928
May-29	7237.3	1752.8	31	8990.0	290.0	5.6699	-0.9620	2.4831	12.020	31.6016
Jun-29	6951.4	1756.0	30	8707.4	290.2	5.6707	-0.9763	2.4900	12.104	32.4391
Jul-29	7104.3	1901.2	31	9005.5	290.5	5.6716	-0.9909	2.4975	12.200	33.0281
Aug-29	7083.5	1927.7	31	9011.2	290.7	5.6722	-1.0015	2.5033	12.244	33.5181
Sep-29	6977.8	1754.5	30	8732.4	291.1	5.6736	-1.0243	2.5057	12.259	34.7270
Oct-29	7193.9	1857.6	31	9051.4	292.0	5.6767	-1.0762	2.5095	12.339	37.4329
Nov-29	7178.0	1622.5	30	8800.5	293.3	5.6814	-1.1547	2.5223	12.575	41.6170
Dec-29	7393.2	1724.1	31	9117.3	294.1	5.6839	-1.1980	2.5511	13.069	43.3550
Jan-30	7318.9	1786.5	31	9105.4	293.7	5.6826	-1.1760	2.5598	12.797	40.4896
Feb-30	6479.2	1721.3	28	8200.5	292.9	5.6797	-1.1276	2.5368	12.480	37.5724
Mar-30	7092.6	1943.6	31	9036.2	291.5	5.6750	-1.0480	2.5194	12.363	33.2775
Apr-30	6983.4	1721.2	30	8704.6	290.2	5.6704	-0.9709	2.5116	12.286	31.7999
May-30	7234.5	1752.1	31	8986.6	289.9	5.6695	-0.9556	2.5120	12.372	32.3197
Jun-30	6948.8	1755.4	30	8704.1	290.1	5.6704	-0.9699	2.5189	12.458	33.1754
Jul-30	7101.6	1900.5	31	9002.1	290.4	5.6712	-0.9845	2.5264	12.557	33.7771
Aug-30	7080.8	1926.9	31	9007.7	290.6	5.6719	-0.9950	2.5321	12.603	34.2777
Sep-30	6975.1	1753.9	30	8729.0	291.0	5.6732	-1.0178	2.5345	12.618	35.5128
Oct-30	7191.1	1856.8	31	9047.9	291.9	5.6763	-1.0697	2.5384	12.700	38.2773
Nov-30	7175.2	1621.8	30	8797.0	293.2	5.6810	-1.1480	2.5511	12.943	42.5520
Dec-30	7390.3	1723.4	31	9113.7	294.0	5.6835	-1.1913	2.5800	13.452	44.3275

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 2014 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-2014 = (7,204.2) – (85.2),

= (7,119.0 MDth).

The reduction of 85 MDth is the accumulated EE/DSM program impact for refineries.

C. Out-of-Model Adjustments for Refinery Cogeneration

For the G-50 refinery load, we have made an adjustment to account for anticipated increased gas demand from and existing customer beginning in October 2012. The amount of additional cogeneration load is about 12.8 MDth/d through the forecast time horizon.

D. Refinery Cogeneration Gas Demand

Gas used for cogeneration at refineries receives G-50 rate treatment. The base gas demand forecasted for cogeneration is adjusted as described in "C." above. Using August 2014 as an example:

G-50 Refinery Gas Demand, Aug-2014
= (1,960.5) + (12.8 MDth/d) x (31 days/mo, for Aug-2014),
= (1,960.5) + (396.8),
= (2,357.3 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 years 2010-2011, while forecasts cover years 2012-2030.

B. Monthly Forecast Tables

The additional five tables below provide monthly gas demand for the refinery segment. Recorded data are for years 2010-2011, while forecasts cover years 2012-2030.

Annual Refinery Gas Demand: Recorded (2010-2011) and Forecast (2012-2030) (MDth)

		Refinery Industrial (G-30) Gas Demand			Refinery Cogeneration (G-50) Gas Demand			
Date	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 Month	Ref **G50**, Base Econ. Fcst	Out-of-model Adj. for **Refinery G-50**	Base Ref **G50** *plus* Out-of-model Adj (MDth)
2010	**107,136**	86,235	0	86,235	365	20,901	0	20,901
2011	**108,035**	86,279	0	86,279	365	21,756	0	21,756
2012	**110,496**	87,538	334	87,204	366	22,115	1,177	23,292
2013	**112,623**	86,718	668	86,049	365	21,904	4,670	26,574
2014	**111,968**	86,462	1,003	85,459	365	21,839	4,670	26,509
2015	**111,401**	86,276	1,337	84,939	365	21,792	4,670	26,462
2016	**111,392**	86,522	1,671	84,851	366	21,858	4,683	26,541
2017	**110,532**	86,115	2,005	84,110	365	21,752	4,670	26,422
2018	**109,943**	85,912	2,340	83,572	365	21,701	4,670	26,371
2019	**109,373**	85,723	2,674	83,050	365	21,653	4,670	26,323
2020	**109,134**	85,787	3,008	82,779	366	21,672	4,683	26,355
2021	**108,360**	85,449	3,342	82,107	365	21,584	4,670	26,254
2022	**107,911**	85,357	3,676	81,681	365	21,561	4,670	26,231
2023	**107,474**	85,275	4,011	81,264	365	21,540	4,670	26,210
2024	**107,356**	85,435	4,345	81,090	366	21,583	4,683	26,266
2025	**106,631**	85,135	4,679	80,456	365	21,505	4,670	26,175
2026	**106,255**	85,103	5,013	80,089	365	21,496	4,670	26,166
2027	**106,215**	85,071	5,013	80,057	365	21,488	4,670	26,158
2028	**106,480**	85,269	5,013	80,256	366	21,542	4,683	26,224
2029	**106,133**	85,004	5,013	79,991	365	21,472	4,670	26,142
2030	**106,091**	84,971	5,013	79,958	365	21,463	4,670	26,133

Monthly Refinery Gas Demand: Recorded (2010-2011) and Forecast (2012-2030) (MDth)

			Refinery Industrial (G-30) Gas Demand			Refinery Cogeneration (G-50) Gas Demand			
Year (for "Sum-If")	Date	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 Month	Ref G50, Base Econ. Fcst	Out-of-model Adj. for Refinery G-50	Base Ref G50 *plus* Out-of-model Adj (MDth)
2010	Jan-10	**8,871**	7,377	0	7,377	31	1,494	0	1,494
2010	Feb-10	**8,528**	6,914	0	6,914	28	1,613	0	1,613
2010	Mar-10	**8,822**	6,948	0	6,948	31	1,874	0	1,874
2010	Apr-10	**8,262**	6,637	0	6,637	30	1,624	0	1,624
2010	May-10	**8,753**	7,059	0	7,059	31	1,694	0	1,694
2010	Jun-10	**8,642**	6,912	0	6,912	30	1,730	0	1,730
2010	Jul-10	**9,000**	7,210	0	7,210	31	1,790	0	1,790
2010	Aug-10	**8,935**	7,259	0	7,259	31	1,676	0	1,676
2010	Sep-10	**9,335**	7,552	0	7,552	30	1,783	0	1,783
2010	Oct-10	**9,966**	7,911	0	7,911	31	2,055	0	2,055
2010	Nov-10	**8,986**	7,178	0	7,178	30	1,808	0	1,808
2010	Dec-10	**9,038**	7,278	0	7,278	31	1,760	0	1,760
2011	Jan-11	**9,032**	7,260	0	7,260	31	1,772	0	1,772
2011	Feb-11	**7,732**	6,109	0	6,109	28	1,623	0	1,623
2011	Mar-11	**8,287**	6,505	0	6,505	31	1,783	0	1,783
2011	Apr-11	**9,572**	7,680	0	7,680	30	1,893	0	1,893
2011	May-11	**9,655**	7,772	0	7,772	31	1,882	0	1,882
2011	Jun-11	**9,241**	7,377	0	7,377	30	1,864	0	1,864
2011	Nov-11	**8,480**	6,917	0	6,917	30	1,563	0	1,563
2011	Dec-11	**10,050**	8,149	0	8,149	31	1,900	0	1,900
2012	Jan-12	**9,325**	7,518	28	7,490	31	1,835	0	1,835
2012	Feb-12	**8,700**	6,895	26	6,869	29	1,832	0	1,832
2012	Mar-12	**9,274**	7,301	28	7,273	31	2,001	0	2,001
2012	Apr-12	**8,927**	7,184	27	7,157	30	1,771	0	1,771
2012	May-12	**9,208**	7,435	28	7,407	31	1,801	0	1,801
2012	Jun-12	**8,914**	7,138	27	7,111	30	1,803	0	1,803
2012	Jul-12	**9,217**	7,294	28	7,265	31	1,952	0	1,952
2012	Aug-12	**9,222**	7,271	28	7,243	31	1,979	0	1,979
2012	Sep-12	**8,936**	7,163	27	7,135	30	1,801	0	1,801
2012	Oct-12	**9,661**	7,386	28	7,358	31	1,907	397	2,304
2012	Nov-12	**9,391**	7,369	27	7,341	30	1,666	384	2,049
2012	Dec-12	**9,721**	7,584	28	7,556	31	1,769	397	2,165
2013	Jan-13	**9,660**	7,491	57	7,435	31	1,829	397	2,225
2013	Feb-13	**8,682**	6,617	51	6,566	28	1,758	358	2,116
2013	Mar-13	**9,557**	7,235	57	7,178	31	1,982	397	2,379
2013	Apr-13	**9,204**	7,120	55	7,065	30	1,755	384	2,139
2013	May-13	**9,502**	7,376	57	7,319	31	1,786	397	2,183
2013	Jun-13	**9,205**	7,086	55	7,031	30	1,790	384	2,174
2013	Jul-13	**9,522**	7,243	57	7,187	31	1,938	397	2,335
2013	Aug-13	**9,528**	7,223	57	7,166	31	1,966	397	2,362
2013	Sep-13	**9,234**	7,116	55	7,061	30	1,789	384	2,173
2013	Oct-13	**9,573**	7,338	57	7,281	31	1,895	397	2,291
2013	Nov-13	**9,309**	7,325	55	7,270	30	1,656	384	2,039
2013	Dec-13	**9,647**	7,547	57	7,490	31	1,760	397	2,157

Monthly Refinery Gas Demand: Recorded (2010-2011) and Forecast (2012-2030) (MDth)

			Refinery Industrial (G-30) Gas Demand			Refinery Cogeneration (G-50) Gas Demand			
Year (for "Sum-If")	Date	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 Month	Ref G50, Base Econ. Fcst	Out-of-model Adj. for Refinery G-50	Base Ref G50 *plus* Out-of-model Adj (MDth)
2014	Jan-14	**9,594**	7,462	85	7,376	31	1,821	397	2,218
2014	Feb-14	**8,624**	6,592	77	6,515	28	1,751	358	2,109
2014	Mar-14	**9,495**	7,208	85	7,123	31	1,975	397	2,372
2014	Apr-14	**9,148**	7,097	82	7,015	30	1,749	384	2,133
2014	May-14	**9,448**	7,355	85	7,270	31	1,781	397	2,178
2014	Jun-14	**9,154**	7,067	82	6,985	30	1,785	384	2,169
2014	Jul-14	**9,469**	7,224	85	7,139	31	1,933	397	2,330
2014	Aug-14	**9,476**	7,204	85	7,119	31	1,961	397	2,357
2014	Sep-14	**9,184**	7,098	82	7,015	30	1,785	384	2,168
2014	Oct-14	**9,520**	7,319	85	7,234	31	1,890	397	2,286
2014	Nov-14	**9,259**	7,306	82	7,224	30	1,651	384	2,035
2014	Dec-14	**9,597**	7,530	85	7,444	31	1,756	397	2,153
2015	Jan-15	**9,541**	7,441	114	7,328	31	1,816	397	2,213
2015	Feb-15	**8,573**	6,572	103	6,469	28	1,746	358	2,104
2015	Mar-15	**9,442**	7,189	114	7,076	31	1,970	397	2,367
2015	Apr-15	**9,101**	7,081	110	6,971	30	1,745	384	2,129
2015	May-15	**9,402**	7,341	114	7,227	31	1,778	397	2,175
2015	Jun-15	**9,109**	7,053	110	6,944	30	1,782	384	2,166
2015	Jul-15	**9,423**	7,210	114	7,097	31	1,930	397	2,326
2015	Aug-15	**9,430**	7,191	114	7,077	31	1,957	397	2,353
2015	Sep-15	**9,139**	7,084	110	6,974	30	1,781	384	2,165
2015	Oct-15	**9,474**	7,305	114	7,191	31	1,886	397	2,283
2015	Nov-15	**9,214**	7,292	110	7,182	30	1,648	384	2,032
2015	Dec-15	**9,551**	7,516	114	7,402	31	1,753	397	2,149
2016	Jan-16	**9,509**	7,438	142	7,296	31	1,816	397	2,212
2016	Feb-16	**8,865**	6,816	132	6,683	29	1,811	371	2,182
2016	Mar-16	**9,431**	7,202	142	7,060	31	1,974	397	2,370
2016	Apr-16	**9,084**	7,089	137	6,952	30	1,747	384	2,131
2016	May-16	**9,378**	7,344	142	7,202	31	1,779	397	2,175
2016	Jun-16	**9,083**	7,054	137	6,917	30	1,782	384	2,166
2016	Jul-16	**9,394**	7,210	142	7,068	31	1,929	397	2,326
2016	Aug-16	**9,401**	7,189	142	7,048	31	1,956	397	2,353
2016	Sep-16	**9,110**	7,082	137	6,945	30	1,781	384	2,165
2016	Oct-16	**9,443**	7,303	142	7,161	31	1,886	397	2,282
2016	Nov-16	**9,182**	7,288	137	7,151	30	1,647	384	2,031
2016	Dec-16	**9,513**	7,507	142	7,366	31	1,751	397	2,147
2017	Jan-17	**9,464**	7,425	170	7,255	31	1,812	397	2,209
2017	Feb-17	**8,516**	6,567	154	6,413	28	1,745	358	2,103
2017	Mar-17	**9,383**	7,187	170	7,017	31	1,970	397	2,366
2017	Apr-17	**9,038**	7,075	165	6,910	30	1,744	384	2,128
2017	May-17	**9,331**	7,329	170	7,159	31	1,775	397	2,172
2017	Jun-17	**9,038**	7,040	165	6,875	30	1,778	384	2,162
2017	Jul-17	**9,347**	7,196	170	7,025	31	1,926	397	2,322
2017	Aug-17	**9,354**	7,175	170	7,004	31	1,953	397	2,349
2017	Sep-17	**9,064**	7,068	165	6,903	30	1,777	384	2,161
2017	Oct-17	**9,396**	7,288	170	7,117	31	1,882	397	2,278
2017	Nov-17	**9,136**	7,273	165	7,108	30	1,644	384	2,028
2017	Dec-17	**9,465**	7,492	170	7,322	31	1,747	397	2,144

Monthly Refinery Gas Demand: Recorded (2010-2011) and Forecast (2012-2030) (MDth)

			Refinery Industrial (G-30) Gas Demand			Refinery Cogeneration (G-50) Gas Demand			
Year (for "Sum-If")	Date	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 Month	Ref G50, Base Econ. Fcst	Out-of-model Adj. for Refinery G-50	Base Ref G50 *plus* Out-of-model Adj (MDth)
2018	Jan-18	**9,415**	7,409	199	7,210	31	1,808	397	2,205
2018	Feb-18	**8,470**	6,551	179	6,372	28	1,740	358	2,099
2018	Mar-18	**9,333**	7,170	199	6,972	31	1,965	397	2,361
2018	Apr-18	**8,990**	7,059	192	6,866	30	1,740	384	2,124
2018	May-18	**9,281**	7,312	199	7,114	31	1,771	397	2,168
2018	Jun-18	**8,990**	7,024	192	6,832	30	1,774	384	2,158
2018	Jul-18	**9,298**	7,179	199	6,980	31	1,921	397	2,318
2018	Aug-18	**9,304**	7,158	199	6,959	31	1,948	397	2,345
2018	Sep-18	**9,016**	7,051	192	6,859	30	1,773	384	2,157
2018	Oct-18	**9,345**	7,270	199	7,072	31	1,877	397	2,274
2018	Nov-18	**9,087**	7,255	192	7,063	30	1,640	384	2,024
2018	Dec-18	**9,414**	7,474	199	7,275	31	1,743	397	2,139
2019	Jan-19	**9,365**	7,391	227	7,164	31	1,804	397	2,201
2019	Feb-19	**8,426**	6,537	205	6,331	28	1,737	358	2,095
2019	Mar-19	**9,285**	7,155	227	6,927	31	1,961	397	2,357
2019	Apr-19	**8,944**	7,044	220	6,824	30	1,736	384	2,120
2019	May-19	**9,233**	7,297	227	7,070	31	1,767	397	2,164
2019	Jun-19	**8,943**	7,009	220	6,789	30	1,771	384	2,154
2019	Jul-19	**9,250**	7,163	227	6,936	31	1,917	397	2,314
2019	Aug-19	**9,256**	7,142	227	6,915	31	1,944	397	2,340
2019	Sep-19	**8,969**	7,036	220	6,816	30	1,769	384	2,153
2019	Oct-19	**9,297**	7,254	227	7,027	31	1,873	397	2,270
2019	Nov-19	**9,039**	7,239	220	7,019	30	1,636	384	2,020
2019	Dec-19	**9,365**	7,457	227	7,230	31	1,739	397	2,136
2020	Jan-20	**9,318**	7,376	255	7,121	31	1,800	397	2,197
2020	Feb-20	**8,684**	6,756	238	6,518	29	1,795	371	2,166
2020	Mar-20	**9,239**	7,140	255	6,886	31	1,957	397	2,353
2020	Apr-20	**8,900**	7,030	247	6,783	30	1,733	384	2,117
2020	May-20	**9,188**	7,283	255	7,028	31	1,764	397	2,160
2020	Jun-20	**8,900**	6,995	247	6,749	30	1,767	384	2,151
2020	Jul-20	**9,204**	7,149	255	6,895	31	1,913	397	2,310
2020	Aug-20	**9,210**	7,129	255	6,874	31	1,940	397	2,337
2020	Sep-20	**8,925**	7,022	247	6,776	30	1,766	384	2,150
2020	Oct-20	**9,251**	7,240	255	6,985	31	1,869	397	2,266
2020	Nov-20	**8,995**	7,224	247	6,978	30	1,633	384	2,017
2020	Dec-20	**9,319**	7,442	255	7,187	31	1,735	397	2,132
2021	Jan-21	**9,274**	7,364	284	7,080	31	1,797	397	2,194
2021	Feb-21	**8,348**	6,516	256	6,259	28	1,731	358	2,089
2021	Mar-21	**9,199**	7,132	284	6,848	31	1,954	397	2,351
2021	Apr-21	**8,862**	7,022	275	6,747	30	1,731	384	2,114
2021	May-21	**9,149**	7,274	284	6,990	31	1,762	397	2,158
2021	Jun-21	**8,861**	6,987	275	6,712	30	1,765	384	2,149
2021	Jul-21	**9,165**	7,141	284	6,857	31	1,911	397	2,308
2021	Aug-21	**9,170**	7,120	284	6,836	31	1,938	397	2,334
2021	Sep-21	**8,887**	7,014	275	6,739	30	1,764	384	2,147
2021	Oct-21	**9,211**	7,231	284	6,947	31	1,867	397	2,264
2021	Nov-21	**8,956**	7,216	275	6,941	30	1,631	384	2,015
2021	Dec-21	**9,279**	7,433	284	7,149	31	1,733	397	2,130

Monthly Refinery Gas Demand: Recorded (2010-2011) and Forecast (2012-2030) (MDth)

			Refinery Industrial (G-30) Gas Demand			Refinery Cogeneration (G-50) Gas Demand			
Year (for "Sum-If")	Date	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 Month	Ref G50, Base Econ. Fcst	Out-of-model Adj. for Refinery G-50	Base Ref G50 *plus* Out-of-model Adj (MDth)
2022	Jan-22	**9,235**	7,355	312	7,043	31	1,795	397	2,192
2022	Feb-22	**8,314**	6,509	282	6,227	28	1,729	358	2,087
2022	Mar-22	**9,161**	7,124	312	6,812	31	1,952	397	2,349
2022	Apr-22	**8,825**	7,014	302	6,712	30	1,729	384	2,113
2022	May-22	**9,111**	7,267	312	6,954	31	1,760	397	2,156
2022	Jun-22	**8,824**	6,980	302	6,677	30	1,763	384	2,147
2022	Jul-22	**9,127**	7,133	312	6,821	31	1,909	397	2,306
2022	Aug-22	**9,132**	7,113	312	6,800	31	1,936	397	2,332
2022	Sep-22	**8,850**	7,006	302	6,704	30	1,762	384	2,146
2022	Oct-22	**9,173**	7,224	312	6,911	31	1,865	397	2,262
2022	Nov-22	**8,919**	7,208	302	6,906	30	1,629	384	2,013
2022	Dec-22	**9,240**	7,424	312	7,112	31	1,731	397	2,128
2023	Jan-23	**9,197**	7,348	341	7,007	31	1,794	397	2,190
2023	Feb-23	**8,280**	6,502	308	6,195	28	1,727	358	2,086
2023	Mar-23	**9,124**	7,118	341	6,777	31	1,950	397	2,347
2023	Apr-23	**8,789**	7,008	330	6,678	30	1,727	384	2,111
2023	May-23	**9,074**	7,260	341	6,919	31	1,758	397	2,155
2023	Jun-23	**8,789**	6,973	330	6,643	30	1,761	384	2,145
2023	Jul-23	**9,090**	7,127	341	6,786	31	1,907	397	2,304
2023	Aug-23	**9,095**	7,106	341	6,765	31	1,934	397	2,330
2023	Sep-23	**8,814**	7,000	330	6,670	30	1,760	384	2,144
2023	Oct-23	**9,136**	7,217	341	6,876	31	1,863	397	2,260
2023	Nov-23	**8,883**	7,201	330	6,871	30	1,628	384	2,011
2023	Dec-23	**9,203**	7,417	341	7,077	31	1,730	397	2,126
2024	Jan-24	**9,161**	7,341	368	6,973	31	1,792	397	2,188
2024	Feb-24	**8,543**	6,729	344	6,385	29	1,788	371	2,159
2024	Mar-24	**9,089**	7,112	368	6,744	31	1,949	397	2,345
2024	Apr-24	**8,755**	7,002	356	6,646	30	1,726	384	2,110
2024	May-24	**9,039**	7,254	368	6,886	31	1,757	397	2,153
2024	Jun-24	**8,755**	6,967	356	6,611	30	1,760	384	2,144
2024	Jul-24	**9,055**	7,121	368	6,753	31	1,906	397	2,302
2024	Aug-24	**9,061**	7,100	368	6,732	31	1,932	397	2,329
2024	Sep-24	**8,780**	6,994	356	6,638	30	1,759	384	2,142
2024	Oct-24	**9,101**	7,211	368	6,843	31	1,862	397	2,258
2024	Nov-24	**8,849**	7,195	356	6,839	30	1,626	384	2,010
2024	Dec-24	**9,168**	7,411	368	7,043	31	1,728	397	2,125
2025	Jan-25	**9,124**	7,335	397	6,937	31	1,790	397	2,187
2025	Feb-25	**8,216**	6,492	359	6,133	28	1,725	358	2,083
2025	Mar-25	**9,053**	7,106	397	6,709	31	1,947	397	2,344
2025	Apr-25	**8,720**	6,996	385	6,612	30	1,724	384	2,108
2025	May-25	**9,003**	7,248	397	6,851	31	1,755	397	2,152
2025	Jun-25	**8,720**	6,962	385	6,577	30	1,759	384	2,142
2025	Jul-25	**9,018**	7,115	397	6,718	31	1,904	397	2,301
2025	Aug-25	**9,024**	7,094	397	6,697	31	1,931	397	2,327
2025	Sep-25	**8,745**	6,988	385	6,604	30	1,757	384	2,141
2025	Oct-25	**9,064**	7,205	397	6,807	31	1,860	397	2,257
2025	Nov-25	**8,813**	7,189	385	6,805	30	1,625	384	2,009
2025	Dec-25	**9,131**	7,405	397	7,007	31	1,727	397	2,123

Monthly Refinery Gas Demand: Recorded (2010-2011) and Forecast (2012-2030) (MDth)

			Refinery Industrial (G-30) Gas Demand			Refinery Cogeneration (G-50) Gas Demand			
Year (for "Sum-If")	Date	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 Month	Ref G50, Base Econ. Fcst	Out-of-model Adj. for Refinery G-50	Base Ref G50 *plus* Out-of-model Adj (MDth)
2026	Jan-26	**9,091**	7,330	426	6,905	31	1,789	397	2,186
2026	Feb-26	**8,187**	6,489	385	6,105	28	1,724	358	2,082
2026	Mar-26	**9,021**	7,104	426	6,678	31	1,947	397	2,343
2026	Apr-26	**8,690**	6,994	412	6,582	30	1,724	384	2,108
2026	May-26	**8,971**	7,245	426	6,820	31	1,755	397	2,151
2026	Jun-26	**8,689**	6,959	412	6,547	30	1,758	384	2,142
2026	Jul-26	**8,987**	7,112	426	6,687	31	1,903	397	2,300
2026	Aug-26	**8,992**	7,092	426	6,666	31	1,930	397	2,327
2026	Sep-26	**8,714**	6,986	412	6,574	30	1,757	384	2,140
2026	Oct-26	**9,033**	7,202	426	6,776	31	1,860	397	2,256
2026	Nov-26	**8,783**	7,186	412	6,774	30	1,624	384	2,008
2026	Dec-26	**9,099**	7,402	426	6,976	31	1,726	397	2,123
2027	Jan-27	**9,087**	7,328	426	6,902	31	1,789	397	2,185
2027	Feb-27	**8,184**	6,487	385	6,102	28	1,723	358	2,082
2027	Mar-27	**9,018**	7,101	426	6,675	31	1,946	397	2,342
2027	Apr-27	**8,686**	6,991	412	6,579	30	1,723	384	2,107
2027	May-27	**8,968**	7,243	426	6,817	31	1,754	397	2,151
2027	Jun-27	**8,686**	6,957	412	6,545	30	1,757	384	2,141
2027	Jul-27	**8,983**	7,110	426	6,684	31	1,903	397	2,299
2027	Aug-27	**8,989**	7,089	426	6,663	31	1,929	397	2,326
2027	Sep-27	**8,711**	6,983	412	6,571	30	1,756	384	2,140
2027	Oct-27	**9,029**	7,199	426	6,774	31	1,859	397	2,256
2027	Nov-27	**8,779**	7,184	412	6,772	30	1,624	384	2,008
2027	Dec-27	**9,095**	7,399	426	6,973	31	1,725	397	2,122
2028	Jan-28	**9,085**	7,325	425	6,900	31	1,788	397	2,185
2028	Feb-28	**8,474**	6,716	397	6,319	29	1,784	371	2,155
2028	Mar-28	**9,015**	7,098	425	6,673	31	1,945	397	2,342
2028	Apr-28	**8,684**	6,989	411	6,578	30	1,723	384	2,106
2028	May-28	**8,965**	7,240	425	6,815	31	1,753	397	2,150
2028	Jun-28	**8,684**	6,954	411	6,543	30	1,757	384	2,141
2028	Jul-28	**8,981**	7,107	425	6,682	31	1,902	397	2,299
2028	Aug-28	**8,987**	7,086	425	6,662	31	1,928	397	2,325
2028	Sep-28	**8,709**	6,981	411	6,570	30	1,755	384	2,139
2028	Oct-28	**9,027**	7,197	425	6,772	31	1,858	397	2,255
2028	Nov-28	**8,777**	7,181	411	6,770	30	1,623	384	2,007
2028	Dec-28	**9,093**	7,396	425	6,972	31	1,725	397	2,121
2029	Jan-29	**9,080**	7,322	426	6,896	31	1,787	397	2,184
2029	Feb-29	**8,177**	6,482	385	6,097	28	1,722	358	2,080
2029	Mar-29	**9,011**	7,095	426	6,670	31	1,944	397	2,341
2029	Apr-29	**8,680**	6,986	412	6,574	30	1,722	384	2,106
2029	May-29	**8,961**	7,237	426	6,811	31	1,753	397	2,149
2029	Jun-29	**8,679**	6,951	412	6,539	30	1,756	384	2,140
2029	Jul-29	**8,976**	7,104	426	6,679	31	1,901	397	2,298
2029	Aug-29	**8,982**	7,084	426	6,658	31	1,928	397	2,324
2029	Sep-29	**8,704**	6,978	412	6,566	30	1,755	384	2,138
2029	Oct-29	**9,022**	7,194	426	6,768	31	1,858	397	2,254
2029	Nov-29	**8,772**	7,178	412	6,766	30	1,622	384	2,006
2029	Dec-29	**9,088**	7,393	426	6,967	31	1,724	397	2,121
2030	Jan-30	**9,076**	7,319	426	6,893	31	1,786	397	2,183
2030	Feb-30	**8,174**	6,479	385	6,095	28	1,721	358	2,080
2030	Mar-30	**9,007**	7,093	426	6,667	31	1,944	397	2,340
2030	Apr-30	**8,676**	6,983	412	6,571	30	1,721	384	2,105
2030	May-30	**8,957**	7,235	426	6,809	31	1,752	397	2,149
2030	Jun-30	**8,676**	6,949	412	6,537	30	1,755	384	2,139
2030	Jul-30	**8,973**	7,102	426	6,676	31	1,900	397	2,297
2030	Aug-30	**8,979**	7,081	426	6,655	31	1,927	397	2,324
2030	Sep-30	**8,701**	6,975	412	6,563	30	1,754	384	2,138
2030	Oct-30	**9,019**	7,191	426	6,765	31	1,857	397	2,253
2030	Nov-30	**8,769**	7,175	412	6,763	30	1,622	384	2,006
2030	Dec-30	**9,085**	7,390	426	6,965	31	1,723	397	2,120

2012 CALIFORNIA GAS REPORT

ELECTRIC GENERATION
JULY 2012

2012 CALIFORNIA GAS REPORT

NON-COGENERATION ELECTRIC GENERATION
JULY 2012

The Gas Company

A Sempra Energy utility℠

2012 CGR Workpapers

SDG&E/SoCalGas

Jeff Huang

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

Workpaper List

Energy Demand Forecast for California.
SoCalGas used the Mid-Case scenario from California Energy Commission's (CEC) Revised California Energy Demand Forecast 2012-2022, dated February 2012.
To view the total CEC report, you can find it by clicking the links below.
http://www.energy.ca.gov/2012publications/CEC-200-2012-001/CEC-200-2012-001-SD-V1.pdf

http://www.energy.ca.gov/2012publications/CEC-200-2012-001/CEC-200-2012-001-SD-V2.pdf

To view the electric demand Mid-Demand Case forms, click on the link below.
http://www.energy.ca.gov/2012_energypolicy/documents/2012-02-23_workshop/mid_case/

See Schedule 1a, 1b, and 1c.

Energy Demand Forecast for Outside of California
For outside of California, load data were based on Ventyx's most recent update of peak and energy. For the most part, Ventyx acquired the data from other utilities' resource plans. The load profiles are based on the average of 7 historical years.

Renewable Power Supply Assumptions and References

Existing and Future Renewable Assumptions
See Schedule 2.

References for IOUs – based on CPUC's Long Term Procurement Plan proceeding R.10-05-006.

References for LADWP – see attached link https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-integratedresourceplanning/a-p-irp-documents?_adf.ctrl-state=junf89ack_87&_afrLoop=78135758812473.

References for SMUD – see attached link https://www.smud.org/en/about-smud/environment/renewable-energy/renewable-energy-portfolio.htm

Green House Gas (GHG) Compliance Costs
See Schedule 3.

Once Through Cooling (OTC) Compliance Schedule
See Schedule 4.

Annual Gas Demand Throughput Forecasts
For SDG&E EG forecast, see Schedule 5a and 5b. For SoCal UEG/EWG, see Schedule 6a and 6b. For SoCal Large Cogen, see Schedule 7a and 7b.

Peak Day Forecasts
For SDG&E, see Schedule 8a and 8b. For SoCalGas, see Schedule 8c and 8d.

Schedule 1a

Form 1.5a - Statewide
Revised California Energy Demand Forecast, 2012 - 2022
Net Energy for Load by Agency and Balancing Authority (GWh)

Balancing Authority	Agency	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average Annual Growth 2010 - 2022
	CCSF	1,051	1,055	1,060	1,067	1,080	1,096	1,111	1,123	1,132	1,142	1,151	1,159	1,167	0.88%
	NCPA - Greater Bay Area	1,556	1,572	1,588	1,606	1,629	1,653	1,675	1,696	1,716	1,738	1,760	1,781	1,802	1.23%
	Other NP15 LSEs - Bay Area	18	18	18	18	18	18	19	19	19	19	19	19	20	0.88%
	PG&E Service Area - Greater Bay Area	40,464	40,839	41,274	41,753	42,250	42,734	43,219	43,694	44,159	44,766	45,380	45,993	46,619	1.19%
	Silicon Valley Power	2,984	2,997	3,026	3,064	3,111	3,155	3,190	3,217	3,240	3,266	3,291	3,314	3,334	0.93%
Greater Bay Area Subtotal		46,071	46,481	46,966	47,509	48,089	48,657	49,214	49,748	50,266	50,930	51,600	52,266	52,942	1.17%
	CDWR-N	1,100	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	1,115	0.11%
	NCPA - Non Bay Area	1,052	1,063	1,074	1,087	1,100	1,113	1,126	1,138	1,150	1,166	1,182	1,198	1,214	1.20%
	Other NP15 LSEs - Non Bay Area	740	728	737	743	750	757	765	772	780	788	796	804	812	0.78%
	PG&E Service Area - Non Bay Area	41,017	41,398	41,839	42,324	42,828	43,319	43,810	44,291	44,763	45,378	46,000	46,622	47,257	1.19%
	WAPA	1,689	1,692	1,693	1,693	1,694	1,695	1,696	1,697	1,698	1,699	1,699	1,700	1,701	0.06%
Total North of Path 15		91,669	92,476	93,423	94,471	95,576	96,656	97,725	98,762	99,771	101,076	102,393	103,705	105,040	1.14%
	CDWR-ZP26	2,121	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	2,150	0.11%
	PG&E Service Area - ZP26	10,692	10,791	10,906	11,033	11,164	11,292	11,420	11,546	11,668	11,829	11,991	12,153	12,319	1.19%
Total Zone Path 26		12,813	12,941	13,056	13,183	13,314	13,442	13,570	13,695	13,818	13,979	14,141	14,303	14,468	1.02%
Total Valley		58,410	58,937	59,513	60,145	60,801	61,441	62,081	62,709	63,324	64,125	64,934	65,742	66,566	1.10%
Total North of Path 26		104,481	105,418	106,479	107,654	108,890	110,098	111,295	112,457	113,590	115,055	116,534	118,008	119,508	1.13%
	Merced	440	441	446	451	458	464	468	471	473	476	479	482	484	0.80%
	Turlock Irrigation District	2,137	2,146	2,169	2,194	2,218	2,240	2,261	2,282	2,302	2,330	2,358	2,387	2,416	1.03%
Total Turlock Irrigation District Control Area		2,577	2,587	2,615	2,645	2,676	2,704	2,729	2,752	2,775	2,806	2,838	2,869	2,900	0.99%
	City of Shasta Lake	212	211	213	216	219	221	222	222	222	223	224	224	225	0.50%
	Modesto Irrigation District	2,663	2,680	2,709	2,741	2,774	2,803	2,830	2,856	2,881	2,915	2,950	2,985	3,020	1.05%
	Redding	840	851	861	871	880	890	901	913	926	942	958	974	992	1.40%
	Roseville	1,292	1,306	1,320	1,336	1,352	1,369	1,385	1,400	1,415	1,435	1,454	1,474	1,494	1.22%
	SMUD	10,952	11,087	11,275	11,410	11,546	11,695	11,863	12,012	12,143	12,308	12,472	12,640	12,814	1.32%
	WAPA (SMUD)	1,595	1,390	1,402	1,436	1,473	1,509	1,532	1,556	1,579	1,605	1,625	1,646	1,667	0.37%
Total SMUD/WAPA Control Area		17,554	17,525	17,780	18,010	18,244	18,487	18,733	18,959	19,165	19,427	19,684	19,944	20,211	1.18%
	Anaheim	2,529	2,567	2,577	2,604	2,636	2,666	2,695	2,722	2,748	2,778	2,807	2,835	2,862	1.04%
	MWD	211	184	182	179	177	177	177	177	177	177	177	178	178	-1.41%
	Other SP15 LSEs - LA Basin	1,189	1,210	1,219	1,232	1,245	1,257	1,269	1,281	1,294	1,312	1,329	1,347	1,365	1.16%
	Pasadena	1,259	1,292	1,307	1,296	1,303	1,313	1,322	1,332	1,343	1,358	1,374	1,389	1,406	0.92%
	Riverside	2,132	2,174	2,185	2,209	2,233	2,257	2,282	2,308	2,333	2,365	2,395	2,426	2,457	1.19%
	SCE Service Area - LA Basin	69,576	70,664	71,096	71,858	72,629	73,337	74,060	74,773	75,491	76,422	77,336	78,260	79,206	1.09%
	Vernon	1,216	1,193	1,197	1,211	1,229	1,241	1,247	1,244	1,240	1,237	1,232	1,228	1,221	0.03%
LA Basin Subtotal		78,112	79,286	79,762	80,590	81,453	82,248	83,051	83,838	84,626	85,649	86,650	87,662	88,694	1.06%
	CDWR-S	4,634	4,698	4,698	4,698	4,698	4,698	4,698	4,698	4,698	4,698	4,698	4,698	4,698	0.11%
	SCE Service Area - Big Creek Ventura	14,886	15,118	15,211	15,374	15,539	15,690	15,845	15,997	16,151	16,350	16,546	16,743	16,946	1.09%
Big Creek/Ventura Subtotal		19,519	19,816	19,909	20,072	20,237	20,388	20,543	20,695	20,849	21,048	21,244	21,441	21,644	0.86%
	MWD	2,129	1,859	1,836	1,815	1,794	1,793	1,792	1,792	1,791	1,792	1,794	1,795	1,797	-1.40%
	Other SP15 LSEs - Out of LA Basin	69	67	68	68	69	70	70	70	69	69	69	68	68	-0.12%
	SCE Service Area - Out of LA Basin	4,280	4,347	4,373	4,420	4,468	4,511	4,556	4,600	4,644	4,701	4,757	4,814	4,872	1.09%
Total SCE TAC Area		104,109	105,375	105,948	106,965	108,020	109,010	110,012	110,994	111,980	113,259	114,514	115,781	117,075	0.98%
SDG&E Service Area		20,867	21,427	21,685	21,958	22,271	22,615	23,009	23,432	23,831	24,283	24,738	25,208	25,700	1.75%
Total South of Path 26		124,976	126,802	127,633	128,923	130,291	131,625	133,022	134,427	135,811	137,543	139,252	140,989	142,775	1.12%
	Burbank	1,209	1,238	1,259	1,277	1,294	1,310	1,326	1,340	1,354	1,371	1,390	1,409	1,429	1.40%
	Glendale	1,145	1,178	1,201	1,218	1,234	1,249	1,264	1,279	1,294	1,314	1,336	1,358	1,381	1.57%
	LADWP	26,025	26,656	27,022	27,286	27,539	27,782	28,009	28,251	28,498	28,879	29,278	29,690	30,132	1.23%
Total LADWP Control Area		28,378	29,073	29,482	29,781	30,066	30,341	30,599	30,870	31,146	31,565	32,003	32,457	32,941	1.25%
Imperial Irrigation District Control Area		3,641	3,772	3,874	3,946	4,007	4,068	4,129	4,197	4,272	4,367	4,471	4,462	4,533	1.84%
Total CAISO		229,457	232,219	234,112	236,577	239,181	241,722	244,316	246,884	249,401	252,598	255,786	258,997	262,283	1.12%
Total Statewide		281,607	285,177	287,863	290,959	294,175	297,322	300,507	303,662	306,759	310,764	314,781	318,728	322,869	1.15%

Schedule 1b

Form 1.5b - Statewide
Revised California Energy Demand Forecast, 2012 - 2022
1 in 2 Net Electricity Peak Demand by Agency and Balancing Authority (MW)

Balancing Authority	Agency	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average Annual Growth 2011 - 2022
	CCSF	128	131	135	137	140	142	143	145	146	147	148	149	1.39%
	NCPA - Greater Bay Area	228	234	240	244	248	252	256	259	262	265	268	270	1.55%
	Other NP15 LSEs - Bay Area	3	3	3	3	3	3	3	3	3	3	3	4	2.65%
	PG&E Service Area - Greater Bay Area	7,626	7,818	8,010	8,137	8,254	8,377	8,480	8,583	8,699	8,819	8,936	9,053	1.57%
	Silicon Valley Power	435	445	456	465	472	478	483	488	491	495	498	499	1.26%
Greater Bay Area Subtotal		8,420	8,631	8,844	8,986	9,117	9,252	9,365	9,479	9,601	9,730	9,854	9,976	1.55%
	CDWR-N	264	264	264	264	264	264	264	264	264	264	264	264	0.00%
	NCPA - Non Bay Area	216	222	227	231	234	237	240	243	246	250	252	255	1.52%
	Other NP15 LSEs - Non Bay Area	84	86	88	89	90	92	93	94	95	96	97	97	1.32%
	PG&E Service Area - Non Bay Area	9,144	9,374	9,603	9,757	9,897	10,043	10,167	10,291	10,430	10,573	10,714	10,855	1.57%
	WAPA	226	232	237	241	244	247	249	251	253	255	256	257	1.18%
Total North of Path 15		18,354	18,809	19,263	19,568	19,846	20,135	20,378	20,621	20,889	21,168	21,436	21,703	1.54%
	CDWR-ZP26	315	315	315	315	315	315	315	315	315	315	315	315	0.00%
	PG&E Service Area - ZP26	2,195	2,250	2,305	2,342	2,376	2,411	2,441	2,471	2,504	2,539	2,572	2,606	1.57%
Total Zone Path 26		2,510	2,565	2,620	2,657	2,691	2,726	2,756	2,786	2,819	2,854	2,887	2,921	1.39%
Total Valley		12,444	12,743	13,039	13,239	13,419	13,609	13,768	13,929	14,107	14,292	14,469	14,648	1.49%
Total North of Path 26		20,864	21,374	21,883	22,225	22,537	22,861	23,134	23,408	23,709	24,021	24,323	24,624	1.52%
	Merced	83	85	87	89	90	91	92	93	93	94	94	94	1.14%
	Turlock Irrigation District	479	491	503	510	517	523	528	534	541	547	553	558	1.40%
Total Turlock Irrigation District Control Area		562	576	590	599	607	614	620	627	634	641	647	652	1.36%
	City of Shasta Lake	19	20	20	21	21	21	21	21	21	21	21	21	0.91%
	Modesto Irrigation District	624	640	655	666	674	682	690	697	705	713	721	727	1.40%
	Redding	226	232	237	241	244	248	252	255	260	264	268	272	1.70%
	Roseville	324	332	340	346	351	355	360	365	370	375	379	383	1.53%
	SMUD	3,024	3,096	3,169	3,205	3,248	3,295	3,339	3,380	3,423	3,465	3,505	3,541	1.45%
	WAPA (SMUD)	188	193	198	202	205	208	210	212	214	216	217	218	1.36%
Total SMUD/WAPA Control Area		4,405	4,513	4,619	4,681	4,743	4,809	4,872	4,930	4,993	5,054	5,111	5,162	1.45%
	Anaheim	554	567	581	592	600	608	616	624	632	638	644	650	1.46%
	MWD	21	21	21	21	21	21	21	21	21	21	21	21	0.00%
	Other SP15 LSEs - LA Basin	267	273	280	285	288	292	296	300	304	308	311	315	1.51%
	Pasadena	287	294	301	305	308	311	314	317	320	324	327	330	1.28%
	Riverside	545	559	572	582	589	598	606	615	624	632	640	647	1.57%
	SCE Service Area - LA Basin	16,108	16,509	16,905	17,197	17,426	17,679	17,897	18,121	18,363	18,608	18,852	19,093	1.56%
	Vernon	162	166	170	174	176	177	177	177	177	177	176	175	0.70%
LA Basin Subtotal		17,944	18,389	18,830	19,156	19,408	19,686	19,928	20,175	20,441	20,708	20,971	21,231	1.54%
	CDWR-S	422	422	422	422	422	422	422	422	422	422	422	422	0.00%
	SCE Service Area - Big Creek Ventura	3,237	3,317	3,397	3,456	3,502	3,553	3,597	3,642	3,690	3,739	3,789	3,837	1.56%
Big Creek/Ventura Subtotal		3,659	3,739	3,819	3,878	3,924	3,975	4,019	4,064	4,112	4,161	4,211	4,259	1.39%
	MWD	210	210	210	209	210	210	211	211	212	212	212	212	0.09%
	Other SP15 LSEs - Out of LA Basin	9	10	10	10	11	11	11	11	11	11	11	10	0.96%
	SCE Service Area - Out of LA Basin	671	688	704	715	726	736	745	754	764	775	785	794	1.54%
Total SCE TAC Area		22,493	23,036	23,573	23,969	24,278	24,618	24,914	25,216	25,541	25,867	26,190	26,506	1.50%
SDG&E Service Area		4,435	4,557	4,681	4,751	4,838	4,933	5,037	5,134	5,230	5,322	5,412	5,498	1.97%
Total South of Path 26		26,928	27,593	28,254	28,720	29,116	29,551	29,951	30,349	30,771	31,189	31,602	32,004	1.58%
	Burbank	311	318	326	329	334	338	342	346	350	355	359	362	1.39%
	Glendale	339	348	356	360	365	370	374	379	385	390	396	401	1.54%
	LADWP	5,946	6,084	6,228	6,309	6,380	6,453	6,527	6,599	6,685	6,771	6,855	6,937	1.41%
Total LADWP Control Area		6,596	6,750	6,910	6,998	7,079	7,161	7,243	7,324	7,420	7,516	7,610	7,700	1.42%
Imperial Irrigation District Control Area		992	1,021	1,050	1,068	1,086	1,103	1,121	1,140	1,160	1,182	1,182	1,196	1.71%
Total CAISO Noncoincident Peak		47,792	48,967	50,137	50,945	51,653	52,411	53,084	53,757	54,480	55,211	55,924	56,628	1.55%
Total CAISO Coincident Peak		46,645	47,792	48,934	49,723	50,413	51,154	51,810	52,467	53,172	53,886	54,582	55,269	1.55%
Total Statewide Noncoincident Peak		60,347	61,827	63,306	64,291	65,168	66,098	66,940	67,778	68,687	69,604	70,474	71,338	1.53%
Total Statewide Coincident Peak		58,899	60,343	61,787	62,748	63,604	64,512	65,334	66,151	67,038	67,933	68,783	69,626	1.53%

Table only developed for the mid case.
Last historic year is 2011 (weather normalized)

Schedule 1c

Form 1.1c - Statewide
Revised California Energy Demand Forecast, 2012 - 2022
Electricity Deliveries to End Users by Agency (GWh)

Planning Area	Agency	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Average Annual Growth 2010 - 2022
PGE	Calaveras Public Power Agency	30	30	30	31	31	32	32	32	33	33	33	34	34	1.0%
	Central Valley Project	2,941	2,757	2,768	2,799	2,832	2,865	2,887	2,909	2,930	2,953	2,972	2,991	3,010	0.2%
	City of Alameda	412	417	421	426	432	437	443	449	455	462	469	476	483	1.3%
	City of Biggs	17	17	17	17	17	17	17	17	18	18	18	18	18	0.5%
	City of Gridley	33	33	34	34	35	35	35	36	36	37	37	38	39	1.4%
	City of Healdsburg	74	75	76	76	77	78	79	80	81	82	84	85	86	1.3%
	City of Hercules	16	16	16	16	17	17	17	17	17	17	18	18	18	1.0%
	City of Lodi	452	456	461	466	472	478	483	487	491	497	503	509	515	1.1%
	City of Lompoc	131	132	134	135	137	138	140	142	143	146	148	150	153	1.3%
	City of Palo Alto	962	972	982	994	1,009	1,024	1,038	1,051	1,062	1,075	1,088	1,101	1,113	1.2%
	City of Redding	766	777	785	795	803	812	822	833	844	859	874	889	905	1.4%
	City of Roseville	1,179	1,192	1,204	1,219	1,234	1,249	1,263	1,278	1,291	1,309	1,327	1,345	1,363	1.2%
	City of San Francisco	959	963	967	974	986	1,000	1,013	1,024	1,033	1,042	1,050	1,058	1,065	0.9%
	City of Shasta Lake	193	193	195	197	200	202	203	203	203	204	204	205	205	0.5%
	City of Ukiah	107	108	109	111	112	114	115	117	118	120	122	124	126	1.4%
	Lassen Municipal Utility District	132	134	135	137	138	140	141	143	145	148	151	153	156	1.4%
	Merced Irrigation District	402	403	407	412	418	423	427	429	432	435	437	440	442	0.8%
	Modesto Irrigation District	2,429	2,445	2,472	2,501	2,531	2,558	2,582	2,605	2,628	2,660	2,692	2,723	2,755	1.1%
	Pacific Gas and Electric Company (Bundled)	77,582	77,612	77,766	78,010	78,292	79,298	80,305	81,292	82,259	83,521	84,796	86,071	87,373	1.0%
	Pacific Gas and Electric Company (Direct Access)	6,517	7,268	8,018	8,769	9,520	9,520	9,520	9,520	9,520	9,520	9,520	9,520	9,520	3.2%
	Plumas-Sierra Rural Electric Cooperation	147	149	150	152	154	155	157	159	161	164	166	169	172	1.3%
	Port of Oakland	45	45	45	46	46	47	47	48	48	48	49	49	49	0.7%
	Port of Stockton	12	12	12	13	13	13	13	13	13	13	14	14	14	1.3%
	Power and Water Resource Purchasing Pooling Authori	531	518	524	529	534	538	543	548	553	558	562	566	570	0.6%
	Silicon Valley Power	2,722	2,734	2,761	2,796	2,839	2,879	2,911	2,935	2,956	2,979	3,002	3,023	3,042	0.9%
	Tuolumne County Public Power Agency	25	25	25	26	26	26	27	27	28	28	28	28	29	1.2%
	Turlock Irrigation District	1,950	1,958	1,979	2,002	2,024	2,044	2,063	2,082	2,100	2,126	2,152	2,178	2,204	1.0%
PGE Total		100,766	101,440	102,495	103,681	104,927	106,139	107,326	108,478	109,601	111,055	112,517	113,974	115,457	1.1%
SMUD	Sacramento Municipal Utility District	10,293	10,420	10,597	10,724	10,851	10,992	11,149	11,289	11,412	11,568	11,722	11,880	12,043	1.3%
SCE	Anza Electric Cooperative, Inc.	44	45	46	46	46	47	47	47	48	49	50	51	52	1.4%
	Azusa Light & Water	239	241	242	245	248	250	252	254	256	258	261	263	266	0.9%
	Bear Valley Electric Service	132	136	138	139	140	142	143	145	147	150	153	156	159	1.6%
	City of Anaheim	2,368	2,404	2,413	2,439	2,468	2,496	2,523	2,549	2,573	2,601	2,628	2,654	2,680	1.0%
	City of Banning	136	139	141	142	143	145	146	148	149	152	154	156	159	1.3%
	City of Colton	328	333	336	340	343	346	349	352	355	360	364	370	375	1.1%
	City of Corona	75	76	76	77	78	79	80	81	82	82	83	83	84	0.9%
	City of Rancho Cucamonga	65	66	66	66	67	68	69	70	71	72	72	73	74	1.1%
	City of Riverside	1,996	2,036	2,046	2,068	2,091	2,113	2,136	2,161	2,185	2,214	2,243	2,271	2,300	1.2%
	City of Vernon	1,138	1,117	1,121	1,134	1,151	1,162	1,168	1,165	1,161	1,158	1,154	1,149	1,144	0.0%
	Metropolitan Water District	2,190	1,913	1,889	1,867	1,845	1,845	1,844	1,844	1,843	1,844	1,846	1,847	1,849	-1.4%
	Moreno Valley Utilities	95	97	97	98	100	101	102	103	105	106	108	109	111	1.3%
	Southern California Edison Company (Bundled)	75,141	75,501	75,076	75,047	75,028	75,873	76,736	77,588	78,446	79,558	80,649	81,753	82,882	0.8%
	Southern California Edison Company (Direct Access)	7,950	8,890	9,830	10,770	11,710	11,710	11,710	11,710	11,710	11,710	11,710	11,710	11,710	3.3%
	Valley Electric Association, Inc.	8	8	8	8	8	8	8	8	8	8	8	8	8	0.0%
	Victorville Municipal	57	55	56	56	57	58	58	58	57	57	57	56	56	-0.1%
SCE Total		91,963	93,057	93,580	94,542	95,524	96,442	97,372	98,282	99,194	100,378	101,538	102,709	103,906	1.0%
LADWP	Los Angeles Department of Water and Power	22,929	23,486	23,808	24,041	24,263	24,478	24,678	24,891	25,109	25,444	25,795	26,159	26,548	1.2%
BUGL	City of Burbank	1,136	1,164	1,184	1,200	1,216	1,231	1,246	1,259	1,272	1,289	1,306	1,324	1,343	1.4%
	City of Glendale	1,076	1,107	1,129	1,145	1,160	1,174	1,188	1,202	1,216	1,235	1,255	1,276	1,298	1.6%
BUGL Total		2,212	2,271	2,312	2,345	2,375	2,405	2,434	2,461	2,488	2,524	2,561	2,600	2,640	1.5%
PASD	City of Pasadena	1,183	1,214	1,228	1,218	1,225	1,234	1,242	1,252	1,262	1,276	1,291	1,306	1,321	0.9%
DWR	Department of Water Resources	7,566	7,671	7,671	7,671	7,671	7,671	7,671	7,671	7,671	7,671	7,671	7,671	7,671	0.1%
SDGE	San Diego Gas and Electric Company (Bundled)	16,283	16,716	16,867	17,032	17,234	17,556	17,924	18,319	18,691	19,114	19,538	19,978	20,437	1.9%
	San Diego Gas and Electric Company (Direct Access)	3,202	3,292	3,382	3,472	3,562	3,562	3,562	3,562	3,562	3,562	3,562	3,562	3,562	0.9%
SDGE Total		19,485	20,008	20,249	20,504	20,796	21,118	21,486	21,881	22,253	22,676	23,100	23,540	23,999	1.8%
IID	Imperial Irrigation District	3,228	3,344	3,434	3,498	3,553	3,606	3,661	3,721	3,787	3,872	3,963	3,955	4,018	1.8%
OTHER	City of Needles	56	56	56	56	56	56	56	56	56	56	56	56	56	0.0%
	Mountain Utilities	5	5	5	5	5	5	5	5	5	5	5	5	5	0.0%
	PacifiCorp	831	844	850	857	864	871	878	885	892	899	906	899	906	0.7%
	Sierra Pacific Power Company	549	550	550	550	550	550	550	550	550	550	550	550	550	0.0%
	Surprise Valley Electrification Corporation	91	91	92	92	92	93	93	94	94	94	95	94	95	0.4%
	Truckee-Donner Public Utility District	148	150	151	153	154	155	157	158	160	161	163	161	163	0.8%
OTHER Total		1,679	1,696	1,705	1,713	1,722	1,730	1,740	1,748	1,757	1,766	1,776	1,766	1,776	0.5%
Statewide Total		261,306	264,608	267,079	269,937	272,908	275,814	278,758	281,674	284,535	288,230	291,935	295,560	299,379	1.1%
Total Pumping Load		12,698	12,341	12,328	12,337	12,349	12,381	12,402	12,423	12,444	12,468	12,489	12,509	12,530	-0.1%
Total Statewide Retail Deliveries excluding pumping		248,608	252,267	254,751	257,600	260,559	263,433	266,356	269,251	272,092	275,761	279,446	283,052	286,849	1.2%

This table includes retail sales and other deliveries only measured at the customer level. Losses and consumption served by self-generation are excluded.
Table includes sales from entities outside of California. Thus, total sales in row 70 are higher than state totals given in Form 1.1b.
Table only developed for the mid case.
Last historic year is 2010.

Schedule 2
Total California Renewable Energy (GWh)

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020
PG&E	17,497	19,464	22,346	23,065	23,610	24,179	26,026	27,951	29,910
SMUD	2,331	2,359	2,387	2,418	2,899	3,048	3,309	3,586	3,868
SCE	20,683	22,462	24,936	26,828	26,736	29,993	30,393	30,552	30,751
LADWP	4,762	4,808	4,853	4,896	5,676	6,223	6,779	7,379	8,512
SDG&E	3,481	4,803	5,906	6,409	6,655	6,643	6,677	6,724	6,834
Other Utilities	1,360	1,407	1,457	1,470	4,210	5,082	5,976	7,286	9,313
Total RPS	50,113	55,304	61,885	65,086	69,785	75,168	79,160	83,478	89,189
Statewide RPS Goal (%)	20.4%	22.3%	24.7%	25.6%	27.2%	28.9%	30.1%	31.4%	33.0%
Total Out-of-State RPS	7,356	7,442	7,531	7,618	7,705	7,792	7,877	7,987	8,098
Total In-State RPS	42,758	47,862	54,354	57,469	62,080	67,376	71,283	75,491	81,091

Schedule 3
GHG Compliance Costs

Year	Nominal $/Short Ton	Nominal $/Metric Ton	Natural Gas Nominal $/ mmBtu	Coal Nominal $/ mmBtu	Oil Nominal $/ mmBtu	Unspec Import $/MWh
2011	$ -	$ -	$ -	$ -	$ -	
2012	$ 10.44	$ 11.51	$ 0.61	$ 1.13	$ 0.87	0
2013	$ 17.83	$ 19.65	$ 1.04	$ 1.93	$ 1.49	$ 8.58
2014	$ 21.08	$ 23.24	$ 1.23	$ 2.28	$ 1.77	$ 10.14
2015	$ 24.35	$ 26.84	$ 1.43	$ 2.63	$ 2.04	$ 11.72
2016	$ 27.91	$ 30.77	$ 1.63	$ 3.01	$ 2.34	$ 13.43
2017	$ 31.49	$ 34.71	$ 1.84	$ 3.40	$ 2.64	$ 15.15
2018	$ 35.37	$ 38.99	$ 2.07	$ 3.82	$ 2.96	$ 17.02
2019	$ 39.29	$ 43.31	$ 2.30	$ 4.24	$ 3.29	$ 18.91
2020	$ 43.52	$ 47.97	$ 2.55	$ 4.70	$ 3.65	$ 20.94

Conversion Factors:	Short/Metric	Ton/mmBtu	Ton/mmBtu	Ton/mmBtu	Ton/MWh
	1.1023	0.0531	0.098	0.076	0.43656

Schedule 4
OTC Compliance Date

Plants	Existing Capacity (MW)	SWRCB Compliance Date	More Recent Approved Date	CGR 2012
Humboldt Bay (1,2)		12/31/2010	Offline	Offline
Potrero (3)		10/1/2011	Offline	Offline
South Bay		12/31/2011	Offline	Offline
El Segundo (3)	335	12/31/2015		8/1/2013
El Segundo (4)	335	12/31/2015		12/31/2015
Harbor (1,2,5)	229	12/31/2015	12/31/2031	12/31/2031
Morro Bay (3,4)	650	12/31/2015		12/31/2015
Encina (1,2,3)	318	12/31/2017		12/31/2017
Encina (4,5)	628	12/31/2017		12/31/2017
Contra Costa (6,7)	674	12/31/2017		12/31/2013
Pittsburg (5,6)	629	12/31/2017		12/31/2017
Moss Landing (1,2)	1,020	12/31/2017		12/31/2017
Moss Landing (6,7)	1,510	12/31/2017		12/31/2017
Haynes (1,2)	444	12/31/2019	12/31/2027	12/31/2027
Haynes (5,6)	535	12/31/2019	12/31/2013	12/31/2013
Haynes (8,9,10)	575	12/31/2019	12/31/2035	12/31/2035
Huntington Beach (1,2)	452	12/31/2020		12/31/2020
Huntington Beach (3,4)	452	12/31/2020		1/1/2012
Redondo (5,6)	354	12/31/2020		12/31/2020
Redondo (7,8)	989	12/31/2020		12/31/2020
Alamitos (1,2)	350	12/31/2020		12/31/2020
Alamitos (3,4)	668	12/31/2020		12/31/2020
Alamitos (5,6)	993	12/31/2020		12/31/2020
Mandalay (1,2)	430	12/31/2020		12/31/2020
Ormand Beach (1,2)	1,516	12/31/2020		12/31/2020
Scattergood (1,2)	367	12/31/2020	12/31/2024	12/31/2024
Scattergood (3)	450	12/31/2020	12/31/2015	12/31/2015
San Onofre (2,3)	2,246	12/31/2022		n/a
Diablo Canyon (1,2)	2,240	12/31/2024		n/a

Schedule 5a
2012 CGR - Annual Gas Demand Forecast
SDG&E Power-Plant - BASE HYDRO Ueg/Ewg

	Annual Throughput (BCF)
2012	50
2013	43
2014	43
2015	43
2016	43
2017	42
2018	41
2019	40
2020	39
2021	39
2022	39
2023	39
2024	39
2025	39
2026	39
2027	39
2028	39
2029	39
2030	39

The EG forecast is held constant at 2020 levels for 2021 through 2030.

2012 CGR Work Papers - Jeff Huang

Schedule 5b
2012 CGR - Annual Gas Demand Forecast
SDG&E Power-Plant - DRY HYDRO Ueg/Ewg

	Annual Throughput (BCF)
2012	50
2013	46
2014	46
2015	46
2016	46
2017	45
2018	44
2019	42
2020	41
2021	41
2022	41
2023	41
2024	41
2025	41
2026	41
2027	41
2028	41
2029	41
2030	41

The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 6a
2012 CGR - Annual Gas Demand Forecast
SoCalgas Noncore G50 - BASE HYDRO Ueg/Ewg

	Annual Throughput (BCF)
2012	195
2013	189
2014	183
2015	185
2016	194
2017	196
2018	198
2019	200
2020	202
2021	202
2022	202
2023	202
2024	202
2025	202
2026	202
2027	202
2028	202
2029	202
2030	202

The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 6b
2012 CGR - Annual Gas Demand Forecast
SoCalgas Noncore G50 - DRY HYDRO Ueg/Ewg

	Annual Throughput (BCF)
2012	195
2013	208
2014	201
2015	202
2016	214
2017	216
2018	218
2019	220
2020	222
2021	222
2022	222
2023	222
2024	222
2025	222
2026	222
2027	222
2028	222
2029	222
2030	222

The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 7a
2012 CGR - Annual Gas Demand Forecast
SoCalgas Noncore G50 - BASE HYDRO Large Co-Generation

	Annual Throughput (BCF)
2012	51
2013	51
2014	51
2015	51
2016	52
2017	52
2018	52
2019	51
2020	51
2021	51
2022	51
2023	51
2024	51
2025	51
2026	51
2027	51
2028	51
2029	51
2030	51

The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 7b
2012 CGR - Annual Gas Demand Forecast
SoCalgas Noncore G50 - DRY HYDRO Large Co-Generation

	Annual Throughput (BCF)
2012	51
2013	52
2014	52
2015	52
2016	52
2017	52
2018	52
2019	52
2020	52
2021	52
2022	52
2023	52
2024	52
2025	52
2026	52
2027	52
2028	52
2029	52
2030	52

The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 8a
2012 CGR - Winter Peak Day Gas Demand Forecast
SDG&E Power-Plant -- BASE HYDRO Ueg/Ewg

	Peak Day Throughput (MMCFD)
2012	145
2013	148
2014	146
2015	149
2016	146
2017	149
2018	151
2019	153
2020	156
2021	156
2022	156
2023	156
2024	156
2025	156
2026	156
2027	156
2028	156
2029	156
2030	156

The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 8b
2012 CGR - Summer Peak Day Gas Demand Forecast
SDG&E Power-Plant - DRY HYDRO Ueg/Ewg

	Peak Day Throughput (MMCFD)
2012	240
2013	204
2014	247
2015	219
2016	248
2017	233
2018	219
2019	207
2020	194
2021	194
2022	194
2023	194
2024	194
2025	194
2026	194
2027	194
2028	194
2029	194
2030	194

The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 8c
2012 CGR - Winter Peak Day Gas Demand Forecast
SoCalgas Noncore G50 - BASE HYDRO Ueg/Ewg/Large Cogen

	Peak Day Throughput (MMCFD)
2012	624
2013	676
2014	642
2015	633
2016	701
2017	732
2018	764
2019	798
2020	834
2021	834
2022	834
2023	834
2024	834
2025	834
2026	834
2027	834
2028	834
2029	834
2030	834

The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 8d
2012 CGR - Summer Peak Day Gas Demand Forecast
SoCalgas Noncore G50 - DRY HYDRO Ueg/Ewg/Large Cogen

	Peak Day Throughput (MMCFD)
2012	1,259
2013	1,482
2014	1,333
2015	1,369
2016	1,398
2017	1,414
2018	1,431
2019	1,448
2020	1,465
2021	1,465
2022	1,465
2023	1,465
2024	1,465
2025	1,465
2026	1,465
2027	1,465
2028	1,465
2029	1,465
2030	1,465

The EG forecast is held constant at 2020 levels for 2021 through 2030.

2012 CALIFORNIA GAS REPORT

INDUSTRIAL/COMMERCIAL COGENERATION < 20MW
JULY 2012

The Gas Company

A Sempra Energy utility℠

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.

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

BASE EQUATION TO FORECAST ANNUAL DEMAND

The base forecast equation for annual demand is shown below:

LN(SmCoGen_MDth/yr) = 8.65095 + LN(#Cust) x (0.26059)
+ LN(G/E) x (-0.231069), where

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

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

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

For example, the calculation of small cogeneration gas demand for 2014 are as follows:

LN[SmCoGen_MDth/yr] = 8.65095 + LN(166) x (0.260593)
+ LN[(11.7991 ¢/Kwh)/(9.11071 ¢/Kwh)] x (-0.2310696)

LN[SmCoGen_MDth/yr] = 9.9228

(20,389 MDth/yr) = (EXP[9.9228])

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

Base Annual Forecast of Small Cogeneration Gas Demand

Year (YYYY)	Annual (Cal Yr) Load (MDth)	Cust (cnt)	Avg. Annual Monthly Load per Cust (Therms/ cust)	LN(Ann.MDTh /Yr)	LN(Cust) (cnt)	LN (G/E)	Gas/Elec. (G/E) Price Ratio	SCE-Retail Ind Elec. Price (Nom ¢/Kwh)	SCG's "EG tier1" Burner-Tip Price cnv. to ¢/Kwh at 87.60 Thm/Yr per Kw (Nom ¢/Kwh-Equiv.)	SCG's "EG tier1" Burner-Tip Price (Nom ¢/Thm)
2011	21,361	169.0	105,331	9.9330	5.13	0.236909	1.267	9.05099	11.4705	47.794
2012	20,951	165.0	105,814	9.9499	5.11	0.136657	1.146	8.84388	10.1389	42.246
2013	20,707	165.7	104,147	9.9382	5.11	0.192090	1.212	8.98437	10.8871	45.363
2014	20,389	165.6	102,585	9.9228	5.11	0.258571	1.295	9.11071	11.7991	49.163
2015	20,150	165.5	101,463	9.9109	5.11	0.308802	1.362	9.22103	12.5571	52.321
2016	20,190	165.4	101,742	9.9130	5.11	0.299298	1.349	9.32872	12.5836	52.432
2017	20,010	165.3	100,875	9.9040	5.11	0.337623	1.402	9.44222	13.2343	55.143
2018	19,825	165.2	99,986	9.8947	5.11	0.377409	1.459	9.56652	13.9528	58.137
2019	19,647	165.2	99,125	9.8857	5.11	0.416017	1.516	9.69047	14.6899	61.208
2020	19,501	165.1	98,430	9.8782	5.11	0.447737	1.565	9.84731	15.4087	64.203
2021	19,375	165.0	97,825	9.8717	5.11	0.475509	1.609	10.03903	16.1511	67.296
2022	19,260	165.0	97,287	9.8658	5.11	0.500790	1.650	10.23447	16.8871	70.363
2023	19,157	164.9	96,813	9.8604	5.11	0.523413	1.688	10.43373	17.6098	73.374
2024	19,066	164.8	96,390	9.8557	5.10	0.543586	1.722	10.63686	18.3185	76.327
2025	18,981	164.8	95,997	9.8512	5.10	0.562420	1.755	10.84394	19.0302	79.292
2026	18,939	164.7	95,814	9.8490	5.10	0.571679	1.771	11.05506	19.5811	81.588
2027	18,897	164.7	95,627	9.8468	5.10	0.580936	1.788	11.27029	20.1480	83.950
2028	18,856	164.6	95,441	9.8446	5.10	0.590202	1.804	11.48971	20.7315	86.381
2029	18,813	164.6	95,267	9.8423	5.10	0.599456	1.821	11.71340	21.3316	88.882
2030	18,771	164.5	95,090	9.8401	5.10	0.608714	1.838	11.94144	21.9492	91.455

This total annual small cogeneration gas demand was “split” into monthly load using the monthly proportions in the table below.

Month (mm)	Date (mmm)	*Smoothed* Monthly Load as % of Annual (2004-2010) (% of Ann. Tot.)
1	Jan	8.0420%
2	Feb	7.1519%
3	Mar	7.9145%
4	Apr	7.7413%
5	May	8.1792%
6	Jun	8.5850%
7	Jul	9.0338%
8	Aug	9.2560%
9	Sep	8.7704%
10	Oct	8.8709%
11	Nov	8.1829%
12	Dec	8.2721%
Check-Sum Total:		100.0000%

FORECAST RESULTS

Based on the year 2014 example above, the August 2014 small cogeneration (G-50) gas demand is calculated as:

SmCoGen_G-50 = (1,887.2 MDth) = (20,389 MDth/yr) x (0.0.092560)

The tables below provide the small cogeneration gas demand forecast, monthly, from 2012 through 2030.

Year (for "Sum-If")	Date	Monthly Small CoGen (C&I) Gas Small Cogen (C&I) (G-50) Gas Demand (MDth)
2010	Jan-10	1,695
2010	Feb-10	1,507
2010	Mar-10	1,668
2010	Apr-10	1,632
2010	May-10	1,724
2010	Jun-10	1,809
2010	Jul-10	1,904
2010	Aug-10	1,951
2010	Sep-10	1,849
2010	Oct-10	1,870
2010	Nov-10	1,725
2010	Dec-10	1,743
2011	Jan-11	1,718
2011	Feb-11	1,528
2011	Mar-11	1,691
2011	Apr-11	1,654
2011	May-11	1,747
2011	Jun-11	1,834
2011	Nov-11	1,748
2011	Dec-11	1,767
2012	Jan-12	1,685
2012	Feb-12	1,498
2012	Mar-12	1,658
2012	Apr-12	1,622
2012	May-12	1,714
2012	Jun-12	1,799
2012	Jul-12	1,893
2012	Aug-12	1,939
2012	Sep-12	1,837
2012	Oct-12	1,859
2012	Nov-12	1,714
2012	Dec-12	1,733
2013	Jan-13	1,665
2013	Feb-13	1,481
2013	Mar-13	1,639
2013	Apr-13	1,603
2013	May-13	1,694
2013	Jun-13	1,778
2013	Jul-13	1,871
2013	Aug-13	1,917
2013	Sep-13	1,816
2013	Oct-13	1,837
2013	Nov-13	1,694
2013	Dec-13	1,713
2014	Jan-14	1,640
2014	Feb-14	1,458
2014	Mar-14	1,614
2014	Apr-14	1,578
2014	May-14	1,668
2014	Jun-14	1,750
2014	Jul-14	1,842
2014	Aug-14	1,887
2014	Sep-14	1,788
2014	Oct-14	1,809
2014	Nov-14	1,668
2014	Dec-14	1,687
2015	Jan-15	1,620
2015	Feb-15	1,441
2015	Mar-15	1,595
2015	Apr-15	1,560
2015	May-15	1,648
2015	Jun-15	1,730
2015	Jul-15	1,820
2015	Aug-15	1,865
2015	Sep-15	1,767
2015	Oct-15	1,787
2015	Nov-15	1,649
2015	Dec-15	1,667

Year (for "Sum-If")	Date	Monthly Small CoGen (C&I) Gas Small Cogen (C&I) (G-50) Gas Demand (MDth)
2016	Jan-16	1,624
2016	Feb-16	1,444
2016	Mar-16	1,598
2016	Apr-16	1,563
2016	May-16	1,651
2016	Jun-16	1,733
2016	Jul-16	1,824
2016	Aug-16	1,869
2016	Sep-16	1,771
2016	Oct-16	1,791
2016	Nov-16	1,652
2016	Dec-16	1,670
2017	Jan-17	1,609
2017	Feb-17	1,431
2017	Mar-17	1,584
2017	Apr-17	1,549
2017	May-17	1,637
2017	Jun-17	1,718
2017	Jul-17	1,808
2017	Aug-17	1,852
2017	Sep-17	1,755
2017	Oct-17	1,775
2017	Nov-17	1,637
2017	Dec-17	1,655
2018	Jan-18	1,594
2018	Feb-18	1,418
2018	Mar-18	1,569
2018	Apr-18	1,535
2018	May-18	1,621
2018	Jun-18	1,702
2018	Jul-18	1,791
2018	Aug-18	1,835
2018	Sep-18	1,739
2018	Oct-18	1,759
2018	Nov-18	1,622
2018	Dec-18	1,640
2019	Jan-19	1,580
2019	Feb-19	1,405
2019	Mar-19	1,555
2019	Apr-19	1,521
2019	May-19	1,607
2019	Jun-19	1,687
2019	Jul-19	1,775
2019	Aug-19	1,818
2019	Sep-19	1,723
2019	Oct-19	1,743
2019	Nov-19	1,608
2019	Dec-19	1,625
2020	Jan-20	1,568
2020	Feb-20	1,395
2020	Mar-20	1,543
2020	Apr-20	1,510
2020	May-20	1,595
2020	Jun-20	1,674
2020	Jul-20	1,762
2020	Aug-20	1,805
2020	Sep-20	1,710
2020	Oct-20	1,730
2020	Nov-20	1,596
2020	Dec-20	1,613

		Monthly Small CoGen (C&I) Gas
Year (for "Sum-If")	Date	Small Cogen (C&I) (G-50) Gas Demand (MDth)
2021	Jan-21	1,558
2021	Feb-21	1,386
2021	Mar-21	1,533
2021	Apr-21	1,500
2021	May-21	1,585
2021	Jun-21	1,663
2021	Jul-21	1,750
2021	Aug-21	1,793
2021	Sep-21	1,699
2021	Oct-21	1,719
2021	Nov-21	1,585
2021	Dec-21	1,603
2022	Jan-22	1,549
2022	Feb-22	1,377
2022	Mar-22	1,524
2022	Apr-22	1,491
2022	May-22	1,575
2022	Jun-22	1,653
2022	Jul-22	1,740
2022	Aug-22	1,783
2022	Sep-22	1,689
2022	Oct-22	1,708
2022	Nov-22	1,576
2022	Dec-22	1,593
2023	Jan-23	1,541
2023	Feb-23	1,370
2023	Mar-23	1,516
2023	Apr-23	1,483
2023	May-23	1,567
2023	Jun-23	1,645
2023	Jul-23	1,731
2023	Aug-23	1,773
2023	Sep-23	1,680
2023	Oct-23	1,699
2023	Nov-23	1,568
2023	Dec-23	1,585
2024	Jan-24	1,533
2024	Feb-24	1,364
2024	Mar-24	1,509
2024	Apr-24	1,476
2024	May-24	1,559
2024	Jun-24	1,637
2024	Jul-24	1,722
2024	Aug-24	1,765
2024	Sep-24	1,672
2024	Oct-24	1,691
2024	Nov-24	1,560
2024	Dec-24	1,577
2025	Jan-25	1,526
2025	Feb-25	1,358
2025	Mar-25	1,502
2025	Apr-25	1,469
2025	May-25	1,553
2025	Jun-25	1,630
2025	Jul-25	1,715
2025	Aug-25	1,757
2025	Sep-25	1,665
2025	Oct-25	1,684
2025	Nov-25	1,553
2025	Dec-25	1,570

Year (for "Sum-If")	Date	Monthly Small CoGen (C&I) Gas Small Cogen (C&I) (G-50) Gas Demand (MDth)
2026	Jan-26	1,523
2026	Feb-26	1,355
2026	Mar-26	1,499
2026	Apr-26	1,466
2026	May-26	1,549
2026	Jun-26	1,626
2026	Jul-26	1,711
2026	Aug-26	1,753
2026	Sep-26	1,661
2026	Oct-26	1,680
2026	Nov-26	1,550
2026	Dec-26	1,567
2027	Jan-27	1,520
2027	Feb-27	1,352
2027	Mar-27	1,496
2027	Apr-27	1,463
2027	May-27	1,546
2027	Jun-27	1,622
2027	Jul-27	1,707
2027	Aug-27	1,749
2027	Sep-27	1,657
2027	Oct-27	1,676
2027	Nov-27	1,546
2027	Dec-27	1,563
2028	Jan-28	1,516
2028	Feb-28	1,349
2028	Mar-28	1,492
2028	Apr-28	1,460
2028	May-28	1,542
2028	Jun-28	1,619
2028	Jul-28	1,703
2028	Aug-28	1,745
2028	Sep-28	1,654
2028	Oct-28	1,673
2028	Nov-28	1,543
2028	Dec-28	1,560
2029	Jan-29	1,513
2029	Feb-29	1,346
2029	Mar-29	1,489
2029	Apr-29	1,456
2029	May-29	1,539
2029	Jun-29	1,615
2029	Jul-29	1,700
2029	Aug-29	1,741
2029	Sep-29	1,650
2029	Oct-29	1,669
2029	Nov-29	1,539
2029	Dec-29	1,556
2030	Jan-30	1,510
2030	Feb-30	1,343
2030	Mar-30	1,486
2030	Apr-30	1,453
2030	May-30	1,535
2030	Jun-30	1,612
2030	Jul-30	1,696
2030	Aug-30	1,737
2030	Sep-30	1,646
2030	Oct-30	1,665
2030	Nov-30	1,536
2030	Dec-30	1,553

2012 CALIFORNIA GAS REPORT

INDUSTRIAL/COMMERCIAL COGENERATION > 20 MW
JULY 2012

The Gas Company

A Sempra Energy utility™

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

2012 CALIFORNIA GAS REPORT

EOR RELATED COGENERATION
JULY 2012

A Sempra Energy utility

ENHANCED OIL RECOVERY - COGENERATION

FORECAST METHODOLOGY FOR THE 2012 CALIFORNIA GAS REPORT

Southern California Gas' ("SoCalGas") forecast of enhanced oil recovery ("EOR") cogeneration gas requirements as reported in the *2012 California Gas Report* ("CGR") is based on customer-specific historical data and market analysis. The major steps in developing this forecast are outlined below and described in detail in the following pages.

- Analyze Historical Gas Demand
- Evaluate Market Potential
- Calculate Effect of Bypass

A. Analyze Historical Gas Demand

Historical customer gas demand data for the period 2009 through 2011 were analyzed in order to determine typical throughput volumes over the past few years.

B. Evaluate Market Potential

Potential EOR gas demand was determined by considering market information given the following assumptions:

1. Oil prices will be high enough for EOR production to be economically desirable.
2. SoCalGas has no capacity or supply constraints.
3. Air quality regulations will continue to either require or encourage the use of gas, rather than oil, in all areas.
4. Most cogeneration facilities are not alternate fuel capable.

No new EOR congeneration projects are scheduled to start up during the forecast period.

C. Calculate Effect of Bypass

Kern/Mojave began operating in February, 1992. At that time, many of SoCalGas' customers began taking service directly from these pipelines, thereby bypassing SoCalGas' distribution system.

Several factors were taken into consideration in order to forecast future bypass volumes. These factors were: the customer's geographical location, the amount of natural gas a customer has contracted to move on Kern/Mojave, the amount of Kern/Mojave gas available from marketers who have no designated end-users, and the amount of gas currently bypassing SoCalGas' distribution system.

Based on these considerations, the following assumptions were made:

1. EOR gas demand for customers located in the Los Angeles Basin, Santa Barbara, and Ventura areas will not bypass SoCalGas' distribution system.
2. Customers in the San Joaquin Valley who have already bypassed SoCalGas' system will continue to bypass at their historical levels.

The forecast of gas demand for EOR cogeneration is shown in the following table.

2012 CALIFORNIA GAS REPORT - EOR COGENERATION FORECAST (2012 - 2030)
(MMCFD)

	HISTORICAL			FORECAST																		
SOCALGAS DELIVERIES	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Long-Term Contract Customers	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Short-Term Contract Customers	10	12	11	18	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Total Deliveries	20	12	11	18	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13

2012 CALIFORNIA GAS REPORT

REFINERY-RELATED COGENERATION
JULY 2012

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Refinery Related Cogeneration Gas Demand

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

2012 CALIFORNIA GAS REPORT

WHOLESALE REQUIREMENTS
JULY 2012

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2012 CALIFORNIA GAS REPORT

San Diego Gas & Electric Company
JULY 2012

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San Diego Gas and Electric Company

The detail of SDG&E's forecast is published in the 2012 California Gas Report Workpapers for San Diego Gas and Electric. Please refer to the SDG&E workpapers.

2012 CALIFORNIA GAS REPORT

CITY OF LONG BEACH OIL AND GAS DEPARTMENT
JULY 2012

The Gas Company

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2012 California Gas Report

Long Beach Oil and Gas Workpapers have been redacted in this version.

2012 CALIFORNIA GAS REPORT

SOUTHWEST GAS CORPORATION
JULY 2012

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2012 California Gas Report

Southwest Gas Corporation Workpapers have been redacted in this version.

2012 CALIFORNIA GAS REPORT

CITY OF VERNON
JULY 2012

The Gas Company

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2012 California Gas Report

The City of Vernon's Workpapers have been redacted in this version.

2012 CALIFORNIA GAS REPORT

MEXICALI
JULY 2012

The Gas Company

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2012 California Gas Report

Workpapers for Mexicali have been redacted in this version.

2012 CALIFORNIA GAS REPORT

CORE PEAKDAY FORECAST
JULY 2012

The Gas Company

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SoCalGas Heating Degree Day (HDD) Weather Designs

(Calendar Based)

	Cold		Average	Hot	
	1-in-35 exceedance	1-in-10 exceedance		1-in-10 exceedance	1-in-35 exceedance
January	339.8	319.9	282.1	244.4	224.5
February	275.3	259.2	228.6	198.0	181.9
March	224.3	211.2	186.3	161.4	148.2
April	152.3	143.4	126.5	109.6	100.6
May	59.9	56.3	49.7	43.0	39.5
June	16.4	15.5	13.6	11.8	10.9
July	2.5	2.4	2.1	1.8	1.7
August	2.0	1.9	1.7	1.5	1.4
September	5.2	4.9	4.3	3.7	3.4
October	44.8	42.2	37.2	32.2	29.6
November	176.7	166.3	146.7	127.1	116.7
December	356.8	335.9	296.2	256.6	235.7
	1656.0	1559.0	**1375.0**	1191.0	1094.0

Notes:

1/ 20-Yr-Avg (Jan1991-Dec2010)

2/ Daily system wide temperature based on six-zone average using customer counts by zone for December 2010.

2012-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-2" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
		----	----	----	----	----	----	----	----	----	----
1	RESIDEN	1950.0	1931.9	1907.6	1892.2	1879.9	1873.6	1874.0	1879.5	1876.6	1875.2
2	Com G10	430.7	431.9	429.8	428.1	426.7	426.1	424.4	422.2	419.8	417.8
2	GAC 2/	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
2	GEN 2/	2.1	1.8	2.9	2.1	2.1	2.1	2.1	2.0	2.0	2.0
3	Ind G10	82.1	80.7	77.9	76.3	75.3	74.6	73.4	71.8	70.0	68.3
4	NGV 2/	27.6	28.8	30.0	31.2	32.5	33.7	35.0	36.2	37.4	38.7
		======	======	======	======	======	======	======	======	======	======
Total:	MDth/day	2492.6	2475.2	2448.3	2430.1	2416.6	2410.3	2408.9	2411.8	2406.1	2402.1
	MMcf/day 4/	2441.6	2424.6	2398.2	2380.3	2367.2	2360.9	2359.6	2362.5	2356.8	2352.9
	Days per Mo	31	31	31	31	31	31	31	31	31	31
Pk-Day Temp. (deg-F) =		**45.4**	45.4	45.4	45.4	45.4	45.4	45.4	45.4	45.4	45.4
Hdd: December--ColdYr =		356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8
"Wkday/Wkend" Factor-Res:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
"Wkday/Wkend" Factor-NonRes:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2012-CGR Res and C&I Calculations

Notes:

1/ =("Cold-Dec" / 31 days)+[("Cold-Dec" - "Base-Dec")
/ "Cold-Dec_Hdd"]*(65 degF - 45.4 degF)

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf= 1.0209

2012-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-2" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		----	----	----	----	----	----	----	----	----	----
1	RESIDEN	1873.8	1870.8	1867.9	1866.1	1865.0	1864.6	1872.4	1879.5	1886.8	1894.3
2	Com G10	415.5	413.2	411.3	409.9	408.8	408.1	410.3	412.4	414.5	416.6
2	GAC 2/	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2	GEN 2/	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9
3	Ind G10	66.7	65.0	63.1	61.0	58.8	56.6	55.7	54.9	54.1	53.3
4	NGV 2/	39.9	41.1	42.4	43.6	44.8	46.0	47.2	48.3	49.5	50.6
		======	======	======	======	======	======	======	======	======	======
Total:	MDth/day	2398.0	2392.3	2386.7	2382.6	2379.4	2377.4	2387.7	2397.2	2407.0	2416.9
	MMcf/day 4/	2349.0	2343.3	2337.9	2333.9	2330.7	2328.7	2338.8	2348.1	2357.7	2367.4
	Days per Mo	31	31	31	31	31	31	31	31	31	31
Pk-Day Temp. (deg-F) =		45.4	45.4	45.4	45.4	45.4	45.4	45.4	45.4	45.4	45.4
Hdd: December--ColdYr =		356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8
"Wkday/Wkend" Factor-Res:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
"Wkday/Wkend" Factor-NonRes:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2012-CGR Res and C&I Calculations

Notes:

1/ =("Cold-Dec" / 31 days)+[("Cold-Dec" - "Base-Dec")
/ "Cold-Dec_Hdd"]*(65 degF - 45.4 degF)

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf= 1.0209

2012-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-10" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
		----	----	----	----	----	----	----	----	----	----
1	RESIDEN	2291.2	2270.0	2241.4	2223.4	2208.8	2201.4	2201.9	2208.3	2205.0	2203.3
2	Com G10	489.6	491.0	488.8	486.9	485.4	484.7	482.7	480.2	477.4	475.1
2	GAC 2/	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
2	GEN 2/	2.1	1.8	2.9	2.1	2.1	2.1	2.1	2.0	2.0	2.0
3	Ind G10	87.9	86.6	83.7	82.0	81.0	80.2	79.0	77.2	75.4	73.5
4	NGV 2/	27.6	28.8	30.0	31.2	32.5	33.7	35.0	36.2	37.4	38.7
		======	======	======	======	======	======	======	======	======	======
Total:	MDth/day	2898.5	2878.3	2846.9	2825.6	2809.9	2802.3	2800.7	2804.1	2797.4	2792.7
	MMcf/day 4/	2839.2	2819.4	2788.6	2767.8	2752.3	2745.0	2743.3	2746.7	2740.2	2735.6
	Days per Mo	31	31	31	31	31	31	31	31	31	31
Pk-Day Temp. (deg-F) =		**41.2**	41.2	41.2	41.2	41.2	41.2	41.2	41.2	41.2	41.2
Hdd: December--ColdYr =		356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8
"Wkday/Wkend" Factor-Res:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
"Wkday/Wkend" Factor-NonRes:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2012-CGR Res and C&I Calculations

Notes:

1/ =("Cold-Dec" / 31 days)+[("Cold-Dec" - "Base-Dec")
/ "Cold-Dec_Hdd"]*(65 degF - 41.2 degF)

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf= 1.0209

2012-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-10" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		----	----	----	----	----	----	----	----	----	----
1	RESIDEN	2201.7	2198.2	2194.7	2192.6	2191.4	2190.8	2200.1	2208.4	2217.0	2225.8
2	Com G10	472.5	469.8	467.7	466.0	464.7	464.0	466.3	468.8	471.1	473.5
2	GAC 2/	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2	GEN 2/	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9
3	Ind G10	71.8	70.1	68.0	65.7	63.4	61.1	60.2	59.3	58.4	57.6
4	NGV 2/	39.9	41.1	42.4	43.6	44.8	46.0	47.2	48.3	49.5	50.6
		======	======	======	======	======	======	======	======	======	======
Total:	MDth/day	2788.0	2781.3	2774.8	2770.1	2766.3	2763.9	2775.8	2786.8	2798.1	2809.5
	MMcf/day 4/	2730.9	2724.4	2718.0	2713.3	2709.7	2707.3	2719.0	2729.7	2740.8	2752.0
	Days per Mo	31	31	31	31	31	31	31	31	31	31
Pk-Day Temp. (deg-F) =		41.2	41.2	41.2	41.2	41.2	41.2	41.2	41.2	41.2	41.2
Hdd: December--ColdYr =		356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8
"Wkday/Wkend" Factor-Res:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
"Wkday/Wkend" Factor-NonRes:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2012-CGR Res and C&I Calculations

Notes:

1/ =("Cold-Dec" / 31 days)+[("Cold-Dec" - "Base-Dec")
/ "Cold-Dec_Hdd"]*(65 degF - 41.2 degF)

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf= 1.0209

2012-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-35" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
		----	----	----	----	----	----	----	----	----	----
1	RESIDEN	2478.3	2455.3	2424.4	2404.9	2389.2	2381.2	2381.7	2388.7	2385.0	2383.2
2	Com G10	521.9	523.5	521.1	519.1	517.5	516.8	514.7	512.0	509.0	506.5
2	GAC 2/	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
2	GEN 2/	2.1	1.8	2.9	2.1	2.1	2.1	2.1	2.0	2.0	2.0
3	Ind G10	91.1	89.8	86.8	85.1	84.1	83.3	82.0	80.2	78.3	76.4
4	NGV 2/	27.6	28.8	30.0	31.2	32.5	33.7	35.0	36.2	37.4	38.7
		======	======	======	======	======	======	======	======	======	======
Total:	MDth/day	3121.0	3099.3	3065.4	3042.6	3025.5	3017.3	3015.5	3019.2	3012.0	3006.9
	MMcf/day 4/	3057.2	3035.8	3002.6	2980.3	2963.5	2955.5	2953.7	2957.4	2950.3	2945.4
	Days per Mo	31	31	31	31	31	31	31	31	31	31
	Pk-Day Temp. (deg-F) =	**38.9**	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9
	Hdd: December--ColdYr =	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8
	"Wkday/Wkend" Factor-Res:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	"Wkday/Wkend" Factor-NonRes:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2012-CGR Res and C&I Calculations

Notes:

1/ =("Cold-Dec" / 31 days)+[("Cold-Dec" - "Base-Dec")
/ "Cold-Dec_Hdd"]*(65 degF - 38.9 degF)

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf= 1.0209

2012-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-35" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		----	----	----	----	----	----	----	----	----	----
1	RESIDEN	2381.5	2377.6	2373.9	2371.7	2370.3	2369.7	2379.7	2388.7	2398.0	2407.5
2	Com G10	503.7	500.9	498.5	496.8	495.4	494.6	497.1	499.6	502.2	504.6
2	GAC 2/	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
2	GEN 2/	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9	1.9
3	Ind G10	74.6	72.8	70.7	68.4	65.9	63.5	62.6	61.7	60.8	60.0
4	NGV 2/	39.9	41.1	42.4	43.6	44.8	46.0	47.2	48.3	49.5	50.6
		======	======	======	======	======	======	======	======	======	======
Total:	MDth/day	3001.9	2994.6	2987.6	2982.5	2978.5	2975.9	2988.6	3000.4	3012.5	3024.8
	MMcf/day 4/	2940.4	2933.3	2926.4	2921.4	2917.5	2914.9	2927.4	2939.0	2950.9	2962.9
	Days per Mo	31	31	31	31	31	31	31	31	31	31
	Pk-Day Temp. (deg-F) =	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9	38.9
	Hdd: December--ColdYr =	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8	356.8
	"Wkday/Wkend" Factor-Res:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	"Wkday/Wkend" Factor-NonRes:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2012-CGR Res and C&I Calculations

Notes:

1/ =("Cold-Dec" / 31 days)+[("Cold-Dec" - "Base-Dec") / "Cold-Dec_Hdd"]*(65 degF - 38.9 degF)

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf= 1.0209

Friday, May 22, 2012 2012-CGR Sales + Transport + Exchange for Temp=December, Cold Year

No.	"CGR_CLASS	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
		----	----	----	----	----	----	----	----	----	----
1	Residen	39946.5	39575.3	39076.9	38762.8	38509.5	38380.9	38388.3	38501.2	38442.9	38413.6
2	Com G10	9814.9	9831.7	9779.7	9737.1	9705.7	9691.3	9652.9	9604.8	9552.1	9507.6
2	GAC	4.9	5.0	5.0	4.7	4.7	4.6	4.6	4.1	4.1	4.1
2	GEN	64.1	55.5	89.2	64.5	64.2	63.9	63.6	63.3	62.9	62.6
3	Ind G10	2197.5	2151.9	2069.6	2022.2	1995.2	1975.0	1941.7	1898.0	1850.5	1801.9
4	NGV	854.1	891.9	929.9	968.1	1006.5	1045.1	1083.6	1122.2	1160.7	1199.2
		======	======	======	======	======	======	======	======	======	======
		52882	52511	51950	51559	51286	51161	51135	51194	51073	50989
	2012 CGR: Mdth/Hdd	97	96	95	95	94	94	94	94	94	93

Friday, May 22, 2012 2012-CGR Sales + Transport + Exchange for Temp=December, Cold Year

No. "CGR_CLASS	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	----	----	----	----	----	----	----	----	----	----
1 Residen	38385.2	38323.5	38263.3	38227.0	38205.0	38195.7	38356.7	38502.0	38651.9	38805.5
2 Com G10	9457.3	9406.6	9365.4	9334.7	9311.2	9298.3	9348.5	9399.2	9449.4	9498.1
2 GAC	4.1	4.1	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3
2 GEN	62.3	62.0	61.7	61.4	61.1	60.8	60.5	60.2	59.9	59.6
3 Ind G10	1758.7	1714.3	1661.2	1604.1	1544.2	1485.4	1461.3	1437.6	1415.3	1394.1
4 NGV	1237.5	1275.6	1313.5	1351.1	1388.4	1425.5	1462.1	1498.4	1534.2	1569.6
	======	======	======	======	======	======	======	======	======	======
	50905	50786	50669	50582	50514	50469	50693	50901	51114	51330
2012 CGR: Mdth/Hdd	93	93	93	93	93	93	93	93	94	94

Friday, May 22, 2012 2012-CGR Sales + Transport + Exchange for Temp=December, "Base/Zero-Hdd" Year

No.	"CGR_CLASS	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
		----	----	----	----	----	----	----	----	----	----
1	Residen	10816.4	10715.9	10580.9	10495.9	10427.3	10392.5	10394.5	10425.1	10409.3	10401.3
2	Com G10	4789.4	4780.2	4744.2	4717.5	4699.9	4691.5	4675.9	4655.8	4633.5	4615.1
2	GAC	4.9	5.0	5.0	4.7	4.7	4.6	4.6	4.1	4.1	4.1
2	GEN	64.1	55.5	89.2	64.5	64.2	63.9	63.6	63.3	62.9	62.6
3	Ind G10	1703.4	1652.9	1578.6	1536.1	1512.7	1494.6	1467.5	1432.4	1394.4	1355.5
4	NGV	854.1	891.9	929.9	968.1	1006.5	1045.1	1083.6	1122.2	1160.7	1199.2
		======	======	======	======	======	======	======	======	======	======
		18232	18101	17928	17787	17715	17692	17690	17703	17665	17638
	2010 CGR: Mdth	18232	18101	17928	17787	17715	17692	17690	17703	17665	17638

Friday, May 22, 2012 2012-CGR Sales + Transport + Exchange for Temp=December, "Base/Zero-Hdd" Year

No. "CGR_CLASS	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	----	----	----	----	----	----	----	----	----	----
1 Residen	10393.7	10376.9	10360.7	10350.8	10344.9	10342.4	10385.9	10425.3	10465.9	10507.5
2 Com G10	4594.0	4572.6	4555.9	4544.3	4536.2	4533.2	4561.1	4589.2	4617.1	4644.3
2 GAC	4.1	4.1	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.3
2 GEN	62.3	62.0	61.7	61.4	61.1	60.8	60.5	60.2	59.9	59.6
3 Ind G10	1320.9	1285.2	1242.8	1197.4	1149.7	1102.9	1083.0	1063.4	1045.0	1027.3
4 NGV	1237.5	1275.6	1313.5	1351.1	1388.4	1425.5	1462.1	1498.4	1534.2	1569.6
	======	======	======	======	======	======	======	======	======	======
	17612	17576	17538	17509	17484	17468	17556	17640	17726	17811
2010 CGR: Mdth	17612	17576	17538	17509	17484	17468	17556	17640	17726	17811

2012 CALIFORNIA GAS REPORT

SUPPORTING DATA
JULY 2012

The Gas Company

A Sempra Energy utility™

2012 CALIFORNIA GAS REPORT

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

JULY 2012

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	0.0062	Big Bear Lake	Lake Arrowhead
2. Low desert	0.0418	Palm Springs	Palm Springs
		El Centro	Brawley
3. Coastal	0.1774	Los Angeles Airport	Los Angeles Airport
		Newport Beach	Newport Beach Harbor
		Santa Barbara Airport	Santa Barbara Airport
4. High desert	0.0746	Bakersfield	Bakersfield Airport
		Lancaster Airport	Palmdale
		Fresno	Visalia
5. Interior valleys	0.3802	Burbank	Burbank
		Pasadena	Pasadena
		Ontario	Pomona Cal Poly
		Rialto	Redlands
6. Basin	0.3198	Los Angeles Civic Center	Los Angeles Civic Center
		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 2010 customer counts. These weights are used in calculating the data shown from January 1991 to December 2010.

Daily weather temperatures are from the National Climatic Data Center or from preliminary data that SoCalGas captures each day and posts on its web-site: http://www.socalgas.com/business/weather/ for various individual weather stations as well as for its system average values of HDD. Annual HDDs for the entire service area from 1991 to 2010 are listed in Table 2, below.

Table 2

Calendar Month Heating Degree-Days (Jan. 1991 through Dec. 2010)

	Month												Total
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	"Cal-Year"
1991	285	116	315	118	99	25	4	3	4	45	114	278	1406
1992	285	183	201	40	15	14	1	1	1	11	129	374	1255
1993	339	259	115	51	15	11	0	0	3	11	129	277	1210
1994	231	260	129	110	78	6	3	0	2	41	293	311	1464
1995	318	136	179	128	109	40	2	1	2	14	67	246	1242
1996	264	201	169	57	14	3	1	0	1	68	145	263	1186
1997	283	206	113	97	5	4	1	0	0	27	120	298	1154
1998	269	283	186	184	87	20	0	0	5	43	167	323	1567
1999	266	246	284	234	77	38	1	2	5	8	128	247	1536
2000	247	243	209	80	25	5	2	1	3	64	248	242	1369
2001	379	338	195	207	25	6	4	3	3	21	146	360	1687
2002	335	202	225	148	78	10	2	4	8	77	93	315	1497
2003	142	233	166	180	73	17	1	1	3	16	201	306	1339
2004	293	301	86	84	17	8	3	2	4	73	228	293	1392
2005	288	209	176	115	35	11	4	1	9	44	100	235	1227
2006	272	200	338	162	28	3	0	1	5	36	104	279	1428
2007	348	214	125	116	49	16	1	1	12	37	126	354	1399
2008	348	263	148	123	76	8	1	0	2	23	75	335	1402
2009	196	259	193	133	18	15	3	4	1	43	117	320	1302
2010	255	220	174	163	71	13	8	9	13	42	204	269	1441
20-Yr-Avg (Jan1991-Dec2010)													
Avg.	282.2	228.6	186.3	126.5	49.7	13.7	2.1	1.7	4.3	37.2	146.7	296.3	1375.2
St.Dev.	55.3	52.1	65.5	51.7	33.3	10.5	1.9	2.2	3.6	21.2	59.5	40.7	138.620
Min.	142.0	116.0	86.0	40.0	5.0	3.0	0.0	0.0	0.0	8.0	67.0	235.0	1154.0
Max.	379.0	338.0	338.0	234.0	109.0	40.0	8.0	9.0	13.0	77.0	293.0	374.0	1687.0

II. Calculations to Define Our Average-Temperature Year

The simple average of the 20-year period (January 1991 through December 2010) was used to represent the Average Year total and the individual monthly values for HDD. The standard deviation of these 20 years of annual HDDs was 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.

Our model for the annual HDD data is essentially a regression model where the only “explanatory” variable is the constant term. For example, the annual HDDs are modeled by the equation below:

$HDD_y = \beta_0 + e_y$; where β_0 represents the mean and the e_y is an error term.

It turns out (e.g., see *Econometrics*, Wonnacott and Wonnacott, 1970, Wiley & Sons, Inc., 1970, p. 254) that the average of the annual HDD_y estimates β_0 and that the standard deviation of these HDDs about the mean, β_0, estimates the standard deviation, s_e, of the error term, e_y. Further, 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:

$U = (HDD_y - \beta_0)/s_e$, 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 of 138.62 HDD from the last 20 years of data, these equations yield values of about 1,656 HDD for a “1-in-35” cold year and 1,559 as the number of HDDs for a “1-in-10” cold year (an area of 0.1000 under one tail of the T-Distribution translates to 1.328 standard deviations *above* an average-year based on a t-statistic with 19 degrees of freedom). For example, the “1-in-35” cold-year HDD is calculated as follows:

(3) Cold-year HDD = 1,656 which equals approximately

1,375 average-year HDDs + 2.025 * 138.62

Table 3 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 1991 to 2010, as shown as the bottom of Table 2, above. For example, the average-year December value of 296.2 HDD equals the simple average of the 20 December HDD figures from 1991 to 2010, and represents 21.5 percent of the HDDs in an average-year. SoCalGas calculates the cold--temperature-year monthly HDD values using the same shape of the average-year HDDs. For example, since 21.5 percent of average-temperature-year HDDs occurred in December, the estimated number of HDDs during December for a cold-year is equal to 1,656 HDDs multiplied by 21.5 percent, or 356.8 HDDs.

Table 3

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	339.8	319.9	282.1	244.4	224.5
February	275.3	259.2	228.6	198.0	181.9
March	224.3	211.2	186.3	161.4	148.2
April	152.3	143.4	126.5	109.6	100.6
May	59.9	56.3	49.7	43.0	39.5
June	16.4	15.5	13.6	11.8	10.9
July	2.5	2.4	2.1	1.8	1.7
August	2.0	1.9	1.7	1.5	1.4
September	5.2	4.9	4.3	3.7	3.4
October	44.8	42.2	37.2	32.2	29.6
November	176.7	166.3	146.7	127.1	116.7
December	356.8	335.9	296.2	256.6	235.7
	1656	1559	1375	1191	1094

IV. Calculating the Peak-Day Design Temperature

For the 2012 CGR, the peak day temperature design values were developed from the same underlying observed historical data as used in the 2013 TCAP; however, we employed the same generic probability model (the 3-parameter GEV probability distribution) that we used in the 2010 CGR. These values are 38.9°F and 41.2°F, for "1-in-35" and "1-in-10" likelihood exceedances, respectively. The subsequent discussion is modified from our 2013 TCAP work papers.

SoCalGas' Peak-Day design temperature of 38.9 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 three U.S. Weather Bureau weather stations discussed above. Since we have a time series of daily data by year, the following notation will be used for the remainder of this discussion:

(1) $AVG_{y,d}$ = system average value of Temperature

for calendar year "y" and day "d".

The calendar year, y, can range from 1950 through 2010, 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) $MinAVG_y = \min_{d=1}^{n(y)}\{ AVG_{y,d} \}$, for y=1950, 1973, …, 2010.

(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 Table 4, 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, from SAS V6.12) was used to do the calculations. Further, the calculation procedures were implemented to fit the probability models to observed *maximums* of data, like heating degrees. By recognizing that:

$$- MinAVG_y = - \min_{d=1}^{n(y)}\{AVG_{y,d}\} = \max_{d=1}^{n(y)}\{ -AVG_{y,d}\}, \text{ for } y=1950, \ldots, 2010;$$

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

Calculations were done to fit the calculated cumulative distribution function (CDF) to the empirical cumulative distribution function (ECDF) by varying the parameters of the 3-parameter GEV model. 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 Table 4.

In Table 5, 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:

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

where the parameter "α" (shown as *alpha* in Table 5) is a "small" positive value (usually less than ½) that is used to bound the ECDF away from 0 and 1.

Parameter estimates that fit the ECDF for the GEV model were selected. (Convergence to stable parameter estimates was occasionally a problem with fitting a GEV model to the ECDF; however, convergence was obtained in this case.)

The following mathematical expression specifies the GEV model we fit to the data for "-$MinAVG_y$ " shown in Table 5.

(3) $ECDF(-MinAVG_y) = Prob \{ -T < -MinAVG_y \} = \exp[-((1- k \cdot z) (1/k))]$,

where “exp[.]” is the exponential function, and

(4) $z = (-MinAVG_y - \gamma) / \theta$, for each year, y, and

the parameters “k”, “γ” and “θ” are estimated for the GEV model. The estimated values for k, γ and θ are shown in Table 5 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) $\delta = 1 - \exp[-((1- k \cdot z_\delta) (1/k))]$, or $(1- \delta) = \exp[-((1- k \cdot z_\delta) (1/k))]$,

which yields the following equation for z_δ,

(7’) $z_\delta = \{1 - [(-\ln(1- \delta))^{(k)}\} (1/k)$, where “ln[.]” is the natural

logarithm function. The implied equation for $TPDD_\delta$ is:

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

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

(9) solve for “z_δ” from equation (7’) above with (1-δ) = (1 - 1/35) = 1 - 0.0286,

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

The value of $z_\delta = 2.7950$ and $TPDD_\delta = - [\gamma + (z_\delta \cdot \theta)] = 38.9$ degrees Fahrenheit, with values for “k”, “γ” and “θ” in Table 5, below.

SDG&E’s Peak-Day design temperature of 41.2 degrees Fahrenheit, is calculated in a methodologically similar way as for the 38.9 degree peak day temperature. The criteria specified in equation (9) above for a “1-in-35” likelihood would be replaced by a “1-in-10” likelihood.

(9’) solve for “z_δ” from equation (7’) above with (1-δ) = (1 - 1/10) = 1 - 0.1000,

which yields a “z_δ” value of $z_\delta = 1.9317$ and, $TPDD_\delta = - [\gamma + (z_\delta \cdot \theta)] = 41.2$, with values for “k”, “γ” and “θ” in Table 5, below.

A plot of the cumulative distribution function for $MinAVG_y$ based on the fitted model parameters “k”, “γ” and “θ” in Table 5, below, is shown in Figure 1.

Table 4

YEAR	MINAVG	Month(MinAvg)
1950	40.8139	Jan
1951	44.5450	Dec
1952	43.0373	Jan
1953	45.6665	Feb
1954	45.6663	Dec
1955	45.8391	Dec
1956	44.8810	Feb
1957	39.4935	Jan
1958	46.2199	Nov
1959	48.2412	Feb
1960	42.2848	Jan
1961	47.1685	Dec
1962	43.3900	Jan
1963	42.5639	Jan
1964	45.2007	Nov
1965	44.7710	Jan
1966	46.6832	Jan
1967	40.7231	Dec
1968	40.6154	Dec
1969	44.8169	Jan
1970	46.8150	Dec
1971	42.9758	Jan
1972	41.4069	Dec
1973	45.0335	Jan
1974	42.9467	Jan
1975	44.6235	Jan
1976	44.8124	Jan
1977	48.2931	Jan
1978	41.6190	Dec
1979	41.3718	Jan
1980	50.3397	Jan
1981	49.3314	Jan
1982	45.3314	Jan
1983	48.6651	Jan
1984	46.9062	Dec
1985	45.0927	Feb
1986	48.5721	Feb
1987	43.4273	Dec
1988	43.2554	Dec
1989	40.5770	Feb
1990	38.9869	Dec
1991	48.6803	Mar
1992	47.3103	Dec
1993	46.0750	Jan
1994	47.1404	Nov
1995	49.8132	Dec
1996	44.9449	Feb
1997	48.3889	Jan
1998	43.5981	Dec
1999	48.9918	Jan
2000	48.7734	Mar
2001	47.1624	Feb
2002	45.8139	Jan
2003	47.0545	Dec
2004	48.1809	Nov
2005	47.2540	Jan
2006	45.7981	Mar
2007	41.4863	Jan
2008	45.7927	Dec
2009	45.2538	Dec
2010	44.6756	Dec

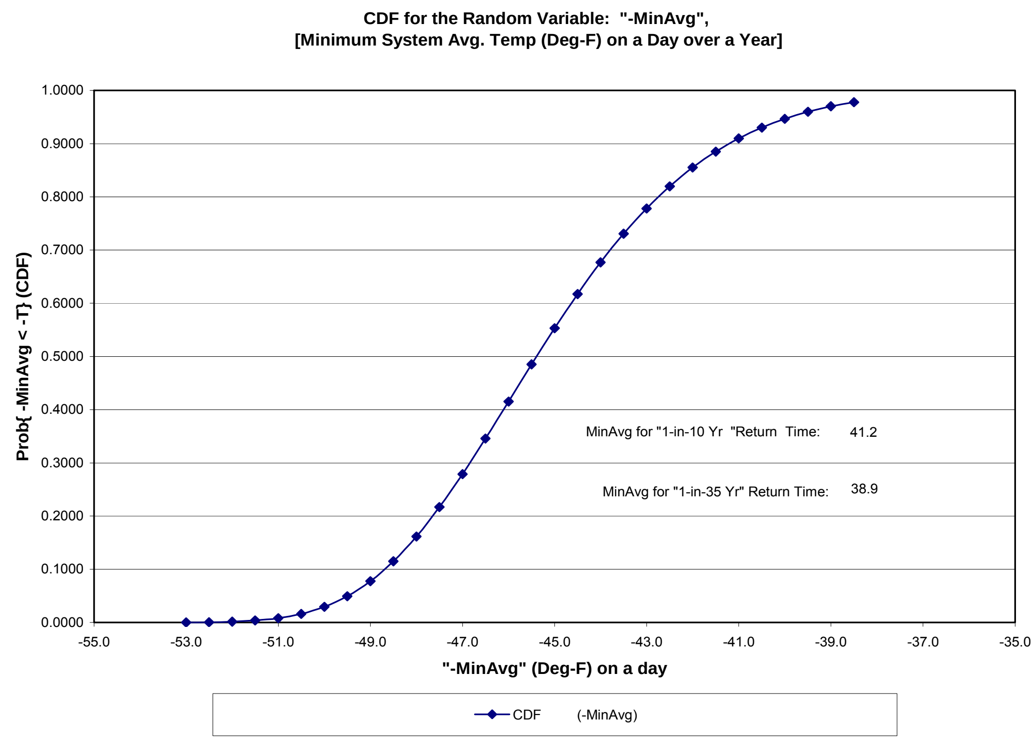
Table 5

alpha= 0.375

YEAR	Month(- MinAvg)	Days/Yr	-MinAvg	Rank	Empirical CDF	Fitted Model CDF
1980	Jan	366	-50.3397	1	0.01623	-1.416112
1995	Dec	365	-49.8132	2	0.03245	-1.231954
1981	Jan	365	-49.3314	3	0.04868	-1.106070
1999	Jan	365	-48.9918	4	0.06491	-1.006049
2000	Mar	366	-48.7734	5	0.08114	-0.920932
1991	Mar	365	-48.6803	6	0.09736	-0.845571
1983	Jan	365	-48.6651	7	0.11359	-0.777101
1986	Feb	365	-48.5721	8	0.12982	-0.713747
1997	Jan	365	-48.3889	9	0.14604	-0.654325
1977	Jan	365	-48.2931	10	0.16227	-0.598002
1959	Feb	365	-48.2412	11	0.17850	-0.544167
2004	Nov	366	-48.1809	12	0.19473	-0.492353
1992	Dec	366	-47.3103	13	0.21095	-0.442194
2005	Jan	365	-47.2540	14	0.22718	-0.393399
1961	Dec	365	-47.1685	15	0.24341	-0.345727
2001	Feb	365	-47.1624	16	0.25963	-0.298977
1994	Nov	365	-47.1404	17	0.27586	-0.252977
2003	Dec	365	-47.0545	18	0.29209	-0.207580
1984	Dec	366	-46.9062	19	0.30832	-0.162653
1970	Dec	365	-46.8150	20	0.32454	-0.118081
1966	Jan	365	-46.6832	21	0.34077	-0.073757
1958	Nov	365	-46.2199	22	0.35700	-0.029583
1993	Jan	365	-46.0750	23	0.37323	0.014532
1955	Dec	365	-45.8391	24	0.38945	0.058674
2002	Jan	365	-45.8139	25	0.40568	0.102928
2006	Mar	365	-45.7981	26	0.42191	0.147374
2008	Dec	366	-45.7927	27	0.43813	0.192092
1953	Feb	365	-45.6665	28	0.45436	0.237162
1954	Dec	365	-45.6663	29	0.47059	0.282666
1982	Jan	365	-45.3314	30	0.48682	0.328684
2009	Dec	365	-45.2538	31	0.50304	0.375304
1964	Nov	366	-45.2007	32	0.51927	0.422614
1985	Feb	365	-45.0927	33	0.53550	0.470708
1973	Jan	365	-45.0335	34	0.55172	0.519686
1996	Feb	366	-44.9449	35	0.56795	0.569657
1956	Feb	366	-44.8810	36	0.58418	0.620736
1969	Jan	365	-44.8169	37	0.60041	0.673051
1976	Jan	366	-44.8124	38	0.61663	0.726742
1965	Jan	365	-44.7710	39	0.63286	0.781965
2010	Dec	365	-44.6756	40	0.64909	0.838894
1975	Jan	365	-44.6235	41	0.66531	0.897725
1951	Dec	365	-44.5450	42	0.68154	0.958682
1998	Dec	365	-43.5981	43	0.69777	1.022019
1987	Dec	365	-43.4273	44	0.71400	1.088034
1962	Jan	365	-43.3900	45	0.73022	1.157073
1988	Dec	366	-43.2554	46	0.74645	1.229543
1952	Jan	366	-43.0373	47	0.76268	1.305932
1971	Jan	365	-42.9758	48	0.77890	1.386828
1974	Jan	365	-42.9467	49	0.79513	1.472954
1963	Jan	365	-42.5639	50	0.81136	1.565208
1960	Jan	366	-42.2848	51	0.82759	1.664729
1978	Dec	365	-41.6190	52	0.84381	1.772993
2007	Jan	365	-41.4863	53	0.86004	1.891962
1972	Dec	366	-41.4069	54	0.87627	2.024320
1979	Jan	365	-41.3718	55	0.89249	2.173889
1950	Jan	365	-40.8139	56	0.90872	2.346370
1967	Dec	365	-40.7231	57	0.92495	2.550837
1968	Dec	366	-40.6154	58	0.94118	2.803054
1989	Feb	365	-40.5770	59	0.95740	3.134301
1957	Jan	365	-39.4935	60	0.97363	3.622228
1990	Dec	365	-38.9869	61	0.98986	4.585979

"Gamma" (Fitted) =	**-46.340**
"Theta" (Fitted) =	**2.654**
Deg. Freedom=	**0.13932**

Figure 1


CDF for the Random Variable: "-MinAvg",
[Minimum System Avg. Temp (Deg-F) on a Day over a Year]
Prob{ -MinAvg < -T} (CDF)
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
-55.0
-53.0
-51.0
-49.0
-47.0
-45.0
-43.0
-41.0
-39.0
-37.0
-35.0
"-MinAvg" (Deg-F) on a day
MinAvg for "1-in-10 Yr "Return Time: 41.2
MinAvg for "1-in-35 Yr" Return Time: 38.9
CDF (-MinAvg)

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

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

The basic approach used the estimated parameters for the probability distribution (see the results provided in Table 5, above) to calculate the fitted temperatures as a function of the empirical CDF listed in Table 5. 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, calculate values of the root-mean-square error (RMSE) of the differences in each third of the distribution, along with the entire set of differences overall. The data in Table 6, 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:

$$\text{RMSE} = \text{SQRT}\left\{ \left(\sum_{i=1, \ldots, N} e[\,i\,]^{2} \right) / \,(N-3) \right\},$$

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

Since both the "1-in-35" and "1-in-10" peak-day temperature values are in the lower third quantile of the fitted distribution, the calculated standard error for these estimates is 0.6 Deg-F.

Table 6

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	50.3397	50.4948	-0.1551	0.024055
U	49.8132	49.9070	-0.0938	0.008795
U	49.3314	49.5137	-0.1824	0.033266
U	48.9918	49.2062	-0.2144	0.045973
U	48.7734	48.9478	-0.1744	0.030428
U	48.6803	48.7216	-0.0413	0.001705
U	48.6651	48.5181	0.1470	0.021598
U	48.5721	48.3315	0.2406	0.057882
U	48.3889	48.1581	0.2309	0.053296
U	48.2931	47.9949	0.2981	0.088891
U	48.2412	47.8402	0.4010	0.160776
U	48.1809	47.6924	0.4885	0.238625
U	47.3103	47.5503	-0.2400	0.057594
U	47.2540	47.4130	-0.1590	0.025285
U	47.1685	47.2798	-0.1113	0.012387
U	47.1624	47.1500	0.0124	0.000153
U	47.1404	47.0231	0.1173	0.013756
U	47.0545	46.8987	0.1557	0.024256
U	46.9062	46.7764	0.1298	0.016848
U	46.8150	46.6557	0.1593	0.025369
M	46.6832	46.5365	0.1467	0.021522
M	46.2199	46.4184	-0.1985	0.039410
M	46.0750	46.3012	-0.2262	0.051170
M	45.8391	46.1846	-0.3455	0.119386
M	45.8139	46.0685	-0.2546	0.064827
M	45.7981	45.9525	-0.1544	0.023849
M	45.7927	45.8366	-0.0439	0.001927
M	45.6665	45.7205	-0.0540	0.002921
M	45.6663	45.6040	0.0623	0.003879
M	45.3314	45.4870	-0.1556	0.024216
M	45.2538	45.3692	-0.1153	0.013306
M	45.2007	45.2504	-0.0497	0.002470
M	45.0927	45.1305	-0.0378	0.001428
M	45.0335	45.0091	0.0244	0.000596
M	44.9449	44.8862	0.0587	0.003442
M	44.8810	44.7614	0.1196	0.014306
M	44.8169	44.6345	0.1824	0.033262
M	44.8124	44.5052	0.3072	0.094359
M	44.7710	44.3733	0.3977	0.158136
M	44.6756	44.2383	0.4373	0.191200
M	44.6235	44.1000	0.5235	0.274093
L	44.5450	43.9578	0.5872	0.344847
L	43.5981	43.8114	-0.2133	0.045497
L	43.4273	43.6601	-0.2328	0.054173
L	43.3900	43.5034	-0.1134	0.012857
L	43.2554	43.3405	-0.0851	0.007242
L	43.0373	43.1706	-0.1333	0.017758
L	42.9758	42.9926	-0.0167	0.000281
L	42.9467	42.8053	0.1415	0.020010
L	42.5639	42.6071	-0.0432	0.001867
L	42.2848	42.3962	-0.1114	0.012408
L	41.6190	42.1700	-0.5510	0.303597
L	41.4863	41.9254	-0.4391	0.192787
L	41.4069	41.6580	-0.2510	0.063023
L	41.3718	41.3616	0.0102	0.000104
L	40.8139	41.0275	-0.2136	0.045628
L	40.7231	40.6416	0.0814	0.006627
L	40.6154	40.1806	0.4348	0.189019
L	40.5770	39.5992	0.9779	0.956211
L	39.4935	38.7901	0.7033	0.494685
L	38.9869	37.3450	1.6418	2.695625
			Overall RMSE ($e_{[i]}$):	0.4 °F
			Upper 3rd RMSE ($e_{[i]}$):	0.2 °F
			Middle 3rd RMSE ($e_{[i]}$):	0.3 °F
			Lower 3rd RMSE ($e_{[i]}$):	0.6 °F

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

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

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

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

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

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

For our peak-day design temperature (38.8°F) associated with a 1-in-35 annual likelihood, the return period is 35 years (δ=1/35). For the 41.2°F peak-day design temperature, the return period is 10 years (δ=1/10). Occasionally, a less precise terminology is used. For example, the 38.8°F peak-day design temperature may be referred to as a "1-in-35 year cold day"; and the 41.2°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[*return period*])^2 x (1- (1 / E [*return period*])),

(4') Var[*return period*] = (E[*return period*]) x (E [*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.

VII. Calculation of Likelihoods for Peak-Day Temperature Events Over a Specified Number of Years

With a specified annual likelihood (i.e., a level of risk) for a peak-day temperature event, several forward-looking questions can be posed:

1). What is the probability that we observe *no* peak-day event over the next N years?

2). What is the probability that we observe *at least one* specified peak-day event over the next N years?"

3). What is the probability that we observe exactly one peak-day event over the next N years?

4). What is the underlying peak-day temperature associated with the annual likelihood computed from setting the probability in question 3 above to a specified value?

To calculate the probabilities to answer questions 1-3, we use a binomial probability model:

(1) $\text{BiNomial}(s, N, \delta) = \{ N! / [(s!) (N\text{-}s)!]\} [\delta]^{(s)} [1 - \delta]^{(N-s)}$, where

N = # of years, s = # of peak-day events and δ = Annual Likelihood of a peak-day event.; the notation "N!" means the product "N(N-1)(N-2) ... (2)(1)" in the formula.

The binomial probability model is the one that applies here since for a specified number of years in the future, N, and a specified annual likelihood, δ, for the peak-day event, there are typically a number of ways that a specified number of annual peak-day events can occur out of the total, N, regardless of the order in which the outcomes might occur.

For δ=0.1, N=10 years the answer to question 1) is calculated from:

(2) Prob{ *No* peak-day event over 10 years } = BiNomial(0, 10, 0.1) = 0.3487

The answer to question 2) is simply:

(3) Prob{ *At Least* One peak-day event over 10 years } =

1 - Prob{ No peak-day event over 10 years } = 1 – 0.3487 = 0.6513

The answer to question 3) is calculated from:

(4) Prob{ *Exactly One* peak-day event over 10 years } = BiNomial(1, 10, 0.1)

(4') Prob{ *Exactly One* peak-day event over 10 years } = 0.3874

Finally, to find an answer to question 4) where there's a 1/10 chance that only one peak-day event occurs over a ten-year period, we solve for δ in the equation:

(5) 0.1000 = BiNomial(1, 10, δ).

A numerical solution to this equation yields δ = 0.0011, approximately, for the annual likelihood of a peak-day event. Our estimation results of Section IV, above, allow us to calculate the peak-day design temperature for this value of δ. The resulting calculations yield $TPDD_{\delta}$ = 37.2°F. A similar set of calculations for the case where we want to find the annual likelihood of a peak-day where only one peak-day event occurs over a thirty-five year period with a chance of 1/35=0.0286. The resulting value of δ = 0.000841 with $TPDD_{\delta}$ = 33.9°F for this value of δ.

VIII. Attachment 1: SAS Program Execution Log

```
NOTE: Copyright (c) 1989-1996 by SAS Institute Inc., Cary, NC, USA.
NOTE: SAS (r) Proprietary Software Release 6.12  TS020
      Licensed to SAN DIEGO GAS & ELECTRIC CO, Site 0009311007.

Title1 "Data Analysis for Maximum/Minimum Daily SysAvg Temperatures (Un-Rounded)." ;
Title2 "Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods." ;

/*******************************************************************************************************/
/*                                                                                                     */
/*                                                                                                     */
/*                                                                                                     */
/* FILE SAVED: "S:\Weather\2010Cgr\SoCalGas\GEV4DlyTemp(NLReg2)_Scg4WP.sas"                            */
/*                                                                                                     */
/*              Aug. 11th, 2011 for Annual Max of Negative of Min. Temp.                               */
/*              Also, separately for and each of twelve(12) calendar months Jan-Dec.                   */
/*              Fit GEV models (3-parameter and 2-parameter), plus a simple T-Dist. model.             */
/*                                                                                                     */
/*                                                                                                     */
/*  2010 California Gas Report Work Paper:  Model Estimation for the G.E.V. distribution               */
/*              rather than the T-Dist, used for the 2013 TCAP.                                        */
/*                                                                                                     */
/*                                                                                                     */
/*******************************************************************************************************/

options mprint ;
/* %cour8p
   %cour8l ; */

 options ls=211 ps=69 ; **<<LANDSCAPE:  SAS-Monospace w/Roman 6pt. Font >>**;
*options ls=160 ps=90 ; **<<PORTRAIT:   SAS-Monospace w/Roman 6pt. Font >>**;

options date number notes ;

libname out2 'S:\Weather\2013Tcap\SoCalGas\' ;
NOTE: Libref OUT2 was successfully assigned as follows:
      Engine:        V612
      Physical Name: S:\Weather\2013Tcap\SoCalGas
  **<< Change library reference to use applicable daily data. >>**;

libname estout2 'S:\Weather\2012Cgr\SoCalGas\MinTemp\' ;
NOTE: Libref ESTOUT2 was successfully assigned as follows:
      Engine:        V612
      Physical Name: S:\Weather\2012Cgr\SoCalGas\MinTemp
  **<< Change library reference to use estimation results directory. >>**;

proc contents data=out2.DlySys_d ;
run ;

NOTE: The PROCEDURE CONTENTS used 0.21 seconds.

data seriesD ;
  set out2.DlySys_d ;
  year = year(date) ;
  month = month(date) ;
  posAvg = avg ;
  negAvg = -avg ;
run ;

NOTE: The data set WORK.SERIESD has 22339 observations and 8 variables.
NOTE: The DATA statement used 1.01 seconds.
```

```
proc means data=seriesD noprint nway ;
 class year month ;
  var posAvg negAvg ;
 output out=mostat
                 mean=posAvg  negAvg
                  max=MxPosAvg MxNegAvg
                  min=MnPosAvg MnNegAvg    ;
run;

NOTE: The data set WORK.MOSTAT has 734 observations and 10 variables.
NOTE: The PROCEDURE MEANS used 0.29 seconds.


proc sort data=mostat ;
   by year month ;
run ;

NOTE: The data set WORK.MOSTAT has 734 observations and 10 variables.
NOTE: The PROCEDURE SORT used 0.2 seconds.


data mostat ;
   set mostat ;
   MxPRatio = MxPosAvg/ PosAvg  ;
   MnPRatio = MnPosAvg/ PosAvg  ;
   MxNRatio = MxNegAvg/ NegAvg  ;
   MnNRatio = MnNegAvg/ NegAvg  ;
run ;

NOTE: The data set WORK.MOSTAT has 734 observations and 14 variables.
NOTE: The DATA statement used 0.29 seconds.


/****************
***<< Print Summary Tables of Means/Minimums/Maximums of daily NEGATIVE-Temperatures (degrees-F). >>*** ;

proc transpose data=mostat out=AvTData prefix=AvT_ ;  **<< Update "year" value as necessary! >>** ;
   where (year < 2011) ;
   by year;
   id month ;
   var NegAvg  ;
run ;

data AvTData ;
   set AvTData ;

 if (mod(year,4)=0) then do ;
        AvTyr = (AvT_1 + AvT_3 + AvT_5 + AvT_7 + AvT_8 + AvT_10 + AvT_12)*31
               + (AvT_4 + AvT_6 + AvT_9 + AvT_11)*30
               + (AvT_2)*29 ;
        AvTyr = AvTyr / 366 ;
        end ;
 else do ;
        AvTyr = (AvT_1 + AvT_3 + AvT_5 + AvT_7 + AvT_8 + AvT_10 + AvT_12)*31
               + (AvT_4 + AvT_6 + AvT_9 + AvT_11)*30
               + (AvT_2)*28 ;
        AvTyr = AvTyr / 365 ;
        end ;

run ;

proc print data=AvTData ;
 id year ;
 var AvTyr AvT_1-AvT_12 ;
title3 'Monthly Mean NEGATIVE Temperature (Deg-F) from 1950 thru 2006.';
run ;
```

```
proc transpose data=mostat out=MnTData prefix=MnT_ ;
   where (year < 2011) ;     **<< Update "year" value as necessary! >>** ;
   by year;
   id month ;
   var MnNegAvg ;
run ;

data MnTData ;
   set MnTData ;
 MnTyr = min(of MnT_1-MnT_12) ;
run ;

proc print data=MnTData ;
 id year ;
 var MnTyr MnT_1-MnT_12 ;
title3 'Monthly MINIMUM NEGATIVE-Temperature (Deg-F) from 1950 thru 2006.';
run ;
****************/

proc transpose data=mostat out=MxTData prefix=MxT_ ;
   where (year < 2011) ;    **<< Update "year" value as necessary! >>** ;
   by year;
   id month ;
   var MxNegAvg ;
run ;

NOTE: The data set WORK.MXTDATA has 61 observations and 14 variables.
NOTE: The PROCEDURE TRANSPOSE used 0.14 seconds.


data MxTData ;
   set MxTData ;
 MxTyr = max(of MxT_1-MxT_12) ;
run ;

NOTE: The data set WORK.MXTDATA has 61 observations and 15 variables.
NOTE: The DATA statement used 0.14 seconds.


proc print data=MxTData ;
 id year ;
 var MxTyr MxT_1-MxT_12 ;
title3 'Monthly MAXIMUM NEGATIVE-Temperature (Deg-F) from 1950 thru 2010.';    **<< Update "year" value as necessary! >>** ;
run ;

NOTE: The PROCEDURE PRINT used 0.09 seconds.


/****************
***<< Descriptive Statistics: Maximums of daily NEGATIVE-Temperatures (Deg-F) for Year and each calendar month. >>*** ;

proc corr data=MxTData ;
  var MxTyr MxT_1 - MxT_12 ;
```

```
title3 'Correlation Matrix of Monthly Maximum NEGATIVE-Temperatures (Deg-F) within same year.';
run ;

proc arima data=MxTData ;
  identify var=MxTyr ;
  identify var=MxT_1 ;
  identify var=MxT_2 ;
  identify var=MxT_3 ;
  identify var=MxT_4 ;
  identify var=MxT_5 ;
  identify var=MxT_6 ;
  identify var=MxT_7 ;
  identify var=MxT_8 ;
  identify var=MxT_9 ;
  identify var=MxT_10 ;
  identify var=MxT_11 ;
  identify var=MxT_12 ;
title3 "Auto-correlation analysis of each calendar month's Maximum NEGATIVE-Temperatures (Deg-F) within same year.";
run ;

proc univariate normal data=MxTData plot ;
  id year ;
  var MxTyr MxT_1 - MxT_12 ;
title3 "Probability plots and tests for NORMALity by each calendar month's Maximun NEGATIVE-Temperatures (Deg-F) time series.";
run ;


proc means data=MxTData ;
  var MxT_1 - MxT_12  MxTYr ;
run ;
****************/

***<< Statistical Estimation of GEV Models: Maximums of daily heating degrees for Year and each calendar month. >>*** ;

%macro RankIt(file=MxTData,var=MxTYr,rank=RankYr,prob=PrMxTYr,Nobser=61,PltValue=0.375) ;
          **<< Update "Nobser" value as necessary! >>** ;
proc sort data=&file ;
  by &var ;
run ;

data &file ;
   set &file ;
   retain &rank 0     alpha &pltvalue ;

  &rank = &rank + 1 ;
  &prob =  (&rank - alpha) / (&Nobser +(1 - 2*alpha)) ;
run ;

proc print data=&file ;
  var &var &rank &prob alpha year ;
run ;
%mend RankIt ;

%macro GEVfit(file=MxTData,ofile=MxTNL1,outfit=fit1,outest=est1,depvar=PrMxTYr,var=MxTYr,typeGEV=1,
              KappaI=0.25,GammaI=-47.05,ThetaI=2.77,YrLo=1950,YrHi=2010) ;

          **<< Update "year" value as necessary! >>** ;

proc sort data=&file ;
   by year ;
run ;
```

```
proc model data=&file converge=0.001
           maxit=500 dw ;  outmodel=&ofile ;
     range year = &YrLo to &YrHi ;  **<< Dropped monthly data beyond 2010 data. >>** ;

     y = (&var - Gamma) / Theta ;

    %if &typeGEV=1 %then %do ;  ***<< 3-parameter GEV Model. >>>*** ;
        &depvar = exp( -(1 - Kappa * (y))**(1/Kappa) ) ;
        %let typmod = 3-parameter GEV Model. ;
        %end ;

    %if &typeGEV=2 %then %do ;  **<< 2-parameter "Double Exponential" or  "Gumbel" Model. >>** ;
        &depvar = exp( -exp(-(y)) ) ;
        %let typmod = 2-parameter Double Exponential or Gumbel Model. ;
        %end ;

    %if (&typeGEV NE 1) AND (&typeGEV NE 2) %then  %do ; **<< 2-parameter "T-Dist" Model. >>** ;
        dft=(&YrHi - &YrLo) +1 -2 ;
        &depvar = probt(y,dft) ;
        %let typmod = 2-parameter T-Dist Model. ;
        %end ;


  %if &typeGEV = 1 %then %do ;
  parms
        Kappa  &KappaI
        Gamma  &GammaI
        Theta  &ThetaI ;
  %end ;

  %if (&typeGEV NE 1)  %then %do ;
  parms
        Gamma  &GammaI
        Theta  &ThetaI ;
  %end ;


  fit &depvar   /out=&outfit  outall
                 outest=&outest corrb corrs outcov ;

title3 "Non-linear Estimation of &&typmod: for Maximum NEGATIVE Temperature (Deg-F)." ;
run ;
%mend GEVfit ;







/****************
****************/

proc means data=MxTData ;
  var MxT_1 - MxT_12  MxTYr ;
 output out=VarStat
        mean=mean1-mean12 meanYr
        std=stdev1-stdev12 stdevYr;
title3 "Calc. Means and Standard Deviantions to use as Starting Values in Non-Linear Estimations." ;
run ;

NOTE: The data set WORK.VARSTAT has 1 observations and 28 variables.
NOTE: The PROCEDURE MEANS used 0.14 seconds.



proc print data=VarStat ;
run ;

NOTE: The PROCEDURE PRINT used 0.01 seconds.



data _null_ ;
```

```
322     set VarStat ;
323
324    call symput('gamma_Yr',meanYr) ;
325    call symput('theta_Yr',stdevYr) ;
326
327    call symput('gamma_12',mean12) ;
328    call symput('theta_12',stdev12) ;
329
330    call symput('gamma_11',mean11) ;
331    call symput('theta_11',stdev11) ;
332
333    call symput('gamma_10',mean10) ;
334    call symput('theta_10',stdev10) ;
335
336    call symput('gamma_9',mean9) ;
337    call symput('theta_9',stdev9) ;
338
339    call symput('gamma_8',mean8) ;
340    call symput('theta_8',stdev8) ;
341
342    call symput('gamma_7',mean7) ;
343    call symput('theta_7',stdev7) ;
344
345    call symput('gamma_6',mean6) ;
346    call symput('theta_6',stdev6) ;
347
348    call symput('gamma_5',mean5) ;
349    call symput('theta_5',stdev5) ;
350
351    call symput('gamma_4',mean4) ;
352    call symput('theta_4',stdev4) ;
353
354    call symput('gamma_3',mean3) ;
355    call symput('theta_3',stdev3) ;
356
357    call symput('gamma_2',mean2) ;
358    call symput('theta_2',stdev2) ;
359
360    call symput('gamma_1',mean1) ;
361    call symput('theta_1',stdev1) ;
362
363  run ;

NOTE: Numeric values have been converted to character values at the places given by: (Line):(Column).
      324:26   325:26   327:26   328:26   330:26   331:26   333:26   334:26   336:25   337:25   339:25   340:25
342:25   343:25   345:25   346:25   348:25   349:25   351:25   352:25   354:25   355:25
      357:25   358:25   360:25   361:25
NOTE: The DATA statement used 0.1 seconds.


364
365
366
367
368
369
370  *********<<< Analysis for "Annual" Data  (i.e., SUFIX "mm" = "_Yr"  >>>******************;
371
372
373
MPRINT(RANKIT):   **<< UPDATE "NOBSER" VALUE AS NECESSARY! >>** ;
374
375
376  %RankIt(file=MxTData,var=MxTYr,rank=RankYr,prob=PrMxTYr,Nobser=61,PltValue=0.375) ;
MPRINT(RANKIT):   PROC SORT DATA=MXTDATA ;
MPRINT(RANKIT):   BY MXTYR ;
MPRINT(RANKIT):   RUN ;

NOTE: The data set WORK.MXTDATA has 61 observations and 15 variables.
NOTE: The PROCEDURE SORT used 0.12 seconds.


MPRINT(RANKIT):   DATA MXTDATA ;
MPRINT(RANKIT):   SET MXTDATA ;
MPRINT(RANKIT):   RETAIN RANKYR 0 ALPHA 0.375 ;
MPRINT(RANKIT):   RANKYR = RANKYR + 1 ;
MPRINT(RANKIT):   PRMXTYR = (RANKYR - ALPHA) / (61 +(1 - 2*ALPHA)) ;
```

```
MPRINT(RANKIT):   RUN ;

NOTE: The data set WORK.MXTDATA has 61 observations and 18 variables.
NOTE: The DATA statement used 0.18 seconds.


MPRINT(RANKIT):   PROC PRINT DATA=MXTDATA ;
MPRINT(RANKIT):   VAR MXTYR RANKYR PRMXTYR ALPHA YEAR ;
MPRINT(RANKIT):   RUN ;

NOTE: The PROCEDURE PRINT used 0.03 seconds.


%GEVfit(file=MxTData,ofile=MxTNL1,outfit=fit1,outest=est1,depvar=PrMxTYr,var=MxTYr,typeGEV=1,
MPRINT(GEVFIT):   **<< UPDATE "YEAR" VALUE AS NECESSARY! >>** ;
        KappaI=0.25,GammaI=&gamma_Yr,ThetaI=&theta_Yr,YrLo=1950,YrHi=2010) ;
MPRINT(GEVFIT):   PROC SORT DATA=MXTDATA ;
MPRINT(GEVFIT):   BY YEAR ;
MPRINT(GEVFIT):   RUN ;

NOTE: The data set WORK.MXTDATA has 61 observations and 18 variables.
NOTE: The PROCEDURE SORT used 0.12 seconds.


MPRINT(GEVFIT):   PROC MODEL DATA=MXTDATA CONVERGE=0.001 MAXIT=500 DW ;
MPRINT(GEVFIT):   OUTMODEL%MXTNL1 ;
MPRINT(GEVFIT):   RANGE YEAR = 1950 TO 2010 ;
MPRINT(GEVFIT):   **<< DROPPED MONTHLY DATA BEYOND 2010 DATA. >>** ;
MPRINT(GEVFIT):   Y % (MXTYR - GAMMA) / THETA ;
MPRINT(GEVFIT):   ***<< 3-PARAMETER GEV MODEL. >>>*** ;
MPRINT(GEVFIT):   PRMXTYR % EXP( -(1 - KAPPA * (Y))**(1/KAPPA) ) ;
MPRINT(GEVFIT):   PARMS KAPPA 0.25 GAMMA -45.16708607 THETA 2.7490016839 ;

MPRINT(GEVFIT):   FIT PRMXTYR /OUT=FIT1 OUTALL OUTEST=EST1 CORRB CORRS OUTCOV ;
MPRINT(GEVFIT):   TITLE3 "Non-linear Estimation of 3-parameter GEV Model.: for Maximum NEGATIVE Temperature (Deg-F)." ;
MPRINT(GEVFIT):   RUN ;

NOTE: At OLS Iteration 4 CONVERGE=0.001 Criteria Met.
NOTE: The data set WORK.FIT1 has 183 observations and 6 variables.
NOTE: The data set WORK.EST1 has 4 observations and 6 variables.

          **<< Update "YrHi" value as necessary! >>** ;


NOTE: The PROCEDURE MODEL used 0.21 seconds.


proc print data=fit1 ;
run ;

NOTE: The PROCEDURE PRINT used 0.01 seconds.


proc transpose data=fit1 out=pred1 prefix=probP ;
   where (_type_ = "PREDICT" ) ;
   by year;
   var prmxtyr ;
run ;

NOTE: The data set WORK.PRED1 has 61 observations and 3 variables.
NOTE: The PROCEDURE TRANSPOSE used 0.09 seconds.


data comb1 ;
   merge MxTData pred1 ;
  by year ;
   ProbP = ProbP1 ;
```

```
  keep year MxTYr PrMxTYr ProbP ;
run ;

NOTE: The data set WORK.COMB1 has 61 observations and 4 variables.
NOTE: The DATA statement used 0.17 seconds.


proc print data=comb1 ;
run ;

NOTE: The PROCEDURE PRINT used 0.0 seconds.


proc plot data=comb1 ;
  plot prmxtyr*MxTYr='*'
       probP*MxTYr='-' / overlay ;
run ;

NOTE: The PROCEDURE PLOT used 0.01 seconds.


proc print data=est1 ;
run ;

NOTE: The PROCEDURE PRINT used 0.01 seconds.


/**************
data estout2.est1_Yr ;   ***<<< Save a copy of the "3-parameter G.E.V. Model" estimation results!  >>>*** ;
  set est1 ;
run ;
**************/

data comb  ;
   merge MxTData pred1(rename=(ProbP1=ProbP1)) ;
  by year ;

 ***<< "Log(PrMxTYr) - Log(ProgP)" to calc. RMSE of Proportional Errors Models! >>** ;
   LgPrRat1 = Log(PrMxTYr/ProbP1) ;

 label   LgPrRat1 = "Log(PrMxTYr/ProbP1)- T-Dist" ;

   if (PrMxTYr <= (1/3)) then Quantile=1 ;  **<< "Lower Third" >>** ;
   if (PrMxTYr > (1/3)) AND (PrMxTYr <= (2/3)) then Quantile=2 ; **<< "Middle Third" >>** ;
   if (PrMxTYr > (2/3)) then Quantile=3 ;  **<< "Upper Third" >>** ;

  keep year MxTYr Quantile PrMxTYr ProbP1 LgPrRat1 ;
run ;

NOTE: The data set WORK.COMB has 61 observations and 6 variables.
NOTE: The DATA statement used 0.17 seconds.


proc print data=comb  ;
  var year MxTYr Quantile  PrMxTYr ProbP1  LgPrRat1 ;
title3 "Est'd CDFs and Logarithms of 'Empirical CDF rel. to Fitted CDF' values by Models." ;
run ;

NOTE: The PROCEDURE PRINT used 0.01 seconds.
```

```
proc means data=comb  n mean std min max var uss ;
  var LgPrRat1 ;
title3 "Stats for Logarithms of 'Empirical CDF rel. to Fitted CDF' values by Models to calc. RMSE of Prop. Model
Spec" ;
run ;

NOTE: The PROCEDURE MEANS used 0.01 seconds.


proc sort data=comb ;
  by Quantile ;
run ;

NOTE: The data set WORK.COMB has 61 observations and 6 variables.
NOTE: The PROCEDURE SORT used 0.18 seconds.


proc means data=comb  n mean std min max var uss ;
  by Quantile ;
  var LgPrRat1 ;
title3 "Stats By Quantile for Logarithms of 'Empirical CDF rel. to Fitted CDF' values by Models to calc. RMSE of
Prop. Model Spec" ;
run ;

NOTE: The PROCEDURE MEANS used 0.03 seconds.


quit ;
```

IX. Attachment 2: SAS Program Output

CONTENTS PROCEDURE

Data Set Name:	OUT2.DLYSYS_D	Observations:	22339
Member Type:	DATA	Variables:	4
Engine:	V612	Indexes:	0
Created:	9:29 Wednesday, March 23, 2011	Observation Length:	32
Last Modified:	9:29 Wednesday, March 23, 2011	Deleted Observations:	0
Protection:		Compressed:	NO
Data Set Type:		Sorted:	NO
Label:			

-----Engine/Host Dependent Information-----

Data Set Page Size:	8192
Number of Data Set Pages:	89
File Format:	607
First Data Page:	1
Max Obs per Page:	254
Obs in First Data Page:	229

-----Alphabetic List of Variables and Attributes-----

#	Variable	Type	Len	Pos	Format	Informat	Label
4	AVG	Num	8	24			
3	CDD	Num	8	16			
1	DATE	Num	8	0	YYMMDD8.	YYMMDD.	DATE
2	HDD	Num	8	8			

Data Analysis for Maximum/Minimum Daily SysAvg Temperatures (Un-Rounded).
Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Monthly MAXIMUM NEGATIVE-Temperature (Deg-F) from 1950 thru 2010.

YEAR	MXTYR	MXT_1	MXT_2	MXT_3	MXT_4	MXT_5	MXT_6	MXT_7	MXT_8	MXT_9	MXT_10	MXT_11	MXT_12
1950	-40.8139	-40.8139	-44.9945	-50.7281	-53.8215	-54.7591	-60.3229	-68.4518	-67.9254	-64.1524	-63.2753	-52.1860	-51.8020
1951	-44.5450	-46.1958	-44.6791	-46.0267	-54.2092	-55.4985	-62.1946	-68.2812	-64.6131	-65.7067	-55.7693	-49.1862	-44.5450
1952	-43.0373	-43.0373	-46.8733	-45.9396	-53.2818	-61.0826	-59.8605	-68.6204	-69.5214	-62.0062	-61.1920	-46.9023	-47.0481
1953	-45.6665	-48.5201	-45.6665	-45.7696	-50.5800	-53.9671	-58.8715	-72.3729	-65.5610	-64.7003	-57.3464	-50.4306	-49.1814
1954	-45.6663	-47.6511	-49.5083	-49.0673	-56.7502	-56.4548	-61.5274	-69.9630	-67.5214	-64.1181	-58.4695	-51.3943	-45.6663
1955	-45.8391	-46.1327	-45.9568	-51.5394	-53.8966	-52.9256	-58.6232	-66.4213	-71.2665	-63.6035	-58.1608	-49.7441	-45.8391
1956	-44.8810	-48.5160	-44.8810	-51.4858	-50.4889	-58.3015	-65.1661	-66.3032	-66.5099	-70.5190	-53.5398	-53.4497	-48.6237
1957	-39.4935	-39.4935	-49.0093	-51.1492	-51.3040	-57.6922	-65.2846	-71.3404	-66.5865	-67.6677	-57.1664	-52.1969	-52.8304
1958	-46.2199	-50.2412	-53.6687	-49.7220	-51.1631	-60.7413	-66.3273	-69.7038	-72.8863	-66.5672	-62.8108	-46.2199	-52.9442
1959	-48.2412	-51.4422	-48.2412	-57.6930	-59.7410	-58.2290	-66.7075	-74.6147	-68.4704	-65.9345	-60.1275	-58.6012	-48.7190
1960	-42.2848	-42.2848	-48.3996	-52.2082	-53.3922	-57.4333	-66.4708	-69.3927	-69.6059	-67.3164	-59.0964	-50.3873	-45.6315
1961	-47.1685	-50.8077	-53.3506	-53.4250	-54.5440	-59.0321	-60.5396	-69.2706	-68.8740	-64.3175	-55.8032	-51.7877	-47.1685
1962	-43.3900	-43.3900	-45.2083	-46.9231	-57.9594	-54.9799	-57.8844	-68.3919	-70.2382	-66.2332	-60.9759	-54.8030	-47.8278
1963	-42.5639	-42.5639	-52.9621	-48.0650	-51.2185	-60.4908	-60.6511	-68.4190	-70.4347	-67.5818	-62.4992	-53.0173	-48.8686
1964	-45.2007	-47.5724	-49.7388	-48.1940	-52.1589	-52.5098	-59.0152	-68.4951	-67.9676	-65.8717	-61.5820	-45.2007	-45.6144
1965	-44.7710	-44.7710	-47.7946	-51.7324	-48.2656	-57.5895	-59.0744	-68.4699	-71.3218	-64.3910	-60.8923	-51.6347	-46.3514
1966	-46.6832	-46.6832	-48.1745	-47.3104	-57.5882	-58.5954	-62.9723	-69.9311	-68.7856	-66.8316	-63.4842	-52.6139	-47.2356
1967	-40.7231	-49.5379	-52.8302	-51.1783	-48.2355	-57.8746	-58.9019	-72.4824	-74.7951	-70.3638	-64.8775	-51.6295	-40.7231
1968	-40.6154	-46.2275	-52.4080	-53.7953	-55.4341	-56.9932	-61.6104	-68.0377	-68.4548	-64.8090	-59.6715	-54.2437	-40.6154
1969	-44.8169	-44.8169	-47.3915	-48.6209	-53.7414	-55.7068	-62.7592	-68.7907	-72.2307	-67.2543	-59.2206	-56.3563	-48.7765
1970	-46.8150	-46.9291	-54.2527	-51.9831	-51.7415	-57.6298	-62.0961	-71.5944	-71.4211	-66.0709	-58.2295	-53.2533	-46.8150
1971	-42.9758	-42.9758	-48.9289	-48.6986	-52.7971	-55.8804	-58.5820	-68.9080	-70.6816	-62.7867	-49.2300	-52.3628	-44.6663
1972	-41.4069	-45.9875	-49.8670	-55.4081	-54.2842	-56.8752	-65.9389	-70.1828	-70.1624	-66.2829	-55.9525	-53.8032	-41.4069
1973	-45.0335	-45.0335	-52.1212	-49.1276	-55.3647	-58.1796	-63.7758	-67.4148	-68.0193	-65.8916	-61.9409	-49.7084	-50.8618
1974	-42.9467	-42.9467	-51.8308	-48.2584	-55.6617	-58.3660	-65.5553	-68.7318	-70.9578	-66.8505	-56.3116	-55.0394	-44.7868
1975	-44.6235	-44.6235	-47.9742	-49.7498	-47.3643	-56.3448	-61.4059	-69.4075	-68.6200	-67.4434	-59.1993	-47.7219	-48.6304
1976	-44.8124	-44.8124	-49.5327	-45.4138	-50.4011	-58.0650	-60.5123	-70.7442	-67.7076	-67.4990	-62.8455	-51.6551	-51.2235
1977	-48.2931	-48.2931	-51.9108	-48.6825	-53.4509	-53.9726	-64.7509	-69.5354	-72.9677	-65.7008	-60.5942	-54.0497	-53.2424
1978	-41.6190	-51.1005	-48.2306	-54.1160	-51.2871	-59.4659	-65.8905	-68.8166	-68.7009	-65.8524	-59.3639	-49.0032	-41.6190
1979	-41.3718	-41.3718	-45.8328	-49.7140	-56.2736	-58.7693	-63.9540	-66.6051	-69.8454	-69.2557	-59.9759	-51.5853	-49.5022
1980	-50.3397	-50.3397	-54.7610	-52.8755	-53.2022	-57.2136	-60.6410	-71.9287	-70.0271	-66.2256	-59.0176	-56.0247	-51.6664
1981	-49.3314	-49.3314	-52.1306	-52.3738	-54.8549	-61.4079	-68.3264	-73.1600	-72.9816	-68.2618	-58.1090	-50.9048	-52.9613
1982	-45.3314	-45.3314	-52.3144	-49.2838	-50.3326	-57.8396	-62.8471	-66.7866	-69.7322	-63.7887	-61.7207	-52.0600	-48.3317
1983	-48.6651	-48.6651	-51.5608	-54.5990	-52.4889	-57.6920	-62.6277	-69.1153	-70.4734	-64.0299	-65.4348	-49.4481	-49.4522
1984	-46.9062	-49.5938	-53.8326	-56.9275	-54.8990	-59.4285	-66.1272	-73.1349	-74.8478	-70.7739	-60.6674	-50.0005	-46.9062
1985	-45.0927	-47.3686	-45.0927	-49.0939	-54.9170	-59.0856	-62.8961	-71.5935	-69.5103	-64.7365	-61.8044	-47.5243	-46.7232
1986	-48.5721	-56.1647	-48.5721	-50.3583	-57.7326	-59.4579	-66.4135	-69.1447	-72.3652	-61.1349	-61.4574	-58.2044	-52.9037
1987	-43.4273	-44.2598	-46.0322	-50.7446	-56.2859	-60.0247	-66.6641	-67.1124	-68.1821	-67.0970	-62.0544	-52.6793	-43.4273
1988	-43.2554	-49.9387	-51.3168	-54.3595	-54.0200	-55.3712	-59.1260	-70.9638	-70.1594	-64.2715	-64.0763	-50.9655	-43.2554
1989	-40.5770	-42.9407	-40.5770	-52.1846	-55.4395	-58.1969	-64.4799	-71.3099	-69.5242	-62.8527	-59.7825	-56.0329	-51.8912
1990	-38.9869	-48.7766	-43.3692	-49.1307	-58.2433	-61.1302	-63.2401	-72.1522	-69.8743	-69.0145	-63.4869	-52.3610	-38.9869
1991	-48.6803	-51.7147	-56.1695	-48.6803	-57.5468	-55.8734	-63.8235	-68.0888	-70.4270	-66.6486	-57.5488	-52.6191	-50.5155
1992	-47.3103	-48.1412	-51.8544	-53.3361	-61.2246	-66.6414	-64.4708	-68.0616	-69.0891	-70.1689	-63.4055	-55.4010	-47.3103
1993	-46.0750	-46.0750	-50.8330	-53.4625	-60.3055	-63.5140	-59.7466	-71.1594	-70.1717	-67.4909	-63.2755	-54.9006	-50.1177
1994	-47.1404	-51.5417	-50.0565	-51.7755	-54.2238	-57.1456	-66.9394	-71.1675	-73.6023	-67.1896	-62.0519	-47.1404	-49.9820
1995	-49.8132	-49.9337	-54.1178	-52.5801	-52.0590	-56.5524	-57.8187	-69.9489	-71.8247	-67.3130	-62.8118	-60.4630	-49.8132
1996	-44.9449	-47.7542	-44.9449	-55.0173	-59.6889	-62.8825	-63.9911	-71.8661	-72.0381	-68.9506	-54.4078	-53.3079	-52.4822
1997	-48.3889	-48.3889	-53.4595	-53.2943	-55.7075	-66.9441	-64.8151	-70.6066	-72.0271	-71.8727	-62.3888	-54.8644	-48.9560
1998	-43.5981	-50.7035	-52.3890	-49.8514	-50.0393	-55.2383	-61.1622	-70.3718	-72.6540	-65.0563	-60.8742	-55.3339	-43.5981
1999	-48.9918	-48.9918	-49.9809	-50.1240	-50.2280	-57.6371	-57.3322	-69.3564	-69.0034	-67.8474	-64.4993	-54.8769	-52.0528
2000	-48.7734	-49.7560	-48.9964	-48.7734	-55.6952	-61.3740	-64.7628	-69.3772	-69.5563	-67.2008	-57.1987	-50.3718	-51.1148
2001	-47.1624	-47.3342	-47.1624	-51.9496	-50.0995	-63.0701	-66.6212	-69.4000	-70.5659	-69.0556	-63.0673	-51.6624	-49.0898
2002	-45.8139	-45.8139	-48.9358	-50.2434	-56.2940	-57.7617	-64.9885	-70.1827	-70.0978	-63.3307	-58.9606	-58.5738	-48.7217
2003	-47.0545	-54.5729	-52.8301	-53.0582	-53.4292	-58.6337	-63.0442	-73.2189	-73.6591	-70.3885	-57.5562	-52.9730	-47.0545
2004	-48.1809	-49.0397	-50.7718	-53.6879	-56.6398	-63.7197	-65.9707	-68.9706	-70.3517	-65.6737	-56.1145	-48.1809	-48.2843
2005	-47.2540	-47.2540	-54.0029	-53.5940	-57.5405	-60.9911	-65.4656	-71.0177	-70.9939	-65.8620	-60.5966	-55.1862	-50.5913
2006	-45.7981	-51.5502	-48.3580	-45.7981	-53.6967	-62.5116	-68.5517	-74.8643	-72.2551	-68.2437	-62.2475	-52.0133	-48.0678
2007	-41.4863	-41.4863	-50.7744	-51.4095	-54.2568	-59.5874	-63.9786	-73.0326	-72.5253	-63.5083	-61.4366	-56.1157	-47.4825
2008	-45.7927	-47.4773	-49.8328	-54.5708	-55.1430	-57.5339	-63.9963	-72.7341	-73.0216	-68.8579	-60.3750	-58.5380	-45.7927
2009	-45.2538	-47.9895	-48.1433	-52.3793	-52.8101	-65.4246	-64.0098	-72.2585	-71.2067	-69.0043	-59.0656	-56.6532	-45.2538
2010	-44.6756	-48.7323	-50.9693	-52.1353	-52.0213	-59.1119	-65.8275	-68.1330	-67.5446	-66.6382	-60.3394	-49.6230	-44.6756

Data Analysis for Maximum/Minimum Daily SysAvg Temperatures (Un-Rounded).
Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Calc. Means and Standard Deviantions to use as Starting Values in Non-Linear Estimations.

Variable	N	Mean	Std Dev	Minimum	Maximum
MXT_1	61	-47.2415402	3.3584971	-56.1647000	-39.4934667
MXT_2	61	-49.6124628	3.2506963	-56.1694833	-40.5770167
MXT_3	61	-50.9733855	2.8011398	-57.6930000	-45.4137667
MXT_4	61	-54.0568074	3.0315620	-61.2246333	-47.3643333
MXT_5	61	-58.5803604	3.0564965	-66.9441167	-52.5097667
MXT_6	61	-63.0808470	2.9041691	-68.5517167	-57.3321833
MXT_7	61	-69.9985593	2.0038523	-74.8642667	-66.3032167
MXT_8	61	-70.2122331	2.1448174	-74.8477833	-64.6130500
MXT_9	61	-66.4929194	2.3084588	-71.8727333	-61.1348833
MXT_10	61	-60.0891208	3.0284960	-65.4348000	-49.2300333
MXT_11	61	-52.5437902	3.2774803	-60.4629500	-45.2007000
MXT_12	61	-47.8070137	3.3917276	-53.2423833	-38.9868667
MXTYR	61	-45.1670861	2.7490017	-50.3397000	-38.9868667

Data Analysis for Maximum/Minimum Daily SysAvg Temperatures (Un-Rounded).
Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Calc. Means and Standard Deviantions to use as Starting Values in Non-Linear Estimations.

OBS	_TYPE_	_FREQ_	MEAN1	MEAN2	MEAN3	MEAN4	MEAN5	MEAN6	MEAN7	MEAN8	MEAN9	MEAN10	MEAN11	MEAN12
1	0	61	-47.2415	-49.6125	-50.9734	-54.0568	-58.5804	-63.0808	-69.9986	-70.2122	-66.4929	-60.0891	-52.5438	-47.8070

OBS	MEANYR	STDEV1	STDEV2	STDEV3	STDEV4	STDEV5	STDEV6	STDEV7	STDEV8	STDEV9	STDEV10	STDEV11	STDEV12	STDEVYR
1	-45.1671	3.35850	3.25070	2.80114	3.03156	3.05650	2.90417	2.00385	2.14482	2.30846	3.02850	3.27748	3.39173	2.74900

Data Analysis for Maximum/Minimum Daily SysAvg Temperatures (Un-Rounded).
Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Calc. Means and Standard Deviantions to use as Starting Values in Non-Linear Estimations.

OBS	MXTYR	RANKYR	PRMXTYR	ALPHA	YEAR
1	-50.3397	1	0.01020	0.375	1980
2	-49.8132	2	0.02653	0.375	1995
3	-49.3314	3	0.04286	0.375	1981
4	-48.9918	4	0.05918	0.375	1999
5	-48.7734	5	0.07551	0.375	2000
6	-48.6803	6	0.09184	0.375	1991
7	-48.6651	7	0.10816	0.375	1983
8	-48.5721	8	0.12449	0.375	1986
9	-48.3889	9	0.14082	0.375	1997
10	-48.2931	10	0.15714	0.375	1977
11	-48.2412	11	0.17347	0.375	1959
12	-48.1809	12	0.18980	0.375	2004
13	-47.3103	13	0.20612	0.375	1992
14	-47.2540	14	0.22245	0.375	2005
15	-47.1685	15	0.23878	0.375	1961
16	-47.1624	16	0.25510	0.375	2001
17	-47.1404	17	0.27143	0.375	1994
18	-47.0545	18	0.28776	0.375	2003
19	-46.9062	19	0.30408	0.375	1984
20	-46.8150	20	0.32041	0.375	1970
21	-46.6832	21	0.33673	0.375	1966
22	-46.2199	22	0.35306	0.375	1958
23	-46.0750	23	0.36939	0.375	1993
24	-45.8391	24	0.38571	0.375	1955
25	-45.8139	25	0.40204	0.375	2002
26	-45.7981	26	0.41837	0.375	2006
27	-45.7927	27	0.43469	0.375	2008
28	-45.6665	28	0.45102	0.375	1953
29	-45.6663	29	0.46735	0.375	1954
30	-45.3314	30	0.48367	0.375	1982
31	-45.2538	31	0.50000	0.375	2009
32	-45.2007	32	0.51633	0.375	1964
33	-45.0927	33	0.53265	0.375	1985
34	-45.0335	34	0.54898	0.375	1973
35	-44.9449	35	0.56531	0.375	1996
36	-44.8810	36	0.58163	0.375	1956
37	-44.8169	37	0.59796	0.375	1969
38	-44.8124	38	0.61429	0.375	1976
39	-44.7710	39	0.63061	0.375	1965
40	-44.6756	40	0.64694	0.375	2010
41	-44.6235	41	0.66327	0.375	1975
42	-44.5450	42	0.67959	0.375	1951
43	-43.5981	43	0.69592	0.375	1998
44	-43.4273	44	0.71224	0.375	1987
45	-43.3900	45	0.72857	0.375	1962
46	-43.2554	46	0.74490	0.375	1988
47	-43.0373	47	0.76122	0.375	1952
48	-42.9758	48	0.77755	0.375	1971
49	-42.9467	49	0.79388	0.375	1974
50	-42.5639	50	0.81020	0.375	1963
51	-42.2848	51	0.82653	0.375	1960
52	-41.6190	52	0.84286	0.375	1978
53	-41.4863	53	0.85918	0.375	2007
54	-41.4069	54	0.87551	0.375	1972
55	-41.3718	55	0.89184	0.375	1979
56	-40.8139	56	0.90816	0.375	1950
57	-40.7231	57	0.92449	0.375	1967
58	-40.6154	58	0.94082	0.375	1968
59	-40.5770	59	0.95714	0.375	1989
60	-39.4935	60	0.97347	0.375	1957
61	-38.9869	61	0.98980	0.375	1990

MODEL Procedure

Model Summary

Model Variables	1
Parameters	4
RANGE Variable	YEAR
Equations	1
Number of Statements	3

Model Variables: PRMXTYR

Parameters: GAMMA: -45.17 THETA: 2.749 KAPPA: 0.25 MXTNL1

Equations: PRMXTYR

MODEL Procedure

The Equation to Estimate is:

PRMXTYR = F(GAMMA, THETA, KAPPA)

Data Analysis for Maximum/Minimum Daily SysAvg Temperatures (Un-Rounded).
Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Non-linear Estimation of 3-parameter GEV Model.: for Maximum NEGATIVE Temperature (Deg-F).

MODEL Procedure
OLS Estimation

OLS Estimation Summary

Dataset Option	Dataset
DATA=	MXTDATA
OUT=	FIT1
OUTEST=	EST1

Parameters Estimated	3

RANGE Processed	YEAR
First	1950
Last	2010

Minimization Summary

Method	GAUSS
Iterations	4

Final Convergence	Criteria
R	0.00007219
PPC(KAPPA)	0.000141
RPC(KAPPA)	0.002337
Object	1.54581E-6
Trace(S)	0.00066373
Objective Value	0.00063109

Observations Processed

Read	61
Solved	61

Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Non-linear Estimation of 3-parameter GEV Model.: for Maximum NEGATIVE Temperature (Deg-F).

MODEL Procedure
OLS Estimation

Nonlinear OLS Summary of Residual Errors

Equation	DF Model	DF Error	SSE	MSE	Root MSE	R-Square	Adj R-Sq	Durbin Watson
PRMXTYR	3	58	0.03850	0.0006637	0.02576	0.9924	0.9921	1.829

Nonlinear OLS Parameter Estimates

Parameter	Estimate	Approx. Std Err	'T' Ratio	Approx. Prob>|T|
GAMMA	-46.339721	0.03588	-1291.67	0.0001
THETA	2.654206	0.06301	42.12	0.0001
KAPPA	0.139323	0.03569	3.90	0.0002

Number of Observations		Statistics for System	
Used	61	Objective	0.000631
Missing	0	Objective*N	0.0385

RANGE of Fit: YEAR = 1950 TO 2010

Correlations of Estimates

CorrB	GAMMA	THETA	KAPPA
GAMMA	1.0000	-0.0681	0.3512
THETA	-0.0681	1.0000	0.6131
KAPPA	0.3512	0.6131	1.0000

Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Non-linear Estimation of 3-parameter GEV Model.: for Maximum NEGATIVE Temperature (Deg-F).

MODEL Procedure

Model Summary

Model Variables	1
Parameters	4
RANGE Variable	YEAR
Equations	1
Number of Statements	4

Model Variables: PRMXTYR

Parameters: MXTNL1 GAMMA: -46.34(-1292) THETA: 2.654(42) KAPPA: 0.1393(3.9)

Equations: PRMXTYR

Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Non-linear Estimation of 3-parameter GEV Model.: for Maximum NEGATIVE Temperature (Deg-F).

OBS	YEAR	_ESTYPE_	_TYPE_	_WEIGHT_	PRMXTYR	MXTYR
1	1950	OLS	ACTUAL	1	0.90816	-40.8139
2	1950	OLS	PREDICT	1	0.91802	-40.8139
3	1950	OLS	RESIDUAL	1	-0.00986	-40.8139
4	1951	OLS	ACTUAL	1	0.67959	-44.5450
5	1951	OLS	PREDICT	1	0.61167	-44.5450
6	1951	OLS	RESIDUAL	1	0.06792	-44.5450
7	1952	OLS	ACTUAL	1	0.76122	-43.0373
8	1952	OLS	PREDICT	1	0.77490	-43.0373
9	1952	OLS	RESIDUAL	1	-0.01368	-43.0373
10	1953	OLS	ACTUAL	1	0.45102	-45.6665
11	1953	OLS	PREDICT	1	0.46190	-45.6665
12	1953	OLS	RESIDUAL	1	-0.01088	-45.6665
13	1954	OLS	ACTUAL	1	0.46735	-45.6663
14	1954	OLS	PREDICT	1	0.46192	-45.6663
15	1954	OLS	RESIDUAL	1	0.00543	-45.6663
16	1955	OLS	ACTUAL	1	0.38571	-45.8391
17	1955	OLS	PREDICT	1	0.43779	-45.8391
18	1955	OLS	RESIDUAL	1	-0.05207	-45.8391
19	1956	OLS	ACTUAL	1	0.58163	-44.8810
20	1956	OLS	PREDICT	1	0.56863	-44.8810
21	1956	OLS	RESIDUAL	1	0.01300	-44.8810
22	1957	OLS	ACTUAL	1	0.97347	-39.4935
23	1957	OLS	PREDICT	1	0.95991	-39.4935
24	1957	OLS	RESIDUAL	1	0.01356	-39.4935
25	1958	OLS	ACTUAL	1	0.35306	-46.2199
26	1958	OLS	PREDICT	1	0.38454	-46.2199
27	1958	OLS	RESIDUAL	1	-0.03147	-46.2199
28	1959	OLS	ACTUAL	1	0.17347	-48.2412
29	1959	OLS	PREDICT	1	0.13813	-48.2412
30	1959	OLS	RESIDUAL	1	0.03533	-48.2412
31	1960	OLS	ACTUAL	1	0.82653	-42.2848
32	1960	OLS	PREDICT	1	0.83573	-42.2848
33	1960	OLS	RESIDUAL	1	-0.00920	-42.2848
34	1961	OLS	ACTUAL	1	0.23878	-47.1685
35	1961	OLS	PREDICT	1	0.25730	-47.1685
36	1961	OLS	RESIDUAL	1	-0.01852	-47.1685
37	1962	OLS	ACTUAL	1	0.72857	-43.3900
38	1962	OLS	PREDICT	1	0.74159	-43.3900
39	1962	OLS	RESIDUAL	1	-0.01302	-43.3900
40	1963	OLS	ACTUAL	1	0.81020	-42.5639
41	1963	OLS	PREDICT	1	0.81477	-42.5639
42	1963	OLS	RESIDUAL	1	-0.00457	-42.5639
43	1964	OLS	ACTUAL	1	0.51633	-45.2007
44	1964	OLS	PREDICT	1	0.52601	-45.2007
45	1964	OLS	RESIDUAL	1	-0.00969	-45.2007
46	1965	OLS	ACTUAL	1	0.63061	-44.7710
47	1965	OLS	PREDICT	1	0.58294	-44.7710
48	1965	OLS	RESIDUAL	1	0.04767	-44.7710
49	1966	OLS	ACTUAL	1	0.33673	-46.6832
50	1966	OLS	PREDICT	1	0.32083	-46.6832
51	1966	OLS	RESIDUAL	1	0.01590	-46.6832
52	1967	OLS	ACTUAL	1	0.92449	-40.7231
53	1967	OLS	PREDICT	1	0.92174	-40.7231
54	1967	OLS	RESIDUAL	1	0.00275	-40.7231
55	1968	OLS	ACTUAL	1	0.94082	-40.6154
56	1968	OLS	PREDICT	1	0.92596	-40.6154
57	1968	OLS	RESIDUAL	1	0.01485	-40.6154
58	1969	OLS	ACTUAL	1	0.59796	-44.8169
59	1969	OLS	PREDICT	1	0.57699	-44.8169
60	1969	OLS	RESIDUAL	1	0.02096	-44.8169
61	1970	OLS	ACTUAL	1	0.32041	-46.8150
62	1970	OLS	PREDICT	1	0.30317	-46.8150
63	1970	OLS	RESIDUAL	1	0.01724	-46.8150

Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Non-linear Estimation of 3-parameter GEV Model.: for Maximum NEGATIVE Temperature (Deg-F).

OBS	YEAR	_ESTYPE_	_TYPE_	_WEIGHT_	PRMXTYR	MXTYR
64	1971	OLS	ACTUAL	1	0.77755	-42.9758
65	1971	OLS	PREDICT	1	0.78039	-42.9758
66	1971	OLS	RESIDUAL	1	-0.00284	-42.9758
67	1972	OLS	ACTUAL	1	0.87551	-41.4069
68	1972	OLS	PREDICT	1	0.89013	-41.4069
69	1972	OLS	RESIDUAL	1	-0.01462	-41.4069
70	1973	OLS	ACTUAL	1	0.54898	-45.0335
71	1973	OLS	PREDICT	1	0.54848	-45.0335
72	1973	OLS	RESIDUAL	1	0.00050	-45.0335
73	1974	OLS	ACTUAL	1	0.79388	-42.9467
74	1974	OLS	PREDICT	1	0.78296	-42.9467
75	1974	OLS	RESIDUAL	1	0.01092	-42.9467
76	1975	OLS	ACTUAL	1	0.66327	-44.6235
77	1975	OLS	PREDICT	1	0.60180	-44.6235
78	1975	OLS	RESIDUAL	1	0.06147	-44.6235
79	1976	OLS	ACTUAL	1	0.61429	-44.8124
80	1976	OLS	PREDICT	1	0.57757	-44.8124
81	1976	OLS	RESIDUAL	1	0.03671	-44.8124
82	1977	OLS	ACTUAL	1	0.15714	-48.2931
83	1977	OLS	PREDICT	1	0.13332	-48.2931
84	1977	OLS	RESIDUAL	1	0.02382	-48.2931
85	1978	OLS	ACTUAL	1	0.84286	-41.6190
86	1978	OLS	PREDICT	1	0.87850	-41.6190
87	1978	OLS	RESIDUAL	1	-0.03565	-41.6190
88	1979	OLS	ACTUAL	1	0.89184	-41.3718
89	1979	OLS	PREDICT	1	0.89197	-41.3718
90	1979	OLS	RESIDUAL	1	-0.00013	-41.3718
91	1980	OLS	ACTUAL	1	0.01020	-50.3397
92	1980	OLS	PREDICT	1	0.01969	-50.3397
93	1980	OLS	RESIDUAL	1	-0.00949	-50.3397
94	1981	OLS	ACTUAL	1	0.04286	-49.3314
95	1981	OLS	PREDICT	1	0.05791	-49.3314
96	1981	OLS	RESIDUAL	1	-0.01505	-49.3314
97	1982	OLS	ACTUAL	1	0.48367	-45.3314
98	1982	OLS	PREDICT	1	0.50822	-45.3314
99	1982	OLS	RESIDUAL	1	-0.02455	-45.3314
100	1983	OLS	ACTUAL	1	0.10816	-48.6651
101	1983	OLS	PREDICT	1	0.10172	-48.6651
102	1983	OLS	RESIDUAL	1	0.00645	-48.6651
103	1984	OLS	ACTUAL	1	0.30408	-46.9062
104	1984	OLS	PREDICT	1	0.29111	-46.9062
105	1984	OLS	RESIDUAL	1	0.01297	-46.9062
106	1985	OLS	ACTUAL	1	0.53265	-45.0927
107	1985	OLS	PREDICT	1	0.54057	-45.0927
108	1985	OLS	RESIDUAL	1	-0.00792	-45.0927
109	1986	OLS	ACTUAL	1	0.12449	-48.5721
110	1986	OLS	PREDICT	1	0.10913	-48.5721
111	1986	OLS	RESIDUAL	1	0.01536	-48.5721
112	1987	OLS	ACTUAL	1	0.71224	-43.4273
113	1987	OLS	PREDICT	1	0.73788	-43.4273
114	1987	OLS	RESIDUAL	1	-0.02563	-43.4273
115	1988	OLS	ACTUAL	1	0.74490	-43.2554
116	1988	OLS	PREDICT	1	0.75467	-43.2554
117	1988	OLS	RESIDUAL	1	-0.00977	-43.2554
118	1989	OLS	ACTUAL	1	0.95714	-40.5770
119	1989	OLS	PREDICT	1	0.92742	-40.5770
120	1989	OLS	RESIDUAL	1	0.02972	-40.5770
121	1990	OLS	ACTUAL	1	0.98980	-38.9869
122	1990	OLS	PREDICT	1	0.97027	-38.9869
123	1990	OLS	RESIDUAL	1	0.01953	-38.9869
124	1991	OLS	ACTUAL	1	0.09184	-48.6803
125	1991	OLS	PREDICT	1	0.10053	-48.6803
126	1991	OLS	RESIDUAL	1	-0.00869	-48.6803

Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Non-linear Estimation of 3-parameter GEV Model.: for Maximum NEGATIVE Temperature (Deg-F).

OBS	YEAR	_ESTYPE_	_TYPE_	_WEIGHT_	PRMXTYR	MXTYR
127	1992	OLS	ACTUAL	1	0.20612	-47.3103
128	1992	OLS	PREDICT	1	0.23965	-47.3103
129	1992	OLS	RESIDUAL	1	-0.03353	-47.3103
130	1993	OLS	ACTUAL	1	0.36939	-46.0750
131	1993	OLS	PREDICT	1	0.40477	-46.0750
132	1993	OLS	RESIDUAL	1	-0.03538	-46.0750
133	1994	OLS	ACTUAL	1	0.27143	-47.1404
134	1994	OLS	PREDICT	1	0.26085	-47.1404
135	1994	OLS	RESIDUAL	1	0.01058	-47.1404
136	1995	OLS	ACTUAL	1	0.02653	-49.8132
137	1995	OLS	PREDICT	1	0.03589	-49.8132
138	1995	OLS	RESIDUAL	1	-0.00936	-49.8132
139	1996	OLS	ACTUAL	1	0.56531	-44.9449
140	1996	OLS	PREDICT	1	0.56024	-44.9449
141	1996	OLS	RESIDUAL	1	0.00507	-44.9449
142	1997	OLS	ACTUAL	1	0.14082	-48.3889
143	1997	OLS	PREDICT	1	0.12469	-48.3889
144	1997	OLS	RESIDUAL	1	0.01613	-48.3889
145	1998	OLS	ACTUAL	1	0.69592	-43.5981
146	1998	OLS	PREDICT	1	0.72049	-43.5981
147	1998	OLS	RESIDUAL	1	-0.02457	-43.5981
148	1999	OLS	ACTUAL	1	0.05918	-48.9918
149	1999	OLS	PREDICT	1	0.07820	-48.9918
150	1999	OLS	RESIDUAL	1	-0.01902	-48.9918
151	2000	OLS	ACTUAL	1	0.07551	-48.7734
152	2000	OLS	PREDICT	1	0.09348	-48.7734
153	2000	OLS	RESIDUAL	1	-0.01797	-48.7734
154	2001	OLS	ACTUAL	1	0.25510	-47.1624
155	2001	OLS	PREDICT	1	0.25807	-47.1624
156	2001	OLS	RESIDUAL	1	-0.00297	-47.1624
157	2002	OLS	ACTUAL	1	0.40204	-45.8139
158	2002	OLS	PREDICT	1	0.44132	-45.8139
159	2002	OLS	RESIDUAL	1	-0.03928	-45.8139
160	2003	OLS	ACTUAL	1	0.28776	-47.0545
161	2003	OLS	PREDICT	1	0.27183	-47.0545
162	2003	OLS	RESIDUAL	1	0.01593	-47.0545
163	2004	OLS	ACTUAL	1	0.18980	-48.1809
164	2004	OLS	PREDICT	1	0.14385	-48.1809
165	2004	OLS	RESIDUAL	1	0.04595	-48.1809
166	2005	OLS	ACTUAL	1	0.22245	-47.2540
167	2005	OLS	PREDICT	1	0.24660	-47.2540
168	2005	OLS	RESIDUAL	1	-0.02415	-47.2540
169	2006	OLS	ACTUAL	1	0.41837	-45.7981
170	2006	OLS	PREDICT	1	0.44352	-45.7981
171	2006	OLS	RESIDUAL	1	-0.02515	-45.7981
172	2007	OLS	ACTUAL	1	0.85918	-41.4863
173	2007	OLS	PREDICT	1	0.88589	-41.4863
174	2007	OLS	RESIDUAL	1	-0.02670	-41.4863
175	2008	OLS	ACTUAL	1	0.43469	-45.7927
176	2008	OLS	PREDICT	1	0.44427	-45.7927
177	2008	OLS	RESIDUAL	1	-0.00958	-45.7927
178	2009	OLS	ACTUAL	1	0.50000	-45.2538
179	2009	OLS	PREDICT	1	0.51880	-45.2538
180	2009	OLS	RESIDUAL	1	-0.01880	-45.2538
181	2010	OLS	ACTUAL	1	0.64694	-44.6756
182	2010	OLS	PREDICT	1	0.59518	-44.6756
183	2010	OLS	RESIDUAL	1	0.05175	-44.6756

Data Analysis for Maximum/Minimum Daily SysAvg Temperatures (Un-Rounded).

Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Non-linear Estimation of 3-parameter GEV Model.: for Maximum NEGATIVE Temperature (Deg-F).

OBS	YEAR	MXTYR	PRMXTYR	PROBP
1	1950	-40.8139	0.90816	0.91802
2	1951	-44.5450	0.67959	0.61167
3	1952	-43.0373	0.76122	0.77490
4	1953	-45.6665	0.45102	0.46190
5	1954	-45.6663	0.46735	0.46192
6	1955	-45.8391	0.38571	0.43779
7	1956	-44.8810	0.58163	0.56863
8	1957	-39.4935	0.97347	0.95991
9	1958	-46.2199	0.35306	0.38454
10	1959	-48.2412	0.17347	0.13813
11	1960	-42.2848	0.82653	0.83573
12	1961	-47.1685	0.23878	0.25730
13	1962	-43.3900	0.72857	0.74159
14	1963	-42.5639	0.81020	0.81477
15	1964	-45.2007	0.51633	0.52601
16	1965	-44.7710	0.63061	0.58294
17	1966	-46.6832	0.33673	0.32083
18	1967	-40.7231	0.92449	0.92174
19	1968	-40.6154	0.94082	0.92596
20	1969	-44.8169	0.59796	0.57699
21	1970	-46.8150	0.32041	0.30317
22	1971	-42.9758	0.77755	0.78039
23	1972	-41.4069	0.87551	0.89013
24	1973	-45.0335	0.54898	0.54848
25	1974	-42.9467	0.79388	0.78296
26	1975	-44.6235	0.66327	0.60180
27	1976	-44.8124	0.61429	0.57757
28	1977	-48.2931	0.15714	0.13332
29	1978	-41.6190	0.84286	0.87850
30	1979	-41.3718	0.89184	0.89197
31	1980	-50.3397	0.01020	0.01969
32	1981	-49.3314	0.04286	0.05791
33	1982	-45.3314	0.48367	0.50822
34	1983	-48.6651	0.10816	0.10172
35	1984	-46.9062	0.30408	0.29111
36	1985	-45.0927	0.53265	0.54057
37	1986	-48.5721	0.12449	0.10913
38	1987	-43.4273	0.71224	0.73788
39	1988	-43.2554	0.74490	0.75467
40	1989	-40.5770	0.95714	0.92742
41	1990	-38.9869	0.98980	0.97027
42	1991	-48.6803	0.09184	0.10053
43	1992	-47.3103	0.20612	0.23965
44	1993	-46.0750	0.36939	0.40477
45	1994	-47.1404	0.27143	0.26085
46	1995	-49.8132	0.02653	0.03589
47	1996	-44.9449	0.56531	0.56024
48	1997	-48.3889	0.14082	0.12469
49	1998	-43.5981	0.69592	0.72049
50	1999	-48.9918	0.05918	0.07820
51	2000	-48.7734	0.07551	0.09348
52	2001	-47.1624	0.25510	0.25807
53	2002	-45.8139	0.40204	0.44132
54	2003	-47.0545	0.28776	0.27183
55	2004	-48.1809	0.18980	0.14385
56	2005	-47.2540	0.22245	0.24660
57	2006	-45.7981	0.41837	0.44352
58	2007	-41.4863	0.85918	0.88589
59	2008	-45.7927	0.43469	0.44427
60	2009	-45.2538	0.50000	0.51880
61	2010	-44.6756	0.64694	0.59518

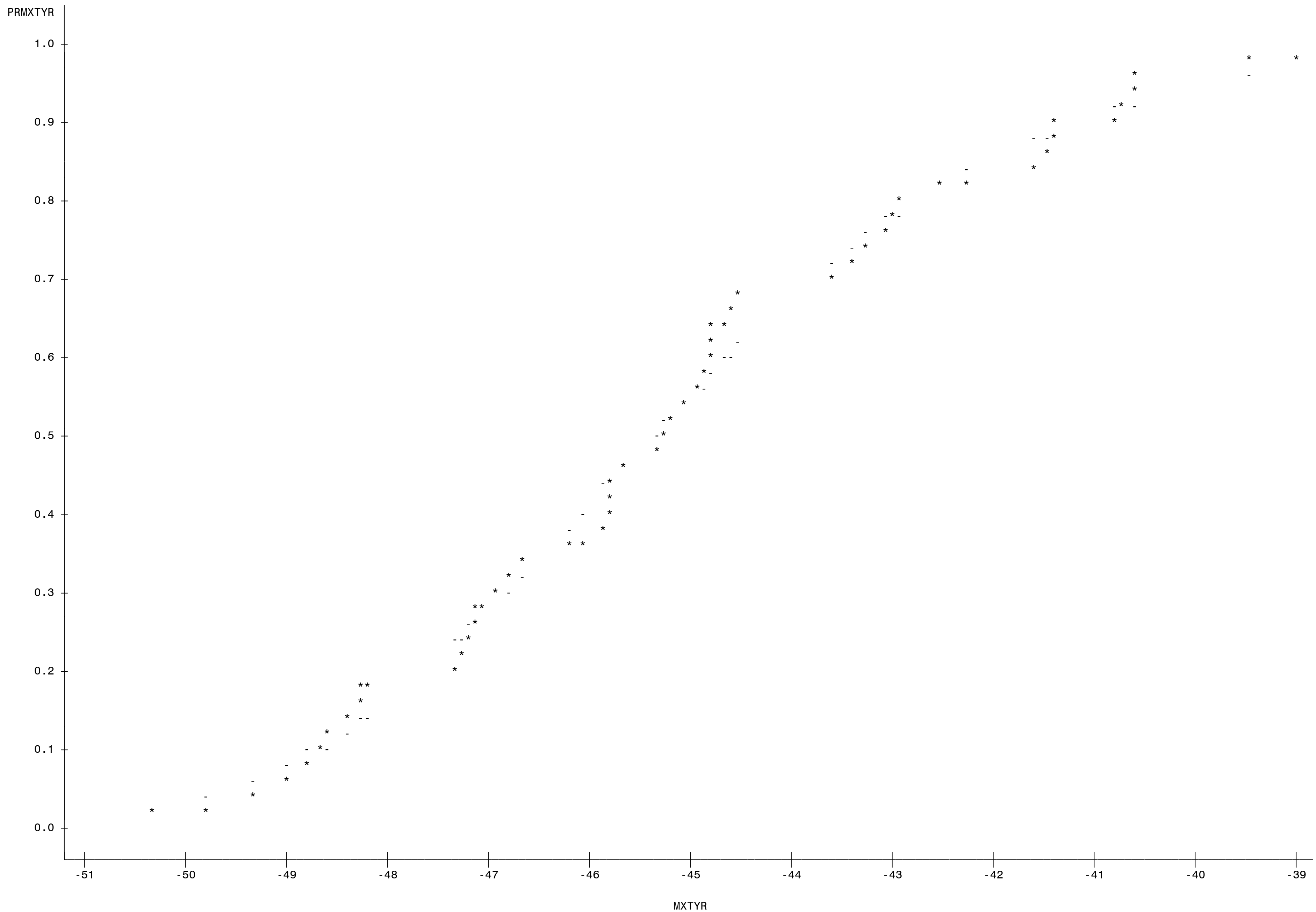
Data Analysis for Maximum/Minimum Daily SysAvg Temperatures (Un-Rounded). 15:42 Monday, July 16, 2012 15

Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.

Non-linear Estimation of 3-parameter GEV Model.: for Maximum NEGATIVE Temperature (Deg-F).

Plot of PRMXTYR*MXTYR. Symbol used is '*'.

Plot of PROBP*MXTYR. Symbol used is '-'.



NOTE: 31 obs hidden.

Data Analysis for Maximum/Minimum Daily SysAvg Temperatures (Un-Rounded).
Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Non-linear Estimation of 3-parameter GEV Model.: for Maximum NEGATIVE Temperature (Deg-F).

OBS	_NAME_	_TYPE_	_NUSED_	GAMMA	THETA	KAPPA
1		OLS	61	-46.3397	2.65421	0.13932
2	GAMMA	OLS	61	0.0013	-0.00015	0.00045
3	THETA	OLS	61	-0.0002	0.00397	0.00138
4	KAPPA	OLS	61	0.0004	0.00138	0.00127

Data Analysis for Maximum/Minimum Daily SysAvg Temperatures (Un-Rounded).
Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Est'd CDFs and Logarithms of 'Empirical CDF rel. to Fitted CDF' values by Models.

OBS	YEAR	MXTYR	QUANTILE	PRMXTYR	PROBP1	LGPRRAT1
1	1950	-40.8139	3	0.90816	0.91802	-0.01080
2	1951	-44.5450	3	0.67959	0.61167	0.10530
3	1952	-43.0373	3	0.76122	0.77490	-0.01781
4	1953	-45.6665	2	0.45102	0.46190	-0.02383
5	1954	-45.6663	2	0.46735	0.46192	0.01168
6	1955	-45.8391	2	0.38571	0.43779	-0.12664
7	1956	-44.8810	2	0.58163	0.56863	0.02261
8	1957	-39.4935	3	0.97347	0.95991	0.01403
9	1958	-46.2199	2	0.35306	0.38454	-0.08540
10	1959	-48.2412	1	0.17347	0.13813	0.22777
11	1960	-42.2848	3	0.82653	0.83573	-0.01107
12	1961	-47.1685	1	0.23878	0.25730	-0.07472
13	1962	-43.3900	3	0.72857	0.74159	-0.01771
14	1963	-42.5639	3	0.81020	0.81477	-0.00562
15	1964	-45.2007	2	0.51633	0.52601	-0.01859
16	1965	-44.7710	2	0.63061	0.58294	0.07860
17	1966	-46.6832	2	0.33673	0.32083	0.04838
18	1967	-40.7231	3	0.92449	0.92174	0.00298
19	1968	-40.6154	3	0.94082	0.92596	0.01591
20	1969	-44.8169	2	0.59796	0.57699	0.03569
21	1970	-46.8150	1	0.32041	0.30317	0.05532
22	1971	-42.9758	3	0.77755	0.78039	-0.00365
23	1972	-41.4069	3	0.87551	0.89013	-0.01656
24	1973	-45.0335	2	0.54898	0.54848	0.00092
25	1974	-42.9467	3	0.79388	0.78296	0.01385
26	1975	-44.6235	2	0.66327	0.60180	0.09725
27	1976	-44.8124	2	0.61429	0.57757	0.06162
28	1977	-48.2931	1	0.15714	0.13332	0.16439
29	1978	-41.6190	3	0.84286	0.87850	-0.04142
30	1979	-41.3718	3	0.89184	0.89197	-0.00014
31	1980	-50.3397	1	0.01020	0.01969	-0.65756
32	1981	-49.3314	1	0.04286	0.05791	-0.30101
33	1982	-45.3314	2	0.48367	0.50822	-0.04951
34	1983	-48.6651	1	0.10816	0.10172	0.06146
35	1984	-46.9062	1	0.30408	0.29111	0.04359
36	1985	-45.0927	2	0.53265	0.54057	-0.01476
37	1986	-48.5721	1	0.12449	0.10913	0.13167
38	1987	-43.4273	3	0.71224	0.73788	-0.03536
39	1988	-43.2554	3	0.74490	0.75467	-0.01303
40	1989	-40.5770	3	0.95714	0.92742	0.03154
41	1990	-38.9869	3	0.98980	0.97027	0.01993
42	1991	-48.6803	1	0.09184	0.10053	-0.09045
43	1992	-47.3103	1	0.20612	0.23965	-0.15072
44	1993	-46.0750	2	0.36939	0.40477	-0.09147
45	1994	-47.1404	1	0.27143	0.26085	0.03975
46	1995	-49.8132	1	0.02653	0.03589	-0.30226
47	1996	-44.9449	2	0.56531	0.56024	0.00901
48	1997	-48.3889	1	0.14082	0.12469	0.12162
49	1998	-43.5981	3	0.69592	0.72049	-0.03470
50	1999	-48.9918	1	0.05918	0.07820	-0.27866
51	2000	-48.7734	1	0.07551	0.09348	-0.21349
52	2001	-47.1624	1	0.25510	0.25807	-0.01158
53	2002	-45.8139	2	0.40204	0.44132	-0.09321
54	2003	-47.0545	1	0.28776	0.27183	0.05695
55	2004	-48.1809	1	0.18980	0.14385	0.27719
56	2005	-47.2540	1	0.22245	0.24660	-0.10308
57	2006	-45.7981	2	0.41837	0.44352	-0.05839
58	2007	-41.4863	3	0.85918	0.88589	-0.03060
59	2008	-45.7927	2	0.43469	0.44427	-0.02180
60	2009	-45.2538	2	0.50000	0.51880	-0.03692
61	2010	-44.6756	2	0.64694	0.59518	0.08338

Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.
Stats for Logarithms of 'Empirical CDF rel. to Fitted CDF' values by Models to calc. RMSE of Prop. Model Spec

Analysis Variable : LGPRRAT1 Log(PrMxTYr/ProbP1)- T-Dist

N	Mean	Std Dev	Minimum	Maximum	Variance	USS
61	-0.0198373	0.1330278	-0.6575600	0.2771920	0.0176964	1.0857889

Analysis Variable : LGPRRAT1 Log(PrMxTYr/ProbP1)- T-Dist

QUANTILE=1

N	Mean	Std Dev	Minimum	Maximum	Variance	USS
20	-0.0501895	0.2219375	-0.6575600	0.2771920	0.0492562	0.9862484

QUANTILE=2

N	Mean	Std Dev	Minimum	Maximum	Variance	USS
21	-0.0081600	0.0626683	-0.1266389	0.0972508	0.0039273	0.0799447

QUANTILE=3

N	Mean	Std Dev	Minimum	Maximum	Variance	USS
20	-0.0017462	0.0320648	-0.0414223	0.1052976	0.0010282	0.0195959

2012 CALIFORNIA GAS REPORT

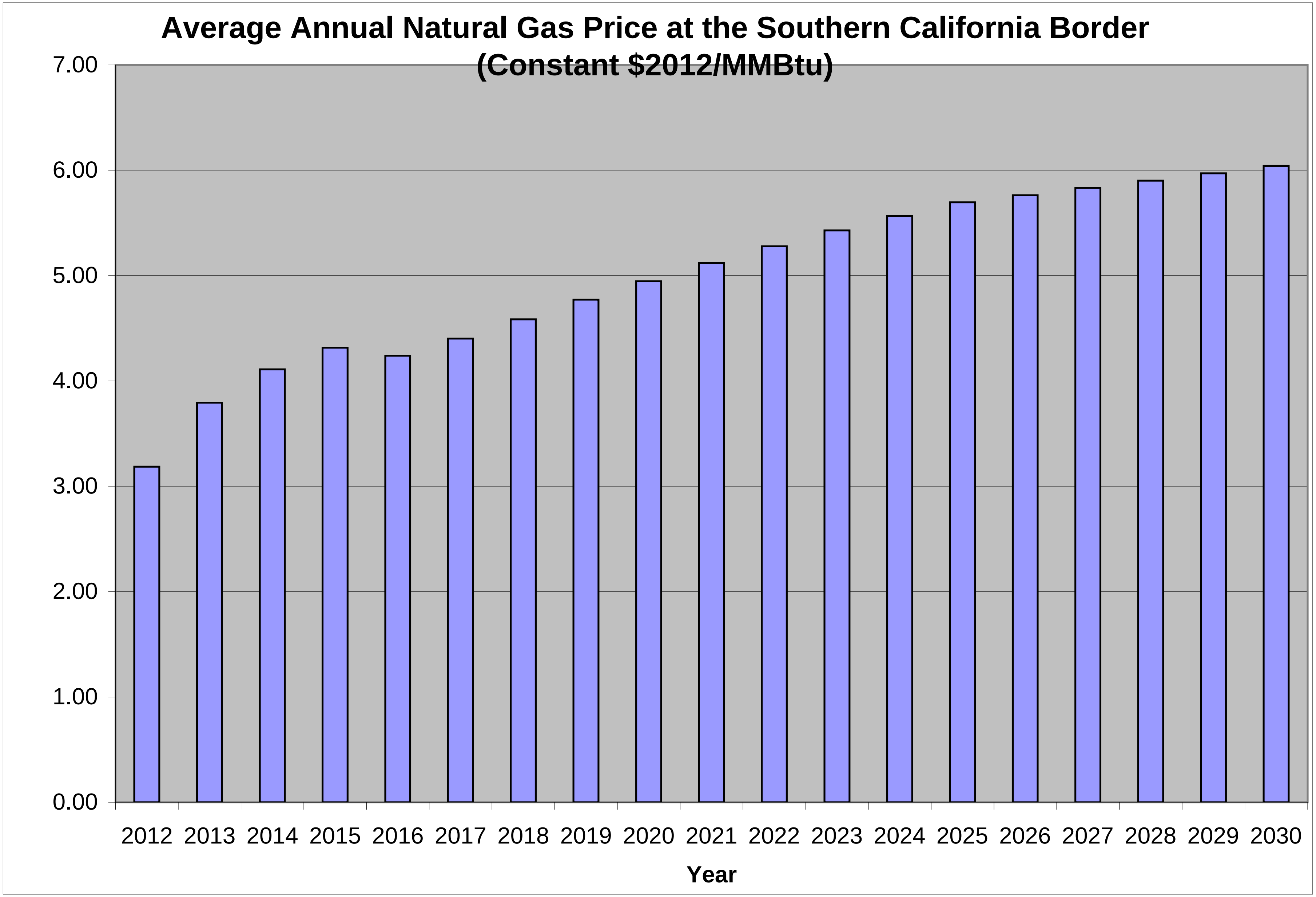
GAS PRICE FORECAST
JULY 2012

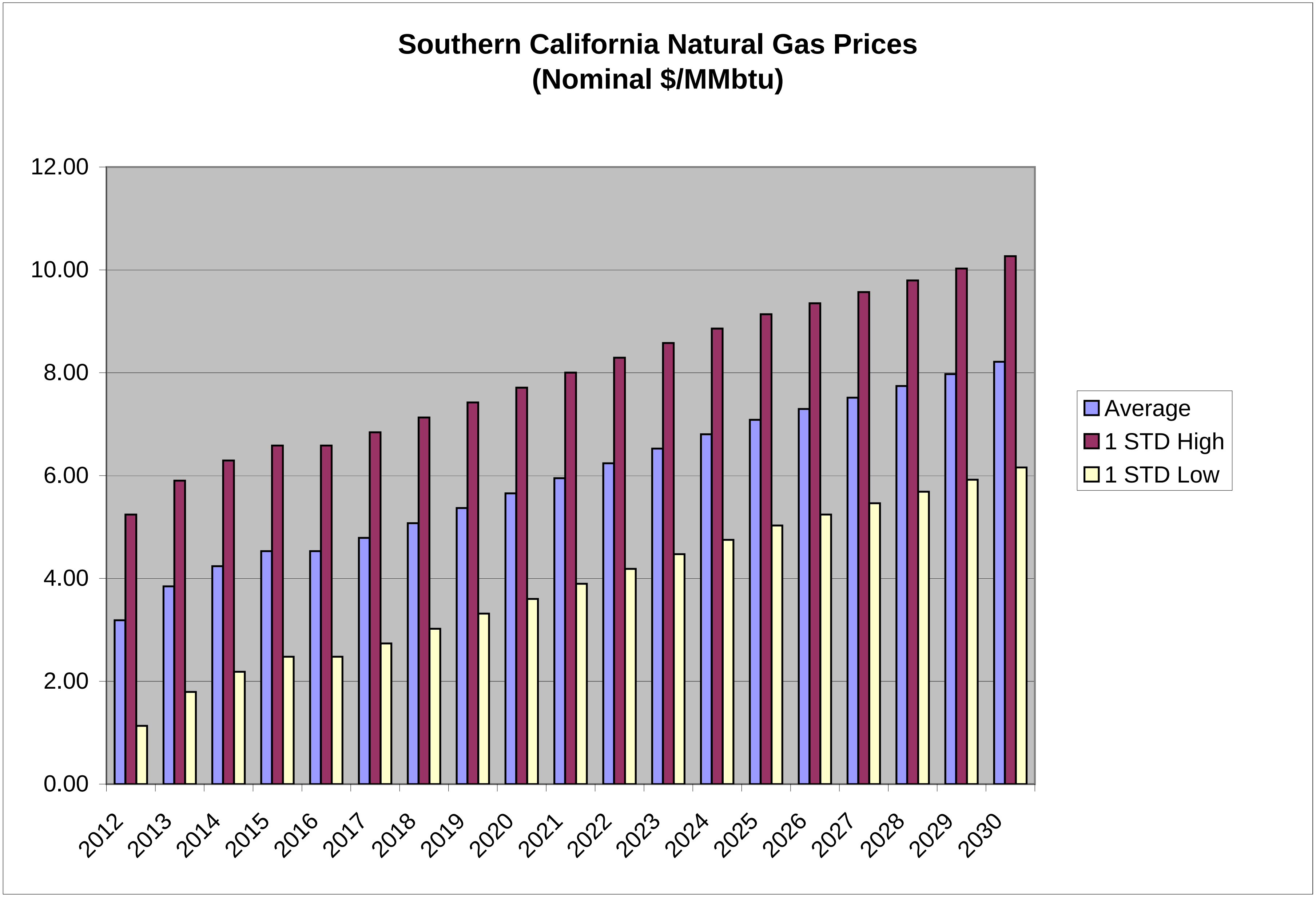
The Gas Company

A Sempra Energy utility℠

SOUTHERN CALIFORNIA GAS COMPANY
2012 CALIFORNIA GAS REPORT
GAS PRICE DATA

Current $ Average	Constant 2012 $	Year	Current $ Average	Nominal $ $2.05 1 STD High	Nominal $ $2.05 1 STD Low
3.19	3.19	2012	3.19	5.24	1.13
3.85	3.79	2013	3.85	5.90	1.79
4.24	4.11	2014	4.24	6.29	2.18
4.53	4.32	2015	4.53	6.58	2.48
4.53	4.24	2016	4.53	6.58	2.48
4.79	4.40	2017	4.79	6.84	2.73
5.07	4.58	2018	5.07	7.13	3.02
5.37	4.77	2019	5.37	7.42	3.31
5.66	4.95	2020	5.66	7.71	3.60
5.95	5.12	2021	5.95	8.00	3.89
6.24	5.28	2022	6.24	8.29	4.19
6.52	5.43	2023	6.52	8.58	4.47
6.80	5.57	2024	6.80	8.86	4.75
7.08	5.70	2025	7.08	9.14	5.03
7.30	5.76	2026	7.30	9.35	5.24
7.52	5.83	2027	7.52	9.57	5.46
7.74	5.90	2028	7.74	9.79	5.69
7.97	5.97	2029	7.97	10.03	5.92
8.21	6.04	2030	8.21	10.27	6.16


Average Annual Natural Gas Price at the Southern California Border
(Constant $2012/MMBtu)
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Year


Southern California Natural Gas Prices
(Nominal $/MMbtu)
12.00
10.00
8.00
6.00
4.00
2.00
0.00
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
Average
1 STD High
1 STD Low

2012 CALIFORNIA GAS REPORT

Alternate Fuels
JULY 2012

The Gas Company

A Sempra Energy utility℠

LONG TERM OUTLOOK for "SPOT" Gas: Southern California Gas

(CBSP = $/Dth Price @ California Border Spot Price)

(Difference = $/Dth Difference, SoCal Border Basis to Price at Henry Hub

YEAR	Supply Component	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YEAR AVERAGE
1991	CBSP	2.59	2.04	1.91	1.96	2.01	1.90	1.76	1.72	1.84	1.94	2.37	2.46	2.04
1992	CBSP	2.34	1.65	1.71	1.61	1.80	1.92	1.78	2.18	2.31	2.80	2.40	2.34	2.07
1993	CBSP	2.39	1.84	2.03	2.19	2.56	1.90	2.03	2.29	2.43	2.19	2.08	2.56	2.21
1994	CBSP	2.23	1.99	2.18	1.89	1.90	1.65	1.75	1.72	1.64	1.39	1.68	1.82	1.82
1995	CBSP	1.39	1.26	1.27	1.31	1.34	1.34	1.23	1.45	1.59	1.49	1.60	1.45	1.39
	Difference	-0.12	-0.31	-0.26	-0.31	-0.30	-0.21	-0.20	-0.08	-0.04	-0.26	-0.41	-1.20	-0.31
1996	CBSP	1.38	1.48	1.30	1.34	1.33	1.54	2.04	1.92	1.72	2.29	2.99	3.77	1.93
	Difference	-1.56	-3.46	-1.59	-0.90	-0.87	-0.93	-0.48	-0.13	-0.11	-0.04	0.00	0.01	-0.84
1997	CBSP	3.33	2.11	1.81	1.33	2.14	2.18	2.22	2.48	2.90	3.01	2.92	2.27	2.39
	Difference	-0.03	-0.11	-0.08	-0.69	-0.09	-0.02	0.04	0.02	0.04	-0.01	-0.09	-0.07	-0.09
1998	CBSP	2.25	2.24	2.37	2.51	2.20	2.04	2.36	2.24	2.14	2.21	2.38	2.11	2.25
	Difference	0.15	0.03	0.14	0.08	0.06	-0.09	0.17	0.39	0.16	0.31	0.28	0.42	0.17
1999	CBSP	1.91	1.83	1.72	2.10	2.23	2.30	2.36	2.73	2.70	2.96	2.65	2.48	2.33
	Difference	0.06	0.04	-0.05	-0.04	-0.03	0.00	0.13	-0.05	0.13	0.25	0.26	0.12	0.07
2000	CBSP	2.42	2.62	2.85	3.03	3.60	4.68	4.64	5.25	6.06	5.62	9.49	25.71	6.33
	Difference	0.03	-0.04	0.07	0.01	0.08	0.38	0.64	0.87	1.02	0.56	4.06	17.02	2.06
2001	CBSP	12.67	19.11	14.30	13.83	12.00	6.65	4.37	3.27	2.11	2.35	2.38	2.58	7.97
	Difference	4.28	13.51	9.14	8.62	7.77	2.89	1.28	0.26	-0.10	-0.07	-0.05	0.21	3.98
2002	CBSP	2.21	2.25	2.99	3.24	3.12	3.05	3.03	2.84	3.23	3.73	3.87	4.45	3.17
	Difference	-0.08	-0.04	0.00	-0.17	-0.40	-0.18	0.03	-0.23	-0.25	-0.39	-0.18	-0.32	-0.18
2003	CBSP	4.76	5.96	6.07	4.96	5.35	5.42	4.99	4.90	4.56	4.57	4.38	5.58	5.13
	Difference	-0.62	-1.48	-0.15	-0.29	-0.42	-0.43	-0.07	-0.07	-0.07	-0.08	-0.04	-0.51	-0.35
2004	CBSP	5.66	5.02	5.02	5.43	5.95	5.83	5.75	5.38	4.76	5.62	6.16	6.40	5.58
	Difference	-0.47	-0.38	-0.36	-0.27	-0.32	-0.47	-0.18	-0.08	-0.33	-0.75	0.01	-0.22	-0.32
2005	CBSP	5.71	5.73	6.50	6.72	5.92	6.17	6.75	8.01	9.72	11.04	7.87	11.57	7.64
	Difference	-0.44	-0.38	-0.43	-0.49	-0.57	-0.99	-0.86	-1.19	-4.08	-2.46	-2.46	-1.59	-1.33
2006	CBSP	7.71	6.82	5.92	6.07	5.41	5.79	5.97	6.75	4.80	5.47	6.44	6.85	6.17
	Difference	-1.01	-0.83	-0.95	-1.09	-0.86	-0.42	-0.09	-0.48	-0.21	-0.24	-0.87	-0.03	-0.59
2007	CBSP	6.45	7.19	6.23	6.99	7.18	6.88	6.01	5.82	5.57	6.59	6.17	6.89	6.50
	Difference	0.02	-0.83	-0.87	-0.60	-0.46	-0.54	-0.20	-0.44	-0.48	-0.11	-0.93	-0.23	-0.47
2008	CBSP	7.45	7.90	8.56	9.35	9.61	11.04	9.96	7.34	5.43	4.17	4.46	5.11	7.53
	Difference	-0.32	-0.25	-0.55	-0.39	-1.19	-1.18	-0.80	-0.59	-1.51	-2.26	-1.86	-0.46	-0.95
2009	CBSP	4.45	3.71	3.16	2.99	3.42	3.06	3.29	3.16	3.19	4.19	3.77	5.49	3.65
	Difference	-0.83	-0.85	-0.82	-0.52	-0.39	-0.76	-0.11	-0.03	0.24	0.22	0.10	0.21	-0.29
2010	CBSP	5.84	5.41	4.45	4.01	3.95	4.40	4.24	3.88	3.81	3.43	3.72	4.29	4.29
	Difference	-0.02	0.06	0.12	-0.02	-0.18	-0.39	-0.37	-0.48	-0.08	-0.02	0.05	-0.02	-0.11
2011	CBSP	4.37	4.25	3.94	4.25	4.28	4.56	4.44	4.19	4.13	3.55	3.56	3.67	4.10
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2012	CBSP	3.40	3.00	2.92	2.96	3.04	3.10	3.16	3.19	3.19	3.24	3.39	3.67	3.19
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2013	CBSP	3.80	3.80	3.77	3.73	3.75	3.78	3.82	3.84	3.84	3.88	3.97	4.18	3.85
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2014	CBSP	4.29	4.27	4.22	4.11	4.13	4.15	4.19	4.21	4.21	4.24	4.32	4.52	4.24
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2015	CBSP	4.70	4.64	4.55	4.38	4.39	4.42	4.45	4.47	4.47	4.51	4.59	4.79	4.53
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2016	CBSP	4.62	4.45	4.39	4.34	4.39	4.43	4.49	4.52	4.52	4.57	4.69	4.97	4.53
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2017	CBSP	4.88	4.70	4.64	4.59	4.64	4.69	4.75	4.77	4.78	4.83	4.96	5.25	4.79
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2018	CBSP	5.17	4.98	4.91	4.86	4.91	4.97	5.03	5.06	5.06	5.11	5.26	5.57	5.07
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2019	CBSP	5.47	5.27	5.20	5.14	5.20	5.25	5.32	5.35	5.36	5.41	5.56	5.89	5.37
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2020	CBSP	5.76	5.55	5.47	5.42	5.47	5.53	5.61	5.64	5.64	5.70	5.86	6.20	5.66
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2021	CBSP	6.06	5.84	5.76	5.70	5.76	5.82	5.90	5.93	5.94	6.00	6.16	6.53	5.95
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2022	CBSP	6.36	6.13	6.04	5.98	6.04	6.11	6.18	6.22	6.23	6.29	6.46	6.84	6.24
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2023	CBSP	6.65	6.41	6.32	6.25	6.32	6.39	6.47	6.50	6.51	6.58	6.76	7.16	6.52
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2024	CBSP	6.93	6.68	6.59	6.52	6.59	6.66	6.74	6.78	6.79	6.86	7.05	7.46	6.80
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2025	CBSP	7.22	6.95	6.86	6.78	6.86	6.93	7.02	7.06	7.07	7.14	7.34	7.77	7.08
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2026	CBSP	7.43	7.16	7.06	6.99	7.06	7.14	7.23	7.27	7.28	7.35	7.56	8.00	7.30
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2027	CBSP	7.66	7.38	7.28	7.20	7.27	7.36	7.45	7.49	7.50	7.57	7.78	8.24	7.52
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2028	CBSP	7.89	7.60	7.49	7.41	7.49	7.58	7.67	7.72	7.72	7.80	8.02	8.49	7.74
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2029	CBSP	8.12	7.83	7.72	7.64	7.72	7.80	7.90	7.95	7.96	8.04	8.26	8.75	7.97
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08
2030	CBSP	8.37	8.06	7.95	7.87	7.95	8.04	8.14	8.19	8.19	8.28	8.51	9.01	8.21
	Difference	-0.12	0.13	-0.04	0.02	-0.02	0.01	0.01	0.12	0.22	-0.01	0.30	0.37	0.08

NOTES:

1/ Jan.'00-Mar.'08 monthly actuals are simple averages of mid-range estimate of the low and high prices reported each business day by Gas Daily in their "Daily Price Survey."

2/ Forecasted price levels for Apr.'08 through Dec.'30 are the sum of Henry Hub projected price plus basis swap from NYMEX Clearport(sm).

3/ Source for gas price data: Gas Daily's "Daily Price Survey" for REGION--"Others" and LOCATION--"SoCal gas, large pkgs".
Monthly prices are calculated from data reported in Platts Gas Daily--published by the McGraw-Hill Companies, Inc.
From the daily low and high prices reported under the heading "Common," the mid-range, or simple average, of these was calculated for each day.
These daily mid-range values were subsequently averaged over the number of days reported for each respective calendar month to arrive at the monthly historical prices used for each price series.

Year	Propane $/Dth
2010	13.94
2011	17.95
2012	19.49
2013	21.41
2014	22.33
2015	23.14
2016	23.77
2017	24.39
2018	24.91
2019	25.44
2020	25.99
2021	26.56
2022	27.14
2023	27.74
2024	28.35
2025	28.98
2026	29.62
2027	30.27
2028	30.92
2029	31.59
2030	32.28

LONG TERM OUTLOOK for Butane Prices
(Nominal $/Dth, Wholesale @Los Angeles Basin)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YR. AVG.
1995	3.64	2.82	2.43	1.94	2.09	2.09	2.09	2.04	2.18	2.38	2.96	3.83	2.54
1996	3.79	3.79	2.67	2.38	2.38	2.09	2.09	2.52	3.35	4.22	4.76	5.05	3.26
1997	5.00	4.81	3.01	2.96	2.77	2.86	2.82	2.82	3.35	5.00	4.32	4.47	3.68
1998	4.37	3.25	2.52	1.84	2.28	2.23	1.94	1.84	1.94	2.23	2.91	2.86	2.52
1999	2.77	2.53	2.21	2.18	2.23	2.46	2.86	3.13	3.31	4.39	4.94	5.49	3.21
2000	5.73	5.43	4.55	3.45	3.39	3.99	4.91	4.78	4.95	4.95	7.11	7.81	5.09
2001	8.04	6.60	6.56	5.86	5.91	5.08	3.69	3.75	3.53	3.61	3.40	2.99	4.92
2002	2.96	2.95	2.95	2.86	2.82	2.82	2.94	2.99	3.14	4.00	5.14	5.81	3.45
2003	6.21	6.69	5.52	4.66	3.80	3.87	4.01	4.25	4.50	4.94	6.13	6.99	5.13
2004	7.51	6.41	5.27	5.17	5.80	5.98	6.14	6.92	7.48	9.00	10.02	9.57	7.11
2005	9.17	8.75	8.13	8.24	7.62	7.25	7.96	8.02	9.83	12.06	12.06	12.67	9.31
2006	13.59	11.89	9.47	9.51	10.01	9.41	10.06	10.18	9.73	8.74	9.21	10.81	10.22
2007	9.90	10.40	9.72	9.71	9.82	9.62	9.43	9.52	10.49	11.82	17.11	17.11	11.22
2008	17.56	14.44	14.03	13.73	15.19	16.91	17.95	16.30	14.49	10.12	5.41	3.83	13.33
2009	5.07	6.12	5.36	5.59	5.51	7.43	6.97	8.23	8.62	11.44	15.81	17.16	8.61
2010	15.69	14.43	12.57	11.93	12.16	12.53	12.79	13.00	13.54	14.73	16.58	17.35	13.94
2011	20.08	18.46	16.09	15.27	15.56	16.03	16.36	16.64	17.33	18.85	21.22	22.20	17.95
2012	21.92	20.16	17.56	16.67	16.98	17.50	17.86	18.17	18.91	20.58	23.16	24.24	19.49
2013	24.07	22.14	19.29	18.31	18.65	19.22	19.62	19.95	20.77	22.60	25.44	26.62	21.41
2014	25.11	23.09	20.12	19.09	19.45	20.05	20.46	20.81	21.66	23.57	26.53	27.76	22.33
2015	26.02	23.92	20.85	19.79	20.16	20.77	21.20	21.56	22.45	24.43	27.49	28.77	23.14
2016	26.72	24.57	21.41	20.32	20.71	21.34	21.78	22.15	23.06	25.09	28.24	29.55	23.77
2017	27.43	25.22	21.98	20.86	21.25	21.90	22.35	22.73	23.67	25.75	28.99	30.33	24.39
2018	28.00	25.75	22.44	21.30	21.70	22.36	22.82	23.21	24.16	26.30	29.59	30.96	24.91
2019	28.60	26.30	22.92	21.75	22.16	22.84	23.31	23.71	24.68	26.86	30.23	31.63	25.44
2020	29.23	26.88	23.42	22.23	22.65	23.34	23.82	24.22	25.22	27.44	30.89	32.32	25.99
2021	29.86	27.46	23.92	22.71	23.14	23.84	24.34	24.75	25.76	28.04	31.56	33.02	26.56
2022	30.52	28.06	24.45	23.21	23.65	24.37	24.87	25.29	26.33	28.66	32.25	33.74	27.14
2023	31.18	28.68	24.99	23.72	24.16	24.90	25.42	25.85	26.91	29.28	32.96	34.48	27.74
2024	31.88	29.32	25.54	24.24	24.70	25.45	25.98	26.42	27.51	29.94	33.69	35.25	28.35
2025	32.58	29.96	26.11	24.78	25.25	26.01	26.55	27.00	28.11	30.59	34.43	36.03	28.98
2026	33.30	30.62	26.68	25.33	25.80	26.59	27.14	27.60	28.73	31.27	35.19	36.82	29.62
2027	34.03	31.29	27.27	25.88	26.37	27.17	27.74	28.21	29.36	31.96	35.96	37.63	30.27
2028	34.77	31.97	27.86	26.44	26.94	27.76	28.34	28.82	30.00	32.65	36.74	38.44	30.92
2029	35.52	32.67	28.46	27.02	27.52	28.36	28.95	29.44	30.65	33.36	37.54	39.28	31.59
2030	36.29	33.37	29.08	27.60	28.12	28.98	29.58	30.08	31.31	34.08	38.35	40.13	32.28

Oil Prices ($/BBL), from EIA Annual Enery Outlook 2011

Year	WTI	1% GC	No. 2	Kern
2000	39.39	34.16	44.31	28.27
2001	32.63	27.41	36.42	20.74
2002	31.75	27.36	33.89	19.76
2003	37.38	34.01	40.96	26.03
2004	48.46	34.19	53.58	38.38
2005	64.32	49.90	77.96	56.05
2006	73.00	52.21	83.94	65.72
2007	76.80	59.43	90.20	69.95
2008	103.48	81.03	122.84	99.67
2009	61.86	58.71	70.53	53.31
2010	78.05	63.86	88.98	72.86
2011	85.73	69.72	97.74	103.24
2012	104.36	84.59	118.97	112.15
2013	116.19	93.58	132.46	123.23
2014	122.26	97.19	139.38	128.55
2015	127.70	102.66	145.57	133.23
2016	132.08	106.56	150.58	136.87
2017	136.45	111.33	155.56	140.49
2018	140.17	114.95	159.79	143.46
2019	144.00	118.63	164.16	146.54
2020	147.96	120.04	168.68	149.75
2021	151.97	123.19	173.25	153.01
2022	156.10	126.49	177.96	156.39
2023	160.29	129.89	182.74	159.83
2024	164.62	133.47	187.66	163.40
2025	168.98	137.27	192.63	167.02
2026	173.44	141.04	197.72	170.72
2027	177.94	144.82	202.85	174.48
2028	182.48	148.48	208.03	178.27
2029	187.11	152.12	213.30	182.15
2030	191.82	155.74	218.67	186.10

2012 CALIFORNIA GAS REPORT

SERVICE AREA ECONOMIC FORECAST
JULY 2012

The Gas Company

A Sempra Energy utility℠

SOUTHERN CALIFORNIA GAS COMPANY SERVICE AREA ECONOMIC FORECAST

(based on Global Insight's February 2012 Regional Forecast)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EMPLOYMENT (1000's)													
Total	8,217.8	8,398.6	8,444.7	8,309.4	7,785.9	7,684.9	7,712.4	7,816.1	7,965.2	8,132.1	8,299.2	8,439.6	8,542.3
Agriculture	215.5	218.5	221.6	227.1	210.3	219.9	219.9	217.5	214.8	213.9	214.8	216.4	217.6
Total Non-farm	8,002.2	8,180.1	8,223.2	8,082.2	7,575.5	7,465.0	7,492.5	7,598.6	7,750.5	7,918.3	8,084.4	8,223.2	8,324.7
Mining	16.6	18.3	19.0	19.9	18.5	18.6	19.5	19.5	19.5	19.5	18.8	18.2	17.8
Construction	458.7	485.1	459.8	403.0	319.0	283.7	276.7	280.1	292.8	328.5	376.2	415.6	438.8
Manufacturing	890.8	884.9	865.7	830.8	739.1	712.9	712.9	718.8	732.7	740.9	749.4	752.9	753.6
Transportation, Information, Utilities	566.3	570.5	577.5	572.9	528.7	524.0	537.4	540.2	555.5	566.7	580.3	591.1	602.6
Trade	1,411.9	1,451.8	1,468.9	1,433.4	1,323.9	1,311.1	1,310.8	1,332.8	1,354.2	1,368.8	1,382.5	1,397.1	1,406.7
Retail	985.3	1,010.2	1,014.3	984.6	910.2	901.9	900.7	911.9	921.2	925.6	930.0	935.3	936.6
Wholesale (including warehousing)	426.6	441.6	454.6	448.8	413.7	409.3	410.1	420.9	433.0	443.2	452.5	461.8	470.1
Restaurants	537.9	557.4	570.9	573.5	551.3	550.7	562.7	569.7	575.5	578.2	581.0	584.3	585.2
Finance, Insurance & Real Estate	497.6	505.4	488.2	456.0	423.3	411.7	409.2	408.0	408.1	411.7	415.8	414.8	411.6
Services	2,211.3	2,278.1	2,317.4	2,310.0	2,195.1	2,197.0	2,227.6	2,277.1	2,326.7	2,394.0	2,457.1	2,517.6	2,568.4
Accomodation	124.0	126.8	130.3	131.2	123.6	122.7	125.2	128.8	130.6	130.5	129.6	128.5	127.6
Personal & Laundry Services	81.3	82.9	84.6	85.2	80.3	79.9	79.0	79.3	80.0	80.0	79.1	78.3	77.7
Professional & Business Services	1,088.7	1,135.9	1,143.6	1,106.2	1,005.0	1,000.4	1,013.3	1,041.8	1,075.0	1,127.2	1,181.0	1,222.6	1,255.8
Health & Social Services	696.1	708.6	729.9	754.5	762.3	772.9	786.5	802.8	815.0	829.8	843.7	866.8	887.3
Misc. Services	221.3	223.8	229.0	232.9	223.9	221.1	223.5	224.4	226.1	226.4	223.8	221.4	219.8
Government & Education	1,411.1	1,428.7	1,455.8	1,482.7	1,476.5	1,455.3	1,435.5	1,452.3	1,485.6	1,510.0	1,523.3	1,531.5	1,540.1
OTHER INDICATORS													
Southern California Consumer Inflation*	4.5%	4.3%	3.3%	3.5%	-0.8%	1.2%	2.7%	1.6%	2.0%	1.9%	2.0%	2.0%	1.9%
Inflation--US Gross Domestic Product**	3.3%	3.2%	2.9%	2.2%	1.1%	1.2%	2.1%	1.2%	1.4%	1.7%	1.8%	1.8%	1.8%

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

** Chained Price Index--US GDP, from Global Insight's Feb 2012 US forecast.

SOUTHERN CALIFORNIA GAS COMPANY SERVICE AREA ECONOMIC FORECAST

(based on Global Insight's February 2012 Regional Forecast)

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EMPLOYMENT (1000's)													
Total	8,617.1	8,681.5	8,753.5	8,812.1	8,869.9	8,935.0	9,010.5	9,090.4	9,176.0	9,263.3	9,344.1	9,423.5	9,501.0
Agriculture	218.3	218.7	219.1	219.9	220.6	221.4	222.2	223.0	223.9	225.1	226.0	227.0	227.9
Total Non-farm	8,398.8	8,462.8	8,534.3	8,592.3	8,649.4	8,713.7	8,788.4	8,867.5	8,952.0	9,038.3	9,118.1	9,196.5	9,273.2
Mining	17.2	16.5	15.8	15.2	15.0	14.8	14.6	14.4	14.3	14.3	14.2	14.1	14.0
Construction	452.0	462.1	473.7	483.7	490.3	497.0	508.2	523.6	538.1	553.6	566.4	577.1	587.0
Manufacturing	752.3	750.6	747.6	746.9	745.4	740.5	734.8	727.6	718.9	710.5	701.8	693.5	686.0
Transportation, Information, Utilities	612.2	617.3	621.5	626.8	631.8	637.9	645.2	652.8	661.5	669.0	676.6	684.6	691.2
Trade	1,411.9	1,415.7	1,418.6	1,420.4	1,421.7	1,424.9	1,430.7	1,438.6	1,447.0	1,456.4	1,462.8	1,469.9	1,474.5
Retail	936.7	936.4	935.8	935.9	934.8	935.1	937.2	941.2	946.3	952.7	959.6	966.3	972.0
Wholesale (including warehousing)	475.2	479.3	482.8	484.5	487.0	489.8	493.6	497.4	500.7	503.7	503.2	503.6	502.5
Restaurants	585.2	585.0	584.6	584.7	584.0	584.2	585.5	588.0	591.2	595.2	599.5	603.7	607.3
Finance, Insurance & Real Estate	411.4	410.5	411.6	411.5	411.1	411.9	411.8	411.4	411.7	412.5	413.7	415.6	417.4
Services	2,605.7	2,642.6	2,683.5	2,718.6	2,752.3	2,792.3	2,836.1	2,877.9	2,924.0	2,970.5	3,016.2	3,061.1	3,105.5
Accomodation	126.5	125.7	125.0	124.2	123.3	123.2	123.4	123.9	124.9	126.2	127.6	129.2	130.5
Personal & Laundry Services	77.2	76.4	75.9	75.4	74.9	74.5	74.4	74.4	74.5	74.6	74.7	74.9	74.9
Professional & Business Services	1,281.2	1,311.5	1,347.5	1,379.1	1,409.8	1,444.4	1,479.7	1,512.0	1,545.7	1,578.6	1,609.6	1,639.9	1,671.7
Health & Social Services	902.6	912.8	920.6	926.7	932.6	939.4	948.0	957.2	968.3	980.3	992.9	1,005.4	1,016.4
Misc. Services	218.2	216.2	214.6	213.2	211.7	210.8	210.5	210.4	210.6	210.9	211.3	211.7	211.9
Government & Education	1,550.9	1,562.5	1,577.4	1,584.5	1,597.8	1,610.2	1,621.5	1,633.2	1,645.2	1,656.3	1,666.9	1,676.9	1,690.3
OTHER INDICATORS													
Southern California Consumer Inflation*	1.9%	1.8%	1.7%	2.1%	2.2%	2.0%	2.1%	2.1%	2.2%	2.2%	2.2%	2.1%	2.1%
Inflation--US Gross Domestic Product**	1.8%	1.6%	1.6%	1.7%	1.7%	1.7%	1.7%	1.7%	1.8%	1.8%	1.8%	1.8%	1.8%

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

** Chained Price Index--US GDP, from Global Insight's Feb 2012 US forecast.