2010 California Gas Report Workpapers

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Prepared by

The Gas Company

A Sempra Energy utility℠

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2010 CALIFORNIA GAS REPORT

HISTORICAL DATA
JULY 2010

The Gas Company

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SOUTHERN CALIFORNIA GAS COMPANY
2010 California Gas Report
ANNUAL GAS SUPPLY AND SENDOUT - MMCF/DAY
RECORDED YEARS 2005 TO 2009

Line	CAPACITY AVAILABLE		2005	2006	2007	2008	2009
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		274	242	232	209	216
	Out-of-State Gas						
11	Pacific Interstate Companies		-	-	-	-	-
12	Other Out-of-State		2,220	2,386	2,462	2,585	2,397
13	Total Out-of-State Gas		2,220	2,386	2,462	2,585	2,397
14	TOTAL SUPPLY TAKEN		2,494	2,628	2,694	2,794	2,613
15	Net Underground Storage Withdrawal		(11)	13	23	(28)	8
16	TOTAL THROUGHPUT (1)(2)		2,483	2,641	2,717	2,766	2,621
	DELIVERIES BY END-USE (3)						
17	Core	Residential	660	678	673	659	645
18		Commercial	211	215	224	211	210
19		Industrial	65	65	65	64	59
20		NGV	20	21	23	25	26
21		Subtotal	956	979	985	959	940
22	Noncore	Commercial	60	63	60	59	56
23		Industrial	344	347	345	341	324
24		EOR Steaming	34	39	39	39	35
25		Electric Generation	676	769	849	907	811
26		Subtotal	1,114	1,218	1,293	1,346	1,226
27	Wholesale/International		393	394	406	422	412
28	Co. Use & LUAF		20	50	33	39	43
29	SYSTEM TOTAL-THROUGHPUT (1)(2)		2,483	2,641	2,717	2,766	2,621
	TRANSPORTATION AND EXCHANGE						
30	Core	All End Uses	7	11	14	17	20
31	Noncore	Commercial/Industrial	404	410	405	400	380
32		EOR Steaming	34	39	39	39	35
33		Electric Generation	676	769	849	907	811
34		Subtotal-Retail	1,121	1,229	1,307	1,363	1,246
35	Wholesale/International		393	394	406	422	412
36	TOTAL TRANSPORTATION & EXCHANGE		1,514	1,623	1,713	1,785	1,658

2010 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS - SUMMARY
JULY 2010

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2010 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS - AVERAGE TEMPERATURE YEAR
JULY 2010

The Gas Company

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TABLE 1-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2010 THRU 2014

AVERAGE TEMPERATURE YEAR

LINE			2010	2011	2012	2013	2014	LINE
	CAPACITY AVAILABLE							
1	California Line 85 Zone (California Producers		160	160	160	160	160	1
2	California Coastal Zone (California Producers		150	150	150	150	150	2
	Out-of-State Gas							
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,875	3,875	3,875	3,875	3,875	7
	GAS SUPPLY TAKEN							
8	California Source Gas		310	310	310	310	310	8
9	Out-of-State		2,272	2,245	2,243	2,235	2,230	9
10	TOTAL SUPPLY TAKEN		2,582	2,555	2,553	2,545	2,540	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		2,582	2,555	2,553	2,545	2,540	12
	REQUIREMENTS FORECAST BY END-USE [5/]							
13	CORE [6/]	Residential	633	625	623	619	617	13
14		Commercial	215	216	216	217	217	14
15		Industrial	56	55	54	53	52	15
16		NGV	27	28	28	29	30	16
17		Subtotal-CORE	931	924	922	919	916	17
18	NONCORE	Commercial	53	51	50	48	46	18
19		Industrial	305	304	297	295	294	19
20		EOR Steaming	30	29	29	29	29	20
21		Electric Generation (EG)	781	787	799	795	795	21
22		Subtotal-NONCORE	1,169	1,171	1,175	1,167	1,164	22
23	WHOLESALE &	Core	176	176	175	176	176	23
24	INTERNATIONAL	Noncore Excl. EG	43	43	44	45	45	24
25		Electric Generation (EG)	232	211	207	208	209	25
26		Subtotal-WHOLESALE & INTL.	451	430	427	429	430	26
27		Co. Use & LUAF	30	30	30	30	30	27
28	SYSTEM TOTAL THROUGHPUT [4/]		2,582	2,555	2,553	2,545	2,540	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	20	20	20	20	20	29
30	NONCORE	Commercial/Industrial	358	355	347	342	340	30
31		EOR Steaming	30	29	29	29	29	31
32		Electric Generation (EG)	781	787	799	795	795	32
33		Subtotal-RETAIL	1,190	1,191	1,195	1,187	1,184	33
	WHOLESALE &							
34	INTERNATIONAL	All End Uses	451	430	427	429	430	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,641	1,621	1,621	1,616	1,614	35
	CURTAILMENT (RETAIL & WHOLESALE)							
36		Core	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	38

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

	2010	2011	2012	2013	2014
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	4	3	3	3	3
5/ Requirement forecast by end-use includes sales, transportation, and exchange volume					
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	935	928	926	923	921

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		2,235	2,163	2,148	2,157	9
10	TOTAL SUPPLY TAKEN		2,545	2,473	2,458	2,467	10
11	Net Underground Storage Withdrawal		0	0	0	0	11
12	TOTAL THROUGHPUT 4/		2,545	2,473	2,458	2,467	12
	REQUIREMENTS FORECAST BY END-USE 5/						
13	CORE 6/	Residential	618	623	624	626	13
14		Commercial	216	214	215	219	14
15		Industrial	51	45	37	35	15
16		NGV	31	35	40	46	16
17		Subtotal-CORE	916	916	917	927	17
18	NONCORE	Commercial	44	35	27	28	18
19		Industrial	293	274	261	255	19
20		EOR Steaming	29	29	29	29	20
21		Electric Generation (EG)	802	771	774	775	21
22		Subtotal-NONCORE	1,168	1,110	1,091	1,087	22
23	WHOLESALE &	Core	176	179	184	189	23
24	INTERNATIONAL	Noncore Excl. EG	45	46	47	48	24
25		Electric Generation (EG)	210	193	190	188	25
26		Subtotal-WHOLESALE & INTL.	432	418	421	424	26
27		Co. Use & LUAF	30	29	29	29	27
28	SYSTEM TOTAL THROUGHPUT 4/		2,545	2,473	2,458	2,467	28
	TRANSPORTATION AND EXCHANGE						
29	CORE	All End Uses	20	20	20	20	29
30	NONCORE	Commercial/Industrial	337	309	288	283	30
31		EOR Steaming	29	29	29	29	31
32		Electric Generation (EG)	802	771	774	775	32
33		Subtotal-RETAIL	1,188	1,129	1,111	1,107	33
	WHOLESALE &						
34	INTERNATIONAL	All End Uses	432	418	421	424	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,620	1,547	1,532	1,531	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	3	3	2	2

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:	920	921	922	932

Work Paper: TABLE 1-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2010

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		2,708	2,621	2,278	2,070	1,883	1,931	2,148	2,254	2,171	2,001	2,369	2,844	2,272	9
10	TOTAL SUPPLY TAKEN		3,018	2,931	2,588	2,380	2,193	2,241	2,458	2,564	2,481	2,311	2,679	3,154	2,582	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,018	2,931	2,588	2,380	2,193	2,241	2,458	2,564	2,481	2,311	2,679	3,154	2,582	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,054	987	812	656	462	375	344	343	349	429	710	1,097	633	13
14		Commercial	277	285	228	210	195	186	164	160	177	171	246	284	215	14
15		Industrial	61	68	58	56	52	53	48	49	53	54	58	60	56	15
16		NGV	25	26	25	29	27	27	27	25	28	28	27	27	27	16
17		Subtotal-CORE	1,419	1,367	1,124	951	736	641	583	578	607	682	1,040	1,468	931	17
18	NONCORE	Commercial	61	59	56	53	50	49	48	48	48	49	55	61	53	18
19		Industrial	315	309	302	304	305	315	302	317	313	304	294	284	305	19
20		EOR Steaming	31	31	31	31	31	31	29	29	29	29	29	29	30	20
21		Electric Generation (EG)	607	600	575	603	680	798	1,037	1,132	1,033	809	758	727	781	21
22		Subtotal-NONCORE	1,014	999	965	991	1,066	1,193	1,415	1,525	1,423	1,191	1,135	1,101	1,169	22
23	WHOLESALE &	Core	269	265	226	184	143	118	108	105	108	129	194	270	176	23
24	INTERNATIONAL	Noncore Excl. EG	44	50	45	46	44	45	43	42	39	38	41	40	43	24
25		Electric Generation (EG)	238	216	199	179	178	219	278	283	275	245	238	237	232	25
26		Subtotal-WHOLESALE & IN	550	531	470	409	365	381	430	431	422	411	472	548	451	26
27		Co. Use & LUAF	35	34	30	28	26	26	29	30	29	27	31	37	30	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,018	2,931	2,588	2,380	2,193	2,241	2,458	2,564	2,481	2,311	2,679	3,154	2,582	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	27	27	22	20	18	17	15	14	16	16	23	27	20	29
30	NONCORE	Commercial/Industrial	376	368	359	357	355	364	350	365	361	353	348	345	358	30
31		EOR Steaming	31	31	31	31	31	31	29	29	29	29	29	29	30	31
32		Electric Generation (EG)	607	600	575	603	680	798	1,037	1,132	1,033	809	758	727	781	32
33		Subtotal-RETAIL	1,041	1,026	987	1,011	1,084	1,210	1,430	1,540	1,439	1,207	1,158	1,129	1,190	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	550	531	470	409	365	381	430	431	422	411	472	548	451	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,592	1,558	1,456	1,421	1,449	1,591	1,860	1,970	1,861	1,618	1,631	1,676	1,641	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	4	4	4	4	4	4	4	4	4	4	4	4	4
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:	1,430	1,376	1,132	957	738	641	584	579	607	684	1,045	1,479	935

Work Paper: **TABLE 1-SCG**

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2011

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	2,619	2,251	1,993	1,806	1,918	2,139	2,220	2,165	1,984	2,305	2,814	2,245	9
10	TOTAL SUPPLY TAKEN		3,049	2,929	2,561	2,303	2,116	2,228	2,449	2,530	2,475	2,294	2,615	3,124	2,555	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	2,929	2,561	2,303	2,116	2,228	2,449	2,530	2,475	2,294	2,615	3,124	2,555	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,042	975	802	648	457	370	340	339	345	424	701	1,084	625	13
14		Commercial	279	287	230	211	196	187	165	161	178	173	248	286	216	14
15		Industrial	60	67	57	55	51	52	47	48	52	53	57	58	55	15
16		NGV	26	27	26	30	28	28	28	26	29	29	27	27	28	16
17		Subtotal-CORE	1,407	1,356	1,115	944	731	637	580	574	603	678	1,033	1,456	924	17
18	NONCORE	Commercial	59	57	54	51	48	47	46	46	46	48	53	59	51	18
19		Industrial	307	303	299	300	302	318	302	317	313	303	294	285	304	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	694	651	600	576	648	808	1,045	1,113	1,039	806	732	722	787	21
22		Subtotal-NONCORE	1,088	1,041	982	956	1,027	1,202	1,423	1,506	1,427	1,186	1,108	1,095	1,171	22
23	WHOLESALE &	Core	268	265	224	184	143	117	108	105	107	128	193	270	176	23
24	INTERNATIONAL	Noncore Excl. EG	45	50	46	47	44	45	43	42	39	38	41	40	43	24
25		Electric Generation (EG)	205	183	165	145	146	200	266	273	269	237	211	228	211	25
26		Subtotal-WHOLESALE & INT	518	499	435	376	332	363	418	420	415	403	444	537	430	26
27		Co. Use & LUAF	36	34	30	27	25	26	29	30	29	27	31	37	30	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,049	2,929	2,561	2,303	2,116	2,228	2,449	2,530	2,475	2,294	2,615	3,124	2,555	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	27	27	22	20	18	17	15	14	16	16	23	28	20	29
30	NONCORE	Commercial/Industrial	365	360	353	351	350	365	348	363	360	351	346	344	355	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	694	651	600	576	648	808	1,045	1,113	1,039	806	732	722	787	32
33		Subtotal-RETAIL	1,115	1,068	1,004	976	1,045	1,219	1,437	1,520	1,443	1,202	1,131	1,122	1,191	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	518	499	435	376	332	363	418	420	415	403	444	537	430	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,633	1,567	1,439	1,352	1,378	1,581	1,855	1,940	1,858	1,605	1,574	1,659	1,621	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	3	3	3	3	3	3	3	3	3	3	3	3	3

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:	1,418	1,364	1,122	949	733	637	580	575	603	680	1,037	1,467	928

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		2,699	2,519	2,267	2,048	1,837	1,929	2,130	2,204	2,157	2,001	2,327	2,798	2,243	9
10	TOTAL SUPPLY TAKEN		3,009	2,829	2,577	2,358	2,147	2,239	2,440	2,514	2,467	2,311	2,637	3,108	2,553	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,009	2,829	2,577	2,358	2,147	2,239	2,440	2,514	2,467	2,311	2,637	3,108	2,553	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,041	941	802	648	457	370	339	338	345	423	701	1,083	623	13
14		Commercial	280	278	230	211	197	187	165	162	178	173	248	287	216	14
15		Industrial	60	64	56	55	50	51	47	48	52	52	56	58	54	15
16		NGV	27	27	27	30	28	29	29	27	29	30	28	28	28	16
17		Subtotal-CORE	1,407	1,309	1,115	944	732	637	580	575	604	678	1,033	1,456	922	17
18	NONCORE	Commercial	57	54	53	50	47	46	45	45	45	46	51	57	50	18
19		Industrial	304	289	292	297	298	315	295	310	306	296	286	277	297	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	666	631	618	633	677	821	1,063	1,127	1,058	825	748	710	799	21
22		Subtotal-NONCORE	1,056	1,003	992	1,008	1,051	1,210	1,432	1,511	1,438	1,196	1,115	1,074	1,175	22
23	WHOLESALE &	Core	269	258	224	184	143	117	108	105	107	128	193	270	175	23
24	INTERNATIONAL	Noncore Excl. EG	45	49	46	47	45	46	44	43	40	39	42	41	44	24
25		Electric Generation (EG)	197	177	169	146	151	202	247	251	248	242	223	231	207	25
26		Subtotal-WHOLESALE & INT	510	484	440	378	339	365	399	399	396	410	458	542	427	26
27		Co. Use & LUAF	35	33	30	28	25	26	29	29	29	27	31	36	30	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,009	2,829	2,577	2,358	2,147	2,239	2,440	2,514	2,467	2,311	2,637	3,108	2,553	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	27	27	22	20	18	17	15	14	16	16	23	28	20	29
30	NONCORE	Commercial/Industrial	361	343	344	347	345	361	340	355	351	342	337	335	347	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	666	631	618	633	677	821	1,063	1,127	1,058	825	748	710	799	32
33		Subtotal-RETAIL	1,083	1,030	1,014	1,028	1,069	1,227	1,446	1,526	1,454	1,212	1,138	1,101	1,195	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	510	484	440	378	339	365	399	399	396	410	458	542	427	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,594	1,514	1,454	1,406	1,408	1,592	1,846	1,925	1,850	1,621	1,596	1,644	1,621	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	3	3	3	3	3	3	3	3	3	3	3	3	3

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:	1,418	1,318	1,123	950	733	638	581	576	604	680	1,038	1,467	926

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		2,702	2,609	2,238	2,031	1,809	1,924	2,116	2,177	2,131	1,964	2,328	2,807	2,235	9
10	TOTAL SUPPLY TAKEN		3,012	2,919	2,548	2,341	2,119	2,234	2,426	2,487	2,441	2,274	2,638	3,117	2,545	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		3,012	2,919	2,548	2,341	2,119	2,234	2,426	2,487	2,441	2,274	2,638	3,117	2,545	12
	REQUIREMENTS FORECAST BY END-USE [5/]															
13	CORE [6/]	Residential	1,031	965	794	642	452	366	336	335	341	420	694	1,073	619	13
14		Commercial	281	288	231	212	197	188	166	162	179	174	249	288	217	14
15		Industrial	59	65	55	54	49	50	46	47	51	51	55	57	53	15
16		NGV	27	28	28	31	29	30	30	28	30	30	29	29	29	16
17		Subtotal-CORE	1,398	1,347	1,108	939	728	634	578	572	601	675	1,027	1,447	919	17
18	NONCORE	Commercial	55	53	51	48	45	44	43	43	43	44	49	55	48	18
19		Industrial	299	295	289	292	293	309	293	308	304	294	285	276	295	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	682	658	603	628	663	822	1,055	1,104	1,036	796	756	728	795	21
22		Subtotal-NONCORE	1,064	1,035	972	996	1,030	1,204	1,420	1,484	1,412	1,164	1,119	1,088	1,167	22
23	WHOLESALE &	Core	269	266	225	185	143	118	108	105	108	129	193	270	176	23
24	INTERNATIONAL	Noncore Excl. EG	46	52	48	48	46	47	45	44	41	40	42	42	45	24
25		Electric Generation (EG)	199	183	166	146	147	205	247	253	250	240	226	233	208	25
26		Subtotal-WHOLESALE & INT	514	502	438	379	336	370	401	402	399	409	461	545	429	26
27		Co. Use & LUAF	35	34	30	27	25	26	28	29	29	27	31	37	30	27
28	SYSTEM TOTAL THROUGHPUT [4/]		3,012	2,919	2,548	2,341	2,119	2,234	2,426	2,487	2,441	2,274	2,638	3,117	2,545	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	27	27	22	20	18	17	15	14	16	16	23	28	20	29
30	NONCORE	Commercial/Industrial	353	348	340	340	338	353	336	351	347	339	334	331	342	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	682	658	603	628	663	822	1,055	1,104	1,036	796	756	728	795	32
33		Subtotal-RETAIL	1,091	1,063	994	1,016	1,047	1,220	1,435	1,499	1,428	1,180	1,142	1,115	1,187	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	514	502	438	379	336	370	401	402	399	409	461	545	429	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,606	1,565	1,433	1,395	1,384	1,590	1,835	1,901	1,827	1,589	1,603	1,661	1,616	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	3	3	3	3	3	3	3	3	3	3	3	3	3

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:	1,408	1,356	1,115	944	729	634	578	573	601	677	1,032	1,458	923

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		2,696	2,604	2,232	2,030	1,810	1,904	2,116	2,174	2,130	1,988	2,310	2,783	2,230	9
10	TOTAL SUPPLY TAKEN		3,006	2,914	2,542	2,340	2,120	2,214	2,426	2,484	2,440	2,298	2,620	3,093	2,540	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,006	2,914	2,542	2,340	2,120	2,214	2,426	2,484	2,440	2,298	2,620	3,093	2,540	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,028	962	792	640	451	365	335	334	340	418	692	1,069	617	13
14		Commercial	280	288	230	212	197	188	166	162	178	173	249	287	217	14
15		Industrial	57	64	54	53	48	49	45	46	50	50	54	56	52	15
16		NGV	28	29	28	32	30	30	30	28	31	31	30	30	30	16
17		Subtotal-CORE	1,394	1,343	1,104	936	726	633	576	570	599	673	1,024	1,442	916	17
18	NONCORE	Commercial	53	51	49	46	43	42	42	41	42	43	47	53	46	18
19		Industrial	297	294	289	290	292	308	292	307	303	294	284	275	294	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	683	659	601	628	665	811	1,058	1,103	1,038	822	746	715	795	21
22		Subtotal-NONCORE	1,062	1,033	968	994	1,029	1,190	1,420	1,481	1,412	1,188	1,106	1,072	1,164	22
23	WHOLESALE &	Core	269	267	225	185	143	118	108	105	107	129	193	271	176	23
24	INTERNATIONAL	Noncore Excl. EG	46	53	48	49	46	47	45	44	41	40	43	42	45	24
25		Electric Generation (EG)	200	184	167	150	151	202	248	255	252	241	222	230	209	25
26		Subtotal-WHOLESALE & INT	515	504	439	383	340	366	402	404	400	410	458	543	430	26
27		Co. Use & LUAF	35	34	30	27	25	26	28	29	29	27	31	36	30	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,006	2,914	2,542	2,340	2,120	2,214	2,426	2,484	2,440	2,298	2,620	3,093	2,540	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	27	27	22	20	18	17	15	14	16	16	23	27	20	29
30	NONCORE	Commercial/Industrial	350	345	338	336	335	350	334	349	345	336	331	328	340	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	683	659	601	628	665	811	1,058	1,103	1,038	822	746	715	795	32
33		Subtotal-RETAIL	1,089	1,061	990	1,014	1,047	1,206	1,435	1,496	1,428	1,204	1,129	1,100	1,184	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	515	504	439	383	340	366	402	404	400	410	458	543	430	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,604	1,564	1,429	1,397	1,387	1,572	1,837	1,899	1,828	1,614	1,588	1,643	1,614	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	3	3	3	3	3	3	3	3	3	3	3	3	3

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:	1,404	1,351	1,112	941	727	633	577	571	599	675	1,029	1,453	921

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		2,706	2,626	2,243	1,974	1,802	1,916	2,116	2,191	2,130	1,997	2,330	2,811	2,235	9
10	TOTAL SUPPLY TAKEN		3,016	2,936	2,553	2,284	2,112	2,226	2,426	2,501	2,440	2,307	2,640	3,121	2,545	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,016	2,936	2,553	2,284	2,112	2,226	2,426	2,501	2,440	2,307	2,640	3,121	2,545	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,028	963	792	640	451	365	335	334	340	418	692	1,070	618	13
14		Commercial	279	287	230	211	196	187	165	162	178	173	248	287	216	14
15		Industrial	56	62	53	51	47	48	44	45	48	49	53	54	51	15
16		NGV	29	30	29	33	31	31	31	29	32	32	30	31	31	16
17		Subtotal-CORE	1,393	1,342	1,104	936	725	632	576	570	599	672	1,024	1,441	916	17
18	NONCORE	Commercial	50	49	47	44	42	40	40	40	40	41	45	51	44	18
19		Industrial	297	292	288	289	290	307	291	305	302	292	283	274	293	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	692	680	612	579	663	824	1,059	1,123	1,041	831	768	741	802	21
22		Subtotal-NONCORE	1,068	1,051	976	942	1,024	1,201	1,419	1,497	1,411	1,193	1,125	1,095	1,168	22
23	WHOLESALE &	Core	270	267	225	185	143	117	108	105	107	129	194	271	176	23
24	INTERNATIONAL	Noncore Excl. EG	46	53	48	49	46	47	46	44	41	40	43	42	45	24
25		Electric Generation (EG)	204	190	171	146	149	203	250	256	252	246	223	234	210	25
26		Subtotal-WHOLESALE & INT	520	509	444	379	338	367	404	405	400	415	460	548	432	26
27		Co. Use & LUAF	35	34	30	27	25	26	28	29	29	27	31	37	30	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,016	2,936	2,553	2,284	2,112	2,226	2,426	2,501	2,440	2,307	2,640	3,121	2,545	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	27	27	22	20	18	17	15	14	16	16	23	27	20	29
30	NONCORE	Commercial/Industrial	347	342	334	333	332	348	331	345	342	333	328	325	337	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	692	680	612	579	663	824	1,059	1,123	1,041	831	768	741	802	32
33		Subtotal-RETAIL	1,095	1,078	998	961	1,041	1,217	1,433	1,512	1,427	1,209	1,148	1,122	1,188	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	520	509	444	379	338	367	404	405	400	415	460	548	432	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,615	1,587	1,442	1,341	1,379	1,584	1,837	1,917	1,828	1,623	1,608	1,670	1,620	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	3	3	3	3	3	3	3	3	3	3	3	3	3

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:	1,403	1,350	1,111	941	727	632	576	571	599	674	1,028	1,453	920

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		2,727	2,501	2,212	1,998	1,788	1,784	1,915	2,001	1,959	1,964	2,305	2,804	2,163	9
10	TOTAL SUPPLY TAKEN		3,037	2,811	2,522	2,308	2,098	2,094	2,225	2,311	2,269	2,274	2,615	3,114	2,473	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,037	2,811	2,522	2,308	2,098	2,094	2,225	2,311	2,269	2,274	2,615	3,114	2,473	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,040	940	801	647	456	369	339	338	344	423	700	1,082	623	13
14		Commercial	277	275	227	209	194	185	164	160	176	171	246	284	214	14
15		Industrial	49	53	46	45	41	42	39	39	43	43	46	48	45	15
16		NGV	33	33	33	38	35	36	36	33	37	37	35	35	35	16
17		Subtotal-CORE	1,399	1,300	1,108	939	727	633	577	571	600	674	1,027	1,449	916	17
18	NONCORE	Commercial	40	37	37	35	33	32	31	31	31	32	36	40	35	18
19		Industrial	281	266	270	272	274	290	273	286	283	274	266	258	274	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	727	653	605	623	671	739	909	981	923	847	799	772	771	21
22		Subtotal-NONCORE	1,077	986	940	959	1,007	1,090	1,242	1,328	1,267	1,183	1,129	1,099	1,110	22
23	WHOLESALE &	Core	276	264	230	189	145	119	109	106	108	131	198	277	179	23
24	INTERNATIONAL	Noncore Excl. EG	47	52	49	50	47	48	47	45	42	41	44	43	46	24
25		Electric Generation (EG)	202	177	165	144	146	179	224	234	225	218	186	210	193	25
26		Subtotal-WHOLESALE & INT	525	493	444	383	338	346	380	385	376	390	428	530	418	26
27		Co. Use & LUAF	36	33	30	27	25	25	26	27	27	27	31	37	29	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,037	2,811	2,522	2,308	2,098	2,094	2,225	2,311	2,269	2,274	2,615	3,114	2,473	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	26	26	22	19	17	16	14	14	16	16	23	27	20	29
30	NONCORE	Commercial/Industrial	321	303	307	307	307	322	304	318	315	306	301	298	309	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	727	653	605	623	671	739	909	981	923	847	799	772	771	32
33		Subtotal-RETAIL	1,103	1,012	962	979	1,024	1,106	1,257	1,342	1,282	1,198	1,152	1,126	1,129	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	525	493	444	383	338	346	380	385	376	390	428	530	418	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,628	1,504	1,406	1,361	1,363	1,452	1,636	1,727	1,658	1,588	1,580	1,656	1,547	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

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

	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	3	3	3	3	3	3	3	3	3	3	3	3	3

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:	1,410	1,309	1,116	945	729	634	578	572	600	677	1,032	1,460	921

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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		2,703	2,579	2,191	1,978	1,765	1,761	1,894	1,978	1,936	1,942	2,284	2,785	2,148	9
10	TOTAL SUPPLY TAKEN		3,013	2,889	2,501	2,288	2,075	2,071	2,204	2,288	2,246	2,252	2,594	3,095	2,458	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,013	2,889	2,501	2,288	2,075	2,071	2,204	2,288	2,246	2,252	2,594	3,095	2,458	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,039	973	800	647	456	369	339	338	344	423	700	1,081	624	13
14		Commercial	278	285	228	210	195	186	164	160	177	172	247	285	215	14
15		Industrial	41	46	39	38	35	35	32	33	36	36	39	40	37	15
16		NGV	38	39	38	44	41	41	41	38	42	42	40	40	40	16
17		Subtotal-CORE	1,396	1,343	1,106	938	726	632	576	570	598	673	1,025	1,446	917	17
18	NONCORE	Commercial	31	30	29	27	26	25	25	25	25	25	28	31	27	18
19		Industrial	265	261	256	258	259	276	259	271	268	260	252	245	261	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	727	677	605	624	672	740	910	982	924	848	800	773	774	21
22		Subtotal-NONCORE	1,051	997	919	938	986	1,069	1,222	1,307	1,246	1,162	1,109	1,078	1,091	22
23	WHOLESALE &	Core	284	280	236	193	149	122	111	108	110	135	203	285	184	23
24	INTERNATIONAL	Noncore Excl. EG	48	54	49	50	48	49	47	46	43	42	44	44	47	24
25		Electric Generation (EG)	199	180	162	142	143	176	221	231	222	215	183	207	190	25
26		Subtotal-WHOLESALE & INT	531	515	448	385	340	346	380	385	375	391	430	535	421	26
27		Co. Use & LUAF	35	34	29	27	24	24	26	27	26	26	30	36	29	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,013	2,889	2,501	2,288	2,075	2,071	2,204	2,288	2,246	2,252	2,594	3,095	2,458	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	26	27	21	19	17	16	14	14	15	16	22	27	20	29
30	NONCORE	Commercial/Industrial	296	291	285	285	285	300	283	296	293	285	280	276	288	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	727	677	605	624	672	740	910	982	924	848	800	773	774	32
33		Subtotal-RETAIL	1,078	1,023	940	957	1,003	1,085	1,237	1,321	1,262	1,178	1,131	1,105	1,111	33
34	WHOLESALE & INTERNATIONAL	All End Uses	531	515	448	385	340	346	380	385	375	391	430	535	421	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,608	1,538	1,388	1,343	1,343	1,432	1,616	1,706	1,637	1,569	1,562	1,640	1,532	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	2	2	2	2	2	2	2	2	2	2	2	2	2

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:	1,407	1,352	1,114	944	728	632	577	571	599	675	1,030	1,458	922

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		2,717	2,592	2,202	1,987	1,772	1,766	1,899	1,982	1,940	1,948	2,295	2,800	2,157	9
10	TOTAL SUPPLY TAKEN		3,027	2,902	2,512	2,297	2,082	2,076	2,209	2,292	2,250	2,258	2,605	3,110	2,467	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,027	2,902	2,512	2,297	2,082	2,076	2,209	2,292	2,250	2,258	2,605	3,110	2,467	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,043	976	803	649	457	370	340	339	345	424	702	1,085	626	13
14		Commercial	283	291	233	214	199	189	167	163	180	175	252	291	219	14
15		Industrial	38	42	36	35	32	33	30	31	33	33	36	37	35	15
16		NGV	44	45	44	50	47	47	47	44	48	49	46	46	46	16
17		Subtotal-CORE	1,408	1,355	1,116	948	735	640	584	577	606	681	1,036	1,459	927	17
18	NONCORE	Commercial	32	31	29	28	26	25	25	25	25	26	28	32	28	18
19		Industrial	259	255	250	252	253	270	253	265	262	254	247	240	255	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	728	678	607	625	673	741	912	983	926	849	801	773	775	21
22		Subtotal-NONCORE	1,047	992	915	934	981	1,065	1,219	1,302	1,242	1,158	1,105	1,074	1,087	22
23	WHOLESALE &	Core	292	288	242	199	152	124	114	111	113	138	208	293	189	23
24	INTERNATIONAL	Noncore Excl. EG	49	55	50	51	48	49	48	46	43	42	45	44	48	24
25		Electric Generation (EG)	197	177	160	139	141	173	219	228	220	213	181	204	188	25
26		Subtotal-WHOLESALE & INT	537	520	452	389	342	347	380	386	375	393	434	541	424	26
27		Co. Use & LUAF	35	34	29	27	24	24	26	27	26	26	31	36	29	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,027	2,902	2,512	2,297	2,082	2,076	2,209	2,292	2,250	2,258	2,605	3,110	2,467	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	27	27	22	20	18	16	14	14	16	16	23	27	20	29
30	NONCORE	Commercial/Industrial	290	286	279	280	279	295	278	290	287	280	275	272	283	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	728	678	607	625	673	741	912	983	926	849	801	773	775	32
33		Subtotal-RETAIL	1,074	1,019	937	953	999	1,082	1,233	1,316	1,257	1,174	1,128	1,101	1,107	33
34	WHOLESALE & INTERNATIONAL	All End Uses	537	520	452	389	342	347	380	386	375	393	434	541	424	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,610	1,540	1,389	1,342	1,341	1,429	1,613	1,702	1,633	1,566	1,561	1,642	1,531	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	2	2	2	2	2	2	2	2	2	2	2	2	2

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:	1,419	1,364	1,124	954	737	641	585	578	607	684	1,041	1,471	932

2008 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS - COLD TEMPERATURE YEAR
JULY 2008

The Gas Company

A Sempra Energy utility℠

TABLE 3-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED YEARS 2010 THRU 2014

COLD TEMPERATURE YEAR & DRY HYDRO YEAR

LINE			2010	2011	2012	2013	2014	LINE
	CAPACITY AVAILABLE							
1	California Line 85 Zone (California Producers		160	160	160	160	160	1
2	California Coastal Zone (California Producers		150	150	150	150	150	2
	Out-of-State Gas							
3	Wheeler Ridge Zone (KR, MP, PG&E, OEHI) [1/]		765	765	765	765	765	3
4	Southern Zone (EPN,TGN,NBP) [2/]		1,210	1,210	1,210	1,210	1,210	4
5	Northern Zone (TW,EPN,QST, KR) [3/]		1,590	1,590	1,590	1,590	1,590	5
6	Total Out-of-State Gas		3,565	3,565	3,565	3,565	3,565	6
7	TOTAL CAPACITY AVAILABLE		3,875	3,875	3,875	3,875	3,875	7
	GAS SUPPLY TAKEN							
8	California Source Gas		310	160	160	160	160	8
9	Out-of-State		2,363	2,586	2,581	2,576	2,568	9
10	TOTAL SUPPLY TAKEN		2,673	2,746	2,741	2,736	2,728	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		2,673	2,746	2,741	2,736	2,728	12
	REQUIREMENTS FORECAST BY END-USE [5/]							
13	CORE [6/]	Residential	693	685	683	678	676	13
14		Commercial	226	228	228	229	228	14
15		Industrial	57	56	55	54	53	15
16		NGV	27	28	28	29	30	16
17		Subtotal-CORE	1,004	996	994	991	988	17
18	NONCORE	Commercial	55	53	51	49	47	18
19		Industrial	305	304	297	295	294	19
20		EOR Steaming	30	29	29	29	29	20
21		Electric Generation (EG)	781	873	882	883	879	21
22		Subtotal-NONCORE	1,171	1,258	1,260	1,256	1,249	22
23	WHOLESALE &	Core	191	190	190	191	191	23
24	INTERNATIONAL	Noncore Excl. EG	43	43	44	45	45	24
25		Electric Generation (EG)	233	226	222	222	223	25
26		Subtotal-WHOLESALE & INTL.	467	460	456	458	459	26
27		Co. Use & LUAF	31	32	32	32	32	27
28	SYSTEM TOTAL THROUGHPUT [4/]		2,673	2,746	2,741	2,736	2,728	28
	TRANSPORTATION AND EXCHANGE							
29	CORE	All End Uses	21	21	21	21	21	29
30	NONCORE	Commercial/Industrial	360	356	348	344	341	30
31		EOR Steaming	30	29	29	29	29	31
32		Electric Generation (EG)	781	873	882	883	879	32
33		Subtotal-RETAIL	1,192	1,280	1,281	1,277	1,271	33
	WHOLESALE &							
34	INTERNATIONAL	All End Uses	467	460	456	458	459	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,660	1,739	1,737	1,735	1,729	35
	CURTAILMENT (RETAIL & WHOLESALE)							
36		Core	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	38

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

	2010	2011	2012	2013	2014
4/ Excludes own-source gas supply of gas procurement by the City of Long Beach	4	3	3	3	3

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

	2010	2011	2012	2013	2014
6/ Core end-use demand exclusive of core aggregation transportation (CAT) in MDth/d:	1,009	1,001	999	996	993

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		2,423	2,356	2,342	2,351	9
10	TOTAL SUPPLY TAKEN		2,733	2,666	2,652	2,661	10
11	Net Underground Storage Withdrawal		0	0	0	0	11
12	TOTAL THROUGHPUT 4/		2,733	2,666	2,652	2,661	12
	REQUIREMENTS FORECAST BY END-USE 5/						
13	CORE 6/	Residential	676	682	683	686	13
14		Commercial	228	225	226	231	14
15		Industrial	52	46	38	35	15
16		NGV	31	35	40	46	16
17		Subtotal-CORE	987	988	988	999	17
18	NONCORE	Commercial	46	36	29	29	18
19		Industrial	293	274	261	255	19
20		EOR Steaming	29	29	29	29	20
21		Electric Generation (EG)	882	864	867	868	21
22		Subtotal-NONCORE	1,250	1,204	1,185	1,181	22
23	WHOLESALE &	Core	191	194	200	205	23
24	INTERNATIONAL	Noncore Excl. EG	45	46	47	48	24
25		Electric Generation (EG)	228	203	201	198	25
26		Subtotal-WHOLESALE & INTL.	465	444	447	451	26
27		Co. Use & LUAF	32	31	31	31	27
28	SYSTEM TOTAL THROUGHPUT 4/		2,733	2,666	2,652	2,661	28
	TRANSPORTATION AND EXCHANGE						
29	CORE	All End Uses	21	21	21	21	29
30	NONCORE	Commercial/Industrial	338	311	289	284	30
31		EOR Steaming	29	29	29	29	31
32		Electric Generation (EG)	882	864	867	868	32
33		Subtotal-RETAIL	1,271	1,224	1,206	1,202	33
	WHOLESALE &						
34	INTERNATIONAL	All End Uses	465	444	447	451	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,736	1,668	1,654	1,653	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	3	3	2	2

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

	2015	2020	2025	2030
transportation (CAT) in MDth/d:	992	993	994	1,004

Work Paper: TABLE 3-SCG

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2010

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		2,924	2,819	2,424	2,166	1,936	1,946	2,151	2,256	2,176	2,028	2,487	3,069	2,363	9
10	TOTAL SUPPLY TAKEN		3,234	3,129	2,734	2,476	2,246	2,256	2,461	2,566	2,486	2,338	2,797	3,379	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/]		3,234	3,129	2,734	2,476	2,246	2,256	2,461	2,566	2,486	2,338	2,797	3,379	2,673	12
	REQUIREMENTS FORECAST BY END-USE [5/]															
13	CORE [6/]	Residential	1,201	1,119	909	721	488	382	345	344	351	447	786	1,252	693	13
14		Commercial	303	309	243	219	202	190	165	160	179	175	264	311	226	14
15		Industrial	64	71	60	58	52	54	48	50	54	55	59	62	57	15
16		NGV	25	26	25	29	27	27	27	25	28	28	27	27	27	16
17		Subtotal-CORE	1,593	1,526	1,237	1,027	769	653	585	579	612	705	1,136	1,652	1,004	17
18	NONCORE	Commercial	62	61	58	55	51	50	49	49	49	51	56	63	55	18
19		Industrial	315	309	302	304	305	315	302	317	313	304	294	284	305	19
20		EOR Steaming	31	31	31	31	31	31	29	29	29	29	29	29	30	20
21		Electric Generation (EG)	607	600	575	603	680	798	1,037	1,132	1,033	809	758	727	781	21
22		Subtotal-NONCORE	1,016	1,001	966	993	1,068	1,194	1,417	1,527	1,424	1,192	1,137	1,103	1,171	22
23	WHOLESALE &	Core	304	297	253	200	160	118	107	104	105	131	212	306	191	23
24	INTERNATIONAL	Noncore Excl. EG	44	50	45	46	44	45	43	42	39	38	41	40	43	24
25		Electric Generation (EG)	239	218	200	180	179	220	280	285	277	246	239	238	233	25
26		Subtotal-WHOLESALE & IN	587	565	498	426	383	383	430	431	421	414	492	585	467	26
27		Co. Use & LUAF	38	37	32	29	26	26	29	30	29	27	33	40	31	27
28	SYSTEM TOTAL THROUGHPUT [4/]		3,234	3,129	2,734	2,476	2,246	2,256	2,461	2,566	2,486	2,338	2,797	3,379	2,673	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	29	30	24	21	18	17	15	14	16	16	25	30	21	29
30	NONCORE	Commercial/Industrial	378	370	360	358	357	365	351	366	363	354	350	347	360	30
31		EOR Steaming	31	31	31	31	31	31	29	29	29	29	29	29	30	31
32		Electric Generation (EG)	607	600	575	603	680	798	1,037	1,132	1,033	809	758	727	781	32
33		Subtotal-RETAIL	1,046	1,031	990	1,014	1,086	1,211	1,432	1,541	1,441	1,208	1,161	1,133	1,192	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	587	565	498	426	383	383	430	431	421	414	492	585	467	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,632	1,596	1,488	1,440	1,469	1,594	1,862	1,972	1,862	1,623	1,653	1,718	1,660	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	4	4	4	4	4	4	4	4	4	4	4	4	4

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:	1,606	1,537	1,247	1,034	771	653	586	580	612	707	1,141	1,666	1,009

Work Paper: **TABLE 3-SCG**

SOUTHERN CALIFORNIA GAS COMPANY

ANNUAL GAS SUPPLY AND REQUIREMENTS - MMCF/DAY
ESTIMATED FOR YEAR: 2011

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		2,999	2,899	2,494	2,217	2,012	2,098	2,310	2,367	2,277	2,049	2,463	3,073	2,586	9
10	TOTAL SUPPLY TAKEN		3,309	3,209	2,804	2,527	2,322	2,408	2,620	2,677	2,587	2,359	2,773	3,383	2,746	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		3,309	3,209	2,804	2,527	2,322	2,408	2,620	2,677	2,587	2,359	2,773	3,383	2,746	12
	REQUIREMENTS FORECAST BY END-USE [5/]															
13	CORE [6/]	Residential	1,186	1,106	898	713	482	377	341	339	347	442	776	1,237	685	13
14		Commercial	305	311	245	221	204	191	166	161	180	176	266	313	228	14
15		Industrial	63	70	59	57	51	52	47	48	53	54	58	61	56	15
16		NGV	26	27	26	30	28	28	28	26	29	29	27	27	28	16
17		Subtotal-CORE	1,580	1,513	1,227	1,020	764	649	582	575	608	700	1,127	1,638	996	17
18	NONCORE	Commercial	60	59	56	53	50	48	48	48	48	49	54	61	53	18
19		Industrial	307	303	299	300	302	318	302	317	313	303	294	285	304	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	730	713	683	686	782	948	1,194	1,245	1,136	838	757	751	873	21
22		Subtotal-NONCORE	1,126	1,105	1,066	1,068	1,162	1,344	1,573	1,638	1,526	1,220	1,134	1,125	1,258	22
23	WHOLESALE &	Core	303	298	251	200	159	118	107	104	105	130	211	305	190	23
24	INTERNATIONAL	Noncore Excl. EG	45	50	46	47	44	45	43	42	39	38	41	40	43	24
25		Electric Generation (EG)	217	205	180	163	165	225	284	287	278	243	228	235	226	25
26		Subtotal-WHOLESALE & INT	565	553	477	410	368	388	434	433	422	411	479	580	460	26
27		Co. Use & LUAF	39	38	33	30	27	28	31	31	30	28	33	40	32	27
28	SYSTEM TOTAL THROUGHPUT [4/]		3,309	3,209	2,804	2,527	2,322	2,408	2,620	2,677	2,587	2,359	2,773	3,383	2,746	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	30	30	24	21	19	17	15	14	16	16	25	30	21	29
30	NONCORE	Commercial/Industrial	367	362	354	353	351	366	350	365	361	352	348	345	356	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	730	713	683	686	782	948	1,194	1,245	1,136	838	757	751	873	32
33		Subtotal-RETAIL	1,155	1,134	1,090	1,089	1,181	1,361	1,588	1,653	1,543	1,236	1,159	1,155	1,280	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	565	553	477	410	368	388	434	433	422	411	479	580	460	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,720	1,687	1,567	1,498	1,549	1,748	2,022	2,086	1,965	1,647	1,638	1,735	1,739	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	3	3	3	3	3	3	3	3	3	3	3	3	3

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:	1,592	1,524	1,236	1,026	766	649	582	576	609	702	1,132	1,652	1,001

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		2,981	2,783	2,498	2,244	2,026	2,137	2,300	2,352	2,253	2,053	2,483	3,071	2,581	9
10	TOTAL SUPPLY TAKEN		3,291	3,093	2,808	2,554	2,336	2,447	2,610	2,662	2,563	2,363	2,793	3,381	2,741	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	3,093	2,808	2,554	2,336	2,447	2,610	2,662	2,563	2,363	2,793	3,381	2,741	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,185	1,067	897	712	481	377	340	339	347	442	776	1,236	683	13
14		Commercial	306	301	245	221	204	192	166	162	181	176	266	314	228	14
15		Industrial	62	67	58	56	51	52	47	48	52	53	58	60	55	15
16		NGV	27	27	27	30	28	29	29	27	29	30	28	28	28	16
17		Subtotal-CORE	1,580	1,461	1,227	1,020	765	650	582	576	609	700	1,128	1,638	994	17
18	NONCORE	Commercial	59	55	54	51	48	47	46	46	46	48	53	59	51	18
19		Industrial	304	289	292	297	298	315	295	310	306	296	286	277	297	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	719	685	686	713	793	989	1,216	1,260	1,142	848	777	753	882	21
22		Subtotal-NONCORE	1,111	1,059	1,061	1,090	1,169	1,380	1,586	1,645	1,523	1,221	1,145	1,118	1,260	22
23	WHOLESALE &	Core	304	289	252	200	159	118	107	104	105	130	211	305	190	23
24	INTERNATIONAL	Noncore Excl. EG	45	49	46	47	45	46	44	43	40	39	42	41	44	24
25		Electric Generation (EG)	213	198	188	167	171	224	260	264	256	245	234	238	222	25
26		Subtotal-WHOLESALE & INT	562	537	486	414	375	388	411	411	401	414	487	585	456	26
27		Co. Use & LUAF	39	36	33	30	27	29	31	31	30	28	33	40	32	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,291	3,093	2,808	2,554	2,336	2,447	2,610	2,662	2,563	2,363	2,793	3,381	2,741	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	30	29	24	21	19	17	15	15	16	16	25	30	21	29
30	NONCORE	Commercial/Industrial	362	345	346	348	347	362	341	356	352	344	339	336	348	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	719	685	686	713	793	989	1,216	1,260	1,142	848	777	753	882	32
33		Subtotal-RETAIL	1,140	1,088	1,085	1,111	1,187	1,397	1,601	1,659	1,539	1,237	1,170	1,148	1,281	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	562	537	486	414	375	388	411	411	401	414	487	585	456	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,702	1,624	1,571	1,525	1,562	1,785	2,012	2,070	1,941	1,651	1,657	1,733	1,737	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	3	3	3	3	3	3	3	3	3	3	3	3	3

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:	1,593	1,471	1,237	1,026	767	650	583	577	609	703	1,133	1,652	999

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		2,976	2,890	2,486	2,246	2,009	2,112	2,299	2,303	2,214	2,039	2,483	3,083	2,576	9
10	TOTAL SUPPLY TAKEN		3,286	3,200	2,796	2,556	2,319	2,422	2,609	2,613	2,524	2,349	2,793	3,393	2,736	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,286	3,200	2,796	2,556	2,319	2,422	2,609	2,613	2,524	2,349	2,793	3,393	2,736	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,174	1,095	889	706	477	373	337	336	343	438	769	1,225	678	13
14		Commercial	307	312	246	222	205	192	167	162	181	177	267	315	229	14
15		Industrial	61	68	57	55	50	51	46	47	51	52	57	59	54	15
16		NGV	27	28	28	31	29	30	30	28	30	30	29	29	29	16
17		Subtotal-CORE	1,569	1,504	1,220	1,014	761	647	579	573	606	697	1,121	1,628	991	17
18	NONCORE	Commercial	56	55	52	49	47	45	45	44	45	46	51	57	49	18
19		Industrial	299	295	289	292	293	309	293	308	304	294	285	276	295	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	729	727	691	727	790	974	1,218	1,216	1,105	839	788	777	883	21
22		Subtotal-NONCORE	1,113	1,106	1,062	1,097	1,158	1,357	1,584	1,597	1,483	1,208	1,152	1,138	1,256	22
23	WHOLESALE &	Core	304	299	252	200	159	119	107	104	105	131	211	306	191	23
24	INTERNATIONAL	Noncore Excl. EG	46	52	48	48	46	47	45	44	41	40	42	42	45	24
25		Electric Generation (EG)	214	202	182	166	168	225	262	264	258	246	233	240	222	25
26		Subtotal-WHOLESALE & INT	564	553	482	415	373	391	415	412	405	416	487	587	458	26
27		Co. Use & LUAF	39	38	33	30	27	28	31	31	30	28	33	40	32	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,286	3,200	2,796	2,556	2,319	2,422	2,609	2,613	2,524	2,349	2,793	3,393	2,736	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	30	30	24	21	19	17	15	15	16	16	25	30	21	29
30	NONCORE	Commercial/Industrial	355	350	342	341	339	354	337	352	349	340	335	332	344	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	729	727	691	727	790	974	1,218	1,216	1,105	839	788	777	883	32
33		Subtotal-RETAIL	1,143	1,136	1,085	1,117	1,177	1,374	1,599	1,612	1,499	1,224	1,177	1,169	1,277	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	564	553	482	415	373	391	415	412	405	416	487	587	458	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,707	1,689	1,567	1,533	1,550	1,765	2,013	2,023	1,904	1,640	1,664	1,756	1,735	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	3	3	3	3	3	3	3	3	3	3	3	3	3

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:	1,582	1,514	1,229	1,020	762	647	580	574	606	699	1,126	1,641	996

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		2,969	2,875	2,481	2,219	2,006	2,093	2,269	2,322	2,204	2,054	2,481	3,062	2,568	9
10	TOTAL SUPPLY TAKEN		3,279	3,185	2,791	2,529	2,316	2,403	2,579	2,632	2,514	2,364	2,791	3,372	2,728	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,279	3,185	2,791	2,529	2,316	2,403	2,579	2,632	2,514	2,364	2,791	3,372	2,728	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,171	1,091	886	703	475	372	336	335	342	436	766	1,221	676	13
14		Commercial	306	312	245	221	204	192	166	162	181	176	266	314	228	14
15		Industrial	60	67	56	54	49	50	45	46	50	51	55	58	53	15
16		NGV	28	29	28	32	30	30	30	28	31	31	30	30	30	16
17		Subtotal-CORE	1,564	1,499	1,216	1,011	759	645	578	571	605	695	1,118	1,622	988	17
18	NONCORE	Commercial	54	53	50	48	45	43	43	43	43	44	49	55	47	18
19		Industrial	297	294	289	290	292	308	292	307	303	294	284	275	294	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	729	721	692	708	792	962	1,189	1,232	1,097	857	789	765	879	21
22		Subtotal-NONCORE	1,110	1,097	1,061	1,075	1,157	1,343	1,553	1,611	1,473	1,224	1,151	1,124	1,249	22
23	WHOLESALE &	Core	304	299	252	200	159	118	107	104	105	131	212	306	191	23
24	INTERNATIONAL	Noncore Excl. EG	46	53	48	49	46	47	45	44	41	40	43	42	45	24
25		Electric Generation (EG)	216	201	182	164	168	222	265	271	262	247	235	238	223	25
26		Subtotal-WHOLESALE & INT	567	553	482	413	373	387	417	419	408	418	489	586	459	26
27		Co. Use & LUAF	38	37	33	30	27	28	30	31	29	28	33	40	32	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,279	3,185	2,791	2,529	2,316	2,403	2,579	2,632	2,514	2,364	2,791	3,372	2,728	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	29	30	24	21	18	17	15	14	16	16	25	30	21	29
30	NONCORE	Commercial/Industrial	352	347	339	338	336	351	335	350	346	338	333	330	341	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	729	721	692	708	792	962	1,189	1,232	1,097	857	789	765	879	32
33		Subtotal-RETAIL	1,140	1,127	1,084	1,096	1,176	1,360	1,568	1,626	1,489	1,240	1,175	1,154	1,271	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	567	553	482	413	373	387	417	419	408	418	489	586	459	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,706	1,679	1,566	1,509	1,549	1,747	1,985	2,044	1,897	1,658	1,665	1,739	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.)

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	3	3	3	3	3	3	3	3	3	3	3	3	3

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:	1,577	1,509	1,225	1,017	760	645	579	572	604	697	1,123	1,636	993

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		2,980	2,891	2,483	2,217	1,981	2,103	2,281	2,307	2,210	2,068	2,509	3,074	2,423	9
10	TOTAL SUPPLY TAKEN		3,290	3,201	2,793	2,527	2,291	2,413	2,591	2,617	2,520	2,378	2,819	3,384	2,733	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		3,290	3,201	2,793	2,527	2,291	2,413	2,591	2,617	2,520	2,378	2,819	3,384	2,733	12
	REQUIREMENTS FORECAST BY END-USE [5/]															
13	CORE [6/]	Residential	1,171	1,092	886	703	476	372	336	335	342	436	766	1,221	676	13
14		Commercial	305	311	245	221	204	192	166	162	180	176	266	314	228	14
15		Industrial	58	65	55	53	48	49	44	45	49	50	54	57	52	15
16		NGV	29	30	29	33	31	31	31	29	32	32	30	31	31	16
17		Subtotal-CORE	1,563	1,498	1,215	1,010	758	644	577	571	604	694	1,117	1,622	987	17
18	NONCORE	Commercial	52	51	48	46	43	42	41	41	41	42	47	52	46	18
19		Industrial	297	292	288	289	290	307	291	305	302	292	283	274	293	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	736	731	690	708	771	974	1,197	1,212	1,104	865	813	777	882	21
22		Subtotal-NONCORE	1,114	1,103	1,055	1,072	1,134	1,352	1,558	1,587	1,476	1,229	1,171	1,133	1,250	22
23	WHOLESALE &	Core	305	299	253	201	159	118	107	104	105	131	212	306	191	23
24	INTERNATIONAL	Noncore Excl. EG	46	53	48	49	46	47	46	44	41	40	43	42	45	24
25		Electric Generation (EG)	221	211	190	166	167	224	274	280	264	256	244	241	228	25
26		Subtotal-WHOLESALE & INT	573	563	490	415	372	389	426	428	411	427	498	590	465	26
27		Co. Use & LUAF	39	38	33	30	27	28	30	31	30	28	33	40	32	27
28	SYSTEM TOTAL THROUGHPUT [4/]		3,290	3,201	2,793	2,527	2,291	2,413	2,591	2,617	2,520	2,378	2,819	3,384	2,733	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	29	30	23	21	18	17	15	14	16	16	25	30	21	29
30	NONCORE	Commercial/Industrial	349	343	336	335	334	349	332	347	343	335	330	327	338	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	736	731	690	708	771	974	1,197	1,212	1,104	865	813	777	882	32
33		Subtotal-RETAIL	1,144	1,133	1,079	1,093	1,152	1,369	1,572	1,602	1,492	1,245	1,196	1,163	1,271	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	573	563	490	415	372	389	426	428	411	427	498	590	465	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,716	1,695	1,569	1,508	1,524	1,758	1,999	2,029	1,902	1,672	1,694	1,753	1,736	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	3	3	3	3	3	3	3	3	3	3	3	3	3
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:	1,576	1,508	1,224	1,016	760	644	578	572	604	697	1,122	1,635	992

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		3,010	2,785	2,474	2,227	1,979	1,951	2,047	2,132	2,041	2,047	2,491	3,098	2,356	9
10	TOTAL SUPPLY TAKEN		3,320	3,095	2,784	2,537	2,289	2,261	2,357	2,442	2,351	2,357	2,801	3,408	2,666	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT [4/]		3,320	3,095	2,784	2,537	2,289	2,261	2,357	2,442	2,351	2,357	2,801	3,408	2,666	12
	REQUIREMENTS FORECAST BY END-USE [5/]															
13	CORE [6/]	Residential	1,184	1,066	896	711	481	377	340	339	346	441	775	1,234	682	13
14		Commercial	302	297	243	219	202	190	165	160	179	174	264	311	225	14
15		Industrial	51	55	48	46	42	43	39	40	43	44	48	50	46	15
16		NGV	33	33	33	38	35	36	36	33	37	37	35	35	35	16
17		Subtotal-CORE	1,571	1,451	1,220	1,014	760	645	579	572	605	696	1,121	1,630	988	17
18	NONCORE	Commercial	41	39	38	36	34	33	33	33	33	34	37	42	36	18
19		Industrial	281	266	270	272	274	290	273	286	283	274	266	258	274	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	786	740	711	741	797	879	1,024	1,094	992	898	857	842	864	21
22		Subtotal-NONCORE	1,138	1,074	1,048	1,079	1,134	1,231	1,358	1,442	1,337	1,235	1,189	1,170	1,204	22
23	WHOLESALE &	Core	312	296	258	205	161	120	108	105	106	133	216	313	194	23
24	INTERNATIONAL	Noncore Excl. EG	47	52	49	50	47	48	47	45	42	41	44	43	46	24
25		Electric Generation (EG)	213	186	176	159	159	190	238	249	233	224	198	212	203	25
26		Subtotal-WHOLESALE & INT	572	533	483	414	368	358	392	398	381	399	458	568	444	26
27		Co. Use & LUAF	39	36	33	30	27	27	28	29	28	28	33	40	31	27
28	SYSTEM TOTAL THROUGHPUT [4/]		3,320	3,095	2,784	2,537	2,289	2,261	2,357	2,442	2,351	2,357	2,801	3,408	2,666	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	29	28	23	20	18	17	14	14	16	16	24	30	21	29
30	NONCORE	Commercial/Industrial	323	305	308	309	308	323	306	319	316	308	303	299	311	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	786	740	711	741	797	879	1,024	1,094	992	898	857	842	864	32
33		Subtotal-RETAIL	1,167	1,103	1,071	1,099	1,152	1,248	1,373	1,456	1,353	1,251	1,214	1,200	1,224	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	572	533	483	414	368	358	392	398	381	399	458	568	444	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,739	1,636	1,554	1,513	1,520	1,606	1,765	1,855	1,734	1,649	1,672	1,768	1,668	35
	CURTAILMENT (RETAIL & WHOLESALE)															
36		Core	0	0	0	0	0	0	0	0	0	0	0	0	0	36
37		Noncore	0	0	0	0	0	0	0	0	0	0	0	0	0	37
38		TOTAL - Curtailment	0	0	0	0	0	0	0	0	0	0	0	0	0	38

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

	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	3	3	3	3	3	3	3	3	3	3	3	3	3

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:	1,584	1,462	1,230	1,021	762	646	580	573	605	699	1,127	1,644	993

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		2,987	2,873	2,454	2,207	1,958	1,928	2,026	2,108	2,018	2,025	2,472	3,080	2,342	9
10	TOTAL SUPPLY TAKEN		3,297	3,183	2,764	2,517	2,268	2,238	2,336	2,418	2,328	2,335	2,782	3,390	2,652	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,297	3,183	2,764	2,517	2,268	2,238	2,336	2,418	2,328	2,335	2,782	3,390	2,652	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,183	1,103	896	711	481	376	340	338	346	441	774	1,234	683	13
14		Commercial	303	309	243	220	202	190	165	160	179	175	264	312	226	14
15		Industrial	43	48	40	39	35	36	32	33	36	37	40	42	38	15
16		NGV	38	39	38	44	41	41	41	38	42	42	40	40	40	16
17		Subtotal-CORE	1,567	1,499	1,217	1,013	759	644	578	570	603	695	1,119	1,627	988	17
18	NONCORE	Commercial	33	32	30	29	27	26	26	26	26	27	29	33	29	18
19		Industrial	265	261	256	258	259	276	259	271	268	260	252	245	261	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	786	767	711	742	797	879	1,025	1,095	993	898	858	842	867	21
22		Subtotal-NONCORE	1,112	1,089	1,027	1,057	1,113	1,210	1,338	1,421	1,316	1,214	1,169	1,149	1,185	22
23	WHOLESALE &	Core	320	314	265	210	165	122	110	107	108	137	222	321	200	23
24	INTERNATIONAL	Noncore Excl. EG	48	54	49	50	48	49	47	46	43	42	44	44	47	24
25		Electric Generation (EG)	210	189	173	156	157	188	235	246	230	221	195	209	201	25
26		Subtotal-WHOLESALE & INT	578	558	488	417	370	359	392	398	381	400	461	574	447	26
27		Co. Use & LUAF	39	37	32	30	27	26	27	28	27	27	33	40	31	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,297	3,183	2,764	2,517	2,268	2,238	2,336	2,418	2,328	2,335	2,782	3,390	2,652	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	29	29	23	20	18	17	14	14	16	16	24	30	21	29
30	NONCORE	Commercial/Industrial	297	293	286	287	286	302	285	297	294	287	282	278	289	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	786	767	711	742	797	879	1,025	1,095	993	898	858	842	867	32
33		Subtotal-RETAIL	1,141	1,118	1,049	1,078	1,131	1,227	1,353	1,435	1,332	1,230	1,193	1,179	1,206	33
34	WHOLESALE & INTERNATIONAL	All End Uses	578	558	488	417	370	359	392	398	381	400	461	574	447	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,720	1,675	1,537	1,494	1,500	1,585	1,745	1,834	1,713	1,630	1,654	1,752	1,654	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	2	2	2	2	2	2	2	2	2	2	2	2	2
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:	1,581	1,510	1,227	1,019	761	644	579	572	604	697	1,124	1,641	994

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		3,003	2,887	2,467	2,216	1,965	1,934	2,030	2,111	2,021	2,031	2,483	3,097	2,351	9
10	TOTAL SUPPLY TAKEN		3,313	3,197	2,777	2,526	2,275	2,244	2,340	2,421	2,331	2,341	2,793	3,407	2,661	10
11	Net Underground Storage Withdrawal		0	0	0	0	0	0	0	0	0	0	0	0	0	11
12	TOTAL THROUGHPUT 4/		3,313	3,197	2,777	2,526	2,275	2,244	2,340	2,421	2,331	2,341	2,793	3,407	2,661	12
	REQUIREMENTS FORECAST BY END-USE 5/															
13	CORE 6/	Residential	1,187	1,107	899	713	482	378	341	340	347	442	777	1,238	686	13
14		Commercial	310	316	248	224	206	194	168	163	182	178	270	318	231	14
15		Industrial	40	44	37	36	32	33	30	31	33	34	37	38	35	15
16		NGV	44	45	44	50	47	47	47	44	48	49	46	46	46	16
17		Subtotal-CORE	1,581	1,512	1,228	1,023	768	652	586	578	611	703	1,130	1,641	999	17
18	NONCORE	Commercial	33	32	31	29	27	27	26	26	26	27	30	34	29	18
19		Industrial	259	255	250	252	253	270	253	265	262	254	247	240	255	19
20		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	20
21		Electric Generation (EG)	787	768	712	743	798	881	1,026	1,096	995	900	859	843	868	21
22		Subtotal-NONCORE	1,108	1,084	1,023	1,053	1,108	1,206	1,335	1,417	1,312	1,210	1,165	1,146	1,181	22
23	WHOLESALE &	Core	329	322	272	216	169	125	112	109	110	140	228	330	205	23
24	INTERNATIONAL	Noncore Excl. EG	49	55	50	51	48	49	48	46	43	42	45	44	48	24
25		Electric Generation (EG)	208	187	171	154	154	185	232	243	228	219	192	206	198	25
26		Subtotal-WHOLESALE & INT	585	564	493	420	372	359	392	399	381	401	465	580	451	26
27		Co. Use & LUAF	39	37	33	30	27	26	27	28	27	27	33	40	31	27
28	SYSTEM TOTAL THROUGHPUT 4/		3,313	3,197	2,777	2,526	2,275	2,244	2,340	2,421	2,331	2,341	2,793	3,407	2,661	28
	TRANSPORTATION AND EXCHANGE															
29	CORE	All End Uses	29	30	23	21	18	17	15	14	16	16	24	30	21	29
30	NONCORE	Commercial/Industrial	292	287	281	281	281	297	279	291	288	281	277	273	284	30
31		EOR Steaming	29	29	29	29	29	29	29	29	29	29	29	29	29	31
32		Electric Generation (EG)	787	768	712	743	798	881	1,026	1,096	995	900	859	843	868	32
33		Subtotal-RETAIL	1,137	1,114	1,046	1,073	1,126	1,223	1,349	1,431	1,328	1,226	1,189	1,176	1,202	33
	WHOLESALE &															
34	INTERNATIONAL	All End Uses	585	564	493	420	372	359	392	399	381	401	465	580	451	34
35	TOTAL TRANSPORTATION & EXCHANGE		1,722	1,678	1,539	1,494	1,498	1,583	1,742	1,830	1,709	1,627	1,655	1,756	1,653	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	2	2	2	2	2	2	2	2	2	2	2	2	2

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:	1,594	1,523	1,238	1,030	770	653	587	579	612	706	1,136	1,655	1,004

2010 CALIFORNIA GAS REPORT

FORECAST OF REQUIREMENTS
JULY 2010

The Gas Company

A Sempra Energy utility℠

2010 CALIFORNIA GAS REPORT

CUSTOMER FORECAST
JULY 2010

The Gas Company

A Sempra Energy utility℠

SOUTHERN CALIFORNIA GAS COMPANY: CUSTOMER FORECAST
2010 CGR
(annual averages)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Residential												
Single-Family												
Active	3,547,653	3,563,668	3,594,118	3,631,310	3,673,731	3,719,001	3,765,465	3,812,332	3,858,813	3,904,608	3,949,809	3,994,309
Inactive	93,101	101,479	102,350	103,412	104,622	105,912	107,236	108,570	109,893	111,197	112,483	113,750
Connected	3,640,755	3,665,147	3,696,468	3,734,722	3,778,353	3,824,913	3,872,701	3,920,903	3,968,707	4,015,804	4,062,292	4,108,059
Multi-Family												
Active	1,681,251	1,705,188	1,720,026	1,738,410	1,759,542	1,785,532	1,817,665	1,854,796	1,894,362	1,934,613	1,975,095	2,015,500
Inactive	112,455	102,323	103,218	104,324	105,595	107,161	109,096	111,328	113,703	116,119	118,547	120,972
Connected	1,793,706	1,807,511	1,823,244	1,842,733	1,865,137	1,892,693	1,926,761	1,966,124	2,008,065	2,050,731	2,093,642	2,136,472
Master-Meter												
Active	41,710	41,343	40,979	40,619	40,261	39,907	39,556	39,208	38,863	38,521	38,182	37,846
Inactive	704	715	726	737	748	758	769	779	788	798	807	816
Connected	42,414	42,058	41,706	41,356	41,009	40,665	40,324	39,986	39,651	39,319	38,989	38,662
Total Residential												
Active	5,270,615	5,310,199	5,355,123	5,410,338	5,473,534	5,544,439	5,622,686	5,706,336	5,792,038	5,877,741	5,963,085	6,047,655
Inactive	206,260	204,517	206,294	208,473	210,966	213,832	217,100	220,677	224,385	228,113	231,838	235,538
Connected	5,476,875	5,514,716	5,561,418	5,618,812	5,684,500	5,758,272	5,839,786	5,927,013	6,016,423	6,105,854	6,194,923	6,283,193
Commercial												
Active	190,000	190,511	191,022	191,024	191,564	192,248	193,099	194,120	195,090	196,029	196,916	197,687
Inactive	53,427	51,953	52,091	52,092	52,241	52,427	52,660	52,939	53,203	53,459	53,701	53,911
Connected	243,427	242,464	243,113	243,116	243,805	244,676	245,759	247,059	248,292	249,488	250,617	251,598
Industrial												
Active	19,699	19,714	19,672	19,693	19,702	19,695	19,679	19,664	19,656	19,646	19,639	19,631
Inactive	8,889	8,534	8,518	8,527	8,530	8,527	8,520	8,514	8,510	8,506	8,503	8,500
Connected	28,589	28,248	28,190	28,220	28,232	28,222	28,199	28,178	28,166	28,153	28,142	28,131
TOTAL												
Active	5,480,314	5,520,424	5,565,817	5,621,055	5,684,800	5,756,383	5,835,464	5,920,120	6,006,784	6,093,417	6,179,641	6,264,973
Inactive	268,576	265,005	266,903	269,092	271,737	274,787	278,281	282,129	286,098	290,078	294,042	297,948
Connected	5,748,890	5,785,429	5,832,720	5,890,147	5,956,536	6,031,169	6,113,744	6,202,249	6,292,881	6,383,495	6,473,682	6,562,921
Net Active Gain	13,335	40,110	45,393	55,238	63,745	71,583	79,081	84,656	86,664	86,633	86,224	85,332
Active Meter Growth	0.24%	0.73%	0.82%	0.99%	1.13%	1.26%	1.37%	1.45%	1.46%	1.44%	1.42%	1.38%

SOUTHERN CALIFORNIA GAS COMPANY: CUSTOMER FORECAST
(annual averages)

	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Residential												
Single-Family												
Active	4,038,153	4,081,325	4,123,850	4,165,714	4,207,062	4,248,088	4,288,536	4,327,966	4,366,305	4,404,170	4,442,012	4,479,453
Inactive	114,998	116,227	117,437	118,629	119,806	120,974	122,125	123,247	124,338	125,416	126,493	127,559
Connected	4,153,151	4,197,551	4,241,287	4,284,343	4,326,868	4,369,062	4,410,661	4,451,213	4,490,643	4,529,586	4,568,505	4,607,012
Multi-Family												
Active	2,056,067	2,097,257	2,139,186	2,181,674	2,224,678	2,268,126	2,311,992	2,356,392	2,401,269	2,446,576	2,492,434	2,538,963
Inactive	123,406	125,878	128,395	130,944	133,525	136,132	138,765	141,429	144,122	146,841	149,593	152,386
Connected	2,179,473	2,223,135	2,267,580	2,312,618	2,358,203	2,404,258	2,450,757	2,497,821	2,545,392	2,593,417	2,642,027	2,691,349
Master-Meter												
Active	37,513	37,183	36,855	36,531	36,210	35,891	35,575	35,262	34,952	34,644	34,339	34,037
Inactive	825	834	842	851	859	867	874	882	889	896	903	910
Connected	38,338	38,016	37,698	37,382	37,068	36,757	36,449	36,144	35,841	35,540	35,242	34,947
Total Residential												
Active	6,131,733	6,215,764	6,299,891	6,383,919	6,467,950	6,552,105	6,636,103	6,719,620	6,802,526	6,885,390	6,968,785	7,052,453
Inactive	239,229	242,939	246,674	250,424	254,190	257,973	261,764	265,558	269,349	273,153	276,990	280,855
Connected	6,370,962	6,458,702	6,546,565	6,634,343	6,722,140	6,810,078	6,897,867	6,985,178	7,071,876	7,158,543	7,245,774	7,333,308
Commercial												
Active	198,328	199,005	199,747	200,527	201,315	202,090	202,898	203,720	204,510	205,325	206,127	206,976
Inactive	54,085	54,270	54,472	54,685	54,900	55,111	55,332	55,556	55,771	55,994	56,212	56,444
Connected	252,413	253,275	254,219	255,213	256,215	257,201	258,230	259,276	260,282	261,318	262,339	263,420
Industrial												
Active	19,624	19,616	19,606	19,599	19,591	19,585	19,580	19,575	19,567	19,559	19,558	19,558
Inactive	8,497	8,493	8,489	8,486	8,482	8,480	8,478	8,475	8,472	8,468	8,468	8,468
Connected	28,121	28,109	28,095	28,084	28,074	28,065	28,058	28,050	28,039	28,028	28,026	28,027
TOTAL												
Active	6,349,685	6,434,384	6,519,244	6,604,045	6,688,857	6,773,780	6,858,582	6,942,915	7,026,603	7,110,274	7,194,469	7,278,987
Inactive	301,811	305,702	309,635	313,595	317,572	321,564	325,574	329,589	333,593	337,615	341,670	345,767
Connected	6,651,496	6,740,086	6,828,879	6,917,640	7,006,429	7,095,344	7,184,155	7,272,504	7,360,196	7,447,889	7,536,139	7,624,754
Net Active Gain	84,712	84,699	84,860	84,801	84,812	84,924	84,802	84,333	83,688	83,670	84,196	84,518
Active Meter Growth	1.35%	1.33%	1.32%	1.30%	1.28%	1.27%	1.25%	1.23%	1.21%	1.19%	1.18%	1.17%

2010 CALIFORNIA GAS REPORT

EUFORECASTER
JULY 2010

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

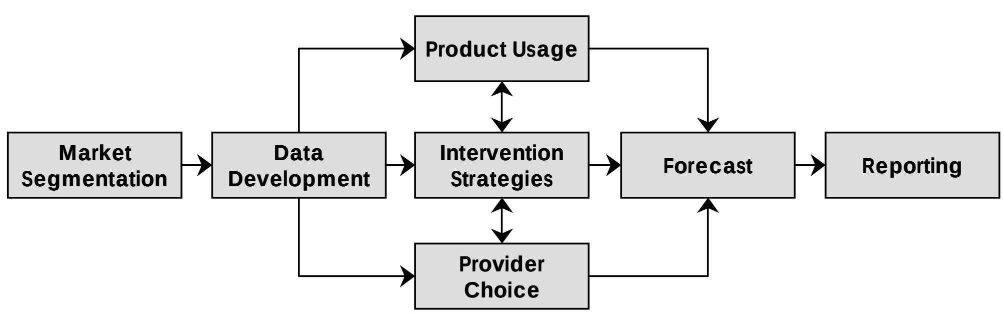
End Use Forecaster has other dimensions that capture factors affecting product demands. Perhaps the most important of these is End Use Forecaster's "vintaging" capability. Vintaging refers to product or service turnover that is a function of either physical lives or contract period. Accurate assessments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

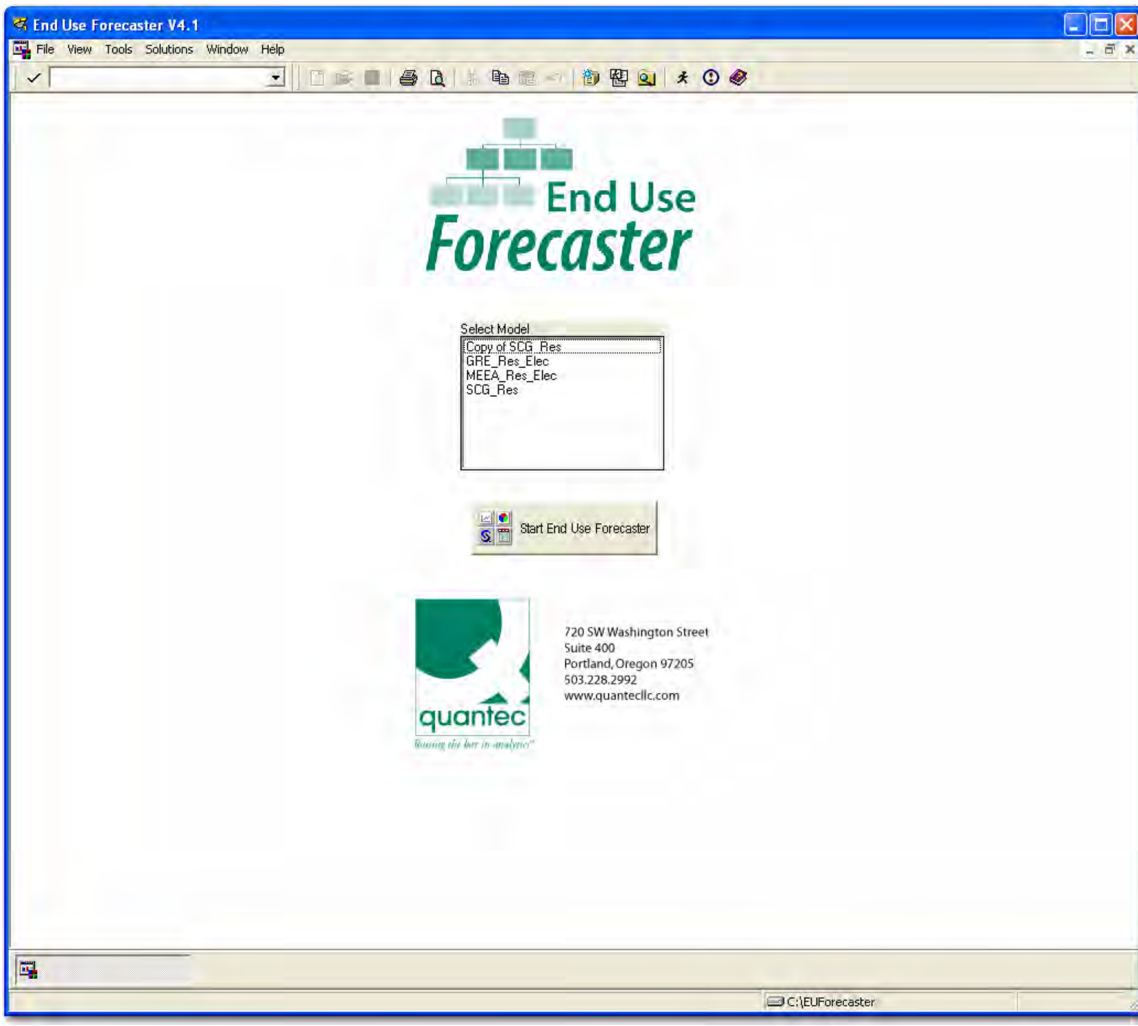
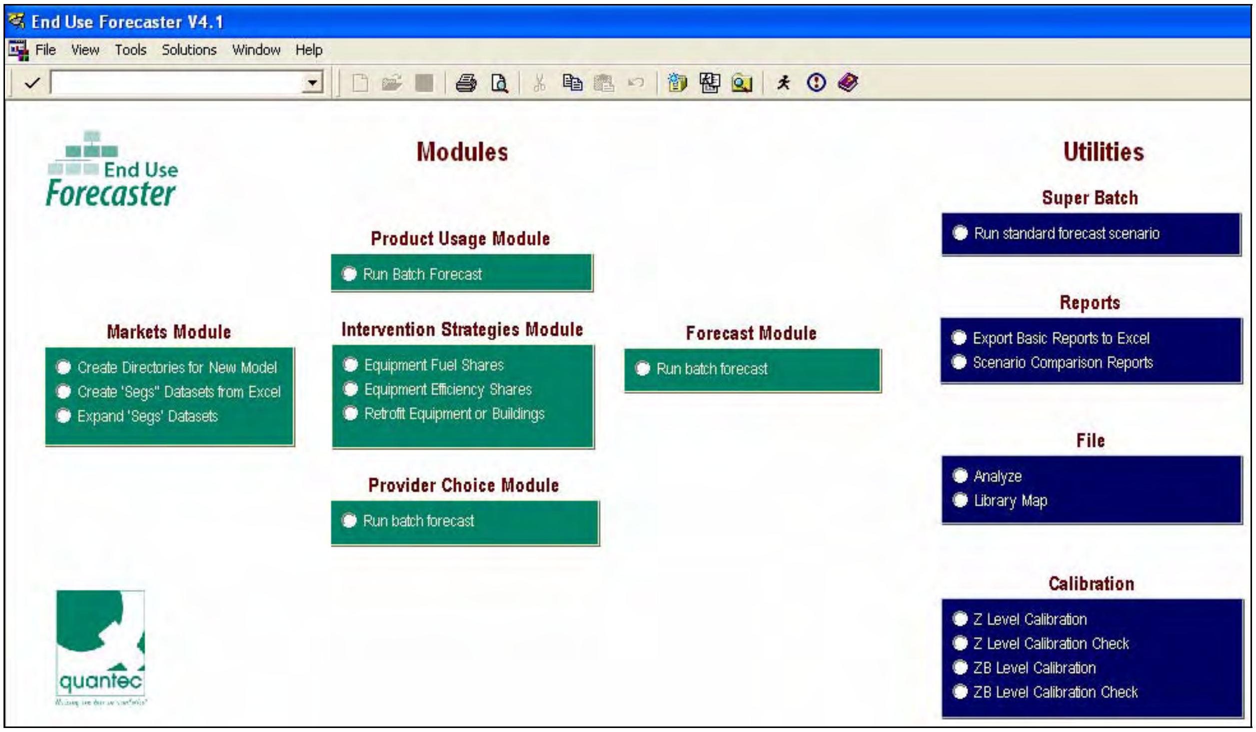


Figure 3. Main Dashboard



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

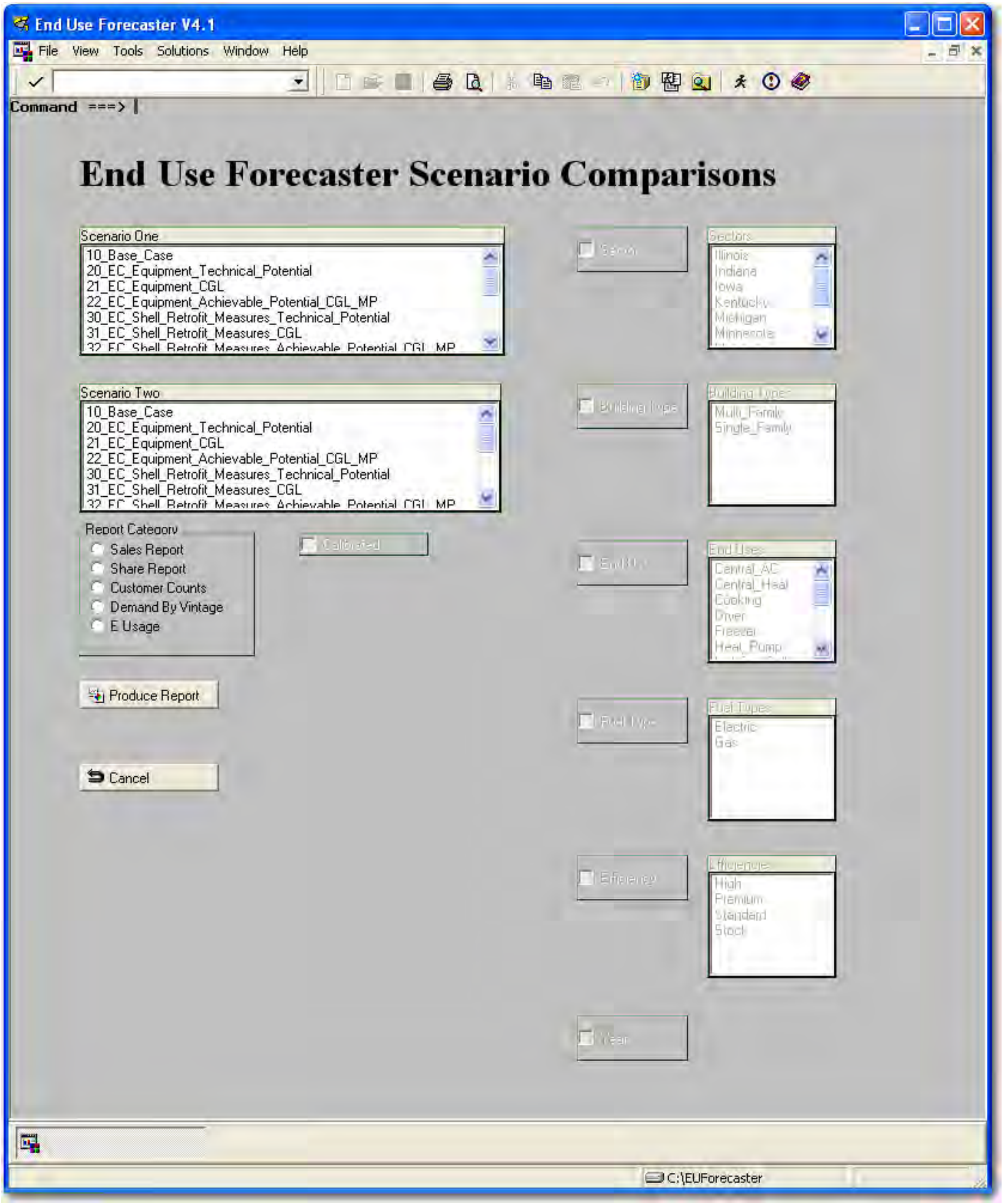
The Forecast Module incorporates all the information compiled from the other modules – Usage, Choice, and Intervention Strategies – related to the overall economic growth of the market segment and equipment lifetime (decay) functions to create the final forecast for a given scenario.

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*.

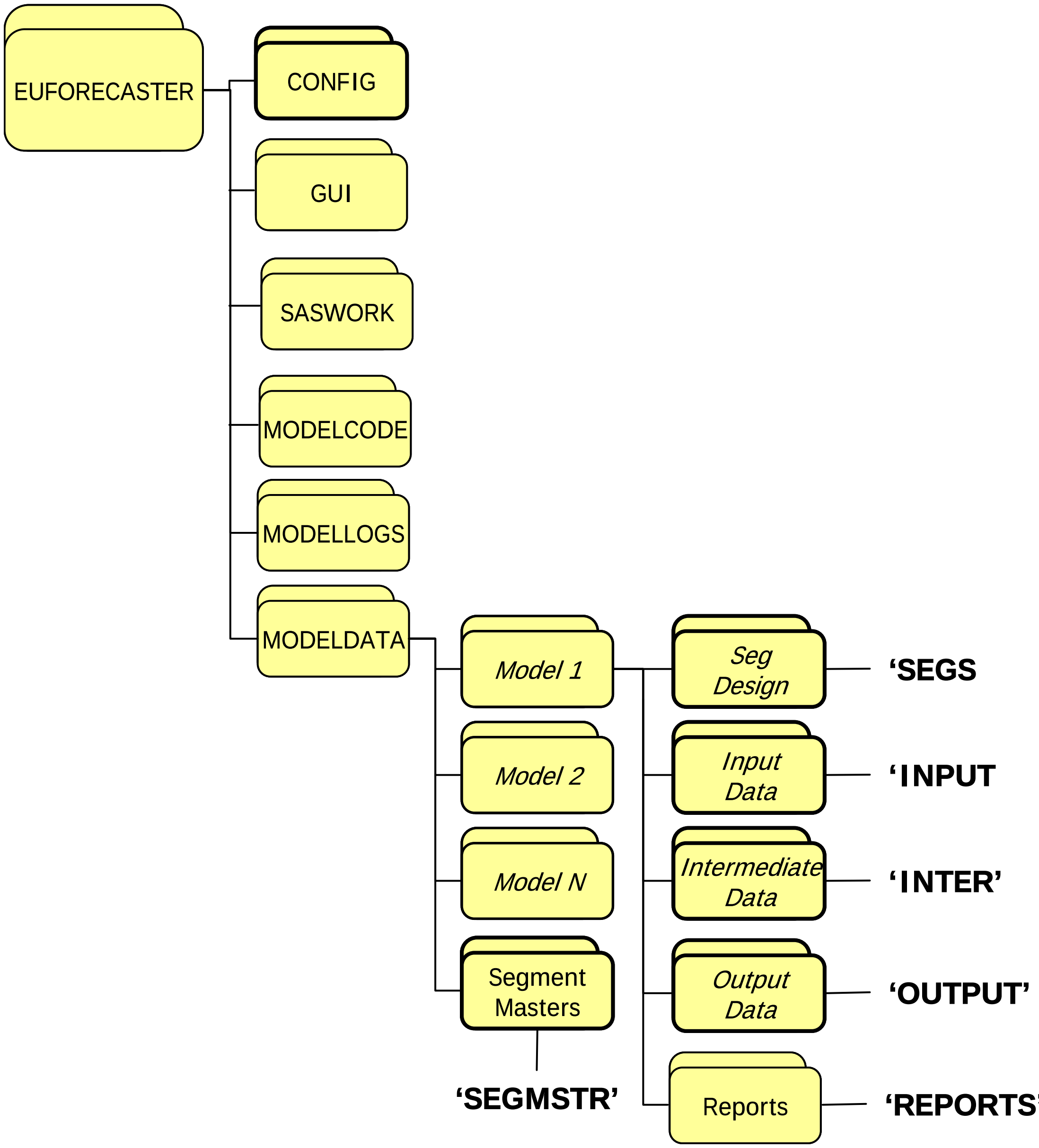
End Use Forecaster's modules run user-specified scenarios. To differentiate among these scenarios, scenario-specific datasets have a numeric suffix, such as **priceForecast_10**. In general cases, where the documentation does not refer to a specific scenario, datasets are referred to with an **"_xx"**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

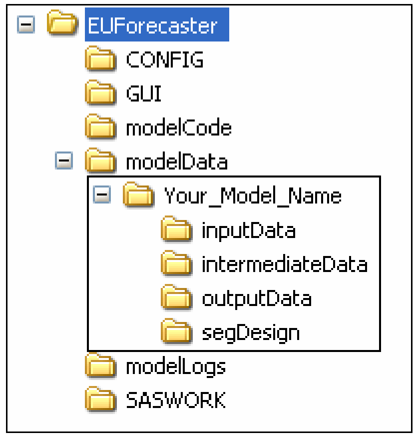
The execution of the first task – creation of a customized market segmentation design – is based on four steps, listed briefly below and then described in greater detail.

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.

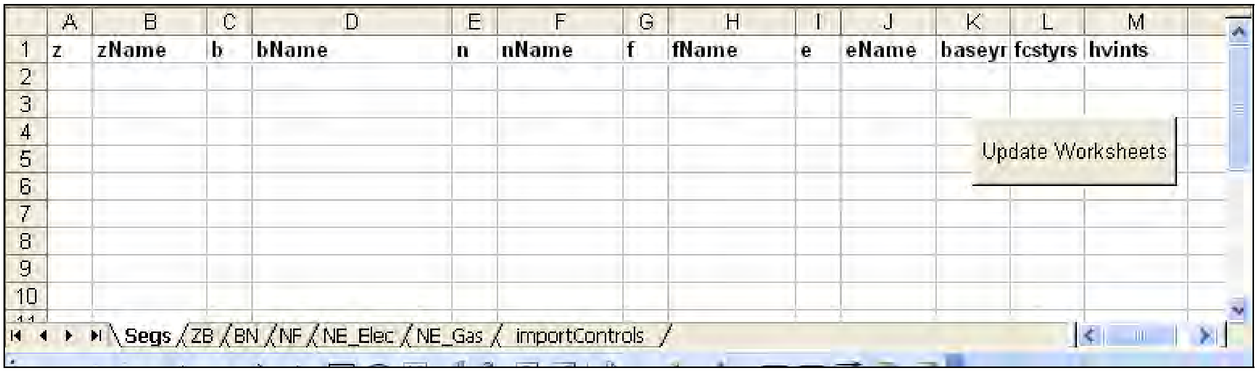
Table 3 summarizes the intended use of each of these dimensions. Note that while the model must include all five dimension, you are not required to use all of them. For example, suppose you want a design with alternative providers at Dimension 4 and do not wish to complicate the model with product/service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

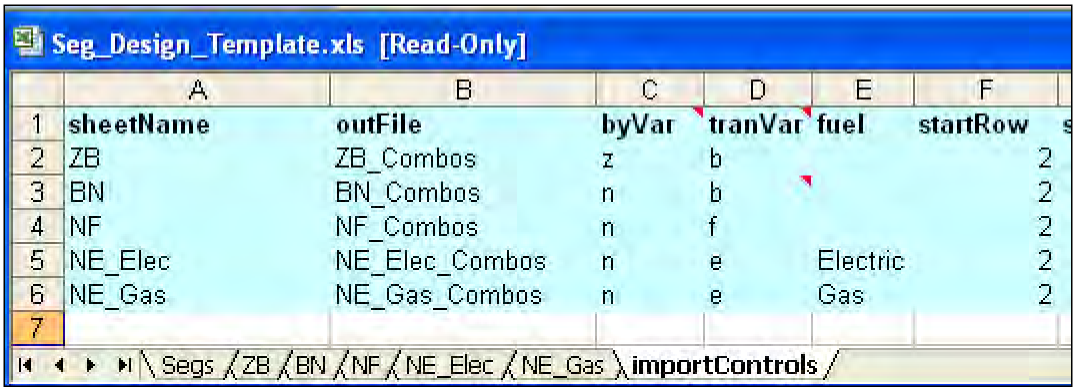
Segs / ZB / BN / NF / NE_Elec / NE_Gas / imp

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"

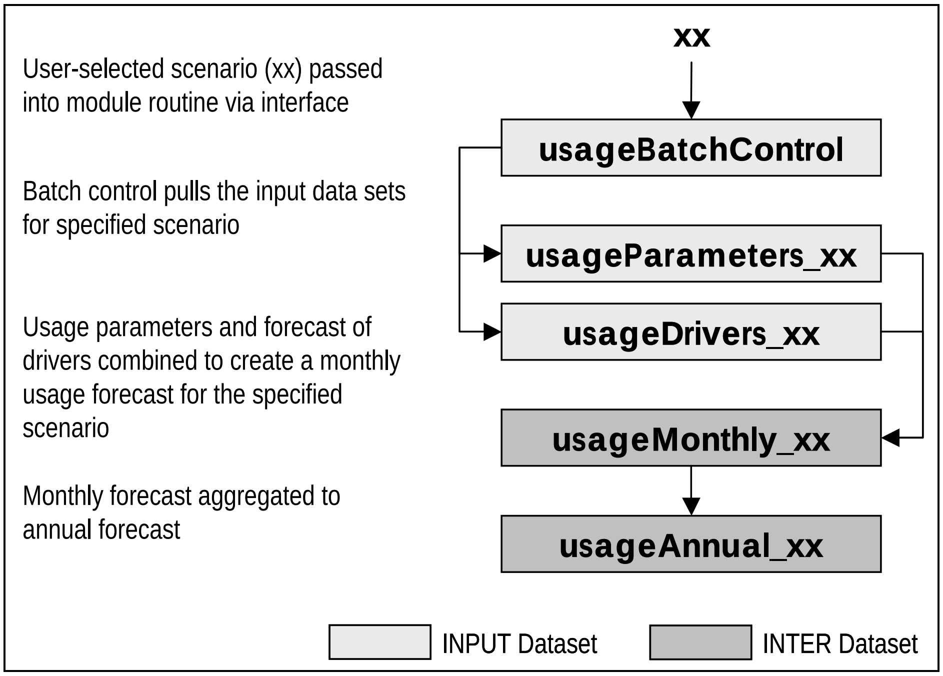


Table 5. Product Usage Module Data Library

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

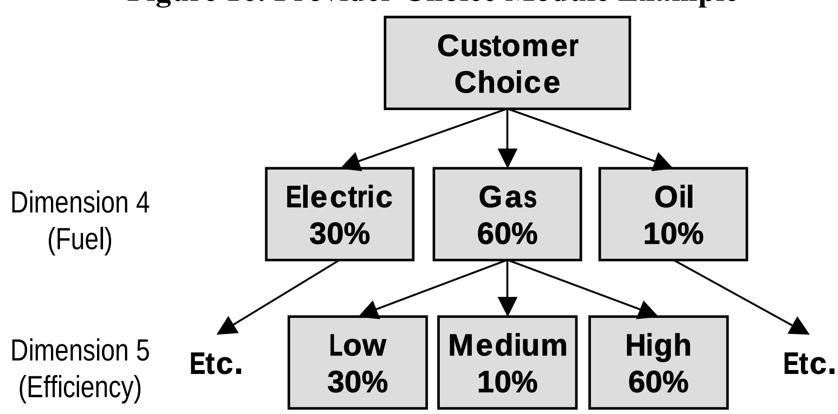
V. Provider Choice Module

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

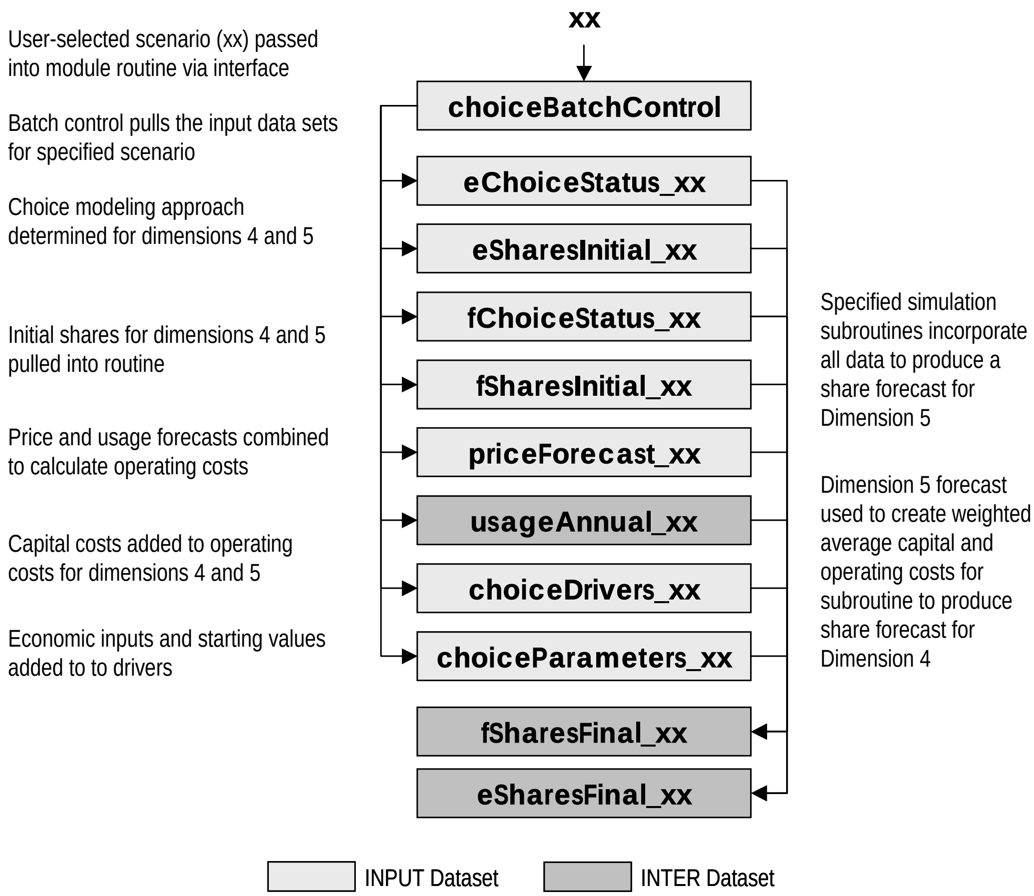
Figure 17 shows the data and analysis flow through the Provider Choice Module.

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**).

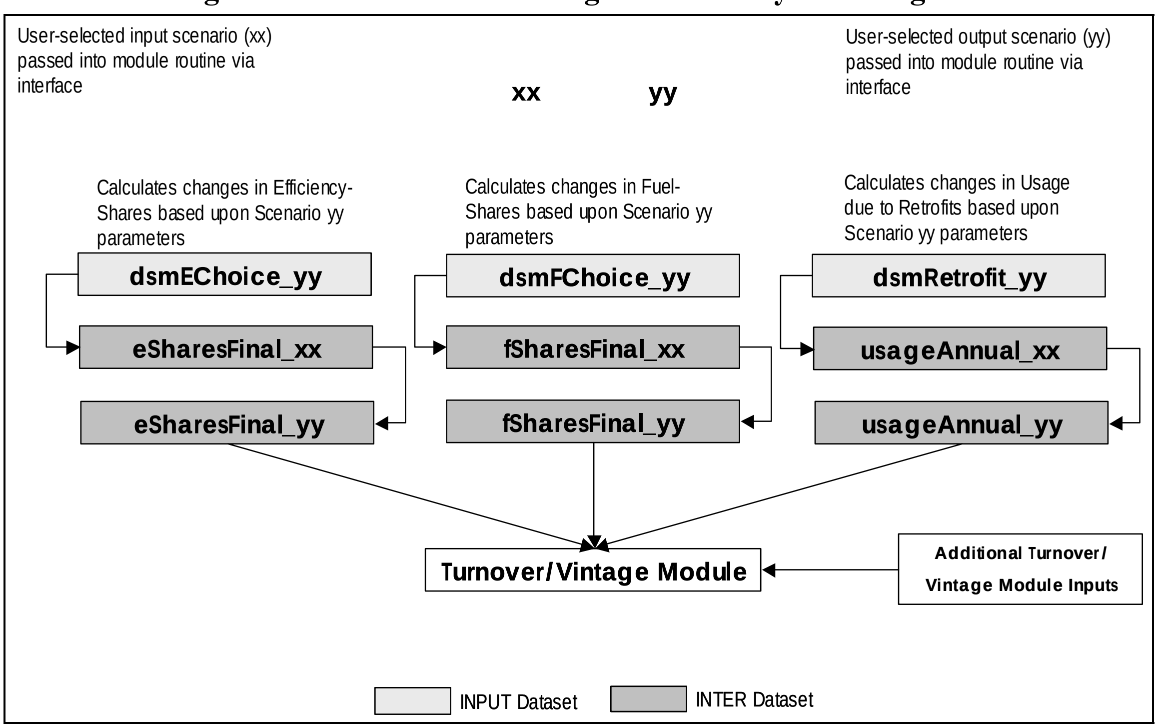
The Market Segmentation module creates base case files ("_10" files) where there is no intervention for each of these program categories. These files serve as templates that allow the user to create different scenarios of interest. To create strategies, you must copy these files to another scenario number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

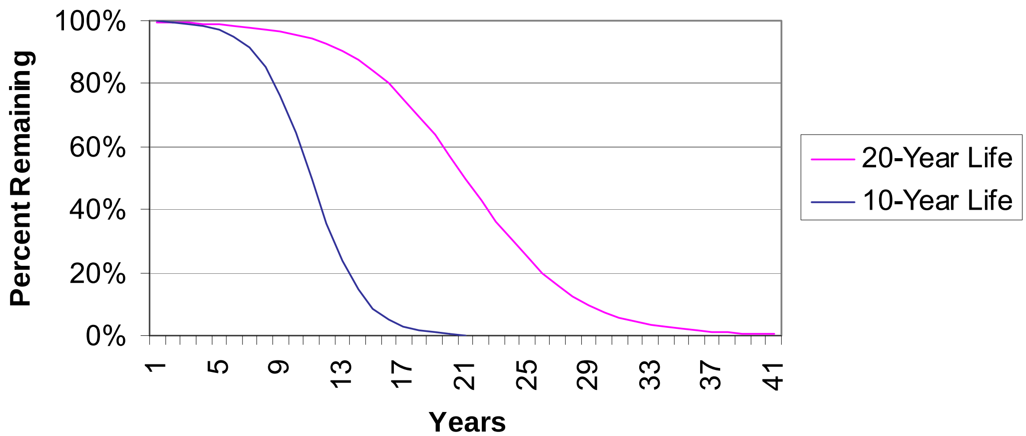
3 These are discrete analogs to the continuous time distributions.

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:

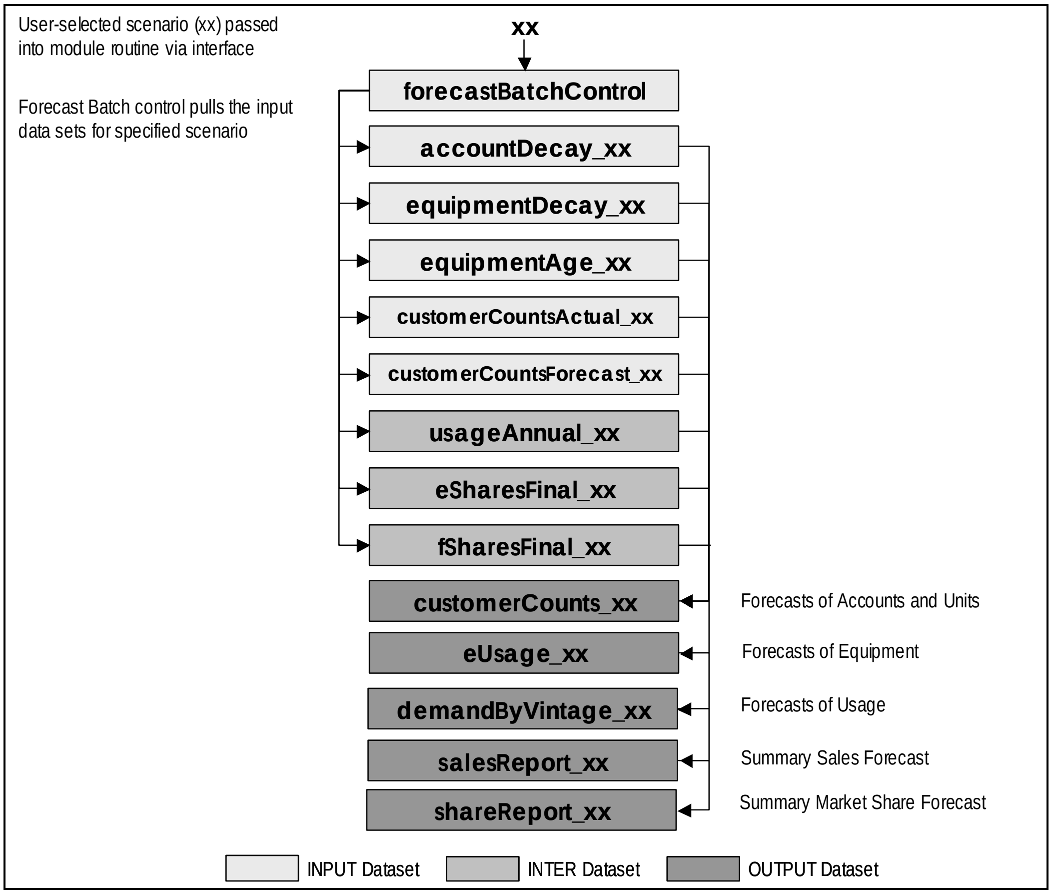
1. Merges all input data across Dimensions 1-3, including:
   - Existing accounts, plus a distribution of accounts across historical building vintages
   - New construction forecast, plus capture rates for new and conversion buildings
   - Dimension 3 saturation, equal to the number of Dimension 2 customers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

2010 CALIFORNIA GAS REPORT

RESIDENTIAL DEMAND FORECAST
JULY 2010

The Gas Company

A Sempra Energy utility℠

Core Residential End-Use Model
2010 California Gas Report

Introduction:

SoCalGas used the End Use Forecaster model to generate annual gas demand forecasts for the residential market from 2009 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 which starts after 2016. During the deployment period of 2011-2016, 1/5 of 1% of the load will have been conserved due to AMI. After 2016, 1% of the load will have been conserved due to AMI energy savings. The residential load was reduced by the AMI expected energy savings.

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 2009 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 2009 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 2009 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:

Mass deployment of AMI gas modules will begin in 2011. The conservtion benefits estimated by SoCalGas represent approximately 1% of core gas throughput in 2016 (post deployment year). The conservation benefits were incorporated in the forecast as a post-model adjustment.

RESIDENTIAL DATA

Southern California Gas Company
2010 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
2010 California Gas Report
Figure 3: Average Temperature Year Demand Forecast

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2009	34,993	29,586	26,953	21,079	15,348	12,029	11,408	11,374	11,211	14,238	22,799	36,404	247,423
2010	33,580	28,392	25,865	20,229	14,729	11,544	10,947	10,915	10,759	13,663	21,879	34,934	237,436
2011	33,169	28,044	25,548	19,981	14,548	11,402	10,813	10,781	10,627	13,496	21,611	34,506	234,527
2012	33,146	28,024	25,530	19,967	14,538	11,394	10,806	10,774	10,619	13,486	21,596	34,482	234,362
2013	32,845	27,771	25,299	19,786	14,406	11,291	10,708	10,676	10,523	13,364	21,400	34,170	232,240
2014	32,739	27,681	25,217	19,722	14,360	11,255	10,673	10,642	10,489	13,321	21,331	34,059	231,489
2015	32,749	27,689	25,225	19,728	14,364	11,258	10,676	10,645	10,492	13,325	21,337	34,069	231,557
2016	32,810	27,741	25,272	19,764	14,391	11,279	10,696	10,665	10,512	13,350	21,377	34,133	231,989
2017	32,888	27,807	25,332	19,811	14,425	11,306	10,722	10,690	10,537	13,382	21,428	34,214	232,541
2018	32,967	27,873	25,393	19,859	14,460	11,333	10,747	10,716	10,562	13,414	21,479	34,296	233,100
2019	33,041	27,936	25,450	19,904	14,492	11,359	10,772	10,740	10,586	13,444	21,528	34,374	233,626
2020	33,112	27,996	25,504	19,946	14,523	11,383	10,795	10,763	10,609	13,473	21,574	34,447	234,124
2021	33,182	28,055	25,558	19,989	14,554	11,407	10,817	10,786	10,631	13,501	21,619	34,520	234,620
2022	33,283	28,140	25,636	20,049	14,598	11,442	10,850	10,818	10,663	13,542	21,685	34,625	235,332
2023	33,356	28,202	25,692	20,094	14,630	11,467	10,874	10,842	10,687	13,572	21,733	34,701	235,851
2024	33,056	27,949	25,461	19,913	14,499	11,364	10,776	10,745	10,591	13,450	21,538	34,389	233,732
2025	33,089	27,977	25,487	19,933	14,513	11,375	10,787	10,756	10,601	13,464	21,559	34,424	233,966
2026	33,124	28,006	25,513	19,953	14,528	11,387	10,798	10,767	10,612	13,477	21,581	34,459	234,207
2027	33,154	28,031	25,537	19,972	14,542	11,397	10,808	10,777	10,622	13,490	21,601	34,491	234,421
2028	33,177	28,051	25,554	19,985	14,552	11,405	10,816	10,784	10,629	13,499	21,616	34,514	234,583
2029	33,194	28,065	25,567	19,996	14,559	11,411	10,821	10,790	10,635	13,506	21,627	34,532	234,704
2030	33,211	28,080	25,581	20,006	14,567	11,417	10,827	10,795	10,641	13,513	21,639	34,550	234,828

Southern California Gas Company
2010 California Gas Report
Figure 4: Cold Temperature Year Demand Forecast

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2009	39,843	33,552	30,159	23,167	16,183	12,263	11,441	11,399	11,278	14,847	25,237	41,546	270,916
2010	38,235	32,198	28,941	22,231	15,530	11,768	10,979	10,939	10,823	14,248	24,218	39,869	259,981
2011	37,767	31,803	28,587	21,959	15,340	11,624	10,845	10,805	10,690	14,074	23,922	39,381	256,796
2012	37,740	31,781	28,567	21,944	15,329	11,616	10,837	10,798	10,683	14,064	23,905	39,353	256,615
2013	37,398	31,493	28,308	21,745	15,190	11,511	10,739	10,700	10,586	13,936	23,688	38,997	254,292
2014	37,277	31,391	28,217	21,675	15,141	11,473	10,704	10,665	10,552	13,891	23,612	38,871	253,470
2015	37,288	31,400	28,225	21,681	15,145	11,477	10,707	10,668	10,555	13,895	23,619	38,882	253,544
2016	37,358	31,459	28,278	21,721	15,174	11,498	10,727	10,688	10,575	13,921	23,663	38,955	254,017
2017	37,447	31,534	28,345	21,773	15,210	11,526	10,753	10,714	10,600	13,954	23,719	39,047	254,621
2018	37,537	31,610	28,413	21,825	15,246	11,553	10,779	10,739	10,625	13,988	23,776	39,141	255,233
2019	37,622	31,681	28,477	21,875	15,281	11,579	10,803	10,764	10,649	14,019	23,830	39,230	255,809
2020	37,702	31,748	28,538	21,921	15,313	11,604	10,826	10,787	10,672	14,049	23,881	39,313	256,354
2021	37,782	31,816	28,598	21,968	15,346	11,629	10,849	10,809	10,694	14,079	23,931	39,397	256,897
2022	37,896	31,912	28,685	22,034	15,392	11,664	10,882	10,842	10,727	14,122	24,004	39,516	257,677
2023	37,980	31,983	28,748	22,083	15,426	11,690	10,906	10,866	10,751	14,153	24,057	39,603	258,245
2024	37,639	31,695	28,490	21,885	15,288	11,585	10,808	10,769	10,654	14,026	23,841	39,247	255,925
2025	37,676	31,727	28,518	21,907	15,303	11,596	10,819	10,779	10,665	14,040	23,864	39,287	256,181
2026	37,715	31,760	28,548	21,929	15,319	11,608	10,830	10,790	10,676	14,054	23,889	39,327	256,446
2027	37,749	31,789	28,574	21,949	15,333	11,619	10,840	10,800	10,685	14,067	23,911	39,363	256,679
2028	37,776	31,811	28,594	21,964	15,343	11,627	10,847	10,808	10,693	14,077	23,927	39,390	256,857
2029	37,795	31,827	28,608	21,976	15,351	11,633	10,853	10,813	10,698	14,084	23,940	39,411	256,989
2030	37,815	31,844	28,624	21,987	15,359	11,639	10,859	10,819	10,704	14,092	23,952	39,431	257,125

Southern California Gas Company
2010 California Gas Report
Figure 5: HOT Temperature Year Demand Forecast

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2009	30,393	25,420	23,856	18,583	14,597	11,896	11,391	11,366	11,170	13,528	20,695	30,994	223,888
2010	29,166	24,394	22,893	17,833	14,008	11,416	10,931	10,907	10,719	12,982	19,860	29,743	214,851
2011	28,808	24,095	22,612	17,615	13,836	11,276	10,797	10,774	10,587	12,823	19,617	29,378	212,219
2012	28,788	24,078	22,596	17,602	13,826	11,268	10,790	10,766	10,580	12,814	19,603	29,358	212,070
2013	28,528	23,860	22,392	17,443	13,701	11,166	10,692	10,669	10,484	12,698	19,425	29,092	210,149
2014	28,435	23,783	22,319	17,386	13,657	11,130	10,657	10,634	10,450	12,657	19,363	28,998	209,470
2015	28,444	23,790	22,326	17,392	13,661	11,133	10,661	10,637	10,453	12,661	19,368	29,006	209,532
2016	28,497	23,835	22,367	17,424	13,686	11,154	10,680	10,657	10,473	12,684	19,404	29,060	209,922
2017	28,564	23,891	22,421	17,465	13,719	11,180	10,706	10,682	10,498	12,715	19,451	29,129	210,421
2018	28,633	23,949	22,475	17,507	13,752	11,207	10,732	10,708	10,523	12,745	19,497	29,200	210,928
2019	28,698	24,003	22,525	17,547	13,783	11,233	10,756	10,732	10,547	12,774	19,541	29,265	211,404
2020	28,759	24,054	22,573	17,584	13,812	11,256	10,779	10,755	10,569	12,801	19,583	29,328	211,854
2021	28,820	24,105	22,621	17,622	13,842	11,280	10,802	10,778	10,592	12,828	19,624	29,390	212,303
2022	28,907	24,178	22,690	17,675	13,884	11,315	10,834	10,811	10,624	12,867	19,684	29,479	212,947
2023	28,971	24,231	22,740	17,714	13,914	11,339	10,858	10,834	10,647	12,896	19,727	29,544	213,417
2024	28,711	24,014	22,536	17,555	13,789	11,238	10,761	10,737	10,551	12,780	19,550	29,279	211,499
2025	28,740	24,038	22,558	17,572	13,803	11,249	10,771	10,748	10,562	12,792	19,570	29,308	211,711
2026	28,769	24,062	22,581	17,591	13,817	11,260	10,783	10,759	10,573	12,806	19,590	29,338	211,930
2027	28,795	24,084	22,602	17,607	13,830	11,271	10,792	10,769	10,583	12,817	19,608	29,365	212,122
2028	28,815	24,101	22,618	17,619	13,839	11,279	10,800	10,776	10,590	12,826	19,621	29,385	212,269
2029	28,830	24,113	22,629	17,628	13,847	11,284	10,805	10,782	10,595	12,833	19,631	29,400	212,379
2030	28,845	24,126	22,641	17,637	13,854	11,290	10,811	10,787	10,601	12,840	19,642	29,416	212,491

Southern California Gas Company
2010 California Gas Report
Figure 6: BASE Temperature Year Demand Forecast

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2009	11,112	10,336	11,193	11,255	11,020	10,716	11,241	11,208	10,798	11,509	10,499	11,243	132,129
2010	10,663	9,919	10,741	10,800	10,575	10,284	10,787	10,756	10,362	11,044	10,075	10,789	126,796
2011	10,533	9,797	10,610	10,668	10,446	10,158	10,655	10,624	10,235	10,909	9,952	10,657	125,242
2012	10,525	9,790	10,602	10,660	10,438	10,151	10,648	10,617	10,228	10,901	9,945	10,649	125,154
2013	10,430	9,702	10,506	10,564	10,344	10,059	10,551	10,520	10,135	10,803	9,854	10,553	124,021
2014	10,396	9,670	10,472	10,530	10,310	10,026	10,517	10,486	10,102	10,768	9,823	10,519	123,620
2015	10,399	9,673	10,475	10,533	10,313	10,029	10,520	10,489	10,105	10,771	9,825	10,522	123,657
2016	10,419	9,691	10,495	10,552	10,333	10,048	10,540	10,509	10,124	10,791	9,844	10,541	123,887
2017	10,444	9,714	10,520	10,578	10,357	10,072	10,565	10,534	10,148	10,816	9,867	10,566	124,182
2018	10,469	9,738	10,545	10,603	10,382	10,096	10,590	10,559	10,173	10,843	9,891	10,592	124,480
2019	10,492	9,760	10,569	10,627	10,406	10,119	10,614	10,583	10,196	10,867	9,913	10,616	124,761
2020	10,515	9,780	10,591	10,650	10,428	10,140	10,637	10,606	10,217	10,890	9,934	10,638	125,027
2021	10,537	9,801	10,614	10,672	10,450	10,162	10,659	10,628	10,239	10,913	9,955	10,661	125,292
2022	10,569	9,831	10,646	10,705	10,481	10,193	10,692	10,660	10,270	10,946	9,986	10,693	125,672
2023	10,592	9,853	10,669	10,728	10,505	10,215	10,715	10,684	10,293	10,970	10,008	10,717	125,949
2024	10,497	9,764	10,574	10,632	10,410	10,123	10,619	10,588	10,200	10,872	9,918	10,620	124,818
2025	10,508	9,774	10,584	10,642	10,421	10,134	10,630	10,599	10,211	10,883	9,928	10,631	124,943
2026	10,518	9,784	10,595	10,653	10,431	10,144	10,641	10,610	10,221	10,894	9,938	10,642	125,072
2027	10,528	9,793	10,605	10,663	10,441	10,153	10,650	10,619	10,230	10,904	9,947	10,652	125,186
2028	10,535	9,800	10,612	10,670	10,448	10,160	10,658	10,627	10,237	10,911	9,954	10,659	125,272
2029	10,541	9,805	10,618	10,676	10,454	10,166	10,663	10,632	10,243	10,917	9,959	10,665	125,337
2030	10,546	9,810	10,623	10,682	10,459	10,171	10,669	10,638	10,248	10,923	9,964	10,670	125,403

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Figure 7: 2009 Historical Data

	Single Family	Multi-Family 2 - 4 Units	Multi-Family > 4 Units	Master Meter	Sub Meter
Total Therm Sales	1,750,395,024	178,402,392	346,886,801	146,434,194	52,109,041
Meter Count					
Pre-1979 Customers	2,368,550	411,268	707,505	35,694	1,742
1979 - 2004 Customers	1,165,685	125,689	423,663	4,109	110
005-2009 Customers	13,418	2,669	10,456	54	0
TOTAL	3,547,653	539,626	1,141,624	39,857	1,852
Use Per Customer (UPC, therms)					
Pre-1979 Customers	492	336	313	3,493	28,563
1979 - 2004 Customers	472	317	292	6,130	34,124
2005-2009 Customers	440	266	228	9,743	0
Price Elasticity	-0.105	-0.112	-0.071	-0.069	-0.105

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Figure 8: Meter Count Forecast

Year	Total	Single Family	Multi-Family 2 - 4 Units	Multi-Family > 4 Units	Master Meter	Sub Meter
2009	5,307,477	3,563,512	553,905	1,147,674	40,581	1,805
2010	5,361,061	3,599,545	559,618	1,159,512	40,581	1,805
2011	5,422,440	3,639,455	566,607	1,173,992	40,581	1,805
2012	5,490,638	3,683,295	574,536	1,190,422	40,581	1,805
2013	5,561,639	3,728,503	582,932	1,207,818	40,581	1,805
2014	5,634,374	3,774,432	591,658	1,225,898	40,581	1,805
2015	5,708,655	3,820,827	600,736	1,244,707	40,581	1,805
2016	5,784,039	3,867,468	610,092	1,264,093	40,581	1,805
2017	5,860,018	3,914,060	619,658	1,283,914	40,581	1,805
2018	5,936,246	3,960,356	629,402	1,304,102	40,581	1,805
2019	6,012,880	4,006,471	639,337	1,324,687	40,581	1,805
2020	6,089,882	4,052,398	649,452	1,345,646	40,581	1,805
2021	6,167,069	4,098,101	659,701	1,366,881	40,581	1,805
2022	6,244,298	4,143,490	670,066	1,388,356	40,581	1,805
2023	6,321,627	4,188,582	680,560	1,410,099	40,581	1,805
2024	6,399,061	4,233,384	691,182	1,432,109	40,581	1,805
2025	6,476,977	4,278,284	701,930	1,454,377	40,581	1,805
2026	6,555,722	4,323,652	712,795	1,476,890	40,581	1,805
2027	6,634,909	4,369,019	723,804	1,499,700	40,581	1,805
2028	6,713,751	4,413,544	734,975	1,522,846	40,581	1,805
2029	6,791,906	4,456,998	746,271	1,546,251	40,581	1,805
2030	6,869,981	4,500,062	757,668	1,569,865	40,581	1,805

Note: The master meter and sub meter groups are expected to decline.
A decay rate was built into the model specification.

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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	-

Figure 10: SoCalGas 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
2009	100.00	0.7412	0.8521	0.7117	0.8521	0.7146	0.8521	0.6937	0.8521	0.7042	0.8521
2010	100.59	1.0223	1.1674	0.9838	1.1674	0.9876	1.1674	0.9603	1.1674	0.9740	1.1674
2011	102.33	1.1038	1.2549	1.0636	1.2549	1.0676	1.2549	1.0392	1.2549	1.0535	1.2549
2012	106.83	1.1365	1.2937	1.0948	1.2937	1.0989	1.2937	1.0694	1.2937	1.0842	1.2937
2013	106.76	1.2025	1.3597	1.1608	1.3597	1.1649	1.3597	1.1354	1.3597	1.1502	1.3597
2014	108.74	1.2536	1.4108	1.2119	1.4108	1.2160	1.4108	1.1865	1.4108	1.2013	1.4108
2015	111.27	1.2893	1.4465	1.2476	1.4465	1.2517	1.4465	1.2222	1.4465	1.2370	1.4465
2016	113.73	1.3340	1.4912	1.2923	1.4912	1.2964	1.4912	1.2669	1.4912	1.2817	1.4912
2017	116.13	1.3765	1.5337	1.3348	1.5337	1.3389	1.5337	1.3094	1.5337	1.3242	1.5337
2018	118.42	1.4187	1.5759	1.3770	1.5759	1.3811	1.5759	1.3516	1.5759	1.3664	1.5759
2019	120.64	1.4625	1.6197	1.4208	1.6197	1.4249	1.6197	1.3954	1.6197	1.4102	1.6197
2020	122.75	1.5067	1.6639	1.4650	1.6639	1.4691	1.6639	1.4396	1.6639	1.4544	1.6639
2021	124.87	1.5520	1.7092	1.5103	1.7092	1.5144	1.7092	1.4849	1.7092	1.4997	1.7092
2022	127.09	1.5908	1.7480	1.5491	1.7480	1.5532	1.7480	1.5237	1.7480	1.5385	1.7480
2023	129.31	1.6386	1.7958	1.5969	1.7958	1.6010	1.7958	1.5715	1.7958	1.7492	1.7958
2024	131.72	1.8015	1.9587	1.7598	1.9587	1.7639	1.9587	1.7344	1.9587	1.8165	1.9587
2025	134.23	1.8688	2.0260	1.8271	2.0260	1.8312	2.0260	1.8017	2.0260	1.8863	2.0260
2026	136.83	1.9386	2.0958	1.8969	2.0958	1.9010	2.0958	1.8715	2.0958	1.9596	2.0958
2027	139.51	2.0119	2.1691	1.9702	2.1691	1.9743	2.1691	1.9448	2.1691	2.0376	2.1691
2028	142.32	2.0899	2.2471	2.0482	2.2471	2.0523	2.2471	2.0228	2.2471	2.1190	2.2471
2029	145.21	2.1713	2.3285	2.1296	2.3285	2.1337	2.3285	2.1042	2.3285	2.2028	2.3285
2030	148.18	2.2551	2.4123	2.2134	2.4123	2.2175	2.4123	2.1880	2.4123	2.2028	2.4123

FIGURE 11: SOCALGS ElecPriceForecast

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
2009	15.38	23.28	14.77	22.35	14.83	22.44	14.40	14.89	14.62	16.45
2010	16.46	24.91	15.84	23.97	15.90	24.06	15.46	15.99	15.68	17.65
2011	18.86	28.54	18.17	27.50	18.24	27.60	17.76	18.36	18.00	20.26
2012	20.49	31.01	19.74	29.87	19.81	29.98	19.28	19.94	19.55	22.00
2013	21.74	32.90	20.99	31.76	21.06	31.87	20.53	21.23	20.80	23.41
2014	22.67	34.30	21.91	33.16	21.99	33.27	21.45	22.18	21.72	24.44
2015	23.46	35.50	22.70	34.35	22.78	34.47	22.24	23.00	22.51	25.33
2016	23.89	36.16	23.15	35.03	23.22	35.14	22.69	23.46	22.96	25.84
2017	24.77	37.49	24.02	36.35	24.10	36.46	23.57	24.37	23.83	26.82
2018	25.83	39.08	25.07	37.93	25.14	38.04	24.60	25.44	24.87	27.99
2019	26.80	40.56	26.04	39.40	26.11	39.51	25.57	26.44	25.84	29.08
2020	27.24	41.23	26.49	40.08	26.56	40.20	26.03	26.92	26.30	29.59
2021	27.59	41.75	26.85	40.62	26.92	40.73	26.39	27.29	26.66	30.00
2022	28.02	42.40	27.29	41.29	27.36	41.40	26.84	27.75	27.10	30.50
2023	28.49	43.11	27.76	42.01	27.83	42.12	27.32	28.25	27.58	31.03
2024	28.91	43.75	28.24	42.74	28.31	42.84	27.84	28.78	28.07	31.59
2025	29.38	44.46	28.72	43.46	28.79	43.56	28.32	29.29	28.56	32.14
2026	29.83	45.15	29.19	44.17	29.26	44.27	28.80	29.78	29.03	32.67
2027	30.62	46.33	29.98	45.37	30.05	45.47	29.60	30.60	29.82	33.56
2028	31.42	47.55	30.79	46.60	30.86	46.69	30.41	31.45	30.64	34.48
2029	32.25	48.79	31.63	47.86	31.69	47.95	31.25	32.31	31.47	35.41
2030	33.09	50.07	32.48	49.15	32.54	49.24	32.11	33.20	32.32	36.38

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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 14: Building Lives and Decay Rate

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

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Figure 15: Gas Appliance Equipment Age (Years)

			Single Family		Multi-Family 2 - 4 Units		Multi-Family > 4 Units		Master Meter		Sub Meter	
End-Use	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
	2005-200	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
	2005-2009	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
	2005-2009	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
	2005-2009	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
	2005-2009	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
	2005-2009	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
	2005-2009	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
	2005-2009	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
	2 005-2009	15	15	15	15	15	15	15	15	15	15	15

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Figure 16: End-Use Saturations

End-use	Vintage	Single Family	Multi-Family 2 - 4 Units	Multi-Family > 4 Units	Master Meter	Sub Meter
Space Heat	Pre-1979	0.9955	0.9809	0.9655	0.9375	1.0000
	1979 - 2004	0.9990	0.9979	0.9933	0.9600	1.0000
	2005-2009	0.9968	1.0000	0.9491	1.0000	1.0000
Water Heat	Pre-1979	0.9994	1.0000	0.9873	0.9834	1.0000
	1979 - 2004	1.0000	1.0000	0.9892	1.0000	1.0000
	2005-2009	1.0000	1.0000	0.9613	1.0000	1.0000
Cooking	Pre-1979	0.9923	0.9855	0.9855	0.9921	0.9705
	1979 - 2004	0.9953	0.9913	0.9913	1.0000	1.0000
	2005-2009	0.9922	1.0000	1.0000	1.0000	1.0000
Drying	Pre-1979	0.8721	0.8153	0.8153	0.7578	0.8529
	1979 - 2004	0.8973	0.8602	0.8602	0.9600	0.7272
	2005-2009	0.924	0.774	0.774	1.000	1.0000
Pool	Pre-1979	0.0772	0.0521	0.1045	0.1179	0.1179
	1979 - 2004	0.1611	0.1308	0.1941	0.0053	0.0053
	2005-2009	0.1555	0.1308	0.1941	0.0053	0.0053
Spa	Pre-1979	0.1354	0.0526	0.0668	0.1329	0.1329
	1979 - 2004	0.2339	0.1923	0.2896	0.2012	0.2012
	2005-2009	0.203	0.192	0.289	0.201	0.2012
Fireplace	Pre-1979	0.5493	0.2634	0.1519	0.1894	0.1894
	1979 - 2004	0.7149	0.6261	0.4775	0.4156	0.4156
	2005-2009	0.7149	0.6261	0.4775	0.4156	0.4156
Barbecue	Pre-1979	0.4595	0.2630	0.1524	0.1875	0.2058
	1979 - 2004	0.5980	0.4739	0.3192	0.3600	0.2727
	2005-2009	0.6581	0.440	0.163	0.000	0.0000

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Figure 17: Gas Fuel Shares

End-use	Single Family	Multi-Family 2 - 4 Units	Multi-Family > 4 Units	Master Meter	Sub Meter
Space Heat	0.9573	0.9399	0.8249	0.9610	0.9610
Water Heat	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	0.7190	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 18: Gas Efficiency Shares

Gas 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	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

2010 CALIFORNIA GAS REPORT

CORE COMMERCIAL AND INDUSTRIAL DEMAND FORECAST
JULY 2010

The Gas Company

A Sempra Energy utility℠

Core Commercial and Industrial End Use Model
2010 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 2010 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 noncore to core migration expected after the year 2009 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 2009 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 2009 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 sping 2010 and based on Global Insight's latest US Economic Forecast. The historical 2009 data comes from the California 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 in March 2006. (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 which starts after 2016. During the deployment phase of 2011-2016, 1/5 of 1% of the core load will have been conserved due to AMI. After 2016, 1% of the load woud have been conserved due to AMI energy savings. The Core Commercial and the Core Industrial loads were reduced by AMI's projected savings

G10 COMMERCIAL DATA TABLES

Southern California Gas Company
2010 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
2010 California Gas Report: Commercial G10
Incremental Meter Forecast by Business Types

Year	Office	Restaurant	Retail	Laundry	Warehouse	School	College	Health	Lodging	Misc	Government	TCU	Construc-tion	Agriculture
2009	41	37	29	5	8	6	2	8	5	34	4	8	5	2
2010	159	142	113	19	32	24	9	33	19	133	14	32	21	7
2011	132	118	94	15	27	20	7	27	16	110	12	26	18	5
2012	154	137	109	18	31	23	8	31	18	128	13	31	20	6
2013	156	139	111	18	32	24	8	32	19	130	14	31	21	6
2014	153	136	108	18	31	23	8	31	18	127	13	30	20	6
2015	138	123	98	16	28	21	7	28	16	115	12	27	18	6
2016	129	115	92	15	26	19	7	26	15	108	11	26	17	5
2017	118	105	84	14	24	18	6	24	14	99	10	24	16	5
2018	114	102	81	13	23	17	6	23	14	95	10	23	15	5
2019	123	109	87	14	25	18	7	25	14	102	11	24	16	5
2020	131	117	93	15	27	20	7	27	16	110	11	26	18	5
2021	120	107	85	14	24	18	6	25	14	100	10	24	16	5
2022	135	120	96	16	28	20	7	28	16	113	12	27	18	6
2023	148	131	105	17	30	22	8	30	17	123	13	29	20	6
2024	153	136	108	18	31	23	8	31	18	127	13	30	20	6
2025	151	134	107	18	31	23	8	31	18	126	13	30	20	6
2026	145	129	103	17	30	22	8	30	17	121	13	29	19	6
2027	150	133	106	17	31	23	8	31	18	125	13	30	20	6
2028	149	132	106	17	30	22	8	30	18	124	13	30	20	6
2029	144	128	102	17	29	22	8	29	17	120	13	29	19	6
2030	149	132	106	17	30	22	8	30	18	124	13	30	20	6

Southern California Gas Company
2010 California Gas Report
Average and Marginal Electric Price Forecast (cents/KWh)

Year	C Agriculture Average Price	C College Average Price	Construction Average Price	C Government Average Price	C Health Average Price	C Laundry Average Price	C Lodging Average Price	C Misc Average Price	C Office Average Price	C Restaurant Average Price	C Retail Average Price	C School Average Price	C TCU Average Price	C Warehouse Average Price
2009	11.04	10.67	11.15	9.94	10.02	10.33	9.28	10.10	9.96	11.30	9.89	9.94	12.02	8.94
2010	12.71	12.32	12.83	11.53	11.61	11.95	10.81	11.71	11.55	13.00	11.47	11.53	13.78	10.46
2011	13.79	13.37	13.92	12.55	12.64	12.99	11.80	12.73	12.56	14.10	12.49	12.55	14.93	11.43
2012	14.69	14.27	14.82	13.41	13.49	13.86	12.61	13.59	13.42	15.00	13.34	13.39	15.85	12.22
2013	15.41	14.99	15.55	14.10	14.16	14.57	13.27	14.28	14.11	15.72	14.02	14.08	16.59	12.86
2014	15.99	15.57	16.13	14.65	14.70	15.13	13.78	14.83	14.66	16.31	14.56	14.62	17.20	13.36
2015	16.31	15.92	16.46	14.94	14.96	15.45	14.00	15.12	14.94	16.63	14.83	14.89	17.54	13.55
2016	16.95	16.56	17.10	15.55	15.55	16.07	14.57	15.73	15.55	17.27	15.43	15.49	18.20	14.11
2017	17.74	17.36	17.90	16.31	16.30	16.84	15.29	16.49	16.31	18.07	16.18	16.24	19.02	14.81
2018	18.53	18.14	18.69	17.06	17.04	17.60	16.00	17.24	17.05	18.86	16.92	16.98	19.83	15.50
2019	18.94	18.57	19.11	17.47	17.44	18.02	16.40	17.65	17.47	19.27	17.32	17.39	20.25	15.90
2020	19.30	18.94	19.47	17.84	17.80	18.39	16.75	18.01	17.83	19.63	17.68	17.75	20.61	16.25
2021	19.68	19.31	19.84	18.20	18.15	18.76	17.10	18.37	18.19	20.00	18.04	18.11	20.98	16.59
2022	20.07	19.72	20.23	18.60	18.54	19.15	17.48	18.76	18.59	20.39	18.43	18.49	21.37	16.96
2023	20.40	20.08	20.56	19.03	18.96	19.55	17.97	19.18	19.02	20.70	18.87	18.92	21.61	17.49
2024	20.80	20.49	20.95	19.43	19.35	19.95	18.36	19.58	19.42	21.09	19.26	19.32	22.00	17.88
2025	21.19	20.89	21.34	19.83	19.75	20.35	18.76	19.98	19.82	21.48	19.66	19.72	22.37	18.28
2026	21.81	21.52	21.97	20.46	20.36	20.97	19.37	20.59	20.44	22.10	20.28	20.33	23.00	18.88
2027	22.45	22.17	22.61	21.10	20.99	21.62	19.99	21.23	21.08	22.74	20.91	20.97	23.64	19.50
2028	23.12	22.84	23.27	21.76	21.63	22.28	20.63	21.89	21.73	23.40	21.56	21.62	24.31	20.13
2029	23.80	23.53	23.96	22.43	22.30	22.96	21.29	22.56	22.41	24.08	22.24	22.29	24.99	20.79
2030	27.02	26.69	27.21	25.45	25.20	25.99	23.99	25.55	25.36	27.29	25.12	25.19	28.48	23.36

	C Agriculture Marginal Price	C College Marginal Price	C Construction Marginal Price	C Government Marginal Price	C Health Marginal Price	C Laundry Marginal Price	C Lodging Marginal Price	C Misc Marginal Price	C Office Marginal Price	C Restaurant Marginal Price	C Retail Marginal Price	C School Marginal Price	C TCU Marginal Price	C Warehouse Marginal Price
2009	10.75	10.91	10.84	10.49	9.98	10.36	9.56	10.26	10.17	10.81	10.01	10.12	10.99	9.34
2010	12.40	12.57	12.50	12.12	11.57	11.98	11.13	11.87	11.78	12.47	11.61	11.72	12.66	10.88
2011	13.46	13.63	13.56	13.17	12.60	13.02	12.14	12.91	12.81	13.53	12.64	12.76	13.72	11.89
2012	14.35	14.53	14.45	14.04	13.45	13.89	12.96	13.77	13.67	14.43	13.48	13.61	14.63	12.69
2013	15.07	15.26	15.17	14.75	14.12	14.59	13.62	14.46	14.35	15.15	14.16	14.29	15.36	13.34
2014	15.65	15.85	15.76	15.31	14.67	15.15	14.14	15.02	14.90	15.73	14.70	14.84	15.95	13.85
2015	15.98	16.20	16.10	15.62	14.91	15.44	14.34	15.30	15.18	16.07	14.96	15.10	16.31	14.02
2016	16.61	16.84	16.74	16.24	15.51	16.05	14.92	15.91	15.78	16.70	15.55	15.71	16.95	14.59
2017	17.40	17.64	17.53	17.01	16.26	16.82	15.64	16.67	16.54	17.50	16.30	16.46	17.76	15.30
2018	18.18	18.42	18.32	17.78	17.00	17.58	16.36	17.42	17.29	18.28	17.04	17.21	18.55	16.01
2019	18.60	18.85	18.74	18.20	17.40	17.99	16.76	17.84	17.70	18.70	17.45	17.62	18.97	16.40
2020	18.97	19.21	19.11	18.56	17.76	18.35	17.11	18.19	18.05	19.07	17.80	17.97	19.34	16.75
2021	19.34	19.59	19.48	18.92	18.11	18.72	17.45	18.56	18.41	19.44	18.16	18.33	19.72	17.09
2022	19.74	19.99	19.88	19.32	18.50	19.10	17.83	18.94	18.80	19.84	18.54	18.72	20.12	17.46
2023	20.09	20.33	20.22	19.70	18.93	19.50	18.30	19.35	19.21	20.19	18.97	19.13	20.45	17.96
2024	20.49	20.73	20.62	20.09	19.32	19.90	18.69	19.74	19.61	20.59	19.37	19.53	20.85	18.35
2025	20.89	21.12	21.02	20.49	19.71	20.29	19.08	20.14	20.00	20.98	19.76	19.92	21.25	18.74
2026	21.52	21.75	21.65	21.11	20.33	20.91	19.69	20.76	20.62	21.61	20.37	20.54	21.88	19.34
2027	22.16	22.40	22.30	21.75	20.96	21.55	20.31	21.39	21.25	22.26	21.00	21.17	22.53	19.95
2028	22.83	23.07	22.96	22.41	21.61	22.20	20.95	22.05	21.90	22.93	21.65	21.82	23.20	20.59
2029	23.51	23.76	23.65	23.09	22.28	22.88	21.61	22.72	22.58	23.61	22.32	22.49	23.89	21.25
2030	26.66	27.11	26.85	26.28	25.12	25.95	24.33	25.74	25.59	26.69	25.21	25.46	27.03	23.87

Southern California Gas Company
2010 California Gas Report
Average and Marginal Gas Price Forecast ($/therm)

Year	Com Price Deflator	C Agriculture Average Price	C College Average Price	C Construction Average Price	C Government Average Price	C Health Average Price	C Laundry Average Price	C Lodging Average Price	C Misc Average Price	C Office Average Price	C Restaurant Average Price	C Retail Average Price	C School Average Price	C TCU Average Price	C Warehouse Average Price
2009	100.00	0.8160	0.7812	0.8266	0.7120	0.7193	0.7490	0.6489	0.7273	0.7133	0.8410	0.7069	0.7115	0.9102	0.6175
2010	100.59	1.0534	1.0188	1.0642	0.9491	0.9562	0.9863	0.8855	0.9644	0.9504	1.0785	0.9438	0.9485	1.1479	0.8539
2011	102.33	1.1254	1.0908	1.1361	1.0210	1.0280	1.0582	0.9572	1.0363	1.0222	1.1504	1.0157	1.0204	1.2198	0.9256
2012	104.52	1.1411	1.1060	1.1516	1.0378	1.0458	1.0745	0.9761	1.0532	1.0392	1.1661	1.0331	1.0378	1.2348	0.9452
2013	106.76	1.2004	1.1661	1.2113	1.0955	1.1021	1.1330	1.0308	1.1107	1.0967	1.2255	1.0900	1.0946	1.2953	0.9988
2014	108.74	1.2468	1.2130	1.2579	1.1406	1.1460	1.1788	1.0734	1.1556	1.1415	1.2720	1.1342	1.1389	1.3426	1.0405
2015	111.27	1.2783	1.2450	1.2896	1.1710	1.1755	1.2098	1.1017	1.1858	1.1718	1.3035	1.1640	1.1687	1.3749	1.0680
2016	113.73	1.3213	1.2897	1.3332	1.2102	1.2113	1.2510	1.1336	1.2245	1.2103	1.3468	1.2009	1.2057	1.4206	1.0973
2017	116.13	1.3611	1.3301	1.3733	1.2489	1.2491	1.2903	1.1701	1.2630	1.2489	1.3867	1.2389	1.2438	1.4613	1.1331
2018	118.42	1.4010	1.3704	1.4133	1.2877	1.2870	1.3297	1.2070	1.3017	1.2876	1.4266	1.2772	1.2821	1.5019	1.1693
2019	120.64	1.4419	1.4118	1.4544	1.3277	1.3261	1.3701	1.2451	1.3415	1.3273	1.4676	1.3165	1.3215	1.5435	1.2067
2020	122.75	1.4843	1.4546	1.4970	1.3691	1.3668	1.4121	1.2848	1.3828	1.3687	1.5101	1.3574	1.3624	1.5866	1.2457
2021	124.87	1.5279	1.4987	1.5408	1.4118	1.4087	1.4553	1.3257	1.4254	1.4112	1.5538	1.3996	1.4046	1.6309	1.2860
2022	127.09	1.5636	1.5348	1.5766	1.4465	1.4424	1.4905	1.3584	1.4599	1.4457	1.5895	1.4336	1.4387	1.6672	1.3181
2023	129.31	1.6099	1.5816	1.6232	1.4919	1.4869	1.5364	1.4019	1.5051	1.4909	1.6359	1.4784	1.4835	1.7143	1.3609
2024	131.72	1.7697	1.7419	1.7832	1.6506	1.6447	1.6957	1.5586	1.6637	1.6495	1.7958	1.6365	1.6416	1.8749	1.5168
2025	134.23	1.8343	1.8069	1.8479	1.7140	1.7072	1.7597	1.6199	1.7270	1.7127	1.8604	1.6993	1.7044	1.9402	1.5774
2026	136.83	1.9019	1.8751	1.9158	1.7805	1.7727	1.8268	1.6842	1.7933	1.7790	1.9282	1.7651	1.7703	2.0087	1.6409
2027	139.51	1.9728	1.9465	1.9869	1.8502	1.8413	1.8971	1.7516	1.8628	1.8485	1.9991	1.8341	1.8393	2.0805	1.7075
2028	142.32	2.0473	2.0215	2.0616	1.9235	1.9135	1.9710	1.8225	1.9359	1.9216	2.0737	1.9066	1.9118	2.1558	1.7775
2029	145.21	2.1253	2.1002	2.1398	2.0002	1.9891	2.0484	1.8968	2.0124	1.9981	2.1518	1.9826	1.9879	2.2348	1.8509
2030	148.18	2.2070	2.1825	2.2218	2.0806	2.0684	2.1295	1.9746	2.0926	2.0783	2.2336	2.0621	2.0675	2.3175	1.9279

Year	Com Price Deflator	C Agriculture Marginal Price	C College Marginal Price	C Construction Marginal Price	C Government Marginal Price	C Health Marginal Price	C Laundry Marginal Price	C Lodging Marginal Price	C Misc Marginal Price	C Office Marginal Price	C Restaurant Marginal Price	C Retail Marginal Price	C School Marginal Price	C TCU Marginal Price	C Warehouse Marginal Price
2009	100.00	0.6850	0.6982	0.6924	0.6627	0.6194	0.6515	0.5841	0.6431	0.6354	0.6904	0.6219	0.6310	0.7052	0.5647
2010	100.59	0.9220	0.9353	0.9295	0.8995	0.8558	0.8882	0.8202	0.8797	0.8719	0.9274	0.8584	0.8675	0.9424	0.8006
2011	102.33	0.9938	1.0072	1.0014	0.9713	0.9275	0.9600	0.8919	0.9515	0.9437	0.9993	0.9301	0.9393	1.0143	0.8723
2012	104.52	1.0112	1.0241	1.0185	0.9893	0.9469	0.9784	0.9123	0.9701	0.9626	1.0165	0.9494	0.9583	1.0310	0.8933
2013	106.76	1.0681	1.0817	1.0758	1.0453	1.0009	1.0339	0.9648	1.0252	1.0173	1.0736	1.0035	1.0128	1.0889	0.9449
2014	108.74	1.1125	1.1266	1.1204	1.0888	1.0429	1.0770	1.0054	1.0680	1.0599	1.1182	1.0455	1.0552	1.1340	0.9848
2015	111.27	1.1424	1.1568	1.1505	1.1180	1.0706	1.1058	1.0321	1.0965	1.0881	1.1482	1.0734	1.0834	1.1645	1.0108
2016	113.73	1.1796	1.1955	1.1885	1.1528	1.1008	1.1394	1.0585	1.1293	1.1200	1.1861	1.1039	1.1148	1.2039	1.0351
2017	116.13	1.2177	1.2340	1.2269	1.1902	1.1369	1.1765	1.0934	1.1660	1.1566	1.2243	1.1400	1.1512	1.2427	1.0694
2018	118.42	1.2561	1.2727	1.2655	1.2279	1.1733	1.2139	1.1288	1.2032	1.1935	1.2629	1.1765	1.1880	1.2816	1.1043
2019	120.64	1.2955	1.3125	1.3051	1.2667	1.2109	1.2524	1.1654	1.2414	1.2315	1.3024	1.2142	1.2259	1.3216	1.1404
2020	122.75	1.3365	1.3539	1.3463	1.3071	1.2502	1.2925	1.2037	1.2813	1.2712	1.3436	1.2535	1.2655	1.3631	1.1782
2021	124.87	1.3787	1.3965	1.3887	1.3488	1.2907	1.3338	1.2433	1.3224	1.3121	1.3859	1.2941	1.3063	1.4059	1.2173
2022	127.09	1.4129	1.4310	1.4231	1.3823	1.3230	1.3670	1.2746	1.3554	1.3449	1.4202	1.3264	1.3389	1.4406	1.2480
2023	129.31	1.4578	1.4762	1.4682	1.4266	1.3660	1.4110	1.3167	1.3991	1.3884	1.4653	1.3695	1.3823	1.4860	1.2895
2024	131.72	1.6159	1.6348	1.6266	1.5841	1.5222	1.5681	1.4718	1.5560	1.5451	1.6236	1.5258	1.5388	1.6448	1.4440
2025	134.23	1.6788	1.6981	1.6897	1.6462	1.5830	1.6299	1.5315	1.6176	1.6064	1.6866	1.5867	1.6000	1.7083	1.5031
2026	136.83	1.7447	1.7644	1.7558	1.7114	1.6468	1.6948	1.5941	1.6821	1.6707	1.7527	1.6505	1.6641	1.7749	1.5651
2027	139.51	1.8138	1.8340	1.8252	1.7797	1.7137	1.7627	1.6598	1.7498	1.7381	1.8220	1.7175	1.7314	1.8447	1.6301
2028	142.32	1.8864	1.9070	1.8980	1.8515	1.7840	1.8341	1.7289	1.8209	1.8089	1.8948	1.7879	1.8021	1.9180	1.6985
2029	145.21	1.9625	1.9836	1.9744	1.9268	1.8577	1.9090	1.8013	1.8955	1.8832	1.9711	1.8617	1.8763	1.9948	1.7702
2030	148.18	2.0422	2.0638	2.0544	2.0057	1.9349	1.9875	1.8772	1.9736	1.9611	2.0510	1.9391	1.9540	2.0753	1.8455

Southern California Gas Company
2010 California Gas Report
2009 Historical Data

Segment	2009 Therm Sales	2009 Meter Count	2009 Meter Count, Existing/Old customers	2009 Meter Count New Customers	Avg Use Per Meter Existing Customers	Avg Use Per Meter New Customers	Price Elasticity
Office	65,091,877	40,544	40,182	362	1,573	2,361	-0.072000
Restaurant	241,487,733	36,825	36,310	515	6,446	7,102	-0.001000
Retail	55,908,522	27,213	26,971	242	2,017	2,621	-0.032000
Laundry	63,475,597	4,656	4,622	34	13,371	19,911	-0.026000
Warehouse	17,879,201	7,927	7,886	41	2,212	3,845	0.000000
School	39,735,837	6,742	6,703	39	5,795	6,919	-0.103000
College	25,935,865	2,587	2,544	43	9,894	8,331	-0.090000
Health	54,726,480	7,995	7,955	40	6,669	20,296	-0.052000
Lodging	56,683,348	4,938	4,865	73	11,187	18,773	-0.013000
Misc	72,108,301	34,943	34,650	293	1,993	6,503	-0.030000
Government	25,750,785	3,713	3,666	47	6,850	4,964	-0.061000
TCU	38,152,605	7,556	7,497	59	4,823	23,720	-0.062000
Construction	6,660,877	6,008	5,921	87	1,021	5,876	-0.179000
Agriculture	35,828,421	1,607	1,600	7	21,933	24,714	-0.059000

Southern California Gas Company
2010 California Gas Report - Commercial G10
Average Use Per Meter therm

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other	Total Building
Office	533	221	27	9	7	28	6	9	27	8	531	1,405
Restaurant	406	786	1,312	540	1,036	1,147	279	16	7	0	258	5,787
Retail	359	218	79	13	88	152	94	21	40	3	497	1,566
Laundry	35	563	5	1	1	7	0	1	5,657	0	5,268	11,538
Warehouse	430	125	18	5	43	49	63	49	143	42	1,382	2,348
School	3,050	1,028	174	13	39	319	33	39	6	42	893	5,635
College	3,954	1,953	191	56	98	235	54	247	60	84	2,690	9,623
Health	1,510	946	152	29	41	117	66	27	208	15	1,597	4,708
Lodging	1,513	3,090	426	104	133	519	256	25	805	1	3,492	10,363
Misc	677	413	84	17	28	69	22	70	27	5	457	1,868
Governmen	2,496	1,451	128	63	37	105	57	67	34	369	978	5,784
TCU	814	293	26	6	12	23	15	40	3	1,278	1,351	3,860
Constructio	268	84	7	0	1	4	2	8	50	0	395	819
Agriculture	2,621	635	108	18	224	499	453	6	661	4,334	8,751	18,309

Southern California Gas Company
2010 California Gas Report
Use Per Meter for New Customers therm

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
2010 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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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	p	f	e	bname	pname	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	n	f	e	bname	nname	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	pname	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
2010 California Gas Report
Employment (in millions)

YEAR	Office	Restaurant	Retail	Laundry	Warehouse	School	College	Health	Lodging	Misc	Government	TCU	Construction	Agriculture	Total
2009	1.05776	0.57201	0.93330	0.08201	0.42081	0.62579	0.20787	0.75906	0.09892	0.23633	0.64169	0.54962	0.34000	0.22998	6.75515
2010	1.08106	0.57169	0.93286	0.08220	0.42062	0.61293	0.20360	0.76930	0.09839	0.23688	0.63760	0.53829	0.30355	0.22566	6.71463
2011	1.14374	0.59239	0.96663	0.08271	0.42381	0.60803	0.20197	0.78130	0.09882	0.23835	0.62439	0.55625	0.30718	0.23030	6.85588
2012	1.18872	0.59676	0.97889	0.08594	0.45780	0.62098	0.20627	0.81671	0.09899	0.22379	0.63375	0.57509	0.37737	0.23956	7.10061
2013	1.24457	0.61243	0.99933	0.08296	0.43825	0.63268	0.21016	0.80657	0.10116	0.23908	0.64154	0.58678	0.38346	0.24306	7.22206
2014	1.27093	0.61798	1.00839	0.08346	0.44242	0.64432	0.21403	0.81736	0.10204	0.24051	0.65049	0.59805	0.40684	0.24721	7.34404
2015	1.28815	0.62354	1.01745	0.08360	0.44494	0.65077	0.21617	0.82973	0.10263	0.24091	0.65519	0.60842	0.42270	0.25199	7.43619
2016	1.31356	0.62680	1.02276	0.08357	0.44727	0.65479	0.21751	0.84419	0.10319	0.24083	0.65796	0.61736	0.43275	0.25722	7.51975
2017	1.33991	0.63120	1.02995	0.08355	0.44965	0.65897	0.21889	0.85802	0.10378	0.24076	0.66099	0.62711	0.44173	0.26239	7.60690
2018	1.37068	0.63535	1.03671	0.08346	0.45253	0.66416	0.22062	0.87226	0.10439	0.24052	0.66492	0.63477	0.45150	0.26744	7.69931
2019	1.40873	0.63822	1.04140	0.08342	0.45566	0.66971	0.22246	0.88520	0.10520	0.24038	0.66911	0.63866	0.46247	0.27200	7.79260
2020	1.44774	0.64177	1.04720	0.08355	0.45719	0.67577	0.22448	0.89528	0.10598	0.24077	0.67588	0.64124	0.47542	0.27508	7.88735
2021	1.48643	0.64676	1.05534	0.08401	0.45766	0.68212	0.22658	0.90524	0.10677	0.24209	0.67450	0.64760	0.48883	0.27843	7.98239
2022	1.51790	0.65149	1.06306	0.08453	0.46112	0.68843	0.22868	0.91469	0.10769	0.24359	0.67935	0.65665	0.50082	0.28198	8.07999
2023	1.55036	0.65606	1.07051	0.08501	0.46439	0.69438	0.23066	0.92540	0.10865	0.24499	0.68391	0.66668	0.51164	0.28571	8.17834
2024	1.58504	0.65996	1.07688	0.08550	0.46780	0.69977	0.23245	0.93644	0.10956	0.24640	0.68797	0.67704	0.52199	0.28949	8.27631
2025	1.62050	0.66428	1.08392	0.08603	0.47103	0.70536	0.23430	0.94717	0.11048	0.24793	0.69221	0.68658	0.53183	0.29326	8.37490
2026	1.65407	0.66878	1.09127	0.08661	0.47213	0.71112	0.23622	0.95856	0.11145	0.24958	0.69656	0.69502	0.54156	0.29707	8.46999
2027	1.68709	0.67399	1.09977	0.08714	0.47350	0.71642	0.23798	0.97110	0.11250	0.25112	0.70051	0.70291	0.55258	0.30128	8.56789
2028	1.72145	0.67951	1.10878	0.08767	0.47481	0.72154	0.23968	0.98354	0.11356	0.25265	0.70431	0.71012	0.56153	0.30543	8.66457
2029	1.75791	0.68475	1.11733	0.08818	0.47583	0.72638	0.24129	0.99627	0.11468	0.25410	0.70787	0.71349	0.56853	0.30936	8.75596
2030	1.79639	0.68935	1.12484	0.08865	0.47592	0.73075	0.24274	1.00824	0.11574	0.25546	0.71540	0.71556	0.57434	0.31341	8.84680

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2010	4.67	6.72	5.08	4.70	9.73	5.42	9.80	12.71	12.14	10.30	8.06	5.59	94.92
2011	4.33	6.24	4.71	4.36	9.03	5.03	9.10	11.80	11.28	9.56	7.49	5.19	88.14
2012	4.00	5.76	4.35	4.03	8.34	4.65	8.40	10.90	10.41	8.83	6.91	4.79	81.36
2013	4.00	5.76	4.35	4.03	8.34	4.65	8.40	10.90	10.41	8.83	6.91	4.79	81.36
2014	3.67	5.28	3.99	3.69	7.64	4.26	7.70	9.99	9.54	8.09	6.34	4.39	74.58
2015	3.67	5.28	3.99	3.69	7.64	4.26	7.70	9.99	9.54	8.09	6.34	4.39	74.58
2016	3.33	4.80	3.63	3.36	6.95	3.87	7.00	9.08	8.67	7.35	5.76	3.99	67.80
2017	3.33	4.80	3.63	3.36	6.95	3.87	7.00	9.08	8.67	7.35	5.76	3.99	67.80
2018	3.00	4.32	3.26	3.02	6.25	3.48	6.30	8.17	7.81	6.62	5.18	3.59	61.02
2019	2.67	3.84	2.90	2.68	5.56	3.10	5.60	7.26	6.94	5.88	4.61	3.19	54.24
2020	2.67	3.84	2.90	2.68	5.56	3.10	5.60	7.26	6.94	5.88	4.61	3.19	54.24
2021	2.33	3.36	2.54	2.35	4.86	2.71	4.90	6.36	6.07	5.15	4.03	2.79	47.46
2022	2.33	3.36	2.54	2.35	4.86	2.71	4.90	6.36	6.07	5.15	4.03	2.79	47.46
2023	2.00	2.88	2.18	2.01	4.17	2.32	4.20	5.45	5.20	4.41	3.46	2.39	40.68
2024	2.00	2.88	2.18	2.01	4.17	2.32	4.20	5.45	5.20	4.41	3.46	2.39	40.68
2025	1.67	2.40	1.81	1.68	3.47	1.94	3.50	4.54	4.34	3.68	2.88	2.00	33.90
2026	1.67	2.40	1.81	1.68	3.47	1.94	3.50	4.54	4.34	3.68	2.88	2.00	33.90
2027	1.33	1.92	1.45	1.34	2.78	1.55	2.80	3.63	3.47	2.94	2.30	1.60	27.12
2028	1.33	1.92	1.45	1.34	2.78	1.55	2.80	3.63	3.47	2.94	2.30	1.60	27.12
2029	0.67	0.96	0.73	0.67	1.39	0.77	1.40	1.82	1.73	1.47	1.15	0.80	13.56
2030	0.67	0.96	0.73	0.67	1.39	0.77	1.40	1.82	1.73	1.47	1.15	0.80	13.56

Southern California Gas Company
2010 California Gas Report
Gas Engine Mdth

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2,010	48	72	109	177	220	266	289	288	270	169	123	79	2,110
2,011	48	72	109	176	219	266	288	287	270	169	123	78	2,105
2,012	48	71	109	176	219	265	288	287	269	169	122	78	2,102
2,013	48	71	109	176	219	265	288	286	269	169	122	78	2,099
2,014	48	71	108	176	219	265	287	286	269	168	122	78	2,097
2,015	48	71	108	176	218	264	287	286	268	168	122	78	2,094
2,016	47	71	108	175	218	264	286	285	268	168	122	78	2,091
2,017	47	71	108	175	218	263	286	285	267	168	122	78	2,086
2,018	47	71	108	175	217	263	285	284	267	167	121	78	2,083
2,019	47	71	108	174	217	263	285	284	266	167	121	77	2,080
2,020	47	70	107	174	216	262	284	283	265	166	121	77	2,072
2,021	47	70	107	173	216	261	283	282	265	166	120	77	2,067
2,022	47	70	107	173	215	260	282	281	264	166	120	77	2,062
2,023	47	70	106	172	214	260	282	281	263	165	120	77	2,056
2,024	46	69	106	171	213	258	280	279	262	164	119	76	2,045
2,025	46	69	106	171	213	257	279	278	261	164	119	76	2,040
2,026	46	69	105	171	212	257	279	278	261	163	119	76	2,034
2,027	46	69	105	170	211	256	278	276	260	163	118	75	2,026
2,028	46	68	104	169	210	254	276	275	258	162	117	75	2,013
2,029	45	68	104	168	209	253	274	273	256	161	117	74	2,002
2,030	45	67	102	166	206	250	271	270	253	159	115	74	1,978
2,031	42	57	101	173	209	256	263	265	254	167	113	64	1,964
2,032	45	67	102	164	204	246	268	267	250	157	113	72	1,956
2,033	44	66	102	163	204	245	268	266	250	157	113	72	1,950
2,034	44	66	101	162	202	244	266	264	248	156	112	71	1,937

Southern California Gas Company
2010 California Gas Report: Commercial G10
Core Commercial Demand Forecast (Mdth)
Average Temperature

Year	Model Output G10 Commercial	AMI	DSM (EE)	G10 Post Energy Savings	Vernon	SGIP+ G30 Noncore to Core Add On	COMM G10
2009	79,943	0		79,943		159	80,101
2010	78,811	0	388	78,423	271	212	78,364
2011	79,873	160	824	78,890	271	265	78,884
2012	80,687	323	1,287	79,078	271	285	79,092
2013	81,532	489	1,750	79,292	271	305	79,327
2014	81,979	656	2,213	79,110	271	325	79,165
2015	82,421	824	2,676	78,920	271	345	78,995
2016	82,717	827	3,139	78,751	271	365	78,845
2017	83,069	831	3,602	78,636	271	385	78,751
2018	83,415	834	4,065	78,516	271	385	78,630
2019	83,694	837	4,528	78,329	271	385	78,443
2020	84,000	840	4,991	78,169	271	385	78,284
2021	84,360	844	5,454	78,062	271	385	78,177
2022	84,783	848	5,917	78,018	271	385	78,132
2023	85,169	852	6,380	77,937	271	385	78,052
2024	85,153	852	3,101	81,200	271	385	81,315
2025	85,488	855	6,176	78,457	271	385	78,572
2026	85,820	858	6,203	78,759	271	385	78,873
2027	86,183	862	6,203	79,119	271	385	79,233
2028	86,559	866	6,203	79,490	271	385	79,605
2029	86,899	869	6,203	79,827	271	385	79,942
2030	87,219	872	6,203	80,144	271	385	80,258

Southern California Gas Company
2010 California Gas Report
Average Year G10 Load Forecast (Monthly) Mdth

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	8,975	8,305	7,304	6,412	6,103	5,569	5,024	4,906	5,284	5,408	7,632	9,179
2010	8,782	8,127	7,149	6,277	5,976	5,455	4,923	4,808	5,161	5,281	7,456	8,969
2011	8,838	8,178	7,196	6,318	6,016	5,492	4,957	4,841	5,196	5,318	7,505	9,028
2012	8,859	8,198	7,214	6,334	6,032	5,506	4,971	4,855	5,211	5,333	7,526	9,053
2013	8,883	8,221	7,234	6,353	6,049	5,523	4,986	4,870	5,228	5,350	7,549	9,080
2014	8,863	8,203	7,218	6,339	6,037	5,512	4,976	4,861	5,218	5,341	7,535	9,062
2015	8,842	8,184	7,201	6,325	6,024	5,500	4,966	4,852	5,208	5,330	7,520	9,044
2016	8,823	8,166	7,187	6,312	6,012	5,490	4,957	4,843	5,199	5,322	7,506	9,027
2017	8,811	8,155	7,177	6,304	6,004	5,483	4,952	4,838	5,194	5,316	7,498	9,017
2018	8,797	8,143	7,166	6,294	5,995	5,475	4,944	4,831	5,186	5,308	7,487	9,004
2019	8,776	8,123	7,149	6,279	5,981	5,462	4,933	4,819	5,173	5,296	7,469	8,982
2020	8,758	8,107	7,134	6,267	5,969	5,451	4,923	4,810	5,163	5,285	7,454	8,964
2021	8,746	8,095	7,125	6,258	5,961	5,444	4,916	4,803	5,156	5,278	7,444	8,952
2022	8,741	8,091	7,121	6,255	5,957	5,440	4,913	4,800	5,153	5,275	7,439	8,947
2023	8,732	8,082	7,113	6,248	5,951	5,435	4,908	4,795	5,148	5,269	7,432	8,937
2024	9,098	8,421	7,411	6,510	6,200	5,662	5,113	4,995	5,362	5,489	7,742	9,311
2025	8,791	8,136	7,161	6,290	5,991	5,471	4,941	4,827	5,182	5,304	7,481	8,997
2026	8,824	8,168	7,188	6,314	6,014	5,492	4,960	4,846	5,202	5,325	7,510	9,031
2027	8,865	8,205	7,221	6,343	6,041	5,517	4,982	4,868	5,225	5,349	7,544	9,073
2028	8,907	8,244	7,255	6,373	6,070	5,543	5,005	4,891	5,250	5,374	7,579	9,115
2029	8,944	8,279	7,286	6,400	6,095	5,566	5,027	4,911	5,272	5,397	7,611	9,154
2030	8,980	8,312	7,315	6,425	6,119	5,588	5,046	4,931	5,293	5,418	7,642	9,190

Southern California Gas Company
2010 California Gas Report
Cold Year G10 Load Forecast (Monthly) Mdth

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	9,808	9,001	7,795	6,721	6,349	5,707	5,052	4,906	5,362	5,507	8,187	10,049
2010	9,600	8,810	7,631	6,581	6,217	5,590	4,950	4,808	5,237	5,379	8,000	9,822
2011	9,660	8,865	7,680	6,624	6,258	5,628	4,985	4,841	5,273	5,416	8,053	9,886
2012	9,683	8,887	7,699	6,641	6,275	5,643	4,998	4,855	5,288	5,431	8,074	9,913
2013	9,710	8,911	7,721	6,660	6,293	5,660	5,014	4,870	5,305	5,449	8,099	9,943
2014	9,688	8,891	7,704	6,646	6,280	5,648	5,004	4,861	5,295	5,439	8,083	9,923
2015	9,665	8,871	7,686	6,631	6,266	5,636	4,994	4,852	5,285	5,428	8,067	9,903
2016	9,644	8,852	7,671	6,617	6,254	5,626	4,985	4,843	5,276	5,419	8,052	9,884
2017	9,631	8,840	7,660	6,609	6,246	5,619	4,979	4,838	5,270	5,414	8,044	9,873
2018	9,616	8,826	7,649	6,599	6,236	5,611	4,972	4,831	5,262	5,406	8,031	9,858
2019	9,593	8,805	7,630	6,583	6,222	5,597	4,960	4,819	5,250	5,393	8,012	9,835
2020	9,573	8,787	7,615	6,570	6,209	5,586	4,950	4,810	5,239	5,382	7,996	9,815
2021	9,560	8,775	7,604	6,561	6,200	5,578	4,943	4,803	5,232	5,375	7,985	9,801
2022	9,555	8,770	7,600	6,557	6,197	5,575	4,940	4,800	5,229	5,371	7,980	9,796
2023	9,545	8,761	7,592	6,550	6,191	5,569	4,935	4,795	5,224	5,366	7,972	9,786
2024	9,945	9,128	7,910	6,824	6,449	5,802	5,141	4,995	5,441	5,590	8,305	10,195
2025	9,609	8,819	7,643	6,594	6,232	5,606	4,968	4,827	5,258	5,402	8,025	9,851
2026	9,646	8,853	7,672	6,619	6,256	5,628	4,987	4,846	5,278	5,422	8,056	9,888
2027	9,690	8,894	7,707	6,649	6,284	5,654	5,010	4,868	5,302	5,447	8,093	9,934
2028	9,735	8,936	7,744	6,681	6,314	5,680	5,033	4,891	5,327	5,472	8,131	9,980
2029	9,777	8,974	7,776	6,709	6,341	5,704	5,055	4,911	5,350	5,495	8,165	10,022
2030	9,815	9,009	7,807	6,735	6,366	5,727	5,075	4,931	5,371	5,517	8,197	10,062

Southern California Gas Company
2010 California Gas Report
Hot Year G10 Load Forecast (Monthly) Mdth

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	8,141	7,609	6,813	6,103	5,858	5,441	5,003	4,906	5,206	5,309	7,080	8,311
2010	7,965	7,444	6,667	5,974	5,735	5,329	4,902	4,808	5,084	5,184	6,913	8,117
2011	8,015	7,492	6,711	6,014	5,774	5,365	4,936	4,841	5,120	5,220	6,960	8,171
2012	8,034	7,510	6,728	6,029	5,789	5,380	4,950	4,855	5,134	5,235	6,979	8,193
2013	8,057	7,531	6,747	6,047	5,806	5,396	4,965	4,870	5,150	5,252	7,001	8,219
2014	8,038	7,514	6,732	6,034	5,794	5,385	4,955	4,861	5,141	5,243	6,988	8,203
2015	8,019	7,497	6,716	6,020	5,781	5,374	4,945	4,852	5,131	5,233	6,974	8,186
2016	8,002	7,481	6,703	6,008	5,770	5,364	4,936	4,843	5,122	5,224	6,962	8,172
2017	7,991	7,471	6,694	6,001	5,763	5,357	4,931	4,838	5,117	5,219	6,955	8,163
2018	7,979	7,459	6,684	5,991	5,754	5,349	4,924	4,831	5,109	5,211	6,944	8,151
2019	7,960	7,441	6,668	5,977	5,740	5,337	4,912	4,819	5,097	5,199	6,928	8,131
2020	7,943	7,426	6,654	5,965	5,729	5,326	4,902	4,810	5,087	5,188	6,913	8,115
2021	7,932	7,416	6,645	5,957	5,721	5,318	4,895	4,803	5,080	5,181	6,904	8,104
2022	7,928	7,412	6,641	5,953	5,718	5,315	4,892	4,800	5,077	5,178	6,900	8,099
2023	7,920	7,404	6,634	5,947	5,712	5,310	4,887	4,795	5,072	5,173	6,893	8,091
2024	8,252	7,715	6,912	6,196	5,951	5,532	5,091	4,995	5,283	5,388	7,181	8,429
2025	7,973	7,453	6,679	5,987	5,750	5,345	4,920	4,827	5,105	5,207	6,939	8,145
2026	8,003	7,482	6,704	6,010	5,772	5,366	4,939	4,846	5,125	5,227	6,965	8,176
2027	8,040	7,516	6,735	6,037	5,798	5,390	4,961	4,868	5,148	5,251	6,997	8,213
2028	8,078	7,552	6,767	6,066	5,825	5,415	4,984	4,891	5,172	5,276	7,030	8,252
2029	8,112	7,584	6,795	6,091	5,850	5,438	5,006	4,911	5,194	5,298	7,060	8,287
2030	8,144	7,614	6,822	6,116	5,873	5,460	5,025	4,931	5,215	5,319	7,088	8,319

Southern California Gas Company
2010 California Gas Report
Base (Zero Hdd) Year G10 Load Forecast (Monthly) Mdth

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	4,898	4,899	4,900	4,901	4,902	4,904	4,905	4,906	4,924	4,925	4,926	4,927
2010	4,783	4,785	4,791	4,795	4,798	4,802	4,806	4,808	4,807	4,808	4,801	4,798
2011	4,814	4,817	4,823	4,828	4,831	4,835	4,839	4,841	4,841	4,842	4,835	4,832
2012	4,826	4,829	4,836	4,840	4,844	4,848	4,852	4,855	4,855	4,856	4,849	4,846
2013	4,839	4,843	4,849	4,854	4,858	4,863	4,867	4,870	4,870	4,872	4,865	4,863
2014	4,829	4,832	4,839	4,844	4,848	4,853	4,858	4,861	4,861	4,863	4,857	4,855
2015	4,817	4,821	4,828	4,834	4,838	4,843	4,848	4,852	4,852	4,854	4,848	4,846
2016	4,807	4,811	4,819	4,824	4,829	4,834	4,840	4,843	4,844	4,846	4,841	4,839
2017	4,800	4,804	4,812	4,818	4,823	4,829	4,834	4,838	4,839	4,842	4,836	4,835
2018	4,793	4,797	4,805	4,811	4,816	4,821	4,827	4,831	4,832	4,834	4,829	4,827
2019	4,782	4,786	4,794	4,800	4,804	4,810	4,816	4,819	4,820	4,823	4,818	4,816
2020	4,772	4,776	4,784	4,790	4,795	4,800	4,806	4,810	4,811	4,813	4,808	4,806
2021	4,765	4,769	4,777	4,783	4,788	4,794	4,799	4,803	4,804	4,806	4,801	4,800
2022	4,762	4,767	4,774	4,780	4,785	4,791	4,797	4,800	4,801	4,804	4,799	4,797
2023	4,758	4,762	4,770	4,776	4,780	4,786	4,792	4,795	4,796	4,799	4,794	4,792
2024	4,957	4,961	4,969	4,975	4,980	4,986	4,991	4,995	4,996	4,999	4,993	4,992
2025	4,789	4,793	4,801	4,807	4,812	4,818	4,823	4,827	4,828	4,831	4,825	4,824
2026	4,808	4,812	4,820	4,826	4,831	4,836	4,842	4,846	4,847	4,849	4,844	4,842
2027	4,830	4,834	4,842	4,848	4,853	4,858	4,864	4,868	4,869	4,871	4,866	4,864
2028	4,853	4,857	4,865	4,871	4,876	4,881	4,887	4,891	4,892	4,894	4,889	4,887
2029	4,873	4,877	4,885	4,891	4,896	4,902	4,907	4,911	4,912	4,915	4,909	4,908
2030	4,893	4,897	4,905	4,911	4,916	4,921	4,927	4,931	4,932	4,934	4,929	4,927

G10 INDUSTRIAL DATA TABLES

Southern California Gas Company
2010 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
2010 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
2009	16.31	15.11	15.28	16.03	16.09	14.82	16.14	15.74	16.74	18.39	17.37
2010	12.29	11.62	11.72	12.14	12.17	11.47	12.19	11.98	12.53	13.44	12.88
2011	14.08	13.37	13.48	13.92	13.95	13.21	13.98	13.75	14.34	15.30	14.71
2012	15.31	14.57	14.68	15.14	15.17	14.40	15.20	14.96	15.57	16.58	15.96
2013	16.35	15.57	15.69	16.16	16.21	15.39	16.23	15.98	16.62	17.67	17.02
2014	17.20	16.40	16.51	17.01	17.06	16.21	17.09	16.82	17.49	18.57	17.90
2015	17.89	17.05	17.17	17.69	17.74	16.85	17.77	17.50	18.19	19.30	18.61
2016	18.27	17.38	17.51	18.06	18.12	17.16	18.15	17.86	18.60	19.77	19.04
2017	19.05	18.13	18.26	18.82	18.89	17.90	18.93	18.63	19.39	20.59	19.84
2018	20.00	19.05	19.18	19.77	19.84	18.81	19.88	19.57	20.36	21.60	20.82
2019	20.94	19.96	20.10	20.70	20.78	19.71	20.82	20.50	21.32	22.59	21.79
2020	21.46	20.47	20.60	21.22	21.29	20.22	21.33	21.01	21.84	23.12	22.31
2021	21.89	20.89	21.03	21.64	21.72	20.64	21.76	21.44	22.27	23.55	22.74
2022	22.33	21.32	21.45	22.07	22.16	21.06	22.20	21.87	22.71	24.01	23.19
2023	22.79	21.77	21.91	22.54	22.62	21.52	22.66	22.34	23.18	24.48	23.66
2024	23.26	22.31	22.44	23.02	23.10	22.07	23.14	22.83	23.62	24.83	24.06
2025	23.73	22.78	22.91	23.49	23.57	22.54	23.62	23.31	24.10	25.30	24.54
2026	24.20	23.25	23.38	23.96	24.04	23.01	24.09	23.78	24.57	25.76	25.00
2027	24.94	23.98	24.11	24.70	24.78	23.74	24.83	24.52	25.31	26.51	25.75
2028	25.70	24.74	24.87	25.46	25.54	24.49	25.59	25.28	26.08	27.29	26.52
2029	26.48	25.51	25.64	26.24	26.33	25.26	26.37	26.06	26.87	28.08	27.31
2030	27.29	26.31	26.44	27.04	27.13	26.05	27.18	26.86	27.68	28.90	28.12

(b) Marginal Price Forecasat

Year	Chemical	Fab Metal	Food	Mining	Petroleum	Prim Metal	Stone	Textile	Transport	Wood Paper	Misc
2009	12.88	12.29	12.32	12.68	12.75	12.15	12.71	12.51	12.91	13.89	13.32
2010	9.70	9.38	9.40	9.59	9.63	9.31	9.61	9.50	9.72	10.25	9.94
2011	11.11	10.78	10.80	11.00	11.04	10.70	11.02	10.90	11.13	11.69	11.36
2012	12.08	11.73	11.75	11.96	12.00	11.65	11.98	11.86	12.10	12.67	12.34
2013	12.90	12.53	12.55	12.78	12.82	12.45	12.79	12.67	12.92	13.52	13.17
2014	13.57	13.19	13.21	13.44	13.49	13.10	13.46	13.33	13.59	14.23	13.86
2015	14.11	13.71	13.74	13.98	14.03	13.62	14.00	13.86	14.14	14.80	14.41
2016	14.42	13.98	14.01	14.27	14.33	13.88	14.29	14.15	14.44	15.17	14.74
2017	15.03	14.58	14.60	14.88	14.93	14.48	14.90	14.75	15.06	15.81	15.37
2018	15.78	15.31	15.34	15.63	15.68	15.20	15.65	15.49	15.81	16.59	16.13
2019	16.53	16.04	16.07	16.37	16.42	15.93	16.39	16.22	16.56	17.36	16.89
2020	16.93	16.44	16.47	16.77	16.83	16.33	16.79	16.63	16.96	17.78	17.30
2021	17.27	16.77	16.80	17.11	17.17	16.66	17.13	16.96	17.30	18.13	17.64
2022	17.62	17.11	17.14	17.45	17.51	17.00	17.47	17.30	17.65	18.48	17.99
2023	17.98	17.47	17.50	17.82	17.88	17.36	17.84	17.67	18.02	18.86	18.36
2024	18.35	17.87	17.90	18.19	18.25	17.77	18.21	18.05	18.38	19.17	18.71
2025	18.72	18.25	18.28	18.57	18.62	18.14	18.59	18.43	18.75	19.54	19.08
2026	19.09	18.62	18.65	18.94	18.99	18.51	18.96	18.80	19.12	19.91	19.45
2027	19.68	19.20	19.22	19.52	19.58	19.09	19.54	19.38	19.71	20.51	20.04
2028	20.28	19.79	19.82	20.12	20.18	19.68	20.14	19.97	20.31	21.12	20.64
2029	20.90	20.40	20.43	20.73	20.79	20.29	20.76	20.59	20.93	21.75	21.27
2030	21.53	21.03	21.06	21.37	21.43	20.92	21.39	21.22	21.56	22.39	21.91

Southern California Gas Company
2010 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
2009	**100.00**	0.6410	0.5935	0.6005	0.6299	0.6322	0.5824	0.6340	0.6185	0.6578	0.7225	0.6826
2010	100.59	0.8774	0.8297	0.8367	0.8662	0.8687	0.8185	0.8704	0.8548	0.8944	0.9595	0.9194
2011	102.33	0.9492	0.9013	0.9083	0.9380	0.9404	0.8901	0.9422	0.9266	0.9662	1.0313	0.9912
2012	104.52	0.9683	0.9216	0.9285	0.9575	0.9597	0.9108	0.9614	0.9461	0.9848	1.0488	1.0095
2013	106.76	1.0227	0.9743	0.9814	1.0113	1.0138	0.9629	1.0156	0.9999	1.0399	1.1056	1.0650
2014	108.74	1.0648	1.0152	1.0223	1.0531	1.0559	1.0033	1.0578	1.0416	1.0828	1.1497	1.1083
2015	111.27	1.0928	1.0420	1.0493	1.0807	1.0837	1.0298	1.0857	1.0692	1.1113	1.1794	1.1371
2016	113.73	1.1238	1.0690	1.0767	1.1105	1.1142	1.0556	1.1164	1.0987	1.1441	1.2161	1.1711
2017	116.13	1.1600	1.1041	1.1119	1.1464	1.1503	1.0903	1.1526	1.1345	1.1810	1.2540	1.2082
2018	118.42	1.1967	1.1397	1.1477	1.1827	1.1869	1.1255	1.1892	1.1708	1.2181	1.2922	1.2457
2019	120.64	1.2345	1.1765	1.1845	1.2202	1.2245	1.1620	1.2270	1.2082	1.2564	1.3315	1.2842
2020	122.75	1.2739	1.2149	1.2231	1.2593	1.2639	1.2001	1.2664	1.2473	1.2963	1.3724	1.3244
2021	124.87	1.3146	1.2546	1.2629	1.2997	1.3044	1.2396	1.3070	1.2876	1.3374	1.4145	1.3658
2022	127.09	1.3471	1.2861	1.2945	1.3319	1.3368	1.2707	1.3394	1.3198	1.3704	1.4484	1.3991
2023	129.31	1.3903	1.3283	1.3368	1.3748	1.3799	1.3126	1.3826	1.3626	1.4142	1.4932	1.4431
2024	131.72	1.5467	1.4836	1.4922	1.5309	1.5362	1.4675	1.5390	1.5186	1.5711	1.6512	1.6004
2025	134.23	1.6077	1.5435	1.5522	1.5916	1.5971	1.5270	1.5999	1.5792	1.6327	1.7139	1.6622
2026	136.83	1.6717	1.6063	1.6152	1.6552	1.6609	1.5894	1.6639	1.6428	1.6972	1.7796	1.7271
2027	139.51	1.7388	1.6722	1.6812	1.7220	1.7279	1.6549	1.7309	1.7095	1.7649	1.8485	1.7952
2028	142.32	1.8093	1.7414	1.7506	1.7921	1.7983	1.7238	1.8014	1.7796	1.8361	1.9210	1.8667
2029	145.21	1.8833	1.8141	1.8233	1.8657	1.8721	1.7960	1.8753	1.8530	1.9107	1.9969	1.9417
2030	148.18	1.9608	1.8902	1.8996	1.9428	1.9495	1.8717	1.9527	1.9301	1.9889	2.0764	2.0203

(b) Marginal Price Forecasat

Year	Price Deflator	Chemical	Fabricated Metal	Food	Mining	Petroleum	Primary Metal	Stone	Textile	Transport	Wood_Paper	Misc
2009	**100.00**	0.5778	0.5513	0.5529	0.5691	0.5722	0.5454	0.5703	0.5613	0.5795	0.6234	0.5976
2010	100.59	0.8139	0.7871	0.7887	0.8051	0.8082	0.7812	0.8062	0.7973	0.8156	0.8598	0.8339
2011	102.33	0.8855	0.8587	0.8603	0.8767	0.8799	0.8528	0.8779	0.8689	0.8872	0.9316	0.9056
2012	104.52	0.9062	0.8802	0.8818	0.8977	0.9007	0.8744	0.8988	0.8900	0.9078	0.9508	0.9256
2013	106.76	0.9583	0.9312	0.9328	0.9494	0.9526	0.9251	0.9506	0.9415	0.9600	1.0050	0.9786
2014	108.74	0.9987	0.9706	0.9723	0.9895	0.9928	0.9643	0.9907	0.9812	1.0005	1.0471	1.0198
2015	111.27	1.0252	0.9962	0.9980	1.0157	1.0191	0.9898	1.0169	1.0072	1.0270	1.0750	1.0469
2016	113.73	1.0509	1.0191	1.0210	1.0405	1.0442	1.0120	1.0418	1.0311	1.0529	1.1056	1.0747
2017	116.13	1.0856	1.0529	1.0549	1.0749	1.0788	1.0456	1.0763	1.0653	1.0877	1.1418	1.1101
2018	118.42	1.1209	1.0875	1.0895	1.1099	1.1139	1.0800	1.1114	1.1001	1.1230	1.1784	1.1459
2019	120.64	1.1573	1.1232	1.1252	1.1461	1.1501	1.1155	1.1476	1.1361	1.1595	1.2161	1.1829
2020	122.75	1.1955	1.1606	1.1627	1.1840	1.1881	1.1528	1.1855	1.1738	1.1977	1.2554	1.2216
2021	124.87	1.2349	1.1993	1.2014	1.2232	1.2274	1.1914	1.2247	1.2128	1.2371	1.2960	1.2615
2022	127.09	1.2660	1.2297	1.2319	1.2541	1.2584	1.2216	1.2557	1.2435	1.2683	1.3284	1.2932
2023	129.31	1.3079	1.2708	1.2730	1.2957	1.3001	1.2625	1.2973	1.2848	1.3102	1.3716	1.3356
2024	131.72	1.4628	1.4249	1.4272	1.4504	1.4549	1.4165	1.4520	1.4393	1.4652	1.5279	1.4911
2025	134.23	1.5223	1.4836	1.4859	1.5096	1.5142	1.4750	1.5113	1.4983	1.5247	1.5888	1.5513
2026	136.83	1.5847	1.5452	1.5475	1.5718	1.5764	1.5363	1.5734	1.5601	1.5872	1.6527	1.6143
2027	139.51	1.6502	1.6097	1.6122	1.6369	1.6417	1.6007	1.6387	1.6251	1.6528	1.7197	1.6805
2028	142.32	1.7191	1.6777	1.6801	1.7055	1.7104	1.6684	1.7073	1.6933	1.7217	1.7902	1.7500
2029	145.21	1.7912	1.7489	1.7514	1.7774	1.7823	1.7394	1.7792	1.7649	1.7939	1.8640	1.8229
2030	148.18	1.8670	1.8236	1.8262	1.8527	1.8578	1.8139	1.8546	1.8400	1.8697	1.9415	1.8994

Southern California Gas Company
2010 CGR - Industrial G10
Historical Throughput and Customer Counts

Business Type	therms_ 2009	meters_ 2009	meters_ 2009_ ExCust	meters_ 2009_ NewCust	avgUse_ 2009_ ExCust	avgUse_ 2009_ NewCust	Price Elasticity	Employment Elasticity
Mining	5634531.77	239	236	3	23726.25	11712.38	0.000000	0.321451
Food	67972289.46	2756	2691	65	25073.20	7697.16	-0.190795	1.242506
Textile	18244511.02	659	653	6	27918.54	2284.54	0.000000	0.033325
Wood_Paper	8192380.06	621	619	2	13224.95	3068.09	0.000000	0.508272
Chemical	18456860.53	994	981	13	18671.99	10741.76	-0.080517	0.650067
Petroleum	8672847.53	145	142	3	57690.14	160282.49	-0.180563	0.084537
Stone	5958266.91	560	560	0	10639.76	0.00	0.000000	0.416909
Prim_Metal	9571036.91	407	407	0	23516.06	0.00	0.000000	0.956685
Fab_Metal	24288838.44	2381	2359	22	10229.94	7109.84	-0.137441	1.023881
Transport	14678930.54	2133	2128	5	6889.11	3782.56	0.000000	0.402505
Misc	42625780.24	8886	8829	57	4799.39	4420.19	-0.108307	0.879307
Total	224296273.40	19781						

Southern California Gas Company
2010 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
2010 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
2010 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
2010 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
2010 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
2010 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
2010 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
2010 CGR - Industrial G10
Employment Forecast (in thousands)

YEAR	Mining	Food	Textile	Wood_Paper	Chemical	Petroleum	Stone	Primary_Metal	Fabricated_Metal	Transportation	Miscellaneous	Total
2009	19.4058	114.0700	33.4200	20.5792	35.8150	5.8683	18.4250	9.1525	84.3867	73.0475	370.9658	785.1308
2010	18.6342	112.2525	31.3858	20.0250	36.3500	5.9150	17.5875	9.2958	78.2692	69.3233	365.1433	764.1725
2011	18.1150	112.6258	31.6525	21.4183	37.3000	5.8142	18.6100	10.0375	77.6350	70.1292	373.4833	776.8208
2012	18.3633	113.4908	32.5225	23.0092	38.2683	5.7242	19.8492	10.4242	83.7042	72.4850	382.2408	800.0783
2013	18.6617	113.4533	32.7467	23.6400	38.8967	5.5933	21.0475	10.4058	91.8525	74.3817	390.0033	820.6767
2014	18.5383	113.0792	32.4733	23.7058	39.2567	5.4450	21.4633	10.3967	98.4758	75.4517	390.3808	828.6617
2015	18.1717	112.2117	31.9767	23.6150	39.7092	5.2892	21.3867	10.3083	102.0383	75.2675	389.8717	829.8467
2016	17.7317	111.6858	31.5808	23.8042	40.2425	5.1783	21.2942	10.2092	103.3875	73.8042	389.7967	828.7067
2017	17.2900	111.3292	31.3617	23.9242	40.8400	5.0742	21.3583	10.1833	103.6925	72.6558	389.4158	827.1183
2018	16.7425	110.9008	31.2125	24.1150	41.4750	4.9692	21.5417	10.1883	103.3133	72.0783	389.2192	825.7508
2019	16.1883	110.2492	31.0967	24.2542	42.0225	4.8392	21.6383	10.1950	103.5367	71.6508	386.7850	822.4533
2020	15.8225	109.5175	31.0267	24.3267	42.4200	4.6892	21.5742	10.1767	103.4058	71.0342	382.5633	816.5517
2021	15.5408	108.7875	30.8817	24.2808	42.7975	4.5408	21.4533	10.1100	102.9767	70.2750	378.7900	810.4292
2022	15.2542	107.9833	30.7392	24.1508	43.0875	4.4592	21.2942	9.9633	102.1600	69.5417	374.6792	803.3083
2023	14.9958	107.1617	30.7400	23.9892	43.3408	4.4283	21.1158	9.7550	100.7250	68.8283	370.1650	795.2375
2024	14.7408	106.3833	30.7983	23.8183	43.5617	4.4133	20.9358	9.5558	99.5750	68.1308	366.7158	788.6217
2025	14.5342	105.6017	30.9900	23.7683	43.6867	4.3900	20.8808	9.3525	98.3283	67.5483	363.1408	782.2158
2026	14.4133	104.8225	31.1842	23.7642	43.8525	4.3483	20.8933	9.1658	97.2750	67.1208	358.3508	775.1850
2027	14.3408	104.1700	31.3817	23.6058	44.0967	4.3008	20.8683	9.0108	96.4558	66.7692	353.6800	768.6758
2028	14.2925	103.6008	31.5175	23.3308	44.3992	4.2475	20.7975	8.8483	95.3458	66.3825	349.9117	762.6733
2029	14.2517	103.1108	31.5375	23.1175	44.6850	4.1800	20.7642	8.6967	94.3117	66.0083	346.7275	757.3842
2030	14.2017	102.6500	31.6333	23.1658	44.9367	4.1133	20.8217	8.4817	93.3308	65.7150	344.0033	753.0425

Southern California Gas Company
2010 CGR - Industrial G10
Core Industrial Demand Forecast **(Mdth)**
Average Temperature

Model Output

Avg	G10-Ind	EE/DSM	AB970	City of Vernon	AMI	Final
2009	22429.6	0.0	0.0	0.00	0.00	22429.6
2010	21109.5	304.9	189.0	67.80	9.15	20916.6
2011	21042.8	630.6	249.9	135.60	38.13	20488.3
2012	21330.9	979.3	251.8	203.40	68.76	20331.2
2013	21401.7	1328.0	253.8	271.20	99.21	19957.1
2014	21368.5	1676.7	255.8	271.20	129.22	19547.1
2015	21303.3	2025.4	257.8	271.20	158.90	19105.6
2016	21235.0	2374.1	259.8	271.20	188.37	18661.1
2017	21137.8	2722.8	261.7	271.20	209.99	18195.5
2018	21039.1	3071.5	261.7	271.20	210.39	17747.7
2019	20911.0	3420.2	261.7	271.20	209.11	17272.3
2020	20740.6	3768.9	261.7	271.20	207.41	16754.9
2021	20562.0	4117.6	261.7	271.20	205.62	16229.3
2022	20391.4	4466.3	261.7	271.20	203.91	15711.8
2023	20170.3	4815.0	261.7	271.20	201.70	15144.1
2024	19637.8	5163.7	261.7	271.20	196.38	14268.3
2025	19407.1	5207.4	261.7	271.20	194.07	13996.1
2026	19175.7	5230.4	261.7	271.20	191.76	13744.1
2027	18960.7	5230.4	261.7	271.20	189.61	13531.2
2028	18755.1	5230.4	261.7	271.20	187.55	13327.7
2029	18563.8	5230.4	261.7	271.20	185.64	13138.3
2030	18379.8	5230.4	261.7	271.20	183.80	12956.1

Southern California Gas Company
2010 CGR - Industrial G10
Core Industrial Demand Forecast (Mdth)
Cold Temperature

Model Output

YEAR	G10-Ind	EE/DSM	AB970	City of Vernon	AMI	Final
2009	22984.3	0.0	0.00	0.00	0.00	22984.3
2010	21631.5	312.5	188.99	67.80	9.34	21430.8
2011	21563.2	646.2	249.85	135.60	39.03	20992.2
2012	21858.4	1003.5	251.83	203.40	70.42	20832.8
2013	21931.0	1360.9	253.81	271.20	101.61	20451.1
2014	21896.9	1718.2	255.79	271.20	132.37	20030.9
2015	21830.1	2075.5	257.77	271.20	162.79	19578.4
2016	21760.1	2432.8	259.75	271.20	192.98	19122.9
2017	21660.5	2790.1	261.73	271.20	215.16	18645.7
2018	21559.3	3147.5	261.73	271.20	215.59	18186.8
2019	21428.1	3504.8	261.73	271.20	214.28	17699.6
2020	21253.5	3862.1	261.73	271.20	212.54	17169.4
2021	21070.4	4219.4	261.73	271.20	210.70	16630.9
2022	20895.7	4576.7	261.73	271.20	208.96	16100.5
2023	20669.1	4934.0	261.73	271.20	206.69	15518.9
2024	20123.4	5291.4	261.73	271.20	201.23	14621.4
2025	19887.0	5336.2	261.73	271.20	198.87	14342.5
2026	19649.9	5359.8	261.73	271.20	196.50	14084.2
2027	19429.6	5359.8	261.73	271.20	194.30	13866.0
2028	19218.9	5359.8	261.73	271.20	192.19	13657.5
2029	19022.8	5359.8	261.73	271.20	190.23	13463.4
2030	18834.3	5359.8	261.73	271.20	188.34	13276.7

Southern California Gas Company
2010 CGR - Industrial G10
Core Industrial Demand Forecast (Mdth)
Cold Temperature

Model Output

YEAR	G10-Ind	EE/DSM	AB970	City of Vernon	AMI	Final
2009	22984.3	0.0	0.00	0.00	0.00	22984.3
2010	21631.5	312.5	188.99	67.80	9.34	21430.8
2011	21563.2	646.2	249.85	135.60	39.03	20992.2
2012	21858.4	1003.5	251.83	203.40	70.42	20832.8
2013	21931.0	1360.9	253.81	271.20	101.61	20451.1
2014	21896.9	1718.2	255.79	271.20	132.37	20030.9
2015	21830.1	2075.5	257.77	271.20	162.79	19578.4
2016	21760.1	2432.8	259.75	271.20	192.98	19122.9
2017	21660.5	2790.1	261.73	271.20	215.16	18645.7
2018	21559.3	3147.5	261.73	271.20	215.59	18186.8
2019	21428.1	3504.8	261.73	271.20	214.28	17699.6
2020	21253.5	3862.1	261.73	271.20	212.54	17169.4
2021	21070.4	4219.4	261.73	271.20	210.70	16630.9
2022	20895.7	4576.7	261.73	271.20	208.96	16100.5
2023	20669.1	4934.0	261.73	271.20	206.69	15518.9
2024	20123.4	5291.4	261.73	271.20	201.23	14621.4
2025	19887.0	5336.2	261.73	271.20	198.87	14342.5
2026	19649.9	5359.8	261.73	271.20	196.50	14084.2
2027	19429.6	5359.8	261.73	271.20	194.30	13866.0
2028	19218.9	5359.8	261.73	271.20	192.19	13657.5
2029	19022.8	5359.8	261.73	271.20	190.23	13463.4
2030	18834.3	5359.8	261.73	271.20	188.34	13276.7

Southern California Gas Company
2010 CGR - Industrial G10
Core Industrial Demand Forecast (Mdth)
Base Temperature

YEAR	Model Output G10-Ind	EE/DSM	AB970	City of Vernon	AMI	Final
2009	19715.6	0.0	0.00	0.00	0.00	19715.6
2010	18555.2	268.0	188.99	67.80	8.19	18400.1
2011	18496.6	554.3	249.85	135.60	33.73	18022.8
2012	18749.8	860.8	251.83	203.40	60.66	17876.7
2013	18812.1	1167.3	253.81	271.20	87.42	17539.9
2014	18782.8	1473.8	255.79	271.20	113.80	17179.8
2015	18725.6	1780.3	257.77	271.20	139.89	16791.9
2016	18665.5	2086.8	259.75	271.20	165.79	16401.4
2017	18580.0	2393.3	261.73	271.20	184.71	15992.5
2018	18493.3	2699.8	261.73	271.20	184.93	15599.0
2019	18380.7	3006.3	261.73	271.20	183.81	15181.1
2020	18231.0	3312.8	261.73	271.20	182.31	14726.3
2021	18073.9	3619.3	261.73	271.20	180.74	14264.4
2022	17924.0	3925.8	261.73	271.20	179.24	13809.5
2023	17729.6	4232.3	261.73	271.20	177.30	13310.5
2024	17261.6	4538.8	261.73	271.20	172.62	12540.6
2025	17058.8	4577.3	261.73	271.20	170.59	12301.4
2026	16855.4	4597.5	261.73	271.20	168.55	12079.9
2027	16666.4	4597.5	261.73	271.20	166.66	11892.7
2028	16485.7	4597.5	261.73	271.20	164.86	11713.8
2029	16317.5	4597.5	261.73	271.20	163.18	11547.3
2030	16155.7	4597.5	261.73	271.20	161.56	11387.2

2010 CALIFORNIA GAS REPORT

NONCORE COMMERCIAL AND INDUSTRIAL DEMAND FORECAST
JULY 2010

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 2009. The recorded usage was then further disaggregated into the 14 commercial or 11 industrial business sectors.

B. Natural Gas Price

The natural gas prices used to forecast demand were based on the price of gas at the burner-tip in each market segment, which is composed of the gas commodity cost, transportation rate (G-30 tariff rate) and Public Purpose Program surcharge. The cost of gas delivered to the SoCalGas "city gate" was used for the gas commodity cost. Since the G-30 tariff rate is priced according to tier, calculations were made to arrive at the overall average and marginal transportation rates from historical usage in 2009. 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 2010 Regional forecast (released February 22nd, 2010). Global Insight prepares regular regional employment forecast for California and the aggregated six largest counties' Metropolitan Statistical Area (MSA) in SoCalGas' service area. (The six counties – Kern, Los Angeles, Orange, Riverside, San Bernardino, and Ventura – account for 85% of the service area's total population and employment). The historical employment data used was derived from the California Employment Development Department (EDD) for the 12 counties served by SoCalGas. The monthly employment used in the model was generally by summing the weighted employment data over the commercial and industrial NAICS codes.

E. Post-Model Adjustment

Once the EuForecaster end-use model forecast was generated, post-model adjustments were made to account for effects the model is not designed to simulate. Energy savings goals that were authorized by the CPUC in decision D.04-09-060 and expected load leaving for service by the City of Vernon were subtracted from the model forecast to arrive at final demand forecast for the commercial and industrial markets. Customer migration from noncore to core has come to an end and no adjustment was made in the forecasting period for future migration.

Noncore Commercial Demand Forecast

Sum of totalUsage	
year	Total from EUForeaster (Therms)
2007	#N/A
2008	#N/A
2009	210,781,523
2010	205,838,604
2011	206,009,399
2012	208,531,502
2013	208,554,894
2014	209,361,970
2015	210,133,446
2016	210,852,938
2017	211,549,765
2018	212,235,959
2019	212,775,767
2020	213,169,131
2021	213,482,486
2022	214,014,918
2023	214,565,181
2024	214,752,027
2025	215,255,045
2026	215,757,072
2027	216,271,413
2028	216,765,479
2029	217,165,413
2030	217,554,845

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

Year	Total
2007	#N/A
2008	#N/A
2009	21,078
2010	20,584
2011	20,601
2012	20,853
2013	20,855
2014	20,936
2015	21,013
2016	21,085
2017	21,155
2018	21,224
2019	21,278
2020	21,317
2021	21,348
2022	21,401
2023	21,457
2024	21,475
2025	21,526
2026	21,576
2027	21,627
2028	21,677
2029	21,717
2030	21,755

Noncore Industrial Demand Forecast

Sum of totalUsage

year	Total from EUForeaster (Therms)
2007	#N/A
2008	#N/A
2009	432,498,318
2010	412,662,030
2011	413,478,268
2012	417,785,757
2013	419,226,836
2014	418,691,367
2015	416,950,770
2016	414,962,953
2017	413,037,490
2018	411,066,257
2019	408,797,463
2020	406,058,033
2021	403,041,610
2022	399,876,006
2023	396,393,054
2024	391,932,308
2025	388,651,372
2026	385,454,846
2027	382,363,577
2028	379,208,008
2029	376,132,896
2030	373,157,326

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

Year	Total
2007	#N/A
2008	#N/A
2009	43,250
2010	41,266
2011	41,348
2012	41,779
2013	41,923
2014	41,869
2015	41,695
2016	41,496
2017	41,304
2018	41,107
2019	40,880
2020	40,606
2021	40,304
2022	39,988
2023	39,639
2024	39,193
2025	38,865
2026	38,545
2027	38,236
2028	37,921
2029	37,613
2030	37,316

Noncore Commercial Demand Forecast (MDth)

Load per HD 20,035 Therm/HDD

	Commercial Average Year				Commercial Cold Year				
Date	End-Use Fcst @AvgYr HDD	DSM	Vernon	AvgYrAdj	Cold Yr less Avg Yr HDD Load Incr.	End-Use Fcst @ColdYr HDD	DSM	Vernon	ColdYrAdj
Jan-09	2,048	0	0	2,048	281	2,102	0	0	2,102
Feb-09	1,803	0	0	1,803	281	1,852	0	0	1,852
Mar-09	1,900	0	0	1,900	281	1,950	0	0	1,950
Apr-09	1,737	0	0	1,737	281	1,783	0	0	1,783
May-09	1,690	0	0	1,690	281	1,735	0	0	1,735
Jun-09	1,585	0	0	1,585	281	1,628	0	0	1,628
Jul-09	1,618	0	0	1,618	281	1,661	0	0	1,661
Aug-09	1,617	0	0	1,617	281	1,660	0	0	1,660
Sep-09	1,569	0	0	1,569	281	1,611	0	0	1,611
Oct-09	1,666	0	0	1,666	281	1,711	0	0	1,711
Nov-09	1,784	0	0	1,784	281	1,832	0	0	1,832
Dec-09	2,061	0	0	2,061	281	2,116	0	0	2,116
Jan-10	2,000	66	3	1,931	281	2,054	66	3	1,986
Feb-10	1,761	58	2	1,701	281	1,809	58	2	1,749
Mar-10	1,855	61	2	1,792	281	1,906	61	2	1,843
Apr-10	1,696	56	2	1,638	281	1,742	56	2	1,684
May-10	1,651	54	2	1,594	281	1,696	54	2	1,639
Jun-10	1,548	51	2	1,495	281	1,590	51	2	1,538
Jul-10	1,580	52	2	1,526	281	1,623	52	2	1,569
Aug-10	1,579	52	2	1,525	281	1,622	52	2	1,569
Sep-10	1,532	50	2	1,480	281	1,574	50	2	1,522
Oct-10	1,627	53	2	1,571	281	1,672	53	2	1,616
Nov-10	1,742	57	2	1,683	281	1,790	57	2	1,731
Dec-10	2,013	66	3	1,944	281	2,068	66	3	1,999
Jan-11	2,001	135	3	1,864	281	2,056	135	3	1,918
Feb-11	1,763	119	2	1,641	281	1,811	119	2	1,690
Mar-11	1,857	125	2	1,729	281	1,907	125	2	1,780
Apr-11	1,697	115	2	1,581	281	1,744	115	2	1,627
May-11	1,652	111	2	1,538	281	1,697	111	2	1,584
Jun-11	1,549	105	2	1,443	281	1,592	105	2	1,485
Jul-11	1,581	107	2	1,472	281	1,624	107	2	1,516
Aug-11	1,581	107	2	1,472	281	1,624	107	2	1,515
Sep-11	1,533	103	2	1,428	281	1,575	103	2	1,470
Oct-11	1,628	110	2	1,516	281	1,673	110	2	1,561
Nov-11	1,744	118	2	1,624	281	1,792	118	2	1,672
Dec-11	2,014	136	3	1,876	281	2,070	136	3	1,931
Jan-12	2,026	209	3	1,814	281	2,080	209	3	1,868
Feb-12	1,784	184	2	1,597	281	1,832	184	2	1,646
Mar-12	1,879	194	2	1,683	281	1,930	194	2	1,734
Apr-12	1,718	178	2	1,538	281	1,764	178	2	1,585
May-12	1,672	173	2	1,497	281	1,717	173	2	1,542
Jun-12	1,568	162	2	1,404	281	1,611	162	2	1,447
Jul-12	1,601	165	2	1,433	281	1,644	165	2	1,476
Aug-12	1,600	165	2	1,433	281	1,643	165	2	1,476
Sep-12	1,552	160	2	1,390	281	1,594	160	2	1,432
Oct-12	1,648	170	2	1,476	281	1,693	170	2	1,520
Nov-12	1,765	182	2	1,581	281	1,813	182	2	1,628
Dec-12	2,039	211	3	1,826	281	2,094	211	3	1,881

Noncore Commercial Demand Forecast (MDth)

Load per HD 20,035 Therm/HDD

Date	Commercial Average Year				Commercial Cold Year				
	End-Use Fcst @AvgYr HDD	DSM	Vernon	AvgYrAdj	Cold Yr less Avg Yr HDD Load Incr.	End-Use Fcst @ColdYr HDD	DSM	Vernon	ColdYrAdj
Jan-13	2,026	284	3	1,740	281	2,081	284	3	1,794
Feb-13	1,784	250	2	1,532	281	1,832	250	2	1,580
Mar-13	1,880	263	2	1,614	281	1,930	263	2	1,665
Apr-13	1,718	241	2	1,475	281	1,765	241	2	1,522
May-13	1,672	234	2	1,436	281	1,718	234	2	1,481
Jun-13	1,569	220	2	1,347	281	1,611	220	2	1,389
Jul-13	1,601	224	2	1,375	281	1,644	224	2	1,418
Aug-13	1,600	224	2	1,374	281	1,643	224	2	1,417
Sep-13	1,552	217	2	1,333	281	1,594	217	2	1,375
Oct-13	1,648	231	2	1,416	281	1,693	231	2	1,460
Nov-13	1,765	247	2	1,516	281	1,813	247	2	1,564
Dec-13	2,039	286	3	1,751	281	2,094	286	3	1,806
Jan-14	2,034	358	3	1,673	281	2,088	358	3	1,728
Feb-14	1,791	315	2	1,474	281	1,839	315	2	1,522
Mar-14	1,887	332	2	1,552	281	1,938	332	2	1,603
Apr-14	1,725	304	2	1,419	281	1,771	304	2	1,465
May-14	1,679	296	2	1,381	281	1,724	296	2	1,426
Jun-14	1,575	277	2	1,295	281	1,617	277	2	1,338
Jul-14	1,607	283	2	1,322	281	1,650	283	2	1,365
Aug-14	1,606	283	2	1,321	281	1,649	283	2	1,365
Sep-14	1,558	274	2	1,282	281	1,600	274	2	1,324
Oct-14	1,655	291	2	1,361	281	1,699	291	2	1,406
Nov-14	1,772	312	2	1,458	281	1,820	312	2	1,506
Dec-14	2,047	360	3	1,684	281	2,102	360	3	1,739
Jan-15	2,041	432	3	1,606	281	2,096	432	3	1,661
Feb-15	1,798	381	2	1,415	281	1,846	381	2	1,463
Mar-15	1,894	401	2	1,490	281	1,945	401	2	1,541
Apr-15	1,731	367	2	1,362	281	1,778	367	2	1,409
May-15	1,685	357	2	1,326	281	1,730	357	2	1,371
Jun-15	1,580	335	2	1,244	281	1,623	335	2	1,286
Jul-15	1,613	342	2	1,269	281	1,656	342	2	1,312
Aug-15	1,612	342	2	1,269	281	1,655	342	2	1,312
Sep-15	1,564	331	2	1,231	281	1,606	331	2	1,273
Oct-15	1,661	352	2	1,307	281	1,705	352	2	1,351
Nov-15	1,779	377	2	1,400	281	1,826	377	2	1,447
Dec-15	2,055	435	3	1,617	281	2,110	435	3	1,672
Jan-16	2,048	507	3	1,539	281	2,103	507	3	1,593
Feb-16	1,804	446	2	1,355	281	1,852	446	2	1,403
Mar-16	1,900	470	2	1,428	281	1,951	470	2	1,478
Apr-16	1,737	430	2	1,305	281	1,784	430	2	1,351
May-16	1,691	418	2	1,270	281	1,736	418	2	1,315
Jun-16	1,586	392	2	1,191	281	1,628	392	2	1,234
Jul-16	1,618	401	2	1,216	281	1,662	401	2	1,259
Aug-16	1,618	400	2	1,215	281	1,661	400	2	1,259
Sep-16	1,569	388	2	1,179	281	1,611	388	2	1,221
Oct-16	1,667	412	2	1,252	281	1,711	412	2	1,297
Nov-16	1,785	442	2	1,341	281	1,833	442	2	1,389
Dec-16	2,062	510	3	1,549	281	2,117	510	3	1,604

Noncore Commercial Demand Forecast (MDth)

Load per HD 20,035 Therm/HDD

	Commercial Average Year				Commercial Cold Year				
Date	End-Use Fcst @AvgYr HDD	DSM	Vernon	AvgYrAdj	Cold Yr less Avg Yr HDD Load Incr.	End-Use Fcst @ColdYr HDD	DSM	Vernon	ColdYrAdj
Jan-17	2,055	581	3	1,471	281	2,110	581	3	1,526
Feb-17	1,810	512	2	1,296	281	1,858	512	2	1,344
Mar-17	1,907	539	2	1,365	281	1,957	539	2	1,416
Apr-17	1,743	493	2	1,248	281	1,789	493	2	1,294
May-17	1,696	480	2	1,215	281	1,742	480	2	1,260
Jun-17	1,591	450	2	1,139	281	1,633	450	2	1,181
Jul-17	1,624	459	2	1,162	281	1,667	459	2	1,206
Aug-17	1,623	459	2	1,162	281	1,666	459	2	1,205
Sep-17	1,575	445	2	1,127	281	1,617	445	2	1,169
Oct-17	1,672	473	2	1,197	281	1,717	473	2	1,242
Nov-17	1,791	506	2	1,282	281	1,838	506	2	1,330
Dec-17	2,069	585	3	1,481	281	2,124	585	3	1,536
Jan-18	2,062	656	3	1,403	281	2,116	656	3	1,458
Feb-18	1,816	577	2	1,236	281	1,864	577	2	1,284
Mar-18	1,913	608	2	1,302	281	1,964	608	2	1,353
Apr-18	1,749	556	2	1,190	281	1,795	556	2	1,237
May-18	1,702	541	2	1,159	281	1,747	541	2	1,204
Jun-18	1,596	508	2	1,087	281	1,639	508	2	1,129
Jul-18	1,629	518	2	1,109	281	1,672	518	2	1,152
Aug-18	1,628	518	2	1,109	281	1,672	518	2	1,152
Sep-18	1,580	502	2	1,075	281	1,622	502	2	1,117
Oct-18	1,678	533	2	1,142	281	1,722	533	2	1,187
Nov-18	1,797	571	2	1,223	281	1,844	571	2	1,271
Dec-18	2,075	660	3	1,413	281	2,130	660	3	1,468
Jan-19	2,067	730	3	1,334	281	2,122	730	3	1,389
Feb-19	1,820	643	2	1,175	281	1,869	643	2	1,223
Mar-19	1,918	677	2	1,238	281	1,968	677	2	1,289
Apr-19	1,753	619	2	1,132	281	1,799	619	2	1,178
May-19	1,706	603	2	1,102	281	1,751	603	2	1,147
Jun-19	1,600	565	2	1,033	281	1,643	565	2	1,076
Jul-19	1,633	577	2	1,054	281	1,676	577	2	1,098
Aug-19	1,632	576	2	1,054	281	1,676	576	2	1,097
Sep-19	1,584	559	2	1,023	281	1,626	559	2	1,064
Oct-19	1,682	594	2	1,086	281	1,726	594	2	1,130
Nov-19	1,801	636	2	1,163	281	1,849	636	2	1,210
Dec-19	2,081	735	3	1,343	281	2,136	735	3	1,398
Jan-20	2,071	804	3	1,264	281	2,125	804	3	1,319
Feb-20	1,824	708	2	1,113	281	1,872	708	2	1,161
Mar-20	1,921	746	2	1,173	281	1,972	746	2	1,223
Apr-20	1,756	682	2	1,072	281	1,803	682	2	1,118
May-20	1,709	664	2	1,043	281	1,755	664	2	1,088
Jun-20	1,603	623	2	979	281	1,646	623	2	1,021
Jul-20	1,636	636	2	999	281	1,679	636	2	1,042
Aug-20	1,636	635	2	998	281	1,679	635	2	1,041
Sep-20	1,587	616	2	968	281	1,629	616	2	1,010
Oct-20	1,685	654	2	1,028	281	1,729	654	2	1,073
Nov-20	1,804	701	2	1,101	281	1,852	701	2	1,149
Dec-20	2,084	810	3	1,272	281	2,140	810	3	1,327

Noncore Commercial Demand Forecast (MDth)

Load per HD 20,035 Therm/HDD

Date	Commercial Average Year				Commercial Cold Year				
	End-Use Fcst @AvgYr HDD	DSM	Vernon	AvgYrAdj	Cold Yr less Avg Yr HDD Load Incr.	End-Use Fcst @ColdYr HDD	DSM	Vernon	ColdYrAdj
Jan-21	2,074	879	3	1,193	281	2,128	879	3	1,247
Feb-21	1,826	774	2	1,050	281	1,875	774	2	1,099
Mar-21	1,924	815	2	1,106	281	1,975	815	2	1,157
Apr-21	1,759	745	2	1,011	281	1,805	745	2	1,058
May-21	1,712	725	2	984	281	1,757	725	2	1,030
Jun-21	1,606	680	2	923	281	1,648	680	2	966
Jul-21	1,639	694	2	942	281	1,682	694	2	986
Aug-21	1,638	694	2	942	281	1,681	694	2	985
Sep-21	1,589	673	2	914	281	1,631	673	2	956
Oct-21	1,687	715	2	970	281	1,732	715	2	1,015
Nov-21	1,807	766	2	1,039	281	1,855	766	2	1,087
Dec-21	2,088	884	3	1,200	281	2,143	884	3	1,256
Jan-22	2,079	953	3	1,123	281	2,134	953	3	1,178
Feb-22	1,831	839	2	989	281	1,879	839	2	1,038
Mar-22	1,929	884	2	1,042	281	1,980	884	2	1,093
Apr-22	1,763	808	2	953	281	1,810	808	2	999
May-22	1,716	787	2	927	281	1,761	787	2	972
Jun-22	1,610	738	2	870	281	1,652	738	2	912
Jul-22	1,643	753	2	888	281	1,686	753	2	931
Aug-22	1,642	753	2	887	281	1,685	753	2	930
Sep-22	1,593	730	2	861	281	1,635	730	2	903
Oct-22	1,692	775	2	914	281	1,736	775	2	959
Nov-22	1,812	830	2	979	281	1,859	830	2	1,027
Dec-22	2,093	959	3	1,131	281	2,148	959	3	1,186
Jan-23	2,084	1,027	3	1,054	281	2,139	1,027	3	1,109
Feb-23	1,836	905	2	929	281	1,884	905	2	977
Mar-23	1,934	953	2	978	281	1,985	953	2	1,029
Apr-23	1,768	871	2	894	281	1,814	871	2	941
May-23	1,721	848	2	870	281	1,766	848	2	915
Jun-23	1,614	796	2	816	281	1,656	796	2	859
Jul-23	1,647	812	2	833	281	1,690	812	2	876
Aug-23	1,646	812	2	833	281	1,689	812	2	876
Sep-23	1,597	787	2	808	281	1,639	787	2	850
Oct-23	1,696	836	2	858	281	1,741	836	2	902
Nov-23	1,816	895	2	919	281	1,864	895	2	966
Dec-23	2,098	1,034	3	1,061	281	2,153	1,034	3	1,116
Jan-24	2,086	1,091	3	992	281	2,141	1,091	3	1,047
Feb-24	1,837	961	2	874	281	1,885	961	2	922
Mar-24	1,935	1,013	2	920	281	1,986	1,013	2	971
Apr-24	1,769	926	2	841	281	1,816	926	2	888
May-24	1,722	901	2	819	281	1,767	901	2	864
Jun-24	1,615	845	2	768	281	1,658	845	2	810
Jul-24	1,648	862	2	784	281	1,692	862	2	827
Aug-24	1,648	862	2	784	281	1,691	862	2	827
Sep-24	1,598	836	2	760	281	1,640	836	2	802
Oct-24	1,697	888	2	807	281	1,742	888	2	852
Nov-24	1,818	951	2	864	281	1,866	951	2	912
Dec-24	2,100	1,099	3	999	281	2,155	1,099	3	1,054

Noncore Commercial Demand Forecast (MDth)

Load per HD 20,035 Therm/HDD

	Commercial Average Year				Commercial Cold Year				
Date	End-Use Fcst @AvgYr HDD	DSM	Vernon	AvgYrAdj	Cold Yr less Avg Yr HDD Load Incr.	End-Use Fcst @ColdYr HDD	DSM	Vernon	ColdYrAdj
Jan-25	2,091	1,100	3	988	281	2,146	1,100	3	1,043
Feb-25	1,842	969	2	870	281	1,890	969	2	919
Mar-25	1,940	1,021	2	917	281	1,991	1,021	2	968
Apr-25	1,773	933	2	838	281	1,820	933	2	884
May-25	1,726	908	2	816	281	1,771	908	2	861
Jun-25	1,619	852	2	765	281	1,661	852	2	807
Jul-25	1,652	869	2	781	281	1,695	869	2	824
Aug-25	1,652	869	2	781	281	1,695	869	2	824
Sep-25	1,602	843	2	757	281	1,644	843	2	799
Oct-25	1,701	895	2	804	281	1,746	895	2	849
Nov-25	1,822	959	2	861	281	1,870	959	2	909
Dec-25	2,105	1,108	3	995	281	2,160	1,108	3	1,050
Jan-26	2,096	1,105	3	988	281	2,151	1,105	3	1,043
Feb-26	1,846	973	2	870	281	1,894	973	2	918
Mar-26	1,945	1,025	2	917	281	1,995	1,025	2	967
Apr-26	1,778	937	2	838	281	1,824	937	2	884
May-26	1,730	912	2	816	281	1,775	912	2	861
Jun-26	1,623	856	2	765	281	1,665	856	2	807
Jul-26	1,656	873	2	781	281	1,699	873	2	824
Aug-26	1,655	873	2	780	281	1,699	873	2	824
Sep-26	1,606	847	2	757	281	1,648	847	2	799
Oct-26	1,705	899	2	804	281	1,750	899	2	848
Nov-26	1,826	963	2	861	281	1,874	963	2	909
Dec-26	2,110	1,113	3	995	281	2,165	1,113	3	1,050
Jan-27	2,101	1,105	3	993	281	2,156	1,105	3	1,048
Feb-27	1,850	973	2	875	281	1,898	973	2	923
Mar-27	1,949	1,025	2	921	281	2,000	1,025	2	972
Apr-27	1,782	937	2	842	281	1,828	937	2	889
May-27	1,734	912	2	820	281	1,779	912	2	865
Jun-27	1,627	856	2	769	281	1,669	856	2	811
Jul-27	1,660	873	2	785	281	1,703	873	2	828
Aug-27	1,659	873	2	784	281	1,703	873	2	828
Sep-27	1,610	847	2	761	281	1,652	847	2	803
Oct-27	1,709	899	2	808	281	1,754	899	2	853
Nov-27	1,831	963	2	865	281	1,878	963	2	913
Dec-27	2,115	1,113	3	1,000	281	2,170	1,113	3	1,055
Jan-28	2,106	1,105	3	998	281	2,160	1,105	3	1,053
Feb-28	1,855	973	2	879	281	1,903	973	2	927
Mar-28	1,954	1,025	2	926	281	2,004	1,025	2	977
Apr-28	1,786	937	2	846	281	1,832	937	2	893
May-28	1,738	912	2	824	281	1,783	912	2	869
Jun-28	1,630	856	2	773	281	1,673	856	2	815
Jul-28	1,664	873	2	788	281	1,707	873	2	832
Aug-28	1,663	873	2	788	281	1,706	873	2	831
Sep-28	1,613	847	2	765	281	1,655	847	2	806
Oct-28	1,713	899	2	812	281	1,758	899	2	856
Nov-28	1,835	963	2	870	281	1,883	963	2	917
Dec-28	2,120	1,113	3	1,004	281	2,175	1,113	3	1,059

Noncore Commercial Demand Forecast (MDth)

Load per HD 20,035 Therm/HDD

Date	Commercial Average Year: End-Use Fcst @AvgYr HDD	DSM	Vernon	AvgYrAdj	Commercial Cold Year: Cold Yr less Avg Yr HDD Load Incr.	End-Use Fcst @ColdYr HDD	DSM	Vernon	ColdYrAdj
Jan-29	2,110	1,105	3	1,002	281	2,164	1,105	3	1,056
Feb-29	1,858	973	2	882	281	1,906	973	2	930
Mar-29	1,957	1,025	2	929	281	2,008	1,025	2	980
Apr-29	1,789	937	2	850	281	1,836	937	2	896
May-29	1,741	912	2	827	281	1,787	912	2	872
Jun-29	1,633	856	2	776	281	1,676	856	2	818
Jul-29	1,667	873	2	791	281	1,710	873	2	835
Aug-29	1,666	873	2	791	281	1,709	873	2	834
Sep-29	1,616	847	2	768	281	1,658	847	2	809
Oct-29	1,717	899	2	815	281	1,761	899	2	860
Nov-29	1,838	963	2	873	281	1,886	963	2	921
Dec-29	2,124	1,113	3	1,008	281	2,179	1,113	3	1,063
Jan-30	2,113	1,105	3	1,005	281	2,168	1,105	3	1,060
Feb-30	1,861	973	2	886	281	1,909	973	2	934
Mar-30	1,961	1,025	2	933	281	2,011	1,025	2	984
Apr-30	1,792	937	2	853	281	1,839	937	2	899
May-30	1,745	912	2	830	281	1,790	912	2	875
Jun-30	1,636	856	2	779	281	1,679	856	2	821
Jul-30	1,670	873	2	794	281	1,713	873	2	838
Aug-30	1,669	873	2	794	281	1,712	873	2	837
Sep-30	1,619	847	2	770	281	1,661	847	2	812
Oct-30	1,720	899	2	818	281	1,764	899	2	863
Nov-30	1,842	963	2	876	281	1,889	963	2	924
Dec-30	2,127	1,113	3	1,012	281	2,182	1,113	3	1,067

Noncore Industrial Demand Forecast
(MDth)

	Industrial - All Temperature Years			
Date	IndModel	DSM	Vernon	Ind-All
Jan-09	3,710	0	0	3,710
Feb-09	3,371	0	0	3,371
Mar-09	3,786	0	0	3,786
Apr-09	3,602	0	0	3,602
May-09	3,676	0	0	3,676
Jun-09	3,456	0	0	3,456
Jul-09	3,829	0	0	3,829
Aug-09	4,251	0	0	4,251
Sep-09	3,948	0	0	3,948
Oct-09	3,655	0	0	3,655
Nov-09	3,102	0	0	3,102
Dec-09	2,863	0	0	2,863
Jan-10	3,540	23	18	3,499
Feb-10	3,216	21	16	3,179
Mar-10	3,613	23	18	3,571
Apr-10	3,437	22	17	3,398
May-10	3,507	23	18	3,467
Jun-10	3,297	21	17	3,259
Jul-10	3,653	23	18	3,611
Aug-10	4,056	26	21	4,010
Sep-10	3,767	24	19	3,724
Oct-10	3,488	22	18	3,448
Nov-10	2,960	19	15	2,926
Dec-10	2,732	18	14	2,700
Jan-11	3,547	47	36	3,464
Feb-11	3,223	43	33	3,147
Mar-11	3,620	48	37	3,536
Apr-11	3,444	45	35	3,364
May-11	3,514	46	35	3,432
Jun-11	3,304	44	33	3,227
Jul-11	3,660	48	37	3,575
Aug-11	4,064	54	41	3,970
Sep-11	3,774	50	38	3,686
Oct-11	3,495	46	35	3,413
Nov-11	2,966	39	30	2,897
Dec-11	2,737	36	28	2,673
Jan-12	3,584	73	54	3,457
Feb-12	3,256	66	49	3,141
Mar-12	3,658	74	55	3,529
Apr-12	3,480	71	52	3,357
May-12	3,551	72	53	3,425
Jun-12	3,338	68	50	3,220
Jul-12	3,699	75	55	3,568
Aug-12	4,107	83	62	3,962
Sep-12	3,814	77	57	3,679
Oct-12	3,531	72	53	3,407
Nov-12	2,997	61	45	2,891
Dec-12	2,766	56	41	2,668

Noncore Industrial Demand Forecast
(MDth)

	Industrial - All Temperature Years			
Date	IndModel	DSM	Vernon	Ind-All
Jan-13	3,596	98	72	3,426
Feb-13	3,267	89	65	3,113
Mar-13	3,670	100	73	3,497
Apr-13	3,492	96	70	3,327
May-13	3,563	98	71	3,394
Jun-13	3,350	92	67	3,191
Jul-13	3,711	102	74	3,536
Aug-13	4,121	113	82	3,926
Sep-13	3,827	105	76	3,646
Oct-13	3,543	97	71	3,376
Nov-13	3,007	82	60	2,865
Dec-13	2,775	76	55	2,644
Jan-14	3,592	124	72	3,396
Feb-14	3,263	113	65	3,085
Mar-14	3,666	127	73	3,466
Apr-14	3,487	121	70	3,297
May-14	3,558	123	71	3,364
Jun-14	3,345	116	67	3,163
Jul-14	3,707	128	74	3,504
Aug-14	4,116	142	82	3,891
Sep-14	3,822	132	76	3,614
Oct-14	3,539	122	71	3,346
Nov-14	3,003	104	60	2,839
Dec-14	2,772	96	55	2,620
Jan-15	3,577	150	72	3,355
Feb-15	3,250	136	65	3,048
Mar-15	3,650	153	73	3,424
Apr-15	3,473	146	70	3,257
May-15	3,544	149	71	3,324
Jun-15	3,331	140	67	3,125
Jul-15	3,691	155	74	3,462
Aug-15	4,099	172	82	3,844
Sep-15	3,806	160	76	3,570
Oct-15	3,524	148	71	3,306
Nov-15	2,991	125	60	2,805
Dec-15	2,760	116	55	2,589
Jan-16	3,560	176	72	3,312
Feb-16	3,234	160	65	3,009
Mar-16	3,633	179	73	3,380
Apr-16	3,456	171	70	3,216
May-16	3,527	174	71	3,281
Jun-16	3,316	164	67	3,085
Jul-16	3,674	182	74	3,418
Aug-16	4,079	202	82	3,795
Sep-16	3,788	187	76	3,525
Oct-16	3,507	173	71	3,263
Nov-16	2,977	147	60	2,770
Dec-16	2,747	136	55	2,556

Noncore Industrial Demand Forecast
(MDth)

	Industrial - All Temperature Years			
Date	IndModel	DSM	Vernon	Ind-All
Jan-17	3,543	202	72	3,270
Feb-17	3,219	183	65	2,971
Mar-17	3,616	206	73	3,337
Apr-17	3,440	196	70	3,175
May-17	3,510	200	71	3,240
Jun-17	3,300	188	67	3,046
Jul-17	3,657	208	74	3,374
Aug-17	4,060	231	82	3,747
Sep-17	3,770	215	76	3,479
Oct-17	3,491	199	71	3,222
Nov-17	2,963	169	60	2,734
Dec-17	2,734	156	55	2,523
Jan-18	3,526	228	72	3,227
Feb-18	3,204	207	65	2,932
Mar-18	3,599	232	73	3,293
Apr-18	3,424	221	70	3,133
May-18	3,494	225	71	3,197
Jun-18	3,284	212	67	3,006
Jul-18	3,639	235	74	3,330
Aug-18	4,041	261	82	3,698
Sep-18	3,752	242	76	3,434
Oct-18	3,474	224	71	3,180
Nov-18	2,949	190	60	2,698
Dec-18	2,721	176	55	2,490
Jan-19	3,507	253	72	3,182
Feb-19	3,186	230	65	2,891
Mar-19	3,579	259	73	3,247
Apr-19	3,405	246	70	3,089
May-19	3,474	251	71	3,152
Jun-19	3,266	236	67	2,964
Jul-19	3,619	261	74	3,284
Aug-19	4,018	290	82	3,646
Sep-19	3,732	270	76	3,386
Oct-19	3,455	250	71	3,135
Nov-19	2,932	212	60	2,661
Dec-19	2,706	195	55	2,455
Jan-20	3,483	279	72	3,132
Feb-20	3,165	254	65	2,846
Mar-20	3,555	285	73	3,197
Apr-20	3,382	271	70	3,041
May-20	3,451	277	71	3,103
Jun-20	3,244	260	67	2,918
Jul-20	3,595	288	74	3,233
Aug-20	3,991	320	82	3,590
Sep-20	3,707	297	76	3,333
Oct-20	3,432	275	71	3,086
Nov-20	2,913	233	60	2,619
Dec-20	2,688	215	55	2,417

Noncore Industrial Demand Forecast
(MDth)

	Industrial - All Temperature Years			
Date	IndModel	DSM	Vernon	Ind-All
Jan-21	3,457	305	72	3,081
Feb-21	3,141	277	65	2,799
Mar-21	3,529	311	73	3,144
Apr-21	3,357	296	70	2,991
May-21	3,425	302	71	3,052
Jun-21	3,220	284	67	2,870
Jul-21	3,568	315	74	3,179
Aug-21	3,962	349	82	3,530
Sep-21	3,679	324	76	3,278
Oct-21	3,406	300	71	3,035
Nov-21	2,891	255	60	2,576
Dec-21	2,668	235	55	2,377
Jan-22	3,430	331	72	3,028
Feb-22	3,117	301	65	2,751
Mar-22	3,501	338	73	3,090
Apr-22	3,331	321	70	2,940
May-22	3,398	328	71	3,000
Jun-22	3,195	308	67	2,820
Jul-22	3,540	341	74	3,125
Aug-22	3,931	379	82	3,470
Sep-22	3,650	352	76	3,222
Oct-22	3,380	326	71	2,983
Nov-22	2,868	277	60	2,532
Dec-22	2,647	255	55	2,336
Jan-23	3,400	357	72	2,972
Feb-23	3,089	324	65	2,700
Mar-23	3,470	364	73	3,033
Apr-23	3,302	346	70	2,886
May-23	3,369	353	71	2,945
Jun-23	3,167	332	67	2,768
Jul-23	3,509	368	74	3,067
Aug-23	3,896	409	82	3,406
Sep-23	3,618	379	76	3,163
Oct-23	3,350	351	71	2,928
Nov-23	2,843	298	60	2,485
Dec-23	2,624	275	55	2,293
Jan-24	3,362	361	72	2,929
Feb-24	3,055	328	65	2,661
Mar-24	3,431	369	73	2,990
Apr-24	3,264	351	70	2,844
May-24	3,331	358	71	2,902
Jun-24	3,132	336	67	2,728
Jul-24	3,470	373	74	3,023
Aug-24	3,853	414	82	3,357
Sep-24	3,578	384	76	3,117
Oct-24	3,313	356	71	2,886
Nov-24	2,811	302	60	2,449
Dec-24	2,594	279	55	2,260

Noncore Industrial Demand Forecast (MDth)

	Industrial - All Temperature Years			
Date	IndModel	DSM	Vernon	Ind-All
Jan-25	3,334	364	72	2,898
Feb-25	3,029	331	65	2,633
Mar-25	3,403	372	73	2,958
Apr-25	3,237	354	70	2,814
May-25	3,303	361	71	2,871
Jun-25	3,105	339	67	2,699
Jul-25	3,441	376	74	2,991
Aug-25	3,820	417	82	3,321
Sep-25	3,548	388	76	3,084
Oct-25	3,285	359	71	2,855
Nov-25	2,788	305	60	2,423
Dec-25	2,573	281	55	2,236
Jan-26	3,307	366	72	2,869
Feb-26	3,004	333	65	2,607
Mar-26	3,375	374	73	2,928
Apr-26	3,210	355	70	2,786
May-26	3,276	363	71	2,842
Jun-26	3,080	341	67	2,672
Jul-26	3,412	378	74	2,961
Aug-26	3,789	419	82	3,287
Sep-26	3,519	389	76	3,053
Oct-26	3,258	361	71	2,827
Nov-26	2,765	306	60	2,399
Dec-26	2,552	282	55	2,214
Jan-27	3,280	366	72	2,842
Feb-27	2,980	333	65	2,582
Mar-27	3,347	374	73	2,901
Apr-27	3,185	355	70	2,760
May-27	3,250	363	71	2,816
Jun-27	3,055	341	67	2,648
Jul-27	3,385	378	74	2,933
Aug-27	3,759	419	82	3,257
Sep-27	3,490	389	76	3,025
Oct-27	3,232	361	71	2,801
Nov-27	2,743	306	60	2,377
Dec-27	2,531	282	55	2,193
Jan-28	3,253	366	72	2,815
Feb-28	2,955	333	65	2,558
Mar-28	3,320	374	73	2,873
Apr-28	3,158	355	70	2,733
May-28	3,223	363	71	2,789
Jun-28	3,030	341	67	2,622
Jul-28	3,357	378	74	2,905
Aug-28	3,728	419	82	3,226
Sep-28	3,462	389	76	2,996
Oct-28	3,205	361	71	2,774
Nov-28	2,720	306	60	2,354
Dec-28	2,510	282	55	2,172

Noncore Industrial Demand Forecast
(MDth)

	Industrial - All Temperature Years			
Date	IndModel	DSM	Vernon	Ind-All
Jan-29	3,227	366	72	2,789
Feb-29	2,932	333	65	2,534
Mar-29	3,293	374	73	2,846
Apr-29	3,133	355	70	2,708
May-29	3,197	363	71	2,763
Jun-29	3,005	341	67	2,598
Jul-29	3,330	378	74	2,878
Aug-29	3,697	419	82	3,196
Sep-29	3,433	389	76	2,968
Oct-29	3,179	361	71	2,748
Nov-29	2,698	306	60	2,332
Dec-29	2,490	282	55	2,152
Jan-30	3,201	366	72	2,763
Feb-30	2,908	333	65	2,511
Mar-30	3,267	374	73	2,820
Apr-30	3,108	355	70	2,683
May-30	3,171	363	71	2,738
Jun-30	2,982	341	67	2,574
Jul-30	3,304	378	74	2,852
Aug-30	3,668	419	82	3,167
Sep-30	3,406	389	76	2,941
Oct-30	3,154	361	71	2,723
Nov-30	2,677	306	60	2,311
Dec-30	2,470	282	55	2,132

EUForecaster (Noncore Commercial), Adj. to "Avg Yr HDD"
Yr-2009 (B4 DSM/COV) for 2009 BCAP

Month	2009 Forecast	(M-Therms)	Share of Ann. Total
1	Jan-09	**21,853.0**	9.714%
2	Feb-09	**19,247.0**	8.556%
3	Mar-09	**20,275.0**	9.013%
4	Apr-09	**18,534.0**	8.239%
5	May-09	**18,040.0**	8.019%
6	Jun-09	**16,920.0**	7.521%
7	Jul-09	**17,267.0**	7.675%
8	Aug-09	**17,260.0**	7.672%
9	Sep-09	**16,745.0**	7.443%
10	Oct-09	**17,782.0**	7.904%
11	Nov-09	**19,043.0**	8.465%
12	Dec-09	**21,998.0**	9.778%
		224,964	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
2009	100.00	100.00	4.7271	4.4383	4.6067	4.3603
2010	100.59	100.59	7.0537	6.7120	6.9103	6.6172
2011	102.33	102.33	7.5060	7.1533	7.3576	7.0548
2012	104.52	104.52	7.6898	7.3617	7.5525	7.2716
2013	106.76	106.76	8.0459	7.7096	7.9049	7.6167
2014	108.74	108.74	8.3989	8.0540	8.2540	7.9581
2015	111.27	111.27	8.7308	8.3783	8.5825	8.2800
2016	113.73	113.73	9.1211	8.7390	8.9596	8.6306
2017	116.13	116.13	9.5026	9.1126	9.3376	9.0016
2018	118.42	118.42	9.8970	9.4998	9.7288	9.3865
2019	120.64	120.64	10.3082	9.9041	10.1370	9.7884
2020	122.75	122.75	10.7376	10.3268	10.5634	10.2088
2021	124.87	124.87	11.1857	10.7683	11.0085	10.6482
2022	127.09	127.09	11.6346	11.2104	11.4544	11.0880
2023	129.31	129.31	12.1229	11.6916	11.9395	11.5668
2024	131.72	131.72	12.8612	12.4225	12.6745	12.2952
2025	134.23	134.23	13.4251	12.9785	13.2349	12.8485
2026	136.83	136.83	14.0157	13.5611	13.8219	13.4285
2027	139.51	139.51	14.6340	14.1710	14.4365	14.0356
2028	142.32	142.32	15.2823	14.8106	15.0809	14.6722
2029	145.21	145.21	15.9609	15.4799	15.7553	15.3385
2030	148.18	148.18	16.6712	16.1813	16.4617	16.0369

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
2009	14.34	10.10	14.34	10.10
2010	14.83	10.45	14.83	10.45
2011	16.83	11.86	16.83	11.86
2012	18.14	12.78	18.14	12.78
2013	18.99	13.39	18.99	13.39
2014	20.00	14.10	20.00	14.10
2015	21.05	14.84	21.05	14.84
2016	21.84	15.39	21.84	15.39
2017	23.12	16.30	23.12	16.30
2018	24.70	17.41	24.70	17.41
2019	26.30	18.54	26.30	18.54
2020	27.43	19.33	27.43	19.33
2021	28.51	20.09	28.51	20.09
2022	29.28	20.64	29.28	20.64
2023	30.10	21.22	30.10	21.22
2024	30.94	21.81	30.94	21.81
2025	31.80	22.41	31.80	22.41
2026	32.66	23.02	32.66	23.02
2027	33.89	23.89	33.89	23.89
2028	35.17	24.79	35.17	24.79
2029	36.50	25.73	36.50	25.73
2030	37.88	26.70	37.88	26.70

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
	2009	0.9289	0.9289	0.9289	0.9289
	2010	1.2071	1.2071	1.2071	1.2071
	2011	1.3192	1.3192	1.3192	1.3192
	2012	1.1334	1.1334	1.1334	1.1334
	2013	1.1918	1.1918	1.1918	1.1918
	2014	1.2939	1.2939	1.2939	1.2939
	2015	1.3815	1.3815	1.3815	1.3815
	2016	1.3815	1.3815	1.3815	1.3815
	2017	1.3888	1.3888	1.3888	1.3888
	2018	1.3961	1.3961	1.3961	1.3961
	2019	1.4034	1.4034	1.4034	1.4034
	2020	1.4107	1.4107	1.4107	1.4107
	2021	1.4180	1.4180	1.4180	1.4180
	2022	1.4399	1.4399	1.4399	1.4399
	2023	1.4691	1.4691	1.4691	1.4691
	2024	1.4983	1.4983	1.4983	1.4983
	2025	1.5275	1.5275	1.5275	1.5275
	2026	1.6005	1.6005	1.6005	1.6005
	2027	1.6735	1.6735	1.6735	1.6735
	2028	1.7465	1.7465	1.7465	1.7465
	2029	1.7757	1.7757	1.7757	1.7757
	2030	1.8195	1.8195	1.8195	1.8195

Prices in Nominal $/Therm

Annual G30 Noncore C&I Gas Rates

						Nominal Dollars					**Constant 2009 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 $/Dth	CPI (Yr-2009 = 1.00)	Com B/T Average 2009-$ /Dth	Com B/T Marginal 2009-$ /Dth	Ind B/T Average 2009-$ /Dth	Ind B/T Marginal 2009-$ /Dth
2008					75.324					1.0080				
2009	**10.725**	**7.836**	**9.520**	**7.056**	36.547	4.727	4.438	4.607	4.360	1.0000	4.727	4.438	4.607	4.360
2010	12.753	9.336	11.319	8.388	57.784	7.054	6.712	6.910	6.617	1.0059	7.012	6.672	6.869	6.578
2011	13.892	10.365	12.408	9.380	61.168	7.506	7.153	7.358	7.055	1.0233	7.335	6.990	7.190	6.894
2012	12.858	9.577	11.484	8.676	64.040	7.690	7.362	7.552	7.272	1.0452	7.357	7.043	7.226	6.957
2013	13.494	10.130	12.084	9.202	66.965	8.046	7.710	7.905	7.617	1.0676	7.536	7.221	7.404	7.134
2014	13.848	10.399	12.399	9.440	70.141	8.399	8.054	8.254	7.958	1.0874	7.724	7.407	7.591	7.319
2015	14.118	10.593	12.635	9.610	73.190	8.731	8.378	8.583	8.280	1.1127	7.846	7.530	7.713	7.441
2016	14.681	10.860	13.066	9.776	76.530	9.121	8.739	8.960	8.631	1.1373	8.020	7.684	7.878	7.589
2017	15.002	11.102	13.352	9.992	80.024	9.503	9.113	9.338	9.002	1.1613	8.183	7.847	8.041	7.751
2018	15.293	11.322	13.612	10.188	83.677	9.897	9.500	9.729	9.386	1.1842	8.358	8.022	8.216	7.927
2019	15.578	11.536	13.865	10.380	87.505	10.308	9.904	10.137	9.788	1.2064	8.545	8.210	8.403	8.114
2020	15.847	11.738	14.104	10.559	91.530	10.738	10.327	10.563	10.209	1.2275	8.748	8.413	8.606	8.317
2021	16.118	11.944	14.346	10.743	95.739	11.186	10.768	11.009	10.648	1.2487	8.958	8.624	8.816	8.528
2022	16.401	12.160	14.599	10.936	99.945	11.635	11.210	11.454	11.088	1.2709	9.155	8.821	9.013	8.725
2023	16.684	12.370	14.849	11.122	104.545	12.123	11.692	11.939	11.567	1.2931	9.375	9.041	9.233	8.945
2024	16.995	12.608	15.128	11.335	111.617	12.861	12.422	12.674	12.295	1.3172	9.764	9.431	9.622	9.334
2025	17.315	12.849	15.413	11.549	116.936	13.425	12.979	13.235	12.849	1.3423	10.001	9.669	9.860	9.572
2026	17.647	13.101	15.709	11.774	122.510	14.016	13.561	13.822	13.428	1.3683	10.244	9.911	10.102	9.814
2027	17.987	13.357	16.012	12.003	128.352	14.634	14.171	14.436	14.036	1.3951	10.490	10.158	10.348	10.061
2028	18.348	13.631	16.334	12.247	134.475	15.282	14.811	15.081	14.672	1.4232	10.738	10.406	10.596	10.309
2029	18.717	13.908	16.662	12.494	140.891	15.961	15.480	15.755	15.339	1.4521	10.992	10.660	10.850	10.563
2030	19.096	14.198	17.001	12.753	147.616	16.671	16.181	16.462	16.037	1.4818	11.250	10.920	11.109	10.822
										Avg-Ann Growth Rate (2009 through 2030):	**4.2%**	**4.5%**	**4.3%**	**4.6%**

2009 G30 C&I Weight of Usage by Tier, BMW

	Service	Tier	Both	Com	Ind
Average	D	1	D1	26.52%	19.21%
Average	D	2	D2	38.71%	32.45%
Average	D	3	D3	15.11%	17.55%
Average	D	4	D4	19.66%	30.79%
Average	T	1	T1	97.96%	42.09%
Average	T	2	T2	2.04%	57.91%
Marginal	D	1	D1	3.26%	2.08%
Marginal	D	2	D2	36.80%	24.20%
Marginal	D	3	D3	20.80%	20.77%
Marginal	D	4	D4	39.14%	52.94%
Marginal	T	1	T1	80.19%	24.61%
Marginal	T	2	T2	19.81%	75.39%

2009 Volume (Therms)			Percent
Com&Ind	D&T	644,573,920	100.00%
Com&Ind	D	609,449,757	94.55%
Com&Ind	T	35,124,163	5.45%
Com	D&T	212,076,037	32.90%
Ind	D&T	432,497,883	67.10%
Com	D	203,635,004	96.02%
Com	T	8,441,033	3.98%
Ind	D	405,814,753	93.83%
Ind	T	26,683,130	6.17%

Obs	seg	service	_TYPE_	("Cust Cnt") _FREQ_	G-30 C&I (Non-Refinery) Therms	Prop/Pct.	Annual Therms/"Cust"
1			0	666	644,573,920	100.0%	967,829
2		D	1	635	609,449,757	94.6%	959,763
3		T	1	31	35,124,163	5.4%	1,133,038
4	COM		2	273	212,076,037	32.9%	776,835
5	IND		2	393	432,497,883	67.1%	1,100,504
6	COM	D	3	259	203,635,004	96.0%	786,236
7	COM	T	3	14	8,441,033	4.0%	602,931
8	IND	D	3	376	405,814,753	93.8%	1,079,295
9	IND	T	3	17	26,683,130	6.2%	1,569,596

Gas Transp. Forecast from Rate Design (Nominal Cents per Therm) **Trans Option: "Class Averge"**

Year	PPP (¢/Thm)	Dcharge ($/mo /mtr)	D1 (¢/Thm)	D2 (¢/Thm)	D3 (¢/Thm)	D4 (¢/Thm)	Tcharge ($/mo /mtr)	T1 (¢/Thm)	T2 (¢/Thm)	CPI	CBSP $/Dth
2006	3.221	$350	16.75	11.48	8.12	5.71	$700	13.54	5.32	0.943	6.17
2007	2.732	$350	16.56	11.15	7.68	5.21	$700	13.28	4.81	0.974	6.50
2008	2.807	$350	16.83	11.32	7.79	5.27	$700	13.67	4.91	1.008	7.53
2009	3.162	$350	15.12	10.19	7.03	4.78	$700	11.09	4.18	1.000	3.65
2010	3.022	$350	18.55	12.20	8.07	5.70	$0	5.22	5.22	1.006	5.78
2011	3.54	$350	19.92	13.34	9.06	6.58	$0	6.14	6.14	1.023	6.12
2012	3.56	$350	18.37	12.31	8.36	6.13	$0	5.18	5.18	1.045	6.40
2013	3.65	$350	19.18	12.94	8.89	6.57	$0	5.36	5.36	1.068	6.70
2014	3.67	$350	19.71	13.30	9.12	6.72	$0	5.45	5.45	1.087	7.01
2015	3.76	$350	20.15	13.57	9.30	6.82	$0	5.49	5.49	1.113	7.32
2016	3.84	$350	21.34	14.14	9.46	6.69	$0	5.54	5.54	1.137	7.65
2017	3.92	$350	21.83	14.46	9.67	6.83	$0	5.66	5.66	1.161	8.00
2018	4.00	$350	22.28	14.75	9.87	6.96	$0	5.77	5.77	1.184	8.37
2019	4.07	$350	22.71	15.03	10.05	7.08	$0	5.87	5.87	1.206	8.75
2020	4.14	$350	23.12	15.30	10.23	7.19	$0	5.97	5.97	1.228	9.15
2021	4.22	$350	23.54	15.58	10.42	7.32	$0	6.08	6.08	1.249	9.57
2022	4.29	$350	23.96	15.86	10.61	7.44	$0	6.18	6.18	1.271	9.99
2023	4.37	$350	24.40	16.15	10.80	7.56	$0	6.29	6.29	1.293	10.45
2024	4.45	$350	24.87	16.46	11.01	7.70	$0	6.41	6.41	1.317	11.16
2025	4.53	$350	25.35	16.78	11.22	7.83	$0	6.52	6.52	1.342	11.69
2026	4.62	$350	25.86	17.11	11.45	7.98	$0	6.65	6.65	1.368	12.25
2027	4.71	$350	26.38	17.45	11.67	8.13	$0	6.78	6.78	1.395	12.84
2028	4.80	$350	26.92	17.81	11.91	8.28	$0	6.90	6.90	1.423	13.45
2029	4.90	$350	27.49	18.18	12.16	8.44	$0	7.05	7.05	1.452	14.09
2030	5.00	$350	28.06	18.56	12.42	8.61	$0	7.19	7.19	1.482	14.76

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

Transportation Charge (¢/Thm):	**12.635**	**=**	**+ (93.8% Ind Dist of total Ind) * { [(100 ¢/$ *12 Mo/Yr)*($350.00 /mo/mtr)/(1,079,295 Thm/Mtr Ind Dist)] + (19.21%* 20.15 ¢/Thm + 32.45%* 13.57 ¢/Thm + 17.55%* 9.30 ¢/Thm + 30.79%* 6.82 ¢/Thm) } + (6.2% Ind Trans of total Ind) * { [(100 ¢/$ *12 Mo/Yr)*($0.00 /mo/mtr)/(1,569,596 Thm/Mtr Ind Trans)] + (42.09%* 5.49 ¢/Thm+57.91%* 5.49¢/Thm) }**
Gas Commodity Price (¢/Thm):	**73.190**	**=**	**("CBPS", market price of gas at the SoCalGas City Gate)**
Customer's "Burner-Tip" Price:	**85.825**	**=**	**(73.190 + 12.635) ¢/Thm**

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

Transportation Charge (¢/Thm):	**9.610**	**=**	**+ (93.8% Ind Dist of total Ind) * { (2.08%* 20.15 ¢/Thm + 24.02%* 13.57 ¢/Thm + 20.77%* 9.30 ¢/Thm + 52.94%* 6.82 ¢/Thm) } + (6.2% Ind Trans of total Ind) * { (24.61%* 5.49 ¢/Thm+75.39%* 5.49¢/Thm) }**
Gas Commodity Price (¢/Thm):	**73.190**	**=**	**("CBPS", market price of gas at the SoCalGas City Gate)**
Customer's "Burner-Tip" Price:	**82.800**	**=**	**(73.190 + 9.610) ¢/Thm**

Scg_G30ComNoncore_09_Source_Data for 2010 CGR WP_RMP.xls - CGR_Employment_Data

YEAR	Office	Restaurant	Retail	Laundry	Warehouse	School	College	Health	Lodging	Misc	Government	TCU	Construction	Agriculture	Total Employment
2009	1.0578	0.5720	0.9333	0.0820	0.4208	0.6258	0.2079	0.7591	0.0989	0.2363	0.6417	0.5496	0.3400	0.2300	6.7551
2010	1.0811	0.5717	0.9329	0.0822	0.4206	0.6129	0.2036	0.7693	0.0984	0.2369	0.6376	0.5383	0.3035	0.2257	6.7146
2011	1.1437	0.5924	0.9666	0.0827	0.4238	0.6080	0.2020	0.7813	0.0988	0.2383	0.6244	0.5562	0.3072	0.2303	6.8559
2012	1.1887	0.5968	0.9789	0.0859	0.4578	0.6210	0.2063	0.8167	0.0990	0.2238	0.6337	0.5751	0.3774	0.2396	7.1006
2013	1.2446	0.6124	0.9993	0.0830	0.4383	0.6327	0.2102	0.8066	0.1012	0.2391	0.6415	0.5868	0.3835	0.2431	7.2221
2014	1.2709	0.6180	1.0084	0.0835	0.4424	0.6443	0.2140	0.8174	0.1020	0.2405	0.6505	0.5981	0.4068	0.2472	7.3440
2015	1.2881	0.6235	1.0174	0.0836	0.4449	0.6508	0.2162	0.8297	0.1026	0.2409	0.6552	0.6084	0.4227	0.2520	7.4362
2016	1.3136	0.6268	1.0228	0.0836	0.4473	0.6548	0.2175	0.8442	0.1032	0.2408	0.6580	0.6174	0.4327	0.2572	7.5197
2017	1.3399	0.6312	1.0300	0.0835	0.4496	0.6590	0.2189	0.8580	0.1038	0.2408	0.6610	0.6271	0.4417	0.2624	7.6069
2018	1.3707	0.6353	1.0367	0.0835	0.4525	0.6642	0.2206	0.8723	0.1044	0.2405	0.6649	0.6348	0.4515	0.2674	7.6993
2019	1.4087	0.6382	1.0414	0.0834	0.4557	0.6697	0.2225	0.8852	0.1052	0.2404	0.6691	0.6387	0.4625	0.2720	7.7926
2020	1.4477	0.6418	1.0472	0.0836	0.4572	0.6758	0.2245	0.8953	0.1060	0.2408	0.6759	0.6412	0.4754	0.2751	7.8874
2021	1.4864	0.6468	1.0553	0.0840	0.4577	0.6821	0.2266	0.9052	0.1068	0.2421	0.6745	0.6476	0.4888	0.2784	7.9824
2022	1.5179	0.6515	1.0631	0.0845	0.4611	0.6884	0.2287	0.9147	0.1077	0.2436	0.6794	0.6567	0.5008	0.2820	8.0800
2023	1.5504	0.6561	1.0705	0.0850	0.4644	0.6944	0.2307	0.9254	0.1087	0.2450	0.6839	0.6667	0.5116	0.2857	8.1783
2024	1.5850	0.6600	1.0769	0.0855	0.4678	0.6998	0.2324	0.9364	0.1096	0.2464	0.6880	0.6770	0.5220	0.2895	8.2763
2025	1.6205	0.6643	1.0839	0.0860	0.4710	0.7054	0.2343	0.9472	0.1105	0.2479	0.6922	0.6866	0.5318	0.2933	8.3749
2026	1.6541	0.6688	1.0913	0.0866	0.4721	0.7111	0.2362	0.9586	0.1115	0.2496	0.6966	0.6950	0.5416	0.2971	8.4700
2027	1.6871	0.6740	1.0998	0.0871	0.4735	0.7164	0.2380	0.9711	0.1125	0.2511	0.7005	0.7029	0.5526	0.3013	8.5679
2028	1.7214	0.6795	1.1088	0.0877	0.4748	0.7215	0.2397	0.9835	0.1136	0.2526	0.7043	0.7101	0.5615	0.3054	8.6646
2029	1.7579	0.6848	1.1173	0.0882	0.4758	0.7264	0.2413	0.9963	0.1147	0.2541	0.7079	0.7135	0.5685	0.3094	8.7560
2030	1.7964	0.6894	1.1248	0.0886	0.4759	0.7308	0.2427	1.0082	0.1157	0.2555	0.7154	0.7156	0.5743	0.3134	8.8468

Employment in "millions".

Scg_G30ComNoncore_09_Source_Data for 2010 CGR WP_RMP.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

Scg_G30ComNoncore_09_Source_Data for 2010 CGR WP_RMP.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

Scg_G30ComNoncore_09_Source_Data for 2010 CGR WP_RMP.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

Scg_G30ComNoncore_09_Source_Data for 2010 CGR WP_RMP.xls ComNCoreUsePerMeterAvg

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other	Total Building
Office	415651	172570	21048	6997	5339	21771	4670	7124	20719	5920	414434	1096245
Restaurant	31646	61254	102236	42058	80768	89364	21760	1261	564	0	20083	450994
Retail	169948	103225	37585	6259	41864	72166	44628	9902	19030	1520	235491	741617
Laundry	1786	28390	233	36	58	337	2	54	285196	0	265559	581651
Warehouse	124189	36078	5133	1430	12370	14223	18184	14131	41299	12268	399608	678914
School	0	0	0	0	0	0	0	0	0	0	0	0
College	581246	287101	28047	8274	14384	34525	7980	36331	8811	12347	395314	1414360
Health	268161	168030	26931	5216	7316	20710	11714	4854	36889	2751	283529	836100
Lodging	80098	163603	22582	5512	7057	27499	13535	1324	42623	27	184912	548771
Misc	277588	169535	34325	6853	11296	28214	9017	28582	10975	2106	187349	765839
Government	383305	222837	19584	9651	5729	16121	8744	10233	5169	56613	150201	888187
TCU	131314	47207	4158	1033	1961	3641	2487	6414	405	206027	217810	622458
Construction	481415	150456	12081	71	1795	6710	4116	14275	90009	309	710212	1471448
Agriculture	107804	26119	4436	740	9226	20515	18651	253	27188	178259	359938	753130

Scg_G30ComNoncore_09_Source_Data for 2010 CGR WP_RMP.xls - 2009_Historical_Data .

Segment	2009 Therm Sales	2009 Meter Count	2009 Meter Count, Existing/Old customers	2009 Meter Count New Customers	Avg Use Per Meter Existing Customers	Avg Use Per Meter New Customers	Price Elasticity	Employment Elasticities
Office	7581304	4	4	0	1895326	0	-0.046000	0.474000
Restaurant	359798	1	1	0	359798	0	-0.046000	0.474000
Retail	1424409	3	3	0	474803	0	-0.046000	0.474000
Laundry	11431803	19	19	0	601674	0	-0.046000	0.474000
Warehouse	273608	2	2	0	136804	0	-0.046000	0.474000
School	0	0	0	0	0	0	-0.046000	0.474000
College	17399067	13	13	0	1338390	0	-0.046000	0.474000
Health	72598520	84	84	0	864268	0	-0.046000	0.474000
Lodging	11394269	18	18	0	633015	0	-0.046000	0.474000
Misc	6857117	5	5	0	1371423	0	-0.046000	0.474000
Government	33430084	34	34	0	983238	0	-0.046000	0.474000
TCU	29328794	51	51	0	575074	0	-0.046000	0.474000
Construction	0	0	0	0	0	0	-0.046000	0.474000
Agriculture	18702750	25	25	0	748110	0	-0.046000	0.474000

Ind_NCore_09_Source_Data(Linked)_bmwCopy4WP.xls - IndNonCoreEmpFcast

YEAR	Mining	Food	Textile	Wood_Pap	Chemical	Petroleum	Stone	Prim_Metal	Fab_Metal	Transport	Misc	EMPLTOT
2009	19.40658	114.07050	33.41917	20.57867	35.81333	5.86783	18.42533	9.15117	84.38550	73.04692	370.96650	795.77209
2010	18.63308	112.25000	31.38550	20.02408	36.34883	5.91442	17.58817	9.29383	78.26842	69.32350	365.14283	770.50587
2011	18.11392	112.62725	31.65325	21.41867	37.30008	5.81367	18.60783	10.03800	77.63467	70.13008	373.48392	786.08087
2012	18.36375	113.49117	32.52200	23.00783	38.26833	5.72292	19.84883	10.42392	83.70442	72.48267	382.24042	806.67486
2013	18.66175	113.45300	32.74733	23.64008	38.89692	5.59358	21.04642	10.40458	91.85175	74.37975	390.00217	820.08590
2014	18.53900	113.07783	32.47308	23.70558	39.25650	5.44425	21.46233	10.39700	98.47558	75.45025	390.37883	825.89067
2015	18.17350	112.21217	31.97708	23.61508	39.70992	5.28783	21.38658	10.30717	102.03750	75.26717	389.87108	826.84710
2016	17.73067	111.68408	31.58025	23.80300	40.24192	5.17833	21.29317	10.20825	103.38583	73.80408	389.79617	829.17204
2017	17.28917	111.32850	31.36208	23.92183	40.83867	5.07292	21.35808	10.18417	103.69242	72.65500	389.41425	831.81056
2018	16.74083	110.90050	31.21142	24.11508	41.47475	4.96800	21.54025	10.18933	103.31425	72.07717	389.21858	833.70719
2019	16.18800	110.24725	31.09658	24.25367	42.02417	4.83800	21.63892	10.19642	103.53508	71.65050	386.78392	835.32915
2020	15.82233	109.51767	31.02500	24.32667	42.41983	4.68833	21.57175	10.17708	103.40483	71.03467	382.56267	836.42313
2021	15.53958	108.78767	30.88217	24.28100	42.79708	4.53950	21.45192	10.10958	102.97583	70.27425	378.78950	837.46034
2022	15.25325	107.98342	30.73925	24.15183	43.08750	4.45825	21.29317	9.96325	102.15942	69.54200	374.67692	837.05140
2023	14.99542	107.15958	30.73942	23.98917	43.33950	4.42767	21.11517	9.75533	100.72450	68.82708	370.16383	836.53228
2024	14.74092	106.38242	30.79892	23.81775	43.56175	4.41117	20.93450	9.55442	99.57450	68.12975	366.71550	836.29723
2025	14.53325	105.60192	30.98958	23.76783	43.68525	4.38917	20.87958	9.35242	98.32825	67.54867	363.14033	835.85758
2026	14.41250	104.82308	31.18400	23.76458	43.85192	4.34717	20.89117	9.16600	97.27458	67.12050	358.34992	835.77458
2027	14.33992	104.16933	31.38250	23.60617	44.09583	4.30017	20.86775	9.01008	96.45550	66.76758	353.67950	835.94177
2028	14.29200	103.60167	31.51717	23.33000	44.39767	4.24808	20.79617	8.84792	95.34708	66.38200	349.91208	835.20510
2029	14.25092	103.11108	31.53717	23.11633	44.68458	4.17992	20.76292	8.69592	94.31133	66.00708	346.72775	833.14102
2030	14.20108	102.64883	31.63242	23.16450	44.93683	4.11225	20.82125	8.48050	93.32925	65.71267	344.00317	831.97901

Ind_NCore_09_Source_Data(Linked)_bmwCopy4WP.xls - IndNonCoreUsePerMeterAvg

Segment	Fire_Tube_Boil	Wat_Tube_Boil	Space_Heat	Water_Heat	Dryer	Furnace_Oven_ Kiln	AC	Engine	Misc_Other	Total
Mining	129593	513013	6668	3972	344368	902495	0	37429	17991	1955529
Food	879689	238082	9519	12401	327015	80205	905	2641	62989	1613447
Textile	487509	67090	4025	12804	222948	70637	0	7384	30080	902476
Wood_Paper	184427	463132	79	323	68862	39574	0	0	28801	785196
Chemical	504555	157909	3544	2464	0	24418	8115	0	294455	995460
Petroleum	39232	0	17608	1358	148635	473018	0	0	48962	728813
Stone	35326	0	5476	991	22244	920878	0	0	44415	1029330
Prim_Metal	28726	103096	3237	372	34027	1271415	116	0	122736	1563725
Fab_Metal	109418	11494	14882	1545	2419	653063	49	909	129414	923193
Transport	75914	113833	23119	2421	1350	635802	179	0	111490	964108
Misc	250454	83005	10161	10628	18616	172569	3	0	159720	705158

Ind_NCore_09_Source_Data(Linked)_bmwCopy4WP.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

Ind_NCore_09_Source_Data(Linked)_bmwCopy4WP.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%

Ind_NCore_09_Source_Data(Linked)_bmwCopy4WP.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%

Ind_NCore_09_Source_Data(Linked)_bmwCopy4WP.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

Ind_NCore_09_Source_Data(Linked)_bmwCopy4WP.xls - 2009_Historical_Data

Segment	2009 Therm Sales	2009 Meter Count	2009 Meter Count, Existing/Old customers	2009 Meter Count New Customers	Avg Use Per Meter Existing Customers	Avg Use Per Meter New Customers	Price Elasticity	Emp Elasticity
Mining	15644228	8	8	0	1955529	.	-0.071000	0.474000
Food	162647971	108	108	0	1613447	.	-0.071000	0.474000
Textile	18952001	21	21	0	902476	.	-0.071000	0.474000
Wood_Paper	30622645	39	39	0	785196	.	-0.071000	0.474000
Chemical	27872875	28	28	0	995460	.	-0.071000	0.474000
Petroleum	25508472	35	35	0	728813	.	-0.071000	0.474000
Stone	14410619	14	14	0	1029330	.	-0.071000	0.474000
Prim_Metal	43784302	28	28	0	1563725	.	-0.071000	0.474000
Fab_Metal	38774117	42	42	0	923193	.	-0.071000	0.474000
Transport	18318044	19	19	0	964108	.	-0.071000	0.474000
Misc	35963044	51	51	0	705158	.	-0.071000	0.474000
Total	432,498,318	393						

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")

SOUTHERN CALIFORNIA GAS COMPANY
2010 California Gas Report REDACTED Workpapers-7/26

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%												

SUMMARY OUTPUT

Regression Statistics		
Multiple R	0.97900809	
R Square	0.95845684	
Adjusted R Square	0.94083247	
Standard Error	194.880553	
Observations	48	**(Jan-2006 through Dec-2009)**

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	14	28915053.6	2065360.97	54.38247367	1.0976E-18
Residual	33	1253288.19	37978.4301		
Total	47	30168341.8			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept (Yr_09, M_08)	4251.4	108.9	39.02	3.4007E-29	4029.7	4473.0
Yr_06	1704.2	79.6	21.42	6.22091E-21	1542.4	1866.1
Yr_07	1402.7	79.6	17.63	2.32065E-18	1240.8	1564.6
Yr_08	458.9	79.6	5.77	1.9082E-06	297.1	620.8
M_01	-541.3	137.8	-3.93	0.000412391	-821.7	-260.9
M_02	-880.6	137.8	-6.39	3.07483E-07	-1160.9	-600.2
M_03	-465.0	137.8	-3.37	0.001905749	-745.3	-184.6
M_04	-649.1	137.8	-4.71	4.31641E-05	-929.5	-368.8
M_05	-575.6	137.8	-4.18	0.000202824	-856.0	-295.3
M_06	-795.7	137.8	-5.77	1.87757E-06	-1076.0	-515.3
M_07	-422.5	137.8	-3.07	0.004306057	-702.9	-142.1
M_09	-303.4	137.8	-2.20	0.034804761	-583.7	-23.0
M_10	-595.9	137.8	-4.32	0.000132781	-876.3	-315.6
M_11	-1149.1	137.8	-8.34	1.24209E-09	-1429.4	-868.7
M_12	-1388.5	137.8	-10.08	1.33955E-11	-1668.8	-1108.1

RESIDUAL OUTPUT

Observation	Predicted Y-Reg#1(w/o Hdd)	Residuals-IndReg#1(w/o Hdd)	ındard Residuals	Date	Month	Monthly Proportions of 2009 Annual Pred Load
1	5414.3	-121.0	-0.741	**Jan-06**		
2	5075.0	-122.0	-0.747	**Feb-06**		
3	5490.6	155.6	0.953	**Mar-06**		
4	5306.5	81.2	0.497	**Apr-06**		
5	5380.0	143.4	0.878	**May-06**		
6	5159.9	56.0	0.343	**Jun-06**		
7	5533.1	-165.9	-1.016	**Jul-06**		
8	5955.6	154.8	0.948	**Aug-06**		
9	5652.2	-73.6	-0.451	**Sep-06**		
10	5359.7	-86.1	-0.527	**Oct-06**		
11	4806.5	12.8	0.079	**Nov-06**		
12	4567.1	-35.1	-0.215	**Dec-06**		
13	5112.8	-33.7	-0.206	**Jan-07**		
14	4773.5	-121.1	-0.742	**Feb-07**		
15	5189.1	23.4	0.143	**Mar-07**		
16	5004.9	24.0	0.147	**Apr-07**		
17	5078.4	70.8	0.433	**May-07**		
18	4858.4	-27.8	-0.170	**Jun-07**		
19	5231.5	68.4	0.419	**Jul-07**		
20	5654.1	47.8	0.293	**Aug-07**		
21	5350.7	14.0	0.086	**Sep-07**		
22	5058.1	107.5	0.658	**Oct-07**		
23	4505.0	-44.3	-0.271	**Nov-07**		
24	4265.6	-128.9	-0.789	**Dec-07**		
25	4169.0	373.4	2.287	**Jan-08**		
26	3829.7	375.6	2.300	**Feb-08**		
27	4245.3	82.7	0.507	**Mar-08**		
28	4061.2	190.8	1.169	**Apr-08**		
29	4134.7	8.3	0.051	**May-08**		
30	3914.7	-55.9	-0.342	**Jun-08**		
31	4287.8	-51.2	-0.314	**Jul-08**		
32	4710.3	-262.6	-1.608	**Aug-08**		
33	4406.9	-121.7	-0.745	**Sep-08**		
34	4114.4	-138.0	-0.845	**Oct-08**		
35	3561.2	-202.3	-1.239	**Nov-08**		
36	3321.8	-199.1	-1.219	**Dec-08**		
37	3710.1	-218.7	-1.340	**Jan-09**	**1**	**8.58%**
38	3370.8	-132.5	-0.812	**Feb-09**	**2**	**7.79%**
39	3786.4	-261.7	-1.603	**Mar-09**	**3**	**8.75%**
40	3602.2	-296.0	-1.813	**Apr-09**	**4**	**8.33%**
41	3675.7	-222.5	-1.362	**May-09**	**5**	**8.50%**
42	3455.7	27.7	0.170	**Jun-09**	**6**	**7.99%**
43	3828.9	148.8	0.911	**Jul-09**	**7**	**8.85%**
44	4251.4	60.1	0.368	**Aug-09**	**8**	**9.83%**
45	3948.0	181.3	1.111	**Sep-09**	**9**	**9.13%**
46	3655.4	116.6	0.714	**Oct-09**	**10**	**8.45%**
47	3102.3	233.8	1.432	**Nov-09**	**11**	**7.17%**
48	2862.9	363.1	2.224	**Dec-09**	**12**	**6.62%**
						100.00%

2010 CALIFORNIA GAS REPORT

NATURAL GAS VEHICLES
JULY 2010

The Gas Company

A Sempra Energy utility™

Southern California Gas Company
2010 California Gas Report
NGV Detail

SoCalGas Co Owned	0.04												
2009 in ccf	81,069	77,156	89,950	80,695	79,718	78,299	85,813	74,728	100,757	100,379	86,804	90,209	1,025,577
YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2009	8.32	7.92	9.23	8.28	8.18	8.03	8.80	7.67	10.34	10.30	8.91	9.26	105.2
2010	8.6	8.1	9.5	8.5	8.4	8.3	9.1	7.9	10.6	10.6	9.2	9.5	108.2
2011	8.8	8.4	9.8	8.7	8.6	8.5	9.3	8.1	10.9	10.9	9.4	9.8	111.2
2012	9.0	8.6	10.0	9.0	8.9	8.7	9.6	8.3	11.2	11.2	9.7	10.1	114.3
2013	9.3	8.8	10.3	9.2	9.1	9.0	9.8	8.6	11.5	11.5	9.9	10.3	117.5
2014	9.5	9.1	10.6	9.5	9.4	9.2	10.1	8.8	11.9	11.8	10.2	10.6	120.8
2015	9.8	9.3	10.9	9.8	9.7	9.5	10.4	9.0	12.2	12.2	10.5	10.9	124.2
2016	10.1	9.6	11.2	10.0	9.9	9.7	10.7	9.3	12.5	12.5	10.8	11.2	127.7
2017	10.4	9.9	11.5	10.3	10.2	10.0	11.0	9.6	12.9	12.8	11.1	11.5	131.2
2018	10.7	10.1	11.8	10.6	10.5	10.3	11.3	9.8	13.3	13.2	11.4	11.9	134.9
2019	11.0	10.4	12.2	10.9	10.8	10.6	11.6	10.1	13.6	13.6	11.7	12.2	138.7
2020	11.3	10.7	12.5	11.2	11.1	10.9	11.9	10.4	14.0	14.0	12.1	12.5	142.6
2021	11.6	11.0	12.9	11.5	11.4	11.2	12.3	10.7	14.4	14.3	12.4	12.9	146.6
2022	11.9	11.3	13.2	11.9	11.7	11.5	12.6	11.0	14.8	14.7	12.8	13.3	150.7
2023	12.2	11.7	13.6	12.2	12.0	11.8	13.0	11.3	15.2	15.2	13.1	13.6	154.9
2024	12.6	12.0	14.0	12.5	12.4	12.2	13.3	11.6	15.6	15.6	13.5	14.0	159.2
2025	12.9	12.3	14.4	12.9	12.7	12.5	13.7	11.9	16.1	16.0	13.9	14.4	163.7
2026	13.3	12.7	14.8	13.2	13.1	12.8	14.1	12.3	16.5	16.5	14.2	14.8	168.3
2027	13.7	13.0	15.2	13.6	13.4	13.2	14.5	12.6	17.0	16.9	14.6	15.2	173.0
2028	14.1	13.4	15.6	14.0	13.8	13.6	14.9	13.0	17.5	17.4	15.1	15.6	177.8
2029	14.4	13.8	16.0	14.4	14.2	14.0	15.3	13.3	18.0	17.9	15.5	16.1	182.8
2030	14.9	14.1	16.5	14.8	14.6	14.3	15.7	13.7	18.5	18.4	15.9	16.5	187.9

Southern California Gas Company
2010 California Gas Report
NGV Detail

3rd party owned													
2009 ccf	7,547,740	7,029,633	7,561,134	8,324,532	8,026,438	7,897,228	8,151,528	7,585,543	8,018,458	8,329,931	7,668,891	7,971,418	94,112,474
YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
MDTH													
2009	774	721	776	854	824	810	836	778	823	855	787	818	9,656
2010	796	741	797	878	847	833	860	800	846	879	809	841	9,926
2011	818	762	820	903	870	856	884	822	869	903	832	864	10,204
2012	841	784	843	928	895	880	909	845	894	928	855	889	10,490
2013	865	805	866	954	920	905	934	869	919	954	879	913	10,784
2014	889	828	891	981	945	930	960	894	945	981	903	939	11,086
2015	914	851	916	1,008	972	956	987	919	971	1,009	929	965	11,396
2016	940	875	941	1,036	999	983	1,015	944	998	1,037	955	992	11,715
2017	966	900	968	1,065	1,027	1,011	1,043	971	1,026	1,066	981	1,020	12,043
2018	993	925	995	1,095	1,056	1,039	1,072	998	1,055	1,096	1,009	1,049	12,380
2019	1,021	951	1,023	1,126	1,085	1,068	1,102	1,026	1,084	1,126	1,037	1,078	12,727
2020	1,049	977	1,051	1,157	1,116	1,098	1,133	1,055	1,115	1,158	1,066	1,108	13,083
2021	1,079	1,005	1,081	1,190	1,147	1,129	1,165	1,084	1,146	1,190	1,096	1,139	13,450
2022	1,109	1,033	1,111	1,223	1,179	1,160	1,198	1,114	1,178	1,224	1,127	1,171	13,826
2023	1,140	1,062	1,142	1,257	1,212	1,193	1,231	1,146	1,211	1,258	1,158	1,204	14,213
2024	1,172	1,091	1,174	1,292	1,246	1,226	1,266	1,178	1,245	1,293	1,191	1,238	14,611
2025	1,205	1,122	1,207	1,329	1,281	1,260	1,301	1,211	1,280	1,329	1,224	1,272	15,020
2026	1,238	1,153	1,241	1,366	1,317	1,296	1,337	1,245	1,316	1,367	1,258	1,308	15,441
2027	1,273	1,186	1,275	1,404	1,354	1,332	1,375	1,279	1,352	1,405	1,293	1,344	15,873
2028	1,309	1,219	1,311	1,443	1,392	1,369	1,413	1,315	1,390	1,444	1,330	1,382	16,318
2029	1,345	1,253	1,348	1,484	1,431	1,408	1,453	1,352	1,429	1,485	1,367	1,421	16,775
2030	1,383	1,288	1,385	1,525	1,471	1,447	1,494	1,390	1,469	1,526	1,405	1,461	17,244

2010 SoCalGas CGR
2010 California Gas Report
Notes : NGV Forecast

Compressed:
2009 throughput is actual received from the billing services department.
Throughput forecast increased at the rate of 2.8 % per year 2010 through 2030, from 105.2 Mdtherms to 187.7 Mdtherms.

Uncompressed:
2009 throughput is actual received from the billing services department.
Uncompressed throughput forecast is expected to grow at the annual compounded rate of 2.8% for the next 20 years, from 9,655.9 in 2010 to 17,244 Mdtherms in 2030. Growth over the next 20 years will mainly come from ports and goods movement market segments.
An estimated 17,000 trucks serve the two Ports. NGVs are expected to play a significant role in the conversion of these trucks as the ports authority seeks to control emissions. Refuse haulers are also expected to contribute to a lesser extent to the overall load growth.

Throughput growth forecast is based on the average of the last four years of non-transit throughput, as a percentage of total throughput.
We do not expect any noticeable throughput from transits, as the transit market is currently saturated.

Station growth forecast uses the same growth rate as the throughput.
NGV stations are expected to grow from a 2009 level of 254 to approximately 454 by 2030, an annual compounded growth rate of 2.8% per year to accommodate the throughput. growth.

2010 CALIFORNIA GAS REPORT

ENERGY EFFICIENCY
JULY 2010

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Southern California Gas Company
2010 California Gas Report
Energy Efficiency Savings Forecast

Proportionally scale it down to match PUC Goals for 2010 - 2012

ANNUAL NET SAVINGS	**2009 Mdth**	**2010 Mdth**	**2011 Mdth**	**2012 Mdth**	**2013 Mdth**	**2014 Mdth**	**2015 Mdth**	**2016 Mdth**
Core Residential	633	869	933	988	988	988	988	988
Core Commercial	742	388	436	463	463	463	463	463
Core Industrial	226	305	326	349	349	349	349	349
NonCore Commercial	106	676	714	766	766	766	766	766
NonCore Industrial retail	247	265	281	301	301	301	301	301
NonCore Industrial refinery	504	297	311	334	334	334	334	334
Total	**2,459**	**2,800**	**3,000**	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**

Cumulative Savings (Mdth)	**2010 Mdth**	**2011 Mdth**	**2012 Mdth**	**2013 Mdth**	**2014 Mdth**	**2015 Mdth**	**2016 Mdth**
Core Residential	**869**	**1,801**	**2,789**	**3,777**	**4,764**	**5,752**	**6,739**
Core Commercial	**388**	**824**	**1,287**	**1,750**	**2,213**	**2,676**	**3,139**
Core Industrial	**305**	**631**	**979**	**1,328**	**1,677**	**2,025**	**2,374**
NonCore Commercial	**676**	**1,390**	**2,155**	**2,921**	**3,686**	**4,452**	**5,218**
NonCore Industrial regular	**265**	**546**	**847**	**1,148**	**1,448**	**1,749**	**2,050**
NonCore Industrial refinery	**297**	**609**	**943**	**1,277**	**1,611**	**1,945**	**2,280**
Total Load Impacts	**2,800**	**5,800**	**9,000**	**12,200**	**15,400**	**18,600**	**21,800**

	1.0273						
Cumulative Savings (MMCF)	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Core Residential	846	1,754	2,715	3,676	4,638	5,599	6,560
	0.846	1.754	2.715	3.676	4.638	5.599	6.560
Core Commercial	378	802	1,253	1,703	2,154	2,605	3,056
Core Industrial	297	614	953	1,293	1,632	1,972	2,311
	675	1,416	2,206	2,996	3,786	4,576	5,367
	0.675	1.416	2.206	2.996	3.786	4.576	5.367
NonCore Commercial	658	1,353	2,098	2,843	3,588	4,334	5,079
NonCore Industrial regular	258	531	824	1,117	1,410	1,703	1,996
	916	1,884	2,922	3,960	4,998	6,037	7,075
	0.916	1.884	2.922	3.960	4.998	6.037	7.075
NonCore Industrial refinery	290	592	918	1,243	1,568	1,894	2,219
Total Cumulative Load	**4,319**	**8,951**	**13,897**	**18,843**	**23,789**	**28,735**	**33,681**

Southern California Gas Company
2010 California Gas Report
Energy Efficiency Savings Forecast

ANNUAL NET SAVINGS	2017 Mdth	2018 Mdth	2019 Mdth	2020 Mdth	2021 Mdth	2022 Mdth	2023 Mdth	2024 Mdth	2025 Mdth	2026 Mdth	2027 Mdth	2028 Mdth	2029 Mdth	2030 Mdth
Core Residential	988	988	988	988	988	988	988	988	988	988	988	988	988	988
Core Commercial	463	463	463	463	463	463	463	463	463	463	463	463	463	463
Core Industrial	349	349	349	349	349	349	349	349	349	349	349	349	349	349
NonCore Commercial	766	766	766	766	766	766	766	766	766	766	766	766	766	766
NonCore Industrial retail	301	301	301	301	301	301	301	301	301	301	301	301	301	301
NonCore Industrial refinery	334	334	334	334	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**	**3,200**	**3,200**	**3,200**	**3,200**

Cumulative Savings (Mdth)	2017 Mdth	2018 Mdth	2019 Mdth	2020 Mdth	2021 Mdth	2022 Mdth	2023 Mdth	2024 Mdth	2025 Mdth	2026 Mdth	2027 Mdth	2028 Mdth	2029 Mdth	2030 Mdth
Core Residential	**7,727**	**8,715**	**9,702**	**10,690**	**11,677**	**12,665**	**13,652**	**14,007**	**14,126**	**14,180**	**14,180**	**14,180**	**14,180**	**14,180**
Core Commercial	**3,602**	**4,065**	**4,528**	**4,991**	**5,454**	**5,917**	**6,380**	**6,101**	**6,176**	**6,203**	**6,203**	**6,203**	**6,203**	**6,203**
Core Industrial	**2,723**	**3,071**	**3,420**	**3,769**	**4,118**	**4,466**	**4,815**	**4,938**	**4,982**	**5,005**	**5,005**	**5,005**	**5,005**	**5,005**
NonCore Commercial	**5,983**	**6,749**	**7,514**	**8,280**	**9,045**	**9,811**	**10,577**	**11,236**	**11,326**	**11,378**	**11,378**	**11,378**	**11,378**	**11,378**
NonCore Industrial regular	**2,351**	**2,652**	**2,953**	**3,254**	**3,555**	**3,856**	**4,157**	**4,210**	**4,246**	**4,266**	**4,266**	**4,266**	**4,266**	**4,266**
NonCore Industrial refinery	**2,614**	**2,948**	**3,282**	**3,617**	**3,951**	**4,285**	**4,619**	**4,449**	**4,486**	**4,509**	**4,509**	**4,509**	**4,509**	**4,509**
Total Load Impacts	**25,000**	**28,200**	**31,400**	**34,600**	**37,800**	**41,000**	**44,200**	**44,941**	**45,341**	**45,541**	**45,541**	**45,541**	**45,541**	**45,541**

Cumulative Savings (MMCF)	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Core Residential	7,522	8,483	9,444	10,406	11,367	12,328	13,290	13,634	13,750	13,804	13,804	13,804	13,804	13,804
	7.522	8.483	9.444	10.406	11.367	12.328	13.290	13.634	13.750	13.804	13.804	13.804	13.804	13.804
Core Commercial	3,506	3,957	4,408	4,858	5,309	5,760	6,211	5,939	6,012	6,038	6,038	6,038	6,038	6,038
Core Industrial	2,650	2,990	3,329	3,669	4,008	4,348	4,687	4,807	4,849	4,872	4,872	4,872	4,872	4,872
	6,157	6,947	7,737	8,527	9,317	10,107	10,898	10,745	10,861	10,910	10,910	10,910	10,910	10,910
	6.157	6.947	7.737	8.527	9.317	10.107	10.898	10.745	10.861	10.910	10.910	10.910	10.910	10.910
NonCore Commercial	5,824	6,569	7,315	8,060	8,805	9,550	10,295	10,938	11,025	11,075	11,075	11,075	11,075	11,075
NonCore Industrial regular	2,289	2,582	2,875	3,167	3,460	3,753	4,046	4,098	4,133	4,153	4,153	4,153	4,153	4,153
	8,113	9,151	10,189	11,227	12,265	13,303	14,342	15,036	15,158	15,228	15,228	15,228	15,228	15,228
	8.113	9.151	10.189	11.227	12.265	13.303	14.342	15.036	15.158	15.228	15.228	15.228	15.228	15.228
NonCore Industrial refinery	2,544	2,870	3,195	3,520	3,846	4,171	4,497	4,331	4,367	4,389	4,389	4,389	4,389	4,389
Total Cumulative Load	**38,627**	**43,573**	**48,519**	**53,465**	**58,411**	**63,357**	**68,303**	**69,567**	**70,195**	**70,509**	**70,509**	**70,509**	**70,509**	**70,509**

2010 CALIFORNIA GAS REPORT

EXCHANGE DEMAND FORECAST
JULY 2010

The Gas Company

A Sempra Energy utility℠

2010 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 2005 to 2007 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
2010 California Gas Report
Exchange Forecast

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2009	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2009	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2010	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2010	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2011	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2011	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2012	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2012	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2013	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2013	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2014	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2014	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2015	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2015	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2016	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2016	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2017	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2017	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2018	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2018	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2019	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2019	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2020	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2020	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2021	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2021	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2022	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2022	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2023	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2023	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2024	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2024	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2025	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2025	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2026	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2026	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2027	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2027	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2028	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2028	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2029	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47
2029	**73.12**	**53.13**	**43.45**	**26.21**	**20.91**	**17.82**	**15.98**	**13.94**	**15.24**	**20.22**	**35.93**	**63.07**	399.02
2030	**0.04**	**0.00**	**0.19**	**0.03**	**0.00**	**0.00**	**0.00**	**0.05**	**0.02**	**0.01**	**0.00**	**0.14**	0.47

2010 CALIFORNIA GAS REPORT

EOR STEAMING
JULY 2010

The Gas Company

A Sempra Energy utility℠

ENHANCED OIL RECOVERY - STEAMING

FORECAST METHODOLOGY FOR THE 2010 CALIFORNIA GAS REPORT

Southern California Gas' ("SoCalGas") forecast of enhanced oil recovery ("EOR") steaming gas requirements as reported in the *2010 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 2007 through 2009 were analyzed in order to determine typical throughput volumes over the past few years. FERC reports from Kern River Transmission Company and the Mojave Pipeline Company ("Kern/Mojave"), Format NO. FERC 567, from the same time period were studied in order to determine bypass trends.

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 located in the San Joaquin Valley whose long-term transportation contracts with SoCalGas expired in 2008 and 2009 will increase their level of bypass.
3. Other customers located in the San Joaquin Valley who have already bypassed SoCalGas' system will continue to bypass at their current levels.

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

2010 CALIFORNIA GAS REPORT - EOR STEAMING FORECAST (2010 - 2030)
(MMCFD)

	HISTORICAL			FORECAST																				
SOCALGAS DELIVERIES	2007	2008	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	19	15	7	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	20	24	28	30	28	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
Total Deliveries	39	39	35	30	28	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29

2010 CALIFORNIA GAS REPORT

ELECTRIC GENERATION
JULY 2010

The Gas Company
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2010 CALIFORNIA GAS REPORT

NON-COGENERATION ELECTRIC GENERATION
JULY 2010

The Gas Company

A Sempra Energy utility℠

The electric generation forecast is based on an analysis of the plant's operation in the western electric market using the Enerprise model from Ventyx. Enerprise (previously called Marketsym) has been used by SoCalGas in previous applications before the Commission. This workpaper includes both the input assumptions and results.

Workpaper List

California Load Forecast

SoCalGas used the California Energy Commission's (CEC) *California Energy Demand 2010-2020, Staff Adopted Forecast* (http://www.energy.ca.gov/2009publications/CEC-200-2009-012/CEC-200-2009-012-CMF.PDF).

See attached file, Chap1Stateforms-Adopted-09.xls.

Load forecasts for Rest of WECC

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. For the period 2010-2020, the growth rate is about 1% in the PNW region, and about 2% in the SW region.

Renewables

33% by 2020 for State of California.
Please see attached file, *2010CGR Renewables.xls.*

Throughput Forecasts data

Please see the consolidated gas demand forecast in the following files and tables.
For SoCal Large Cogen is in Schedule 1 of cogen.xls, SoCal Gas Non-cogeneration Electric Generation is in Schedule 2 of ueg.xls, and SDG&E Non-cogeneration Electric Generation is in Schedule 3 of sdge ueg.xls.

Spread Sheets on Sensitivities

Please see attached file, *sensitivities.xls*, for gas volume sensitivities due to load and renewable resource uncertainties.

Form 1.5b
California Energy Demand 2010-2020 Staff Revised Forecast
1-in-2 Net Electricity Peak Demand by Agency and Balancing Authority

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Growth Rate
PG&E Service Area - Greater Bay Area	7,792	7,873	7,970	8,066	8,131	8,196	8,263	8,339	8,409	8,477	8,558	0.9%
Silicon Valley Power	492	499	508	515	519	524	529	535	540	544	549	1.1%
NCPA - Greater Bay Area	276	280	285	289	292	295	298	301	304	307	311	1.2%
Other NP15 LSEs - Greater Bay Area	6	6	6	6	6	6	6	6	6	6	6	0.4%
CCSF	110	110	111	112	112	112	113	113	113	113	113	0.3%
Greater Bay Area Subtotal	8,675	8,768	8,880	8,988	9,060	9,133	9,209	9,294	9,372	9,448	9,537	1.0%
PG&E Service Area - Non Bay	9,729	9,884	10,061	10,239	10,382	10,527	10,677	10,840	10,998	11,156	11,332	1.5%
NCPA - Non Bay	214	218	222	227	230	234	237	241	245	249	253	1.7%
WAPA	183	186	190	193	196	198	200	203	206	208	210	1.4%
Other NP15 LSEs - Non Bay	154	155	156	157	157	157	158	158	158	159	159	0.3%
CDWR-N	118	118	118	118	118	118	118	118	118	118	118	0.0%
Total North of Path 15	19,074	19,330	19,626	19,922	20,143	20,368	20,600	20,855	21,097	21,338	21,610	1.3%
PG&E Service Area (ZP26)	2,398	2,436	2,480	2,524	2,559	2,595	2,632	2,672	2,711	2,749	2,793	1.5%
CDWR-ZP26	223	223	223	223	223	223	223	223	223	223	223	0.0%
Total Zone Path 26	2,621	2,659	2,702	2,746	2,782	2,817	2,854	2,895	2,933	2,972	3,016	1.4%
Total Valley	13,019	13,220	13,449	13,680	13,864	14,052	14,245	14,456	14,658	14,862	15,088	1.5%
Total North of Path 26	21,694	21,988	22,329	22,668	22,924	23,185	23,454	23,750	24,030	24,310	24,626	1.3%
Merced	89	90	92	94	95	96	97	99	100	102	103	1.5%
Turlock Irrigation District	560	570	582	594	604	614	625	637	648	660	673	1.9%
Total Turlock Irrigation District Control Area	648	660	674	687	699	711	723	736	749	762	776	1.8%
SMUD	3,050	3,088	3,140	3,190	3,232	3,270	3,302	3,334	3,367	3,401	3,438	1.2%
WAPA (SMUD)	200	200	200	200	200	200	200	200	200	200	200	0.0%
Redding	260	266	272	279	285	291	297	304	310	317	325	2.3%
Roseville	345	353	362	371	378	385	393	402	410	419	428	2.2%
City of Shasta Lake	32	32	33	33	34	34	35	36	36	37	37	1.6%
Modesto Irrigation District	653	665	677	690	701	711	722	734	745	756	769	1.6%
Total SMUD/WAPA Control Area	4,541	4,604	4,684	4,764	4,830	4,892	4,950	5,009	5,068	5,130	5,196	1.4%
SCE Service Area - LA Basin	16,482	16,703	16,961	17,233	17,454	17,688	17,928	18,180	18,422	18,667	18,930	1.4%
Anaheim	561	568	576	584	591	598	605	613	620	627	634	1.2%
Riverside	595	606	619	632	644	656	669	682	695	708	722	2.0%
Vernon	191	192	194	196	198	200	201	203	204	206	207	0.8%
MWD	22	22	22	22	22	22	22	22	22	22	22	-0.3%
Other SP15 LSEs - LA Basin	212	215	219	224	227	231	235	239	243	248	252	1.7%
Pasadena	302	303	305	306	305	306	307	307	308	308	308	0.2%
LA Basin Subtotal	18,364	18,610	18,897	19,197	19,441	19,700	19,967	20,246	20,514	20,784	21,076	1.4%
SCE Service Area - Big Creek Ventura	3,994	4,048	4,111	4,176	4,230	4,287	4,345	4,406	4,464	4,524	4,588	1.4%
CDWR-S	300	300	300	300	300	300	300	300	300	300	300	0.0%
Big Creek/Ventura Subtotal	4,294	4,348	4,411	4,476	4,530	4,587	4,645	4,706	4,764	4,824	4,888	1.3%
SCE Service Area - Out of Basin	547	554	562	572	579	587	595	603	611	619	628	1.4%
MWD	212	209	207	206	206	206	205	206	206	206	206	-0.3%
Other SP15 LSEs - Out of Basin	62	63	65	66	68	69	71	73	74	76	78	2.4%
Total SCE TAC Area	23,479	23,785	24,142	24,518	24,823	25,149	25,482	25,833	26,169	26,509	26,875	1.4%
SDG&E Service Area	4,516	4,578	4,658	4,738	4,797	4,856	4,911	4,973	5,032	5,094	5,157	1.3%
Total South of Path 26	27,995	28,363	28,800	29,256	29,620	30,004	30,393	30,806	31,201	31,603	32,032	1.4%
LADWP	5,791	5,846	5,929	5,989	6,025	6,060	6,096	6,132	6,168	6,206	6,247	0.8%
Burbank	304	306	309	312	313	313	314	315	315	316	317	0.4%
Glendale	333	336	340	343	344	344	345	345	346	347	348	0.4%
Total LADWP Control Area	6,428	6,488	6,579	6,644	6,681	6,718	6,755	6,792	6,829	6,869	6,912	0.7%
Imperial Irrigation District Control Area	985	1,012	1,042	1,067	1,090	1,114	1,141	1,169	1,197	1,226	1,256	2.5%
Total CAISO Noncoincident Peak	49,689	50,351	51,129	51,924	52,545	53,190	53,847	54,556	55,231	55,913	56,658	1.3%
Total CAISO Coincident Peak	48,497	49,143	49,902	50,678	51,283	51,913	52,555	53,246	53,905	54,571	55,298	1.3%
Total Statewide Noncoincident Peak	62,292	63,115	64,107	65,086	65,844	66,624	67,416	68,262	69,074	69,898	70,799	1.3%
Total Statewide Coincident Peak	60,797	61,600	62,568	63,524	64,264	65,025	65,798	66,624	67,416	68,221	69,099	1.3%

*Balancing Authority Tables exclude LSEs located in non-California-based control areas. LSE peaks are coincident with control area peak.

Form 1.5a
California Energy Demand 2010-2020 Staff Revised Forecast
Net Energy for Load by Agency and Balancing Authority (GWH)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Growth Rate
PG&E Service Area - Greater Bay Area	39,435	39,766	40,200	40,711	41,037	41,355	41,685	42,050	42,385	42,715	43,064	0.9%
Silicon Valley Power	3,047	3,093	3,164	3,214	3,238	3,261	3,288	3,315	3,337	3,358	3,378	1.0%
NCPA - Greater Bay Area	1,572	1,592	1,616	1,641	1,658	1,675	1,693	1,712	1,729	1,746	1,763	1.2%
Other NP15 LSEs - Greater Bay Area	31	31	31	31	32	32	32	32	33	33	33	0.8%
CCSF	960	968	977	986	992	999	1,005	1,012	1,019	1,025	1,031	0.7%
Greater Bay Area Subtotal	45,044	45,450	45,989	46,583	46,956	47,322	47,703	48,122	48,503	48,876	49,269	0.9%
PG&E Service Area - Non Bay	43,446	44,035	44,738	45,542	46,153	46,762	47,394	48,075	48,731	49,390	50,083	1.4%
NCPA - Non Bay	1,060	1,075	1,093	1,113	1,128	1,144	1,160	1,177	1,194	1,211	1,229	1.5%
WAPA	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	0.0%
Other NP15 LSEs - Non Bay	688	690	693	698	702	707	711	715	719	724	729	0.6%
CDWR-N	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296	1,296	0.0%
Total North of Path 15	93,333	94,346	95,608	97,031	98,035	99,030	100,062	101,185	102,242	103,296	104,405	1.1%
	82,881											
PG&E Service Area (ZP26)	11,052	11,202	11,381	11,585	11,741	11,896	12,056	12,230	12,396	12,564	12,740	1.4%
CDWR-ZP26	2,446	2,446	2,446	2,446	2,446	2,446	2,446	2,446	2,446	2,446	2,446	0.0%
Total Zone Path 26	13,499	13,648	13,827	14,032	14,187	14,342	14,503	14,676	14,843	15,011	15,187	1.2%
Total Valley	61,788	62,545	63,446	64,479	65,266	66,050	66,863	67,739	68,583	69,431	70,322	1.3%
Total North of Path 26	106,832	107,995	109,435	111,062	112,222	113,372	114,565	115,862	117,085	118,307	119,592	1.1%
Merced	463	470	482	490	494	498	502	507	511	514	518	1.1%
Turlock Irrigation District	2,169	2,198	2,236	2,278	2,310	2,343	2,377	2,413	2,449	2,485	2,523	1.5%
Total Turlock Irrigation District Control Area	2,631	2,668	2,718	2,768	2,804	2,841	2,879	2,919	2,959	2,999	3,041	1.5%
SMUD	11,309	11,451	11,666	11,878	12,046	12,195	12,327	12,454	12,582	12,714	12,852	1.3%
WAPA (SMUD)	1,547	1,584	1,625	1,664	1,690	1,716	1,741	1,770	1,792	1,815	1,839	1.7%
Redding	902	917	933	955	975	995	1,016	1,038	1,061	1,084	1,109	2.1%
Roseville	1,367	1,390	1,418	1,448	1,472	1,496	1,522	1,549	1,575	1,602	1,630	1.8%
City of Shasta Lake	193	196	201	204	205	206	208	209	210	211	211	0.9%
Modesto Irrigation District	2,782	2,820	2,873	2,924	2,959	2,992	3,028	3,066	3,102	3,138	3,175	1.3%
Total SMUD/WAPA Control Area	18,100	18,359	18,715	19,073	19,347	19,600	19,841	20,085	20,322	20,563	20,816	1.4%
SCE Service Area - LA Basin	71,946	72,676	73,646	74,834	75,733	76,672	77,632	78,625	79,581	80,552	81,561	1.3%
Anaheim	2,675	2,703	2,741	2,783	2,815	2,848	2,882	2,916	2,947	2,978	3,011	1.2%
Riverside	2,275	2,304	2,339	2,386	2,427	2,470	2,515	2,561	2,607	2,654	2,703	1.7%
Vernon	1,258	1,276	1,312	1,329	1,332	1,336	1,340	1,341	1,340	1,338	1,333	0.6%
MWD	148	146	145	145	144	144	144	144	145	145	145	-0.2%
Other SP15 LSEs - LA Basin	952	963	977	995	1,009	1,025	1,040	1,057	1,073	1,089	1,106	1.5%
Pasadena	1,296	1,305	1,314	1,320	1,322	1,325	1,330	1,335	1,338	1,342	1,347	0.4%
LA Basin Subtotal	80,550	81,373	82,474	83,791	84,782	85,820	86,883	87,978	89,030	90,097	91,206	1.3%
SCE Service Area - Big Creek Ventura	16,921	17,093	17,321	17,601	17,812	18,033	18,259	18,492	18,717	18,945	19,183	1.3%
CDWR-S	5,319	5,319	5,319	5,319	5,319	5,319	5,319	5,319	5,319	5,319	5,319	0.0%
Big Creek/Ventura Subtotal	22,240	22,412	22,640	22,919	23,131	23,352	23,577	23,811	24,036	24,264	24,502	1.0%
SCE Service Area - Out of Basin	3,453	3,488	3,535	3,592	3,635	3,680	3,726	3,774	3,820	3,866	3,915	1.3%
MWD	1,497	1,479	1,462	1,461	1,461	1,461	1,460	1,461	1,462	1,463	1,465	-0.2%
Other SP15 LSEs - Out of Basin	383	388	394	402	408	415	421	428	436	443	451	1.7%
Total SCE TAC Area	108,123	109,141	110,505	112,165	113,417	114,727	116,068	117,453	118,783	120,134	121,538	1.2%
SDG&E Service Area	21,695	21,941	22,284	22,680	22,978	23,283	23,556	23,845	24,130	24,434	24,740	1.3%
Total South of Path 26	129,818	131,081	132,789	134,846	136,395	138,011	139,624	141,297	142,913	144,568	146,278	1.2%
	92,320											
LADWP	27,157	27,430	27,891	28,263	28,513	28,749	28,986	29,213	29,446	29,684	29,925	1.0%
Burbank	1,163	1,171	1,188	1,199	1,204	1,207	1,211	1,214	1,217	1,219	1,222	0.5%
Glendale	1,203	1,213	1,230	1,245	1,252	1,258	1,264	1,270	1,277	1,283	1,290	0.7%
Total LADWP Control Area	29,523	29,814	30,309	30,707	30,968	31,214	31,461	31,697	31,939	32,186	32,437	0.9%
Imperial Irrigation District Control Area	3,763	3,857	3,969	4,077	4,169	4,265	4,369	4,479	4,590	4,705	4,828	2.5%
Total CAISO	236,649	239,076	242,224	245,908	248,617	251,383	254,189	257,159	259,998	262,875	265,870	1.2%
Total Statewide	290,666	293,774	297,936	302,533	305,905	309,303	312,740	316,339	319,809	323,329	326,991	1.2%

*Balancing Authority Tables exclude LSEs located in non-California based control areas.

Investor-Owned-Utility Bundled and Direct Access Forecasts*

Direct Access Assumptions

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sales (GWH)													
PGE	6,376	5,483	5,513	5,603	5,603	5,603	5,603	5,603	5,603	5,603	5,603	5,603	5,603
SCE	8,555	7,699	7,776	7,869	7,869	7,869	7,869	7,869	7,869	7,869	7,869	7,869	7,869
SDGE	3,142	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175	3,175
Net Energy for Load (GWH)													
PGE	6,924	5,955	5,987	6,084	6,084	6,084	6,084	6,084	6,084	6,084	6,084	6,084	6,084
SCE	9,077	8,169	8,251	8,349	8,349	8,349	8,349	8,349	8,349	8,349	8,349	8,349	8,349
SDGE	3,343	3,379	3,379	3,379	3,379	3,379	3,379	3,379	3,379	3,379	3,379	3,379	3,379
Coincident Peak (MW)													
PGE	1,080	904	909	924	924	924	924	924	924	924	924	924	924
SCE	1,386	1,247	1,260	1,275	1,275	1,275	1,275	1,275	1,275	1,275	1,275	1,275	1,275
SDGE	552	558	558	558	558	558	558	558	558	558	558	558	558
Noncoincident Peak (MW)													
PGE	1,107	952	957	973	973	973	973	973	973	973	973	973	973
SCE	1,459	1,313	1,326	1,342	1,342	1,342	1,342	1,342	1,342	1,342	1,342	1,342	1,342
SDGE	581	587	587	587	587	587	587	587	587	587	587	587	587
Load Factors													
PGE	0.714	0.714	0.714	0.714	0.714	0.714	0.714	0.714	0.714	0.714	0.714	0.714	0.714
SCE	0.710	0.710	0.710	0.710	0.710	0.710	0.710	0.710	0.710	0.710	0.710	0.710	0.710
SDGE	0.657	0.657	0.657	0.657	0.657	0.657	0.657	0.657	0.657	0.657	0.657	0.657	0.657

Bundled Customer Forecast

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sales (GWH)													
PGE	81,983	79,976	80,192	81,079	82,279	83,665	84,662	85,650	86,674	87,787	88,843	89,898	91,010
SCE	81,454	78,677	78,666	79,450	80,616	82,043	83,123	84,251	85,405	86,598	87,747	88,914	90,126
SDGE	17,481	16,993	17,083	17,313	17,633	18,003	18,282	18,566	18,821	19,091	19,357	19,641	19,927
Net Energy for Load (GWH)													
PGE	89,917	87,708	87,946	88,919	90,234	91,753	92,846	93,928	95,051	96,271	97,428	98,584	99,803
SCE	87,053	84,081	84,069	84,908	86,153	87,677	88,831	90,035	91,267	92,542	93,769	95,015	96,310
SDGE	18,742	18,220	18,316	18,562	18,905	19,302	19,600	19,904	20,178	20,466	20,751	21,055	21,362
Coincident Peak (MW)													
PGE	19,124	18,868	19,010	19,269	19,586	19,905	20,147	20,394	20,648	20,927	21,193	21,459	21,759
SCE	18,876	19,652	19,763	20,030	20,359	20,706	20,987	21,286	21,592	21,914	22,222	22,535	22,871
SDGE	3,819	3,929	3,958	4,020	4,101	4,181	4,239	4,298	4,353	4,415	4,474	4,536	4,599

Total Service Area Forecast (Bundled + Direct Access)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Sales (GWH)													
PGE	88,359	85,459	85,705	86,682	87,882	89,268	90,265	91,253	92,277	93,390	94,446	95,501	96,612
SCE	90,009	86,377	86,442	87,320	88,485	89,912	90,992	92,121	93,274	94,468	95,616	96,783	97,995
SDGE	20,623	20,169	20,258	20,488	20,809	21,179	21,457	21,742	21,997	22,266	22,532	22,816	23,102
Net Energy for Load (GWH)													
PGE	96,841	93,663	93,933	95,004	96,318	97,838	98,930	100,013	101,135	102,355	103,512	104,669	105,887
SCE	96,129	92,251	92,320	93,257	94,502	96,027	97,180	98,385	99,617	100,891	102,118	103,364	104,659
SDGE	22,085	21,599	21,695	21,941	22,284	22,680	22,978	23,283	23,556	23,845	24,130	24,434	24,740
Coincident Peak (MW)													
PGE	20,204	19,773	19,919	20,193	20,510	20,829	21,071	21,318	21,572	21,851	22,117	22,383	22,683
SCE	20,262	20,899	21,023	21,305	21,634	21,981	22,262	22,561	22,867	23,189	23,497	23,810	24,146
SDGE	4,371	4,487	4,516	4,578	4,658	4,738	4,797	4,856	4,911	4,973	5,032	5,094	5,157

* Does not account for recent passage of SB 695 reopening direct access; further analysis incorporating the legislation will follow.

2010 CGR Work Papers
Jeff Huang

2010 CGR Renewable Assumptions

Existing Renewables	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**
NP15 Biomass	**987**	**986**	**1,018**	**1,015**	**1,016**	**1,017**	**977**
NP15 Geothermal	**7,680**	**7,680**	**7,682**	**7,680**	**7,680**	**7,680**	**7,682**
NP15 Wind	**2,191**	**2,284**	**2,230**	**2,217**	**2,231**	**2,271**	**2,263**
NP15 Solar	-	-	-	-	-	-	-
NP15 Hydro	**3,012**	**3,012**	**3,012**	**3,012**	**3,012**	**3,012**	**3,012**
sub-total	***13,870***	***13,962***	***13,941***	***13,924***	***13,939***	***13,980***	***13,934***
SP15 Biomass	**1,864**	**1,882**	**1,887**	**1,882**	**1,882**	**1,882**	**1,887**
SP15 Geothermal	**7,168**	**7,544**	**7,564**	**7,544**	**7,544**	**7,544**	**7,564**
SP15 Wind	**6,375**	**7,130**	**8,176**	**9,005**	**9,246**	**9,081**	**9,258**
SP15 Solar	-	-	-	-	-	-	-
SP15 Hydro	**1,400**	**1,400**	**1,400**	**1,400**	**1,400**	**1,400**	**1,400**
sub-total	***16,808***	***17,957***	***19,028***	***19,832***	***20,073***	***19,907***	***20,110***
Total	**30,678**	**31,919**	**32,969**	**33,756**	**34,012**	**33,887**	**34,044**

Load Forecast and Renewable Energy (GWh)

Utilities	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2020**
SDG&E Bundled NEL	**18,316**	18,562	18,905	19,302	19,600	19,904	21,362
SDG&E Bundled Sales	**17,083**	17,313	17,633	18,003	18,282	18,566	19,927
% Bundled Renewable	**14%**	18%	28%	30%	30%	30%	33%
Bundled Renewable Energy	***2414***	*3054*	*4828*	*5238*	*5348*	*5431*	*6482*
SDG&E DA NEL	**3,379**	3,379	3,379	3,379	3,379	3,379	3,379
SDG&E DA Sales	**3,175**	3,175	3,175	3,175	3,175	3,175	3,175
% DA Renewable	**2%**	2%	3%	4%	5%	6%	33%
DA Renewable Energy	***64***	*64*	*95*	*127*	*159*	*191*	*1048*
SCE Bundled NEL	**84,069**	84,908	86,153	87,677	88,831	90,035	96,310
SCE Bundled Sales	**78,666**	79,450	80,616	82,043	83,123	84,251	90,126
% Bundled Renewable	**19%**	23%	25%	26%	27%	28%	33%
Bundled Renewable Energy	***14,597***	*17,777*	*19,649*	*20,722*	*21,909*	*23,029*	*29,342*
SCE DA NEL	**8,251**	8,349	8,349	8,349	8,349	8,349	8,349
SCE DA Sales	**7,776**	7,869	7,869	7,869	7,869	7,869	7,869
% DA Renewable	**2%**	2%	3%	4%	5%	6%	33%
DA Renewable Energy	***154***	*156*	*236*	*315*	*393*	*472*	*2,597*
PG&E Bundled NEL	**87,946**	88,919	90,234	91,753	92,846	93,928	99,803
PG&E Bundled Sales	**80,192**	81,079	82,279	83,665	84,662	85,650	91,010
% Bundled Renewable	**16%**	18%	18%	19%	20%	21%	33%
Bundled Renewable Energy	***12,918***	*14,304*	*14,636*	*15,676*	*16,777*	*17,823*	*29,666*
PG&E DA NEL	**5,987**	6,084	6,084	6,084	6,084	6,084	6,084
PG&E DA Sales	**5,513**	5,603	5,603	5,603	5,603	5,603	5,603
% DA Renewable	**2%**	2%	3%	4%	5%	6%	33%
DA Renewable Energy	***110***	*110*	*168*	*224*	*280*	*336*	*1,849*
LADWP NEL	**27,157**	27,430	27,891	28,263	28,513	28,749	29,925
LADWP Sales	**25,039**	25,290	25,716	26,058	26,289	26,507	27,591
% Bundled Renewable	**15%**	18%	20%	21%	22%	23%	33%
Bundled Renewable Energy	***3,772***	*4,507*	*5,058*	*5,400*	*5,733*	*6,046*	*9,032*
DWR NEL	**9,061**	9,061	9,061	9,061	9,061	9,061	9,061
DWR Sales	**8,354**	8,354	8,354	8,354	8,354	8,354	8,354
% Bundled Renewable	**8%**	10%	12%	12%	12%	13%	33%
Bundled Renewable Energy	***668***	*835*	*1,003*	*1,003*	*1,003*	*1,086*	*2,757*
IID NEL	**3,763**	3,857	3,969	4,077	4,169	4,265	4,828
IID Sales	**3,469**	3,556	3,660	3,759	3,844	3,933	4,451
% Bundled Renewable	**8%**	10%	12%	12%	12%	13%	33%

2010 CGR Renewable Assumptions

Bundled Renewable Energy	*272*	*347*	*427*	*439*	*451*	*500*	*1,432*
Turlock NEL	**2,631**	2,668	2,718	2,768	2,804	2,841	3,041
Turlock Sales	**2,426**	2,460	2,506	2,552	2,585	2,619	2,803
% Bundled Renewable	**0%**	0%	9%	9%	9%	9%	33%
Bundled Renewable Energy	*-*	*-*	*221*	*226*	*230*	*233*	*913*
SMUD NEL	**11,309**	11,451	11,666	11,878	12,046	12,195	12,852
SMUD Sales	**10,427**	10,558	10,756	10,952	11,107	11,243	11,850
% Bundled Renewable	**19%**	19%	20%	21%	22%	23%	33%
Bundled Renewable Energy	*1,979*	*1,981*	*2,112*	*2,259*	*2,409*	*2,555*	*3,868*
NP15 Others NEL	**15,948**	16,157	16,424	16,678	16,850	17,023	17,926
NP15 Others Sales	**14,704**	14,897	15,143	15,377	15,536	15,695	16,528
% Bundled Renewable	**8%**	10%	12%	14%	16%	18%	33%
Bundled Renewable Energy	*1,171*	*1,470*	*1,788*	*2,120*	*2,460*	*2,796*	*5,399*
SP15 Others NEL	**12,849**	12,949	13,102	13,264	13,374	13,489	14,073
SP15 Others Sales	**11,847**	11,939	12,080	12,229	12,330	12,437	12,975
% Bundled Renewable	**8%**	10%	12%	14%	16%	18%	33%
Bundled Renewable Energy	*948*	*1,185*	*1,433*	*1,691*	*1,957*	*2,219*	*4,245*
Total NP15 NEL	**132,882**	134,341	136,187	138,222	139,692	141,132	148,767
Total NP15 Sales	**121,616**	122,951	124,641	126,503	127,847	129,165	136,148
Existing NP15 Renewalbes	**13,870**	13,962	13,941	13,924	13,939	13,980	13,934
% Existing Renewable	**11%**	11%	11%	11%	11%	11%	10%
Total NP15 Renewable Forecast	**16,846**	18,701	19,928	21,507	23,159	24,829	44,452
% of Total NP15 Renewable Forecas	**14%**	15%	16%	17%	18%	19%	33%
Total SP15 NEL	**157,784**	159,433	161,749	164,310	166,213	168,171	178,224
Total SP15 Sales	**147,056**	148,593	150,750	153,138	154,912	156,738	166,114
Existing SP15 Renewables	**16,808**	17,957	19,028	19,832	20,073	19,907	20,110
% Existing Renewable	**11%**	12%	13%	13%	13%	13%	12%
Total SP15 Renewable Forecast	**22,221**	27,088	31,725	33,933	35,950	37,888	54,177
% of Total SP15 Renewable Forecas	**15%**	18%	21%	23%	23%	24%	33%
Total CA NEL	**290,666**	293,774	297,936	302,533	305,905	309,303	326,991
Total CA Sales	**268,672**	271,544	275,390	279,640	282,759	285,903	302,262
Existing Renewable	**30,678**	31,919	32,969	33,756	34,012	33,887	34,044
% Existing Renewable	**11%**	12%	12%	12%	12%	12%	11%
Total Renewable Forecast	**39,067**	45,789	51,653	55,439	59,109	62,717	98,629
% of Total Renewable Forecast	**15%**	**17%**	**19%**	**20%**	**21%**	**22%**	**33%**
Total Renewable Required PNW	**1,068**	1,765	2,378	2,760	3,194	3,670	8,221
Total Renewable Required NP15	**1,096**	1,812	2,441	2,833	3,280	3,767	8,439
Total Renewable Required SP15	**5,809**	9,604	12,937	15,014	17,378	19,963	44,721
Total Renewable Required SW	**416**	688	927	1,075	1,245	1,430	3,203
Total Renewable Required	**8,389**	**13,870**	**18,684**	**21,683**	**25,097**	**28,830**	**64,585**

Schedule 1a
2010 CGR - Annual Gas Demand Forecast
SoCalgas Noncore G50 - BASE HYDRO Large Co-Generation

	Annual Throughput (MDth)
2010	52,717
2011	52,699
2012	52,766
2013	52,592
2014	52,617
2015	52,668
2016	52,774
2017	52,880
2018	52,986
2019	53,091
2020	53,197
2021	53,197
2022	53,197
2023	53,197
2024	53,197
2025	53,197
2026	53,197
2027	53,197
2028	53,197
2029	53,197
2030	53,197

The EG forecast for 2016-2019 are interpolated from 2015 and 2020 data.
The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 1b
2010 CGR - Annual Gas Demand Forecast
SoCalgas Noncore G50 - DRY HYDRO Large Co-Generation

	Annual Throughput (MDth)
2010	52,717
2011	53,948
2012	54,057
2013	53,847
2014	53,803
2015	53,912
2016	54,017
2017	54,121
2018	54,226
2019	54,331
2020	54,436
2021	54,436
2022	54,436
2023	54,436
2024	54,436
2025	54,436
2026	54,436
2027	54,436
2028	54,436
2029	54,436
2030	54,436

The EG forecast for 2016-2019 are interpolated from 2015 and 2020 data.
The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 1c
2010 CGR - Winter Peak Day Gas Demand Forecast
SoCalgas Noncore G50 - BASE HYDRO Large Co-Generation

	Peak Day Throughput (MDth/Day)
2010	167
2011	154
2012	164
2013	152
2014	146
2015	165
2016	166
2017	166
2018	167
2019	168
2020	169
2021	169
2022	169
2023	169
2024	169
2025	169
2026	169
2027	169
2028	169
2029	169
2030	169

The EG forecast for 2016-2019 are interpolated from 2015 and 2020 data.
The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 1d
2010 CGR - Summer Peak Day Gas Demand Forecast
SoCalgas Noncore G50 - DRY HYDRO Large Co-Generation

	Peak Day Throughput (MDth/Day)
2010	174
2011	158
2012	171
2013	170
2014	152
2015	176
2016	175
2017	174
2018	174
2019	173
2020	172
2021	172
2022	172
2023	172
2024	172
2025	172
2026	172
2027	172
2028	172
2029	172
2030	172

The EG forecast for 2016-2019 are interpolated from 2015 and 2020 data.
The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 2a
2010 CGR - Annual Gas Demand Forecast
SoCalgas Noncore G50 - BASE HYDRO Ueg/Ewg

	Annual Throughput (MDth)
2010	197,272
2011	199,223
2012	203,960
2013	201,881
2014	201,463
2015	203,695
2016	201,440
2017	199,185
2018	196,931
2019	194,676
2020	192,421
2021	192,421
2022	192,421
2023	192,421
2024	192,421
2025	192,421
2026	192,421
2027	192,421
2028	192,421
2029	192,421
2030	192,421

The EG forecast for 2016-2019 are interpolated from 2015 and 2020 data.
The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 2b
2010 CGR - Annual Gas Demand Forecast
SoCalgas Noncore G50 - DRY HYDRO Ueg/Ewg

	Annual Throughput (MDth)
2010	197,272
2011	230,129
2012	234,107
2013	233,445
2014	231,709
2015	232,621
2016	231,292
2017	229,963
2018	228,634
2019	227,305
2020	225,976
2021	225,976
2022	225,976
2023	225,976
2024	225,976
2025	225,976
2026	225,976
2027	225,976
2028	225,976
2029	225,976
2030	225,976

The EG forecast for 2016-2019 are interpolated from 2015 and 2020 data.
The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 2c
2010 CGR - Winter Peak Day Gas Demand Forecast
SoCalgas Noncore G50 - BASE HYDRO Ueg/Ewg

	Peak Day Throughput (MDth/Day)
2010	604
2011	603
2012	590
2013	624
2014	606
2015	627
2016	634
2017	641
2018	648
2019	655
2020	663
2021	663
2022	663
2023	663
2024	663
2025	663
2026	663
2027	663
2028	663
2029	663
2030	663

The EG forecast for 2016-2019 are interpolated from 2015 and 2020 data.
The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 2d
2010 CGR - Summer Peak Day Gas Demand Forecast
SoCalgas Noncore G50 - DRY HYDRO Ueg/Ewg

	Peak Day Throughput (MDth/Day)
2010	1,171
2011	1,210
2012	1,333
2013	1,211
2014	1,308
2015	1,225
2016	1,202
2017	1,178
2018	1,155
2019	1,131
2020	1,108
2021	1,108
2022	1,108
2023	1,108
2024	1,108
2025	1,108
2026	1,108
2027	1,108
2028	1,108
2029	1,108
2030	1,108

The EG forecast for 2016-2019 are interpolated from 2015 and 2020 data.
The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 3a
2010 CGR - Annual Gas Demand Forecast
SDG&E Power-Plant - BASE HYDRO Ueg/Ewg

	Annual Throughput (MDth)
2010	48,974
2011	46,194
2012	45,618
2013	45,333
2014	45,394
2015	45,972
2016	44,699
2017	43,427
2018	42,154
2019	40,881
2020	39,609
2021	39,609
2022	39,609
2023	39,609
2024	39,609
2025	39,609
2026	39,609
2027	39,609
2028	39,609
2029	39,609
2030	39,609

The EG forecast for 2016-2019 are interpolated from 2015 and 2020 data.
The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 3b
2010 CGR - Annual Gas Demand Forecast
SDG&E Power-Plant - DRY HYDRO Ueg/Ewg

	Annual Throughput (MDth)
2010	48,974
2011	51,412
2012	50,545
2013	49,996
2014	50,197
2015	52,180
2016	50,374
2017	48,567
2018	46,760
2019	44,954
2020	43,147
2021	43,147
2022	43,147
2023	43,147
2024	43,147
2025	43,147
2026	43,147
2027	43,147
2028	43,147
2029	43,147
2030	43,147

The EG forecast for 2016-2019 are interpolated from 2015 and 2020 data.
The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 3c
2010 CGR - Winter Peak Day Gas Demand Forecast
SDG&E Power-Plant -- BASE HYDRO Ueg/Ewg

	Peak Day Throughput (MDth/Day)
2010	196
2011	173
2012	181
2013	184
2014	180
2015	175
2016	170
2017	165
2018	161
2019	156
2020	151
2021	151
2022	151
2023	151
2024	151
2025	151
2026	151
2027	151
2028	151
2029	151
2030	151

The EG forecast for 2016-2019 are interpolated from 2015 and 2020 data.
The EG forecast is held constant at 2020 levels for 2021 through 2030.

Schedule 3d
2010 CGR - Summer Peak Day Gas Demand Forecast
SDG&E Power-Plant - DRY HYDRO Ueg/Ewg

	Peak Day Throughput (MDth/Day)
2010	218
2011	193
2012	221
2013	208
2014	254
2015	261
2016	255
2017	249
2018	244
2019	238
2020	233
2021	233
2022	233
2023	233
2024	233
2025	233
2026	233
2027	233
2028	233
2029	233
2030	233

The EG forecast for 2016-2019 are interpolated from 2015 and 2020 data.
The EG forecast is held constant at 2020 levels for 2021 through 2030.

2010 CGR Sensitivity for Year 2015

Year	Heat Rate
2015	8300 Btu/kwh
	8.3 mmbtu/mwh

UAF	1.0273 mmBtu/mcf
	Gbtu/mmcf

1% Change In Southern California Renewables

Input

1500	**gwh**
12,450.0	GBtu
12,119.1	mmcf

Output

12	**Bcf**

Electricity Demand change by 1000 GWh

Input

1000	**gwh**
8,300.0	GBtu
8,079.4	mmcf

Output

8	**Bcf**

2010 CALIFORNIA GAS REPORT

INDUSTRIAL/COMMERCIAL COGENERATION < 20MW
JULY 2010

The Gas Company

A Sempra Energy utility℠

Southern California Gas Company
Small Electric Generation Gas Demand Forecast

Overview

The small electric generation (Cogen) demand forecast described in this workpaper is for those electric generation customers that have installed equipment primarily to generate electricity for their own use rather than to sell the power to an electric utility.

Forecast Methodology

Demand is determined as the total demand for each existing individual facility taking into account historical operational characteristics and any anticipated future additions or operational changes.

A. Demand Forecast for Small EG (NON SGIP)

The demand forecast for the small EG (non-SGIP) load is estimated on an individual customer basis. Demand for each customer is projected to grow from the previous year's level by the anticipated employment growth of the business. The employment growth for each business sector is classified by the North American Industry Classification System (NAICS) code. These data were obtained by Global Insight's Projection.

$$\text{Use}_{(\text{year, NAICS})} = \text{Use}_{(\text{year -1, NAICS})} * \text{Growth}_{(\text{year, NAICS})}$$

The subsequent table provides a month-by-month summation of the current and expected demand changes for the customers based on an analysis of historical operation characteristics and taking into account any anticipated future additions or changes. Except for some relatively minor changes discussed below, overall demand within this market segment is expected to be mostly constant and stable. Historical load information runs through December 2009.

B. Demand Forecast for SGIP

The Self-Generation Incentive Program (SGIP) is the successor of the AB970 program that was signed into law on September 6, 2000. It required the CPUC to initiate activities for load control and distributed generation. The CPUC Decision D.-01-03-073 authorized self generation incentive program to be applied across utility service areas. The term self generation refers to distributed generation technologies that consist of small gas turbines, internal combustion engines, wind turbines, photovoltaics and fuel cells. The technologies are designated to provide a portion of the customer's entire electric load and for those using natural gas waste heat recovery from the electric power generation system is required. SoCalGas launched its portion of the program on July 2001.

In determining the amount of added load from the SGIP, SoCalGas averages the added load from 2004 to 2008, and projects the same amount of added load each year to year 2017.After 2017, the amount of added load is expected to remain constant. The forecast for SGIP under the G50 rate is included in the large EG forecast and the SGIP forecast under the G10 rate is included in the core commercial and industrial forecast. The 2009-2030 SGIP added load for the small commercial and industrial market segment is depicted in the subsequent table.

Southern California Gas Company		
2010 California Gas Report		
Small Cogen		
2009	Jan	1,736
2009	Feb	1,602
2009	Mar	1,797
2009	Apr	1,669
2009	May	1,966
2009	Jun	1,939
2009	Jul	2,280
2009	Aug	2,254
2009	Sep	2,132
2009	Oct	1,898
2009	Nov	1,703
2009	Dec	1,634
2010	Jan	1,712
2010	Feb	1,579
2010	Mar	1,772
2010	Apr	1,645
2010	May	1,938
2010	Jun	1,912
2010	Jul	2,248
2010	Aug	2,222
2010	Sep	2,102
2010	Oct	1,871
2010	Nov	1,679
2010	Dec	1,610
2011	Jan	1,740
2011	Feb	1,605
2011	Mar	1,801
2011	Apr	1,673
2011	May	1,970
2011	Jun	1,944
2011	Jul	2,285
2011	Aug	2,259
2011	Sep	2,137
2011	Oct	1,902
2011	Nov	1,707
2011	Dec	1,637
2012	Jan	1,805
2012	Feb	1,666
2012	Mar	1,869
2012	Apr	1,735
2012	May	2,044
2012	Jun	2,017
2012	Jul	2,371
2012	Aug	2,344
2012	Sep	2,217
2012	Oct	1,974

Southern California Gas Company			
2010 California Gas Report			
Small Cogen			
2012	Nov		1,771
2012	Dec		1,698
2013	Jan		1,823
2013	Feb		1,681
2013	Mar		1,886
2013	Apr		1,752
2013	May		2,063
2013	Jun		2,036
2013	Jul		2,393
2013	Aug		2,366
2013	Sep		2,238
2013	Oct		1,992
2013	Nov		1,788
2013	Dec		1,715
2014	Jan		1,846
2014	Feb		1,703
2014	Mar		1,911
2014	Apr		1,774
2014	May		2,090
2014	Jun		2,062
2014	Jul		2,425
2014	Aug		2,397
2014	Sep		2,268
2014	Oct		2,018
2014	Nov		1,811
2014	Dec		1,737
2015	Jan		1,861
2015	Feb		1,717
2015	Mar		1,927
2015	Apr		1,789
2015	May		2,107
2015	Jun		2,079

Southern California Gas Company		
2010 California Gas Report		
Small Cogen		
2015	Jul	2,444
2015	Aug	2,417
2015	Sep	2,286
2015	Oct	2,035
2015	Nov	1,826
2015	Dec	1,751
2016	Jan	1,874
2016	Feb	1,729
2016	Mar	1,940
2016	Apr	1,801
2016	May	2,122
2016	Jun	2,093
2016	Jul	2,461
2016	Aug	2,433
2016	Sep	2,302
2016	Oct	2,049
2016	Nov	1,839
2016	Dec	1,763
2017	Jan	1,888
2017	Feb	1,741
2017	Mar	1,954
2017	Apr	1,814
2017	May	2,137
2017	Jun	2,108
2017	Jul	2,479
2017	Aug	2,451
2017	Sep	2,318
2017	Oct	2,063
2017	Nov	1,852
2017	Dec	1,776
2018	Jan	1,900
2018	Feb	1,753
2018	Mar	1,966
2018	Apr	1,826
2018	May	2,151
2018	Jun	2,122
2018	Jul	2,495
2018	Aug	2,466
2018	Sep	2,333
2018	Oct	2,077
2018	Nov	1,864
2018	Dec	1,787
2019	Jan	1,908
2019	Feb	1,760
2019	Mar	1,975
2019	Apr	1,834
2019	May	2,160

Southern California Gas Company			
2010 California Gas Report			
Small Cogen			
2019	Jun		2,131
2019	Jul		2,506
2019	Aug		2,477
2019	Sep		2,343
2019	Oct		2,086
2019	Nov		1,872
2019	Dec		1,795
2020	Jan		1,914
2020	Feb		1,766
2020	Mar		1,981
2020	Apr		1,840
2020	May		2,167
2020	Jun		2,138
2020	Jul		2,514
2020	Aug		2,485
2020	Sep		2,351
2020	Oct		2,092
2020	Nov		1,878
2020	Dec		1,801
2021	Jan		1,924
2021	Feb		1,775
2021	Mar		1,992
2021	Apr		1,849
2021	May		2,178
2021	Jun		2,149
2021	Jul		2,527
2021	Aug		2,498
2021	Sep		2,363
2021	Oct		2,103
2021	Nov		1,888
2021	Dec		1,810
2022	Jan		1,937
2022	Feb		1,786
2022	Mar		2,004
2022	Apr		1,861
2022	May		2,192
2022	Jun		2,163
2022	Jul		2,543
2022	Aug		2,514
2022	Sep		2,378
2022	Oct		2,117
2022	Nov		1,900
2022	Dec		1,822
2023	Jan		1,950
2023	Feb		1,799
2023	Mar		2,018
2023	Apr		1,874

Southern California Gas Company		
2010 California Gas Report		
Small Cogen		
2023	May	2,208
2023	Jun	2,178
2023	Jul	2,560
2023	Aug	2,532
2023	Sep	2,395
2023	Oct	2,131
2023	Nov	1,913
2023	Dec	1,834
2024	Jan	1,963
2024	Feb	1,811
2024	Mar	2,032
2024	Apr	1,887
2024	May	2,223
2024	Jun	2,193
2024	Jul	2,578
2024	Aug	2,549
2024	Sep	2,411
2024	Oct	2,146
2024	Nov	1,926
2024	Dec	1,847
2025	Jan	1,976
2025	Feb	1,823
2025	Mar	2,046
2025	Apr	1,899
2025	May	2,238
2025	Jun	2,207
2025	Jul	2,595
2025	Aug	2,566
2025	Sep	2,427
2025	Oct	2,160
2025	Nov	1,939
2025	Dec	1,859
2026	Jan	1,989
2026	Feb	1,834
2026	Mar	2,058
2026	Apr	1,911
2026	May	2,251
2026	Jun	2,221
2026	Jul	2,611
2026	Aug	2,582
2026	Sep	2,442
2026	Oct	2,174
2026	Nov	1,951
2026	Dec	1,871
2027	Jan	2,001
2027	Feb	1,846
2027	Mar	2,071

Southern California Gas Company			
2010 California Gas Report			
Small Cogen			
2027	Apr		1,923
2027	May		2,265
2027	Jun		2,235
2027	Jul		2,627
2027	Aug		2,598
2027	Sep		2,457
2027	Oct		2,187
2027	Nov		1,963
2027	Dec		1,882
2028	Jan		2,012
2028	Feb		1,856
2028	Mar		2,082
2028	Apr		1,934
2028	May		2,278
2028	Jun		2,247
2028	Jul		2,642
2028	Aug		2,612
2028	Sep		2,471
2028	Oct		2,199
2028	Nov		1,974
2028	Dec		1,893
2029	Jan		2,020
2029	Feb		1,863
2029	Mar		2,091
2029	Apr		1,941
2029	May		2,287
2029	Jun		2,256
2029	Jul		2,652
2029	Aug		2,622
2029	Sep		2,481
2029	Oct		2,208
2029	Nov		1,971
2029	Dec		1,900
2030	Jan		2,026
2030	Feb		1,869
2030	Mar		2,097
2030	Apr		1,948
2030	May		2,294
2030	Jun		2,263
2030	Jul		2,661
2030	Aug		2,631
2030	Sep		2,489
2030	Oct		2,215
2030	Nov		1,988
2030	Dec		1,906

Small Generation Demand Forecast
Self Generation Incentive Program Volumes
Table 2
(Mdth)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4	11.7	12.9	14.2	15.5	101.0
2010	1.6	3.2	4.7	6.3	7.9	9.5	11.0	12.6	14.2	15.8	17.3	18.9	123.0
2011	1.9	3.7	5.6	7.4	9.3	11.2	13.0	14.9	16.7	18.6	20.4	22.3	145.0
2012	2.1	4.3	6.4	8.6	10.7	12.8	15.0	17.1	19.3	21.4	23.6	25.7	167.0
2013	2.4	4.8	7.3	9.7	12.1	14.5	17.0	19.4	21.8	24.2	26.7	29.1	189.0
2014	2.7	5.4	8.1	10.8	13.5	16.2	18.9	21.6	24.3	27.1	29.8	32.5	211.0
2015	3.0	6.0	9.0	11.9	14.9	17.9	20.9	23.9	26.9	29.9	32.9	35.8	233.0
2016	3.3	6.5	9.8	13.1	16.3	19.6	22.9	26.2	29.4	32.7	36.0	39.2	255.0
2017	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2018	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2019	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2020	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2021	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2022	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2023	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2024	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2025	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2026	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2027	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2028	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2029	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0
2030	3.6	7.1	10.7	14.2	17.8	21.3	24.9	28.4	32.0	35.5	39.1	42.6	277.0

2010 CALIFORNIA GAS REPORT

INDUSTRIAL/COMMERCIAL COGENERATION > 20 MW
JULY 2010

The Gas Company

A Sempra Energy utility℠

Industrial/Commercial Cogeneration (>20 MW)

The MARKETSYM production cost model was used to prepare the natural gas demand through 2030. The attached detail summarizes the annual load.

Schedule 1
2008 CGR - SoCalgas Noncore G50-BASE HYDRO Large Co-Generation Template for Gas Demand Forecast Summary (MDth)

	EG-Rate: Tier1 (< 3,000,000 Therms/Yr)	EG-Rate: Tier2 (> 3,000,000 Therms/Yr)	Total
2007	102	54,238	54,340
2008	0	53,743	53,743
2009	0	52,033	52,033
2010	0	51,980	51,980
2011	0	52,057	52,057
2012	0	52,171	52,171
2013	0	52,084	52,084
2014	0	52,084	52,084
2015	0	52,112	52,112
2016	0	52,583	52,583
2017	0	53,031	53,031
2018	0	53,480	53,480
2019	0	54,010	54,010
2020	0	54,546	54,546
2021	0	54,546	54,546
2022	0	54,546	54,546
2023	0	54,546	54,546
2024	0	54,546	54,546
2025	0	54,546	54,546
2026	0	54,546	54,546
2027	0	54,546	54,546
2028	0	54,546	54,546
2029	0	54,546	54,546
2030	0	54,546	54,546

After 2015, the 2020 value was developed by growing the 2015 usage by the same rate as electric energy growth, minus the part that would be met with renewable power. The EG forecast is held constant at 2020 levels for 2025 and 2030.

2010 CALIFORNIA GAS REPORT

EOR RELATED COGENERATION
JULY 2010

The Gas Company

A Sempra Energy utility℠

ENHANCED OIL RECOVERY - COGENERATION

FORECAST METHODOLOGY FOR THE 2010 CALIFORNIA GAS REPORT

Southern California Gas' ("SoCalGas") forecast of enhanced oil recovery ("EOR") cogeneration gas requirements as reported in the *2010 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 2007 through 2009 were analyzed in order to determine typical throughput volumes over the past few years. FERC reports from Kern River Transmission Company and the Mojave Pipeline Company ("Kern/Mojave"), Format NO. FERC 567, from the same time period were studied in order to determine bypass trends.

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 additional 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 located in the San Joaquin Valley whose long-term transportation contracts with SoCalGas expired in 2008 and 2009 will increase their level of bypass.
3. Other customers located in the San Joaquin Valley who have already bypassed SoCalGas' system will continue to bypass at their current levels.

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

2010 CALIFORNIA GAS REPORT - EOR COGENERATION FORECAST (2010 - 2030)
(MMCFD)

	HISTORICAL			FORECAST																				
SOCALGAS DELIVERIES	2007	2008	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	51	46	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	11	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Total Deliveries	62	56	20	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

2010 CALIFORNIA GAS REPORT

REFINERY-RELATED COGENERATION
JULY 2010

The Gas Company

A Sempra Energy utility℠

Southern California Gas Company
Refinery Segment Gas Demand Forecast
Workpaper in Support of CGR 2010

I. Overview

These workpapers document the forecasting methodology for refinery segment gas demand. SoCalGas' refinery segment consists of 17 petroleum refining customers classified in SIC2911, 10 refinery-related cogenerators, 3 hydrogen producers and 1 petroleum refined product transporters. . These customers are characterized by a complex interaction of refinery operations, on-site generation of alternate fuels, and changing regulatory requirements impacting the production of petroleum products. Therefore, the demand forecasts for the refinery market incorporate factors such as refinery operations, alternate fuels competition and gasoline regulations.

II. Forecasting Methodology for Refinery Segment Gas Demand

The refinery segment gas demand forecast is developed by the following procedures.

A). Develop an econometric model to forecast total gas demand for refinery segment customers.

B). Incorporate the savings from both Commission-mandated energy efficiency programs and other refinery process related energy efficient improvements that are not eligible for SoCalGas' Energy Efficiency programs.

C). Break the final gas demand forecast by G-30 and EG rate class categories.

A) Econometric Model

1. Introduction

The refinery market is first forecasted by an econometric model with monthly historic data. The refinery segment gas demand model is a multiple log-linear regression model. The model includes a binary variable to reflect increased noncore demand beginning November 1999 due to one additional customer coming on line.

The refinery segment demand forecast model is developed using historical data from January 1998 through December 2009. The forecast period is from January 2010 through December 2030. Section 2 provides an overview of the input data sets. Section 3 describes the formulation and estimation results of the model. Section 4 shows the econometric forecast result and comparison with the historic data from January 1998 through December 2009.

2. Input Data

The refinery segment gas demand model is calibrated using monthly data from the historical database for the period January 1998 through December 2009. The endogenous (dependent variable) variable is the total refinery segment gas usage. The exogenous variables are monthly gas prices, butane prices and a binary variable. Descriptions for each of these data components are listed below. The input data are listed in Appendix A.

* Historic Gas Usage

Historic monthly gas usage data for refinery segment customers are obtained from SoCalGas Customer Billing Records for the period January 1998 through December 2009. The monthly usage data are then further divided by the number of days for each month to come up with the average daily usage by month.

* Gas Prices

The gas prices are the burner tip gas prices which consist of gas cost, transportation rate, municipal surcharge and PPP (Public Purpose Programs) surcharge. The California Border Spot Prices (CBSP) are used as a proxy for gas cost. The monthly transportation rates for the historic period are generated by taking the monthly recorded revenues divided by the actual throughput. For the forecast period, the forecast weighted average tariff rate is used as transportation rate. The weights are derived from historical usage data by rate category for period Jan 2009 to December 2009. The municipal surcharges are 2% of the gas cost for customers located in the city of Los Angeles and 1.48% for those in other cities.

* One Binary Variable

A binary variable is used in the model. The binary variable, NEW, which equals one for November, 1999 forward, and zero otherwise is designed to reflect the addition of one new customer in November 1999.

3. Model Specification and Estimation Results

* Specification of Equation

A single equation is estimated for the refinery segment gas demand forecast.

The equation is in the following form:

$\ln(USE\_Day_t) = a + b * \ln(GAS/BUTANE) + c * NEW_t + E_t$

Where:

t = Month, for January 1998, t = 1;

$\ln(USE\_Day_t)$ = Natural logarithm of the average daily refinery load (Mdth/day) in month t;

ln(GAS/BUTANE) = Natural logarithm of the ratio of burner tip gas prices to butane prices in month t. The gas and butane prices are the average prices of the month t and month t-1;

NEW_t = New customer dummy variable, for November 1999 and after, NEW=1; otherwise NEW=0;

E_t = Error term

The estimated parameters are the lower case letters a, b, and c.

* Estimation Results

The equation is estimated using EXCEL function LINEST for multiple linear regression. The results of the regression are shown in Table I below. All the coefficients are statistically significant with correct signs. The overall R-squared value equals 0.761. The coefficient b represents the effect of the ratio of gas to butane prices on gas demand. The coefficient c reflects the effect of new customers on gas demand.

Table I. Econometric Model Estimation Results

Parameter	Variable	Parameter Estimate	Standard Error	P Value
a	Intercept	5.224	0.013	0.0001
b	LN(GAS/BUTANE)	-0.172	0.014	0.0050
c	NEW	0.202	0.015	0.0001

$R^2 = 0.761$

F = 224.2; SE (y) =0.062

df = 141

4. Comparison of Forecast vs. Actual Usage

Table II shows the actual gas usage, predicted gas demand and percentage error for years 1998 through December 2009.

Table II. Econometric Model Results - Actual and Predicted Usage

Year	Actual Mdth	Predicted Mdth	Percent Error
1998	67,363	66,331	-1.5%
1999	69,306	71,258	2.8%
2000	79,524	82,885	4.2%
2001	74,607	78,420	5.1%
2002	85,093	82,384	- 3.2%
2003	84,477	81,747	- 3.2%
2004	84,540	85,082	0.6%
2005	83,607	85,001	1.7%
2006	85,627	88,529	3.4%
2007	88,839	89,111	0.3%
2008	96,785	90,709	-6.3%
2009	95,702	92,170	-3.7%

B). ENERGY EFFICIENCY SAVINGS

The forecast volumes derived from the econometric model do not account for the potential savings due to Commission-mandated energy efficiency programs.

To support the Energy Action Plan II (EAP) which was endorsed by Governor Schwarzenegger, the Commission adopted aggressive energy efficiency goals for SoCalGas customers in D.04-09-060. The forecasted savings due to Commission-mandated energy efficiency programs were deducted from the econometric forecast.

C). BREAK THE REFINERY GAS DEMAND FORECAST BY G-30 AND EG RATE-CLASS

The refinery G-30 and refinery-related EG forecast volumes were developed by taking the total refinery gas demand multiplying by the percent of G-30 volumes relative to total refinery volumes based on refinery billing records for the months of January 2009 through December 2009. These percentages, 80% and 20%, are reasonably predictive of the allocation of refinery gas volumes for rate-class G-30 and EG customers for the forecast period.

III. COLD YEAR DEMAND

Refinery gas demand is not weather sensitive. Therefore, the cold year demand is the same as the average year demand.

Appendix

Input and Output Data

Section I: Model Inputs

Refinery Segment Econometric Model

	Gas Burner Tip$/Dth	Gas Burner Tip$/Dth	Gas Burner Tip$/Dth	Gas Burner Tip$/Dth	Gas Burner Tip$/Dth	Gas Burner Tip$/Dth	Gas Burner Tip$/Dth	Gas Burner Tip$/Dth	Gas Burner Tip$/Dth	Gas Burner Tip$/Dth	Gas Burner Tip$/Dth	Gas Burner Tip$/Dth	Gas Burner Tip$/Dth
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2007	$ 7.06	$ 7.82	$ 6.83	$ 7.61	$ 7.80	$ 7.50	$ 6.61	$ 6.42	$ 6.16	$ 7.19	$ 6.77	$ 7.50	$ 7.10
2008	$ 8.07	$ 8.53	$ 9.20	$ 10.01	$ 10.27	$ 11.72	$ 10.62	$ 7.96	$ 6.01	$ 4.68	$ 4.98	$ 5.64	$ 8.14
2009	$ 4.93	$ 4.18	$ 3.61	$ 3.45	$ 3.88	$ 3.51	$ 3.75	$ 3.61	$ 3.65	$ 4.66	$ 4.24	$ 5.98	$ 4.12
2010	$ 6.61	$ 6.28	$ 6.05	$ 6.02	$ 6.05	$ 6.20	$ 6.38	$ 6.45	$ 6.39	$ 6.39	$ 6.66	$ 6.99	$ 6.37
2011	$ 7.30	$ 7.26	$ 6.97	$ 6.41	$ 6.36	$ 6.41	$ 6.48	$ 6.53	$ 6.57	$ 6.67	$ 6.87	$ 7.12	$ 6.75
2012	$ 7.64	$ 7.47	$ 7.25	$ 6.66	$ 6.61	$ 6.66	$ 6.73	$ 6.79	$ 6.83	$ 6.94	$ 7.15	$ 7.41	$ 7.01
2013	$ 7.87	$ 7.83	$ 7.60	$ 6.98	$ 6.93	$ 6.98	$ 7.06	$ 7.11	$ 7.15	$ 7.27	$ 7.49	$ 7.76	$ 7.33
2014	$ 8.23	$ 8.19	$ 7.95	$ 7.30	$ 7.24	$ 7.30	$ 7.38	$ 7.44	$ 7.48	$ 7.60	$ 7.83	$ 8.12	$ 7.67
2015	$ 8.26	$ 8.57	$ 8.31	$ 7.63	$ 7.57	$ 7.63	$ 7.71	$ 7.77	$ 7.82	$ 7.95	$ 8.19	$ 8.49	$ 7.99
2016	$ 8.47	$ 8.96	$ 8.69	$ 7.97	$ 7.91	$ 7.98	$ 8.06	$ 8.13	$ 8.17	$ 8.31	$ 8.56	$ 8.88	$ 8.34
2017	$ 8.69	$ 9.37	$ 9.09	$ 8.34	$ 8.28	$ 8.35	$ 8.43	$ 8.50	$ 8.55	$ 8.69	$ 8.95	$ 9.29	$ 8.71
2018	$ 8.91	$ 9.80	$ 9.50	$ 8.72	$ 8.66	$ 8.73	$ 8.82	$ 8.89	$ 8.94	$ 9.09	$ 9.36	$ 9.71	$ 9.09
2019	$ 9.13	$ 10.25	$ 9.94	$ 9.12	$ 9.05	$ 9.13	$ 9.22	$ 9.29	$ 9.35	$ 9.50	$ 9.79	$ 10.16	$ 9.50
2020	$ 9.38	$ 10.72	$ 10.40	$ 9.54	$ 9.46	$ 9.54	$ 9.64	$ 9.72	$ 9.78	$ 9.94	$ 10.24	$ 10.63	$ 9.92
2021	$ 9.63	$ 11.21	$ 10.87	$ 9.97	$ 9.90	$ 9.98	$ 10.08	$ 10.16	$ 10.22	$ 10.39	$ 10.71	$ 11.12	$ 10.36
2022	$ 9.64	$ 11.73	$ 11.37	$ 10.43	$ 10.35	$ 10.44	$ 10.55	$ 10.63	$ 10.69	$ 10.87	$ 11.20	$ 11.63	$ 10.79
2023	$ 9.89	$ 12.27	$ 11.90	$ 10.91	$ 10.82	$ 10.92	$ 11.03	$ 11.12	$ 11.18	$ 11.37	$ 11.72	$ 12.16	$ 11.27
2024	$ 12.90	$ 12.84	$ 12.45	$ 11.41	$ 11.32	$ 11.42	$ 11.54	$ 11.63	$ 11.70	$ 11.90	$ 12.26	$ 12.73	$ 12.01
2025	$ 13.49	$ 13.43	$ 13.02	$ 11.93	$ 11.84	$ 11.94	$ 12.07	$ 12.17	$ 12.24	$ 12.44	$ 12.83	$ 13.31	$ 12.56
2026	$ 14.12	$ 14.06	$ 13.62	$ 12.49	$ 12.39	$ 12.50	$ 12.63	$ 12.73	$ 12.80	$ 13.02	$ 13.42	$ 13.93	$ 13.14
2027	$ 14.77	$ 14.71	$ 14.26	$ 13.06	$ 12.96	$ 13.07	$ 13.21	$ 13.32	$ 13.40	$ 13.62	$ 14.04	$ 14.58	$ 13.75
2028	$ 15.46	$ 15.39	$ 14.92	$ 13.67	$ 13.56	$ 13.68	$ 13.82	$ 13.93	$ 14.02	$ 14.25	$ 14.69	$ 15.25	$ 14.39
2029	$ 16.18	$ 16.11	$ 15.61	$ 14.30	$ 14.19	$ 14.31	$ 14.46	$ 14.58	$ 14.67	$ 14.92	$ 15.38	$ 15.96	$ 15.06
2030	$ 16.93	$ 16.86	$ 16.34	$ 14.96	$ 14.85	$ 14.98	$ 15.14	$ 15.26	$ 15.35	$ 15.61	$ 16.09	$ 16.71	$ 15.76

	CBSP $/Dth	CBSP $/Dth	CBSP $/Dth	CBSP $/Dth	CBSP $/Dth	CBSP $/Dth	CBSP $/Dth	CBSP $/Dth	CBSP $/Dth	CBSP $/Dth	CBSP $/Dth	CBSP $/Dth	CBSP $/Dth
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2007	$ 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
2008	$ 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
2009	$ 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
2010	$ 5.98	$ 5.66	$ 5.43	$ 5.40	$ 5.43	$ 5.58	$ 5.75	$ 5.83	$ 5.77	$ 5.76	$ 6.03	$ 6.36	$ 5.75
2011	$ 6.58	$ 6.54	$ 6.26	$ 5.70	$ 5.66	$ 5.71	$ 5.77	$ 5.82	$ 5.86	$ 5.96	$ 6.16	$ 6.41	$ 6.04
2012	$ 6.94	$ 6.78	$ 6.56	$ 5.98	$ 5.93	$ 5.98	$ 6.05	$ 6.10	$ 6.14	$ 6.25	$ 6.46	$ 6.72	$ 6.32
2013	$ 7.14	$ 7.11	$ 6.87	$ 6.27	$ 6.21	$ 6.27	$ 6.34	$ 6.40	$ 6.44	$ 6.55	$ 6.77	$ 7.04	$ 6.62
2014	$ 7.48	$ 7.45	$ 7.20	$ 6.57	$ 6.51	$ 6.57	$ 6.65	$ 6.70	$ 6.74	$ 6.87	$ 7.09	$ 7.38	$ 6.93
2015	$ 7.50	$ 7.80	$ 7.55	$ 6.88	$ 6.83	$ 6.89	$ 6.96	$ 7.02	$ 7.07	$ 7.20	$ 7.43	$ 7.73	$ 7.24
2016	$ 7.70	$ 8.18	$ 7.91	$ 7.21	$ 7.15	$ 7.22	$ 7.30	$ 7.36	$ 7.41	$ 7.54	$ 7.79	$ 8.10	$ 7.57
2017	$ 7.90	$ 8.57	$ 8.29	$ 7.56	$ 7.50	$ 7.56	$ 7.65	$ 7.71	$ 7.76	$ 7.90	$ 8.16	$ 8.49	$ 7.92
2018	$ 8.10	$ 8.98	$ 8.69	$ 7.92	$ 7.86	$ 7.93	$ 8.02	$ 8.09	$ 8.14	$ 8.28	$ 8.55	$ 8.90	$ 8.29
2019	$ 8.31	$ 9.41	$ 9.11	$ 8.30	$ 8.23	$ 8.31	$ 8.40	$ 8.47	$ 8.53	$ 8.68	$ 8.96	$ 9.33	$ 8.67
2020	$ 8.55	$ 9.87	$ 9.55	$ 8.70	$ 8.63	$ 8.71	$ 8.80	$ 8.88	$ 8.94	$ 9.10	$ 9.39	$ 9.77	$ 9.07
2021	$ 8.78	$ 10.34	$ 10.00	$ 9.12	$ 9.04	$ 9.12	$ 9.23	$ 9.31	$ 9.37	$ 9.53	$ 9.85	$ 10.24	$ 9.49
2022	$ 8.78	$ 10.84	$ 10.48	$ 9.55	$ 9.48	$ 9.56	$ 9.67	$ 9.75	$ 9.81	$ 9.99	$ 10.32	$ 10.73	$ 9.91
2023	$ 9.01	$ 11.36	$ 10.99	$ 10.01	$ 9.93	$ 10.02	$ 10.13	$ 10.22	$ 10.29	$ 10.47	$ 10.81	$ 11.25	$ 10.37
2024	$ 11.96	$ 11.90	$ 11.51	$ 10.49	$ 10.41	$ 10.50	$ 10.62	$ 10.71	$ 10.78	$ 10.97	$ 11.33	$ 11.79	$ 11.08
2025	$ 12.53	$ 12.47	$ 12.07	$ 11.00	$ 10.91	$ 11.01	$ 11.13	$ 11.23	$ 11.30	$ 11.50	$ 11.88	$ 12.35	$ 11.61
2026	$ 13.13	$ 13.07	$ 12.65	$ 11.52	$ 11.43	$ 11.53	$ 11.67	$ 11.76	$ 11.84	$ 12.05	$ 12.45	$ 12.95	$ 12.17
2027	$ 13.76	$ 13.70	$ 13.25	$ 12.08	$ 11.98	$ 12.09	$ 12.22	$ 12.33	$ 12.41	$ 12.63	$ 13.04	$ 13.57	$ 12.76
2028	$ 14.42	$ 14.36	$ 13.89	$ 12.66	$ 12.56	$ 12.67	$ 12.81	$ 12.92	$ 13.00	$ 13.24	$ 13.67	$ 14.22	$ 13.37
2029	$ 15.11	$ 15.05	$ 14.56	$ 13.27	$ 13.16	$ 13.28	$ 13.43	$ 13.54	$ 13.63	$ 13.87	$ 14.33	$ 14.90	$ 14.01
2030	$ 15.84	$ 15.77	$ 15.25	$ 13.90	$ 13.79	$ 13.91	$ 14.07	$ 14.19	$ 14.28	$ 14.54	$ 15.01	$ 15.62	$ 14.68

Section I: Model Inputs

Refinery Segment Econometric Model

Year	$/Dth Transp Rate Jan	$/Dth Transp Rate Feb	$/Dth Transp Rate Mar	$/Dth Transp Rate Apr	$/Dth Transp Rate May	$/Dth Transp Rate Jun	$/Dth Transp Rate Jul	$/Dth Transp Rate Aug	$/Dth Transp Rate Sep	$/Dth Transp Rate Oct	$/Dth Transp Rate Nov	$/Dth Transp Rate Dec	$/Dth Transp Rate Total
2007	$ 0.28	$ 0.29	$ 0.28	$ 0.29	$ 0.29	$ 0.30	$ 0.29	$ 0.29	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.29
2008	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.27	$ 0.28	$ 0.27	$ 0.27	$ 0.27	$ 0.26	$ 0.27
2009	$ 0.21	$ 0.21	$ 0.21	$ 0.21	$ 0.20	$ 0.21	$ 0.20	$ 0.20	$ 0.20	$ 0.21	$ 0.21	$ 0.20	$ 0.21
2010	$ 0.29	$ 0.29	$ 0.29	$ 0.29	$ 0.29	$ 0.29	$ 0.29	$ 0.29	$ 0.29	$ 0.29	$ 0.29	$ 0.29	$ 0.29
2011	$ 0.33	$ 0.33	$ 0.33	$ 0.33	$ 0.33	$ 0.33	$ 0.33	$ 0.33	$ 0.33	$ 0.33	$ 0.33	$ 0.33	$ 0.33
2012	$ 0.31	$ 0.31	$ 0.31	$ 0.31	$ 0.31	$ 0.31	$ 0.31	$ 0.31	$ 0.31	$ 0.31	$ 0.31	$ 0.31	$ 0.31
2013	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32
2014	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34
2015	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34
2016	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34	$ 0.34
2017	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35
2018	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36
2019	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37
2020	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37
2021	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38
2022	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38
2023	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39
2024	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40
2025	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40
2026	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41
2027	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42
2028	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43
2029	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44
2030	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44

Year	PPP $/Dth Jan	PPP $/Dth Feb	PPP $/Dth Mar	PPP $/Dth Apr	PPP $/Dth May	PPP $/Dth Jun	PPP $/Dth Jul	PPP $/Dth Aug	PPP $/Dth Sep	PPP $/Dth Oct	PPP $/Dth Nov	PPP $/Dth Dec	PPP $/Dth Total
2007	$ 0.27	$ 0.27	$ 0.27	$ 0.27	$ 0.27	$ 0.27	$ 0.27	$ 0.27	$ 0.27	$ 0.27	$ 0.27	$ 0.27	$ 0.27
2008	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.28	$ 0.28
2009	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32	$ 0.32
2010	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30	$ 0.30
2011	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35	$ 0.35
2012	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36
2013	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36	$ 0.36
2014	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37
2015	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38
2016	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38	$ 0.38
2017	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39	$ 0.39
2018	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40	$ 0.40
2019	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41
2020	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41	$ 0.41
2021	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42	$ 0.42
2022	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43	$ 0.43
2023	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44
2024	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44	$ 0.44
2025	$ 0.45	$ 0.45	$ 0.45	$ 0.45	$ 0.45	$ 0.45	$ 0.45	$ 0.45	$ 0.45	$ 0.45	$ 0.45	$ 0.45	$ 0.45
2026	$ 0.46	$ 0.46	$ 0.46	$ 0.46	$ 0.46	$ 0.46	$ 0.46	$ 0.46	$ 0.46	$ 0.46	$ 0.46	$ 0.46	$ 0.46
2027	$ 0.47	$ 0.47	$ 0.47	$ 0.47	$ 0.47	$ 0.47	$ 0.47	$ 0.47	$ 0.47	$ 0.47	$ 0.47	$ 0.47	$ 0.47
2028	$ 0.48	$ 0.48	$ 0.48	$ 0.48	$ 0.48	$ 0.48	$ 0.48	$ 0.48	$ 0.48	$ 0.48	$ 0.48	$ 0.48	$ 0.48
2029	$ 0.49	$ 0.49	$ 0.49	$ 0.49	$ 0.49	$ 0.49	$ 0.49	$ 0.49	$ 0.49	$ 0.49	$ 0.49	$ 0.49	$ 0.49
2030	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50	$ 0.50

Section I: Model Inputs
Refinery Segment Econometric Model

	Butane $/Dth	Butane $/Dth	Butane $/Dth	Butane $/Dth	Butane $/Dth	Butane $/Dth	Butane $/Dth	Butane $/Dth	Butane $/Dth	Butane $/Dth	Butane $/Dth	Butane $/Dth	Butane $/Dth
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
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	$ 12.59	$ 11.58	$ 10.09	$ 9.58	$ 9.76	$ 10.05	$ 10.26	$ 10.43	$ 10.86	$ 11.82	$ 13.31	$ 13.92	$ 11.19
2011	$ 13.76	$ 12.65	$ 11.02	$ 10.46	$ 10.66	$ 10.99	$ 11.21	$ 11.40	$ 11.87	$ 12.92	$ 14.54	$ 15.21	$ 12.23
2012	$ 11.82	$ 10.87	$ 9.47	$ 8.99	$ 9.16	$ 9.44	$ 9.63	$ 9.80	$ 10.20	$ 11.10	$ 12.49	$ 13.07	$ 10.50
2013	$ 12.43	$ 11.43	$ 9.96	$ 9.45	$ 9.63	$ 9.92	$ 10.13	$ 10.30	$ 10.73	$ 11.67	$ 13.14	$ 13.74	$ 11.05
2014	$ 13.50	$ 12.41	$ 10.81	$ 10.26	$ 10.46	$ 10.78	$ 11.00	$ 11.19	$ 11.64	$ 12.67	$ 14.26	$ 14.92	$ 11.99
2015	$ 14.41	$ 13.25	$ 11.55	$ 10.96	$ 11.17	$ 11.50	$ 11.74	$ 11.94	$ 12.43	$ 13.53	$ 15.23	$ 15.93	$ 12.80
2016	$ 14.41	$ 13.25	$ 11.55	$ 10.96	$ 11.17	$ 11.50	$ 11.74	$ 11.94	$ 12.43	$ 13.53	$ 15.23	$ 15.93	$ 12.80
2017	$ 14.49	$ 13.32	$ 11.61	$ 11.02	$ 11.22	$ 11.57	$ 11.81	$ 12.01	$ 12.50	$ 13.60	$ 15.31	$ 16.02	$ 12.87
2018	$ 14.56	$ 13.39	$ 11.67	$ 11.07	$ 11.28	$ 11.63	$ 11.87	$ 12.07	$ 12.56	$ 13.67	$ 15.39	$ 16.10	$ 12.94
2019	$ 14.64	$ 13.46	$ 11.73	$ 11.13	$ 11.34	$ 11.69	$ 11.93	$ 12.13	$ 12.63	$ 13.75	$ 15.47	$ 16.19	$ 13.01
2020	$ 14.71	$ 13.53	$ 11.79	$ 11.19	$ 11.40	$ 11.75	$ 11.99	$ 12.20	$ 12.70	$ 13.82	$ 15.55	$ 16.27	$ 13.07
2021	$ 14.79	$ 13.60	$ 11.85	$ 11.25	$ 11.46	$ 11.81	$ 12.05	$ 12.26	$ 12.76	$ 13.89	$ 15.63	$ 16.35	$ 13.14
2022	$ 15.02	$ 13.81	$ 12.03	$ 11.42	$ 11.64	$ 11.99	$ 12.24	$ 12.45	$ 12.96	$ 14.10	$ 15.87	$ 16.61	$ 13.34
2023	$ 15.32	$ 14.09	$ 12.28	$ 11.65	$ 11.87	$ 12.23	$ 12.49	$ 12.70	$ 13.22	$ 14.39	$ 16.19	$ 16.94	$ 13.62
2024	$ 15.63	$ 14.37	$ 12.52	$ 11.89	$ 12.11	$ 12.48	$ 12.74	$ 12.95	$ 13.48	$ 14.67	$ 16.52	$ 17.28	$ 13.89
2025	$ 15.93	$ 14.65	$ 12.77	$ 12.12	$ 12.34	$ 12.72	$ 12.98	$ 13.20	$ 13.75	$ 14.96	$ 16.84	$ 17.62	$ 14.16
2026	$ 16.69	$ 15.35	$ 13.38	$ 12.70	$ 12.93	$ 13.33	$ 13.61	$ 13.84	$ 14.40	$ 15.68	$ 17.64	$ 18.46	$ 14.83
2027	$ 17.45	$ 16.05	$ 13.99	$ 13.27	$ 13.52	$ 13.94	$ 14.23	$ 14.47	$ 15.06	$ 16.39	$ 18.45	$ 19.30	$ 15.51
2028	$ 18.22	$ 16.75	$ 14.60	$ 13.85	$ 14.11	$ 14.54	$ 14.85	$ 15.10	$ 15.72	$ 17.10	$ 19.25	$ 20.14	$ 16.19
2029	$ 18.52	$ 17.03	$ 14.84	$ 14.09	$ 14.35	$ 14.79	$ 15.09	$ 15.35	$ 15.98	$ 17.39	$ 19.57	$ 20.48	$ 16.46
2030	$ 18.98	$ 17.45	$ 15.21	$ 14.43	$ 14.70	$ 15.15	$ 15.47	$ 15.73	$ 16.37	$ 17.82	$ 20.06	$ 20.98	$ 16.86

Section II: Load Reductions (Energy Efficiency Programs)

EE_ Savings	Mdth	Mdth	Mdth	Mdth	Mdth	Mdth	Mdth	Mdth	Mdth	Mdth	Mdth	Mdth	Mdth
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2007	-	-	-	-	-	-	-	-	-	-	-	-	-
2008	-	-	-	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-	-	-	-
2010	25	23	25	24	25	24	25	25	24	25	24	25	297
2011	52	47	52	50	52	50	52	52	50	52	50	52	609
2012	80	72	80	77	80	77	80	80	77	80	77	80	943
2013	108	98	108	105	108	105	108	108	105	108	105	108	1,277
2014	137	124	137	132	137	132	137	137	132	137	132	137	1,611
2015	165	149	165	160	165	160	165	165	160	165	160	165	1,945
2016	194	175	194	187	194	187	194	194	187	194	187	194	2,280
2017	222	201	222	215	222	215	222	222	215	222	215	222	2,614
2018	250	226	250	242	250	242	250	250	242	250	242	250	2,948
2019	279	252	279	270	279	270	279	279	270	279	270	279	3,282
2020	307	277	307	297	307	297	307	307	297	307	297	307	3,617
2021	336	303	336	325	336	325	336	336	325	336	325	336	3,951
2022	364	329	364	352	364	352	364	364	352	364	352	364	4,285
2023	392	354	392	380	392	380	392	392	380	392	380	392	4,619
2024	378	341	378	366	378	366	378	378	366	378	366	378	4,449
2025	381	344	381	369	381	369	381	381	369	381	369	381	4,486
2026	383	346	383	371	383	371	383	383	371	383	371	383	4,509
2027	383	346	383	371	383	371	383	383	371	383	371	383	4,509
2028	383	346	383	371	383	371	383	383	371	383	371	383	4,509
2029	383	346	383	371	383	371	383	383	371	383	371	383	4,509
2030	383	346	383	371	383	371	383	383	371	383	371	383	4,509

Section III: Forecast Results (Refinery Segment)

Refinery G30 Mdth Forecast

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2007	6,158	4,819	5,996	5,782	5,910	4,760	5,180	5,525	6,058	6,468	6,584	6,990	70,230
2008	6,688	5,890	6,255	5,840	6,526	6,320	6,894	6,383	6,249	6,778	6,627	6,635	77,086
2009	6,332	6,153	6,356	6,450	6,660	6,109	6,363	6,466	6,407	5,951	5,833	7,108	76,188
2010	6,471	5,649	6,014	5,937	6,238	6,441	5,987	6,061	5,916	6,204	6,084	6,283	73,285
2011	6,227	5,525	5,930	5,858	6,153	6,558	6,026	6,116	5,954	6,226	6,118	6,332	73,025
2012	6,138	5,429	5,714	5,762	6,051	6,468	5,806	5,889	5,734	5,996	5,892	6,098	70,980
2013	6,012	5,315	5,679	5,635	5,909	6,310	5,771	5,865	5,710	5,971	5,868	6,074	70,118
2014	6,004	5,310	5,692	5,628	5,902	6,311	5,784	5,875	5,720	5,982	5,879	6,085	70,172
2015	6,029	5,311	5,690	5,630	5,905	6,324	5,783	5,868	5,713	5,975	5,874	6,079	70,182
2016	5,999	5,275	5,622	5,591	5,874	6,290	5,715	5,794	5,642	5,901	5,800	6,003	69,507
2017	5,936	5,211	5,554	5,522	5,804	6,216	5,647	5,725	5,575	5,831	5,732	5,932	68,687
2018	5,877	5,150	5,487	5,456	5,738	6,146	5,580	5,657	5,508	5,762	5,664	5,862	67,885
2019	5,817	5,088	5,420	5,390	5,671	6,075	5,513	5,588	5,442	5,692	5,597	5,792	67,087
2020	5,756	5,027	5,354	5,324	5,605	6,006	5,446	5,520	5,376	5,624	5,530	5,723	66,290
2021	5,696	4,966	5,287	5,259	5,539	5,936	5,379	5,452	5,310	5,555	5,463	5,653	65,495
2022	5,653	4,910	5,231	5,198	5,477	5,872	5,322	5,395	5,254	5,497	5,406	5,595	64,809
2023	5,605	4,861	5,180	5,145	5,426	5,816	5,271	5,342	5,203	5,444	5,354	5,541	64,188
2024	5,485	4,852	5,171	5,135	5,418	5,805	5,263	5,332	5,192	5,433	5,343	5,529	63,958
2025	5,456	4,819	5,144	5,108	5,363	5,777	5,233	5,303	5,165	5,404	5,315	5,500	63,586
2026	5,441	4,807	5,144	5,095	5,348	5,763	5,234	5,303	5,164	5,403	5,314	5,499	63,515
2027	5,442	4,807	5,146	5,095	5,348	5,767	5,236	5,302	5,164	5,403	5,313	5,499	63,521
2028	5,440	4,806	5,146	5,094	5,347	5,768	5,236	5,300	5,161	5,400	5,311	5,496	63,504
2029	5,425	4,791	5,121	5,079	5,333	5,755	5,210	5,272	5,134	5,372	5,283	5,467	63,241
2030	5,400	4,770	5,102	5,056	5,308	5,730	5,191	5,251	5,114	5,351	5,262	5,446	62,980

Refinery EG Mdth Forecast

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2007	1,355	1,238	1,657	1,645	1,436	1,453	1,646	1,677	1,585	1,746	1,356	1,817	18,609
2008	1,858	1,648	1,667	1,463	1,666	1,557	1,703	1,719	1,603	1,725	1,573	1,517	19,699
2009	1,596	1,441	1,724	1,680	1,609	1,550	1,577	1,663	1,583	1,811	1,577	1,704	19,514
2010	1,664	1,453	1,547	1,527	1,604	1,656	1,540	1,559	1,522	1,595	1,565	1,616	18,846
2011	1,608	1,427	1,532	1,513	1,589	1,692	1,557	1,580	1,538	1,608	1,580	1,635	18,859
2012	1,593	1,409	1,484	1,496	1,570	1,677	1,508	1,529	1,488	1,556	1,529	1,582	18,421
2013	1,568	1,386	1,482	1,470	1,541	1,643	1,506	1,530	1,489	1,557	1,530	1,583	18,286
2014	1,573	1,392	1,493	1,475	1,547	1,650	1,517	1,540	1,499	1,567	1,540	1,594	18,385
2015	1,586	1,399	1,500	1,483	1,555	1,661	1,524	1,545	1,504	1,573	1,545	1,599	18,473
2016	1,586	1,396	1,490	1,480	1,554	1,659	1,513	1,534	1,493	1,561	1,534	1,587	18,386
2017	1,577	1,386	1,479	1,469	1,543	1,647	1,503	1,523	1,483	1,550	1,523	1,576	18,262
2018	1,569	1,377	1,470	1,459	1,534	1,636	1,493	1,513	1,473	1,540	1,513	1,566	18,142
2019	1,561	1,368	1,460	1,450	1,524	1,625	1,483	1,503	1,463	1,529	1,503	1,555	18,023
2020	1,553	1,359	1,450	1,440	1,514	1,614	1,473	1,493	1,453	1,519	1,492	1,544	17,905
2021	1,545	1,350	1,440	1,430	1,505	1,604	1,464	1,482	1,443	1,509	1,482	1,534	17,787
2022	1,541	1,342	1,433	1,422	1,496	1,594	1,456	1,475	1,436	1,501	1,475	1,526	17,697
2023	1,536	1,336	1,427	1,415	1,490	1,587	1,451	1,469	1,430	1,495	1,468	1,520	17,623
2024	1,502	1,330	1,421	1,409	1,484	1,581	1,445	1,462	1,424	1,488	1,462	1,513	17,521
2025	1,495	1,322	1,415	1,403	1,471	1,574	1,438	1,456	1,417	1,482	1,456	1,506	17,435
2026	1,492	1,320	1,416	1,400	1,468	1,571	1,439	1,456	1,418	1,482	1,456	1,507	17,423
2027	1,492	1,320	1,416	1,400	1,468	1,572	1,439	1,456	1,417	1,482	1,456	1,506	17,424
2028	1,491	1,319	1,416	1,400	1,467	1,572	1,439	1,455	1,417	1,481	1,455	1,506	17,420
2029	1,487	1,316	1,410	1,396	1,464	1,569	1,433	1,448	1,410	1,474	1,448	1,498	17,352
2030	1,481	1,310	1,405	1,390	1,458	1,562	1,428	1,443	1,405	1,469	1,443	1,493	17,285

Section III: Forecast Results (Refinery Segment)

Refinery G30 + EG Mdth Forecast

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2007	7,513	6,057	7,653	7,426	7,346	6,212	6,826	7,202	7,643	8,214	7,940	8,808	88,839
2008	8,546	7,539	7,922	7,303	8,193	7,877	8,597	8,102	7,852	8,503	8,200	8,152	96,785
2009	7,928	7,594	8,081	8,130	8,269	7,659	7,939	8,129	7,990	7,761	7,410	8,812	95,702
2010	8,134	7,102	7,561	7,463	7,842	8,097	7,527	7,620	7,438	7,799	7,649	7,898	92,132
2011	7,835	6,953	7,463	7,371	7,742	8,250	7,582	7,696	7,492	7,834	7,698	7,968	91,884
2012	7,731	6,839	7,199	7,258	7,622	8,145	7,314	7,418	7,222	7,552	7,421	7,681	89,400
2013	7,579	6,702	7,161	7,105	7,450	7,953	7,276	7,395	7,199	7,528	7,398	7,657	88,404
2014	7,577	6,702	7,184	7,103	7,449	7,961	7,301	7,415	7,219	7,549	7,419	7,678	88,558
2015	7,615	6,710	7,190	7,112	7,460	7,984	7,307	7,414	7,218	7,548	7,419	7,678	88,655
2016	7,585	6,671	7,112	7,071	7,428	7,949	7,229	7,328	7,134	7,461	7,334	7,590	87,893
2017	7,514	6,597	7,034	6,992	7,348	7,863	7,150	7,248	7,057	7,381	7,255	7,509	86,949
2018	7,446	6,526	6,957	6,915	7,271	7,782	7,073	7,170	6,981	7,301	7,177	7,428	86,028
2019	7,378	6,456	6,880	6,840	7,195	7,701	6,996	7,091	6,904	7,222	7,100	7,347	85,110
2020	7,309	6,386	6,804	6,764	7,119	7,620	6,919	7,013	6,829	7,143	7,022	7,267	84,195
2021	7,241	6,316	6,728	6,689	7,043	7,539	6,843	6,935	6,753	7,064	6,945	7,187	83,282
2022	7,193	6,252	6,664	6,620	6,973	7,466	6,779	6,870	6,690	6,998	6,881	7,121	82,505
2023	7,141	6,197	6,607	6,560	6,916	7,403	6,722	6,811	6,632	6,938	6,822	7,060	81,811
2024	6,987	6,183	6,593	6,544	6,902	7,386	6,707	6,794	6,616	6,921	6,805	7,042	81,479
2025	6,951	6,142	6,559	6,511	6,834	7,351	6,671	6,759	6,582	6,886	6,770	7,006	81,021
2026	6,933	6,127	6,560	6,494	6,815	7,334	6,672	6,759	6,582	6,885	6,770	7,006	80,938
2027	6,934	6,127	6,562	6,495	6,816	7,339	6,675	6,758	6,581	6,885	6,769	7,005	80,945
2028	6,931	6,125	6,562	6,493	6,814	7,341	6,675	6,755	6,578	6,881	6,766	7,002	80,923
2029	6,912	6,107	6,531	6,475	6,797	7,324	6,643	6,720	6,544	6,846	6,731	6,965	80,594
2030	6,881	6,080	6,507	6,446	6,765	7,292	6,619	6,694	6,519	6,820	6,705	6,938	80,265

2010 CALIFORNIA GAS REPORT

WHOLESALE REQUIREMENTS
JULY 2010

The Gas Company

A Sempra Energy utility℠

2010 CALIFORNIA GAS REPORT

San Diego Gas & Electric Company
JULY 2010

The Gas Company

A Sempra Energy utility℠

San Diego Gas and Electric Company

The detail of SDG&E's redacted forecast is published in the 2010 California Gas Report Workpapers for San Diego Gas and Electric. Please refer to the redacted version of the workpapers.

2010 CALIFORNIA GAS REPORT

CITY OF LONG BEACH OIL AND GAS DEPARTMENT
JULY 2010

The Gas Company

A Sempra Energy utility℠

2010 California Gas Report

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

2010 CALIFORNIA GAS REPORT

SOUTHWEST GAS CORPORATION
JULY 2010

The Gas Company

A Sempra Energy utility℠

2010 California Gas Report

Southwest Gas Corporation Workpapers have been redacted in this version.

2010 CALIFORNIA GAS REPORT

CITY OF VERNON
JULY 2010

The Gas Company

A Sempra Energy utility™

2010 California Gas Report

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

2010 CALIFORNIA GAS REPORT

MEXICALI
JULY 2010

The Gas Company

A Sempra Energy utility℠

2010 California Gas Report

Mexicali's Workpapers have been redacted in this version.

2010 CALIFORNIA GAS REPORT

PEAKDAY FORECAST
JULY 2010

The Gas Company

A Sempra Energy utility℠

SoCalGas Heating Degree Day (HDD) Weather Designs

(Calendar Based)

	Cold		Average 1/	Hot	
	1-in-35 exceedance	1-in-10 exceedance		1-in-10 exceedance	1-in-35 exceedance
January	342.3	322.3	284.2	246.2	226.1
February	280.0	263.6	232.5	201.4	185.0
March	226.3	213.0	187.9	162.7	149.5
April	146.9	138.3	121.9	105.6	97.0
May	58.9	55.5	48.9	42.4	38.9
June	16.3	15.4	13.5	11.7	10.8
July	2.1	2.0	1.7	1.5	1.4
August	1.6	1.5	1.3	1.1	1.0
September	4.5	4.2	3.7	3.2	2.9
October	42.9	40.4	35.6	30.8	28.3
November	171.7	161.6	142.5	123.5	113.4
December	362.7	341.4	301.1	260.8	239.6
	1656.0	1559.0	**1375.0**	1191.0	1094.0

Notes:

1/ 20-Yr-Avg (Jan1990-Dec2009)

2/ Daily system wide temperature based on six-zone average using customer counts by zone for December 2009.

2010-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-2" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
		----	----	----	----	----	----	----	----	----	----	----
1	RESIDEN	1992.1	1911.7	1888.3	1886.9	1869.9	1863.8	1864.4	1867.8	1872.3	1876.8	1881.0
2	Com G10	434.4	424.9	427.7	428.8	430.0	429.1	428.2	427.4	426.9	426.2	425.2
2	GAC 2/	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
2	GEN 2/	2.7	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
3	Ind G10	78.6	73.2	71.7	71.2	69.9	68.4	66.8	65.4	63.8	62.2	60.6
4	NGV 2/	26.7	27.4	28.2	29.0	29.8	30.6	31.5	32.4	33.3	34.2	35.2
		======	======	======	======	======	======	======	======	======	======	======
Total:	MDth/day	2534.7	2440.0	2418.5	2418.5	2402.2	2394.6	2393.5	2395.6	2398.9	2402.1	2404.6
	MMcf/day 4/	2467.3	2375.2	2354.2	2354.3	2338.4	2331.0	2329.9	2331.9	2335.1	2338.2	2340.7
	Days per Mo	31	31	31	31	31	31	31	31	31	31	31
	Pk-Day Temp. (deg-F) =	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5
	Hdd: December--ColdYr =	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7
	"Wkday/Wkend" Factor-Res:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	"Wkday/Wkend" Factor-NonRes:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2010-CGR Res and C&I Calculations

Notes:

1/ =("Cold-Dec" / 31 days)+[("Cold-Dec" - "Base-Dec")
/ "Cold-Dec_Hdd"]*(65 degF - 45.5 degF)

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf= 1.0273

2010-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-2" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		----	----	----	----	----	----	----	----	----	----	----
1	RESIDEN	1885.0	1889.0	1894.8	1898.9	1881.9	1883.8	1885.7	1887.4	1888.7	1889.7	1890.7
2	Com G10	424.3	423.8	423.5	423.1	440.8	425.9	427.5	429.5	431.5	433.3	435.0
2	GAC 2/	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
2	GEN 2/	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4
3	Ind G10	58.8	56.9	55.1	53.1	50.0	49.1	48.2	47.5	46.7	46.1	45.4
4	NGV 2/	36.2	37.2	38.2	39.3	40.4	41.5	42.7	43.9	45.1	46.4	47.7
		======	======	======	======	======	======	======	======	======	======	======
Total:	MDth/day	2406.9	2409.4	2414.1	2417.0	2415.6	2402.8	2406.6	2410.7	2414.5	2417.9	2421.2
	MMcf/day 4/	2342.9	2345.4	2350.0	2352.7	2351.4	2338.9	2342.7	2346.6	2350.4	2353.6	2356.9
	Days per Mo	31	31	31	31	31	31	31	31	31	31	31
	Pk-Day Temp. (deg-F) =	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5
	Hdd: December--ColdYr =	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7
	"Wkday/Wkend" Factor-Res:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	"Wkday/Wkend" Factor-NonRes:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2010-CGR Res and C&I Calculations

Notes:

1/ =("Cold-Dec" / 31 days)+[("Cold-Dec" - "Base-Dec")
/ "Cold-Dec_Hdd"]*(65 degF - 45.5 degF)

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf=

2010-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-10" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
		----	----	----	----	----	----	----	----	----	----	----
1	RESIDEN	2351.4	2256.5	2228.9	2227.3	2207.1	2200.0	2200.6	2204.7	2210.0	2215.3	2220.3
2	Com G10	495.1	484.5	487.6	488.8	490.3	489.2	488.2	487.2	486.6	485.9	484.7
2	GAC 2/	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
2	GEN 2/	2.7	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
3	Ind G10	84.3	78.5	76.8	76.3	74.9	73.3	71.6	70.0	68.4	66.7	64.9
4	NGV 2/	26.7	27.4	28.2	29.0	29.8	30.6	31.5	32.4	33.3	34.2	35.2
		======	======	======	======	======	======	======	======	======	======	======
Total:	MDth/day	2960.4	2849.6	2824.2	2824.1	2804.8	2795.8	2794.6	2797.0	2800.9	2804.7	2807.7
	MMcf/day 4/	2881.7	2773.9	2749.1	2749.0	2730.2	2721.5	2720.3	2722.7	2726.5	2730.2	2733.1
	Days per Mo	31	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	41.2
Hdd: December--ColdYr =		362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7
"Wkday/Wkend" Factor-Res:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
"Wkday/Wkend" Factor-NonRes:		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2010-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= 1.0273

2010-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-10" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		----	----	----	----	----	----	----	----	----	----	----
1	RESIDEN	2225.0	2229.7	2236.5	2241.4	2221.3	2223.5	2225.8	2227.8	2229.4	2230.5	2231.7
2	Com G10	483.7	483.1	482.8	482.3	502.5	485.5	487.4	489.6	491.9	494.0	495.9
2	GAC 2/	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
2	GEN 2/	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4
3	Ind G10	63.0	61.0	59.1	56.9	53.6	52.6	51.7	50.9	50.1	49.4	48.7
4	NGV 2/	36.2	37.2	38.2	39.3	40.4	41.5	42.7	43.9	45.1	46.4	47.7
		======	======	======	======	======	======	======	======	======	======	======
Total:	MDth/day	2810.5	2813.5	2819.1	2822.5	2820.3	2805.7	2810.0	2814.7	2818.9	2822.7	2826.4
	MMcf/day 4/	2735.8	2738.8	2744.2	2747.5	2745.4	2731.1	2735.4	2739.9	2744.0	2747.7	2751.3
	Days per Mo	31	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	41.2
	Hdd: December--ColdYr =	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7
	"Wkday/Wkend" Factor-Res:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	"Wkday/Wkend" Factor-NonRes:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2010-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= 1.0273

2010-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-35" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
		----	----	----	----	----	----	----	----	----	----	----
1	RESIDEN	2552.0	2449.0	2419.0	2417.3	2395.4	2387.6	2388.3	2392.8	2398.5	2404.2	2409.7
2	Com G10	529.0	517.8	521.0	522.4	523.9	522.8	521.6	520.6	520.0	519.2	517.9
2	GAC 2/	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
2	GEN 2/	2.7	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
3	Ind G10	87.4	81.4	79.7	79.1	77.7	76.0	74.3	72.7	70.9	69.2	67.4
4	NGV 2/	26.7	27.4	28.2	29.0	29.8	30.6	31.5	32.4	33.3	34.2	35.2
		======	======	======	======	======	======	======	======	======	======	======
Total:	MDth/day	3197.9	3078.3	3050.6	3050.4	3029.4	3019.8	3018.4	3021.1	3025.3	3029.4	3032.7
	MMcf/day 4/	3113.0	2996.5	2969.5	2969.3	2948.9	2939.5	2938.2	2940.8	2944.9	2948.9	2952.1
	Days per Mo	31	31	31	31	31	31	31	31	31	31	31
	Pk-Day Temp. (deg-F) =	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8
	Hdd: December--ColdYr =	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7
	"Wkday/Wkend" Factor-Res:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	"Wkday/Wkend" Factor-NonRes:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2010-CGR Res and C&I Calculations

Notes:

1/ =("Cold-Dec" / 31 days)+[("Cold-Dec" - "Base-Dec")
/ "Cold-Dec_Hdd"]*(65 degF - 38.8 degF)

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf= 1.0273

2010-CGR Sales + Transport + Exchange for Month of DECEMBER
(units=Mdth/Day)
"1-in-35" Likelihood Cold Day Temperature

No. "CGR_B"	CLASS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		----	----	----	----	----	----	----	----	----	----	----
1	RESIDEN	2414.8	2419.9	2427.3	2432.6	2410.8	2413.2	2415.7	2417.9	2419.5	2420.8	2422.1
2	Com G10	516.9	516.2	515.9	515.3	536.9	518.8	520.8	523.1	525.6	527.8	529.9
2	GAC 2/	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
2	GEN 2/	2.5	2.5	2.5	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.4
3	Ind G10	65.3	63.3	61.3	59.1	55.6	54.6	53.6	52.8	52.0	51.2	50.5
4	NGV 2/	36.2	37.2	38.2	39.3	40.4	41.5	42.7	43.9	45.1	46.4	47.7
		======	======	======	======	======	======	======	======	======	======	======
Total:	MDth/day	3035.7	3039.1	3045.2	3048.8	3046.2	3030.5	3035.2	3040.1	3044.7	3048.6	3052.5
	MMcf/day 4/	2955.1	2958.3	2964.2	2967.8	2965.2	2950.0	2954.5	2959.3	2963.8	2967.6	2971.4
	Days per Mo	31	31	31	31	31	31	31	31	31	31	31
	Pk-Day Temp. (deg-F) =	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8	38.8
	Hdd: December--ColdYr =	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7	362.7
	"Wkday/Wkend" Factor-Res:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	"Wkday/Wkend" Factor-NonRes:	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Use this Methodology for the 2010-CGR Res and C&I Calculations

Notes:

1/ =("Cold-Dec" / 31 days)+[("Cold-Dec" - "Base-Dec")
/ "Cold-Dec_Hdd"]*(65 degF - 38.8 degF)

2/ "Non-temperature" sensitive market segment.

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

4/ Dth/Mcf= 1.0273

Friday, May 28, 2010 2010-CGR Sales + Transport + Exchange for Month of DECEMBER (units=mdth)
Temp=December, Cold Year

No. "CGR_CLASS	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	----	----	----	----	----	----	----	----	----	----	----
1 Residen	41546.4	39869.4	39380.9	39353.3	38996.9	38870.9	38882.3	38954.8	39047.4	39141.3	39229.7
2 Com G10	10049.3	9822.2	9886.4	9913.1	9943.1	9923.3	9902.6	9884.4	9873.2	9858.0	9834.7
2 GAC	5.7	5.6	5.2	4.8	4.8	4.4	4.4	4.0	4.0	3.6	3.2
2 GEN	84.2	78.5	78.3	78.2	78.1	78.0	77.9	77.8	77.6	77.5	77.4
3 Ind G10	2119.4	1975.9	1934.2	1919.1	1883.4	1843.6	1800.8	1761.8	1720.0	1677.8	1632.9
4 NGV	827.1	850.3	874.1	898.6	923.7	949.6	976.2	1003.5	1031.6	1060.5	1090.2
	======	======	======	======	======	======	======	======	======	======	======
	54632	52602	52159	52167	51830	51670	51644	51686	51754	51819	51868
2010 CGR: Mdth/Hdd	99	95	94	94	94	93	93	93	93	94	94

Friday, May 28, 2010 2010-CGR Sales + Transport + Exchange for Month of DECEMBER (units=mdth)
Temp=December, Cold Year

No. "CGR_CLASS	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
	----	----	----	----	----	----	----	----	----	----	----
1 Residen	39313.3	39396.5	39516.1	39603.3	39247.4	39286.7	39327.3	39363.1	39390.3	39410.6	39431.5
2 Com G10	9814.6	9801.2	9795.7	9785.6	10194.5	9850.7	9888.5	9933.6	9980.2	10022.4	10062.1
2 GAC	3.2	2.8	2.8	2.4	2.4	2.0	2.0	1.6	1.6	0.8	0.0
2 GEN	77.1	76.9	76.7	76.5	76.1	75.9	75.7	75.4	74.9	74.5	73.6
3 Ind G10	1584.0	1534.4	1485.5	1431.8	1349.1	1323.4	1299.5	1279.4	1260.2	1242.3	1225.1
4 NGV	1120.7	1152.1	1184.4	1217.5	1251.6	1286.6	1322.7	1359.7	1397.8	1436.9	1477.2
	======	======	======	======	======	======	======	======	======	======	======
	51913	51964	52061	52117	52121	51825	51916	52013	52105	52188	52269
2010 CGR: Mdth/Hdd	94	94	94	94	94	94	94	94	94	94	94

Friday, May 28, 2010 2010-CGR Sales + Transport + Exchange for Month of DECEMBER (units=mdth)
Temp=December, at ZERO Hdd

No.	"CGR_CLASS	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
		----	----	----	----	----	----	----	----	----	----	----
1	Residen	11242.6	10788.8	10656.6	10649.1	10552.7	10518.6	10521.7	10541.3	10566.3	10591.8	10615.7
2	Com G10	4927.3	4797.5	4831.8	4846.4	4862.7	4854.6	4846.1	4838.7	4834.8	4827.4	4816.0
2	GAC	5.7	5.6	5.2	4.8	4.8	4.4	4.4	4.0	4.0	3.6	3.2
2	GEN	84.2	78.5	78.3	78.2	78.1	78.0	77.9	77.8	77.6	77.5	77.4
3	Ind G10	1643.0	1534.1	1501.6	1488.6	1459.8	1429.0	1395.9	1365.7	1333.4	1300.7	1265.9
4	NGV	827.1	850.3	874.1	898.6	923.7	949.6	976.2	1003.5	1031.6	1060.5	1090.2
		======	======	======	======	======	======	======	======	======	======	======
		18730	18055	17948	17966	17882	17834	17822	17831	17848	17861	17868

Friday, May 28, 2010 2010-CGR Sales + Transport + Exchange for Month of DECEMBER (units=mdth)
Temp=December, at ZERO Hdd

No. "CGR_ CLASS		2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
		----	----	----	----	----	----	----	----	----	----	----
1	Residen	10638.3	10660.8	10693.2	10716.8	10620.5	10631.1	10642.1	10651.8	10659.1	10664.6	10670.3
2	Com G10	4806.2	4799.6	4796.9	4792.0	4991.9	4823.8	4842.3	4864.3	4887.1	4907.8	4927.1
2	GAC	3.2	2.8	2.8	2.4	2.4	2.0	2.0	1.6	1.6	0.8	0.0
2	GEN	77.1	76.9	76.7	76.5	76.1	75.9	75.7	75.4	74.9	74.5	73.6
3	Ind G10	1228.0	1189.5	1151.6	1110.0	1045.8	1025.9	1007.4	991.8	976.9	963.0	949.7
4	NGV	1120.7	1152.1	1184.4	1217.5	1251.6	1286.6	1322.7	1359.7	1397.8	1436.9	1477.2
		======	======	======	======	======	======	======	======	======	======	======
		17873	17882	17906	17915	17988	17845	17892	17945	17997	18048	18098

2010 CALIFORNIA GAS REPORT

SUPPORTING DATA
JULY 2010

The Gas Company

A Sempra Energy utility℠

2010 CALIFORNIA GAS REPORT

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

JULY 2010

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	0.0417	Palm Springs	Palm Springs
		El Centro	Brawley
3. Coastal	0.1779	Los Angeles Airport	Los Angeles Airport
		Newport Beach	Newport Beach Harbor
		Santa Barbara Airport	Santa Barbara Airport
4. High desert	0.0745	Bakersfield	Bakersfield Airport
		Lancaster Airport	Palmdale
		Fresno	Visalia
5. Interior valleys	0.3794	Burbank	Burbank
		Pasadena	Pasadena
		Ontario	Pomona Cal Poly
		San Bernardino	Redlands
6. Basin	0.3203	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 December 2009 customer counts. These weights are used in calculating the data shown from January 1990 to December 2009.

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 1990 to 2009 are listed in Table 2, below.

Table 2

Calendar Month Heating Degree-Days (Jan. 1990 through Dec. 2009)

	Month												Total
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**"Cal-Year"**
1990	298	299	205	71	55	10	1	1	1	10	121	370	1442
1991	285	116	315	118	99	25	4	3	4	45	114	277	1405
1992	285	182	201	40	15	14	1	1	1	11	129	374	1254
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	317	136	179	128	109	40	2	1	2	14	67	246	1241
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	359	1686
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	117	50	16	1	1	12	37	126	354	1401
2008	348	263	148	123	76	8	1	0	2	23	75	334	1401
2009	196	259	194	133	18	16	3	4	1	43	117	320	1304
20-Yr-Avg (Jan1990-Dec2009)													
Avg.	**284.3**	**232.5**	**187.9**	**122.0**	**49.0**	**13.6**	**1.8**	**1.3**	**3.7**	**35.6**	**142.6**	**301.2**	**1375.2**
St.Dev.	**55.0**	**54.4**	**65.6**	**52.3**	**32.9**	**10.5**	**1.3**	**1.3**	**3.0**	**22.0**	**58.2**	**43.2**	**138.566**
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**	**4.0**	**4.0**	**12.0**	**77.0**	**293.0**	**374.0**	**1686.0**

II. Average-Temperature Year

The simple average of the 20-year period (January 1990 through December 2009) 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. Cold-Temperature Year Weather Designs

<u>Cold Year HDD Weather Designs</u>

For SoCalGas, cold-temperature-year HDD weather designs are developed with a 1-in-35 year 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 138.566 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 * 138.566

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 1990 to 2009, as shown as the bottom of Table 2, above. For example, the average-year December value of 301.1 HDD equals the simple average of the 20 December HDD figures from 1990 to 2009, and represents 21.9 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 21.9 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 21.9 percent, or 362.7 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	342.3	322.3	284.2	246.2	226.1
February	280.0	263.6	232.5	201.4	185.0
March	226.3	213.0	187.9	162.7	149.5
April	146.9	138.3	121.9	105.6	97.0
May	58.9	55.5	48.9	42.4	38.9
June	16.3	15.4	13.5	11.7	10.8
July	2.1	2.0	1.7	1.5	1.4
August	1.6	1.5	1.3	1.1	1.0
September	4.5	4.2	3.7	3.2	2.9
October	42.9	40.4	35.6	30.8	28.3
November	171.7	161.6	142.5	123.5	113.4
December	362.7	341.4	301.1	260.8	239.6
	1656	1559	1375	1191	1094

IV. Calculating the Peak-Day Design Temperature

For the 2010 CGR, the peak day temperature design values developed for the 2009 BCAP were used. These values are 38.8°F and 41.2°F, for "1-in-35" and "1-in-10" likelihood exceedances, respectively. The subsequent discussion is reproduced from our 2009 BCAP work papers.

SoCalGas' Peak-Day design temperature of 38.8 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 2006, 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, …, 2006.

(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:

$$- \mathrm{MinAVG}_y = - \min_{d=1}^{n(y)}\{\mathrm{AVG}_{y,d}\} = \max_{d=1}^{n(y)}\{ -\mathrm{AVG}_{y,d}\}, \text{ for } y=1950, \ldots, 2006;$$

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

The calculations done to fit any one of the three probability models chooses the parameter values that provide the "best fit" of the parametric probability model's calculated cumulative distribution function (CDF) to the empirical cumulative distribution function (ECDF). Note that the ECDF is constructed based on the variable "-MinAVG_y" (which is a *maximum* over a set of *negative* temperatures) with values of the variable MinAVG_y that are the same as shown in 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:

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

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.

Of the three probability models considered (GEV, EV1, and T_Dist) the results obtained for the GEV model were selected since the fit to the ECDF was better than that of either the EV1 model or the T_Dist model. (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) $\mathrm{ECDF}(-\mathrm{MinAVG}_y) = \mathrm{Prob}\ \{ -T < -\mathrm{MinAVG}_y \}= \exp[-((1- k \bullet z) (1/k))],$

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

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

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

(7) $\delta = 1 – \exp[-((1- k \bullet z_\delta) (1/k))]$, or $(1- \delta) = \exp[-((1- k \bullet z_\delta) (1/k))]$,

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

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

The value of $z_\delta = 2.855$ and $TPDD_\delta = - [\gamma + (z_\delta \cdot \theta)] = 38.8$ 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 38.8 degree peak day temperature. The criteria specified in equation (9) above for a "1-in-35" likelihood would be replaced by a "1-in-10" likelihood.

(9') solve for "z_δ" from equation (7') above with $(1-\delta) = (1 - 1/10) = 1 - 0.1000$,

which yields a "z_δ" value of $z_\delta = 1.959$ 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	40.9183	Jan
1951	44.5976	Dec
1952	43.1127	Jan
1953	45.6944	Feb
1954	45.7266	Dec
1955	45.8405	Dec
1956	44.9376	Feb
1957	39.5106	Jan
1958	46.3200	Nov
1959	48.2742	Feb
1960	42.3773	Jan
1961	47.2724	Dec
1962	43.4605	Jan
1963	42.6634	Jan
1964	45.2679	Nov
1965	44.8386	Jan
1966	46.7472	Jan
1967	40.8227	Dec
1968	40.6646	Dec
1969	44.8695	Jan
1970	46.8395	Dec
1971	43.0352	Jan
1972	41.4527	Dec
1973	45.1152	Jan
1974	43.0357	Jan
1975	44.6574	Jan
1976	44.8893	Jan
1977	48.4115	Jan
1978	41.7090	Dec
1979	41.3919	Jan
1980	50.3768	Jan
1981	49.3495	Jan
1982	45.3700	Jan
1983	48.7163	Jan
1984	46.9387	Dec
1985	45.1652	Feb
1986	48.6176	Feb
1987	43.5032	Dec
1988	43.3276	Dec
1989	40.6421	Feb
1990	39.0510	Dec
1991	48.6652	Mar
1992	47.4024	Dec
1993	46.1631	Jan
1994	47.1736	Nov
1995	49.8793	Dec
1996	44.9600	Feb
1997	48.3607	Jan
1998	43.6996	Dec
1999	49.0383	Jan
2000	48.8114	Mar
2001	47.1589	Feb
2002	45.8350	Jan
2003	47.1264	Dec
2004	48.2675	Nov
2005	47.2984	Jan
2006	45.7944	Mar

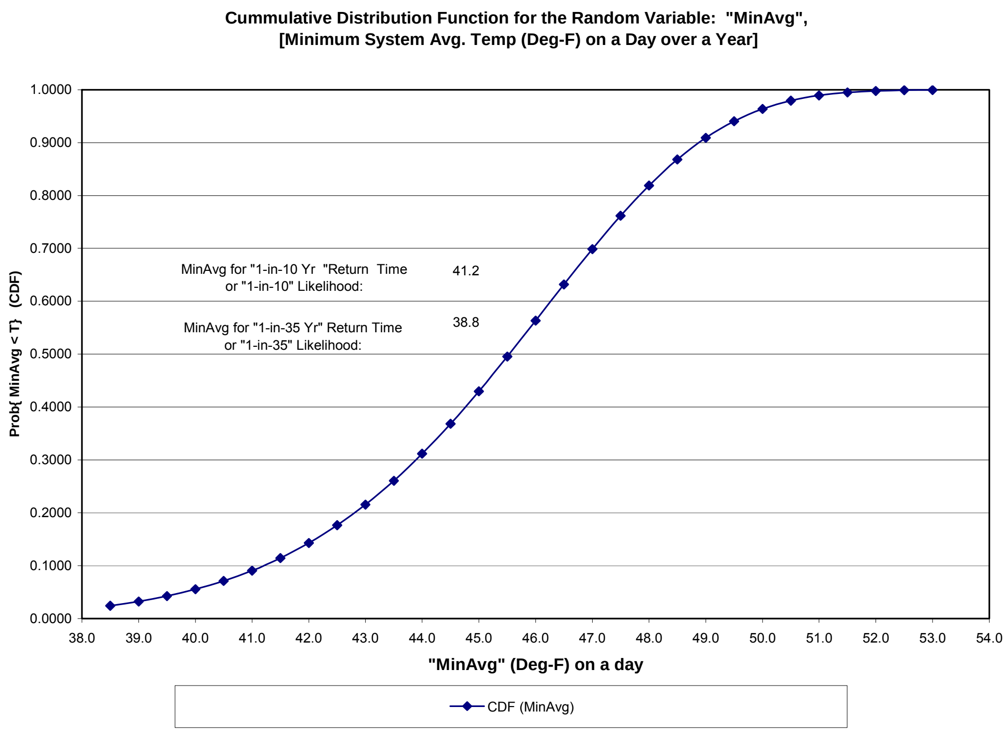
Table 5

alpha= 0.375

YEAR	Month (-MinAvg)	Days/Yr	-MinAvg	"Rank"	Empirical CDF	"Fitted" Model CDF
1980	Jan	366	-50.3768	1	0.01092	0.02390
1995	Dec	365	-49.8793	2	0.02838	0.04117
1981	Jan	365	-49.3495	3	0.04585	0.06799
1999	Jan	365	-49.0383	4	0.06332	0.08830
2000	Mar	366	-48.8114	5	0.08079	0.10533
1983	Jan	365	-48.7163	6	0.09825	0.11302
1991	Mar	365	-48.6652	7	0.11572	0.11729
1986	Feb	365	-48.6176	8	0.13319	0.12135
1977	Jan	365	-48.4115	9	0.15066	0.13987
1997	Jan	365	-48.3607	10	0.16812	0.14466
1959	Feb	365	-48.2742	11	0.18559	0.15302
2004	Nov	366	-48.2675	12	0.20306	0.15368
1992	Dec	366	-47.4024	13	0.22052	0.25018
2005	Jan	365	-47.2984	14	0.23799	0.26311
1961	Dec	365	-47.2724	15	0.25546	0.26637
1994	Nov	365	-47.1736	16	0.27293	0.27889
2001	Feb	365	-47.1589	17	0.29039	0.28078
2003	Dec	365	-47.1264	18	0.30786	0.28495
1984	Dec	366	-46.9387	19	0.32533	0.30938
1970	Dec	365	-46.8395	20	0.34279	0.32250
1966	Jan	365	-46.7472	21	0.36026	0.33483
1958	Nov	365	-46.3200	22	0.37773	0.39283
1993	Jan	365	-46.1631	23	0.39520	0.41435
1955	Dec	365	-45.8405	24	0.41266	0.45856
2002	Jan	365	-45.8350	25	0.43013	0.45930
2006	Mar	365	-45.7944	26	0.44760	0.46484
1954	Dec	365	-45.7266	27	0.46507	0.47407
1953	Feb	365	-45.6944	28	0.48253	0.47845
1982	Jan	365	-45.3700	29	0.50000	0.52199
1964	Nov	366	-45.2679	30	0.51747	0.53546
1985	Feb	365	-45.1652	31	0.53493	0.54887
1973	Jan	365	-45.1152	32	0.55240	0.55536
1996	Feb	366	-44.9600	33	0.56987	0.57524
1956	Feb	366	-44.9376	34	0.58734	0.57807
1976	Jan	366	-44.8893	35	0.60480	0.58416
1969	Jan	365	-44.8695	36	0.62227	0.58665
1965	Jan	365	-44.8386	37	0.63974	0.59051
1975	Jan	365	-44.6574	38	0.65721	0.61284
1951	Dec	365	-44.5976	39	0.67467	0.62007
1998	Dec	365	-43.6996	40	0.69214	0.71966
1987	Dec	365	-43.5032	41	0.70961	0.73900
1962	Jan	365	-43.4605	42	0.72707	0.74308
1988	Dec	366	-43.3276	43	0.74454	0.75553
1952	Jan	366	-43.1127	44	0.76201	0.77476
1974	Jan	365	-43.0357	45	0.77948	0.78138
1971	Jan	365	-43.0352	46	0.79694	0.78143
1963	Jan	365	-42.6634	47	0.81441	0.81145
1960	Jan	366	-42.3773	48	0.83188	0.83240
1978	Dec	365	-41.7090	49	0.84934	0.87440
1972	Dec	366	-41.4527	50	0.86681	0.88811
1979	Jan	365	-41.3919	51	0.88428	0.89118
1950	Jan	365	-40.9183	52	0.90175	0.91283
1967	Dec	365	-40.8227	53	0.91921	0.91675
1968	Dec	366	-40.6646	54	0.93668	0.92290
1989	Feb	365	-40.6421	55	0.95415	0.92374
1957	Jan	365	-39.5106	56	0.97162	0.95735
1990	Dec	365	-39.0510	57	0.98908	0.96684

Mean{-MinAvg}=	-45.2833
St.Dev{-MinAvg}=	2.7909
"Gamma": "Data Analysis Fitted Est."=	**-46.50**
"Theta": "Data Analysis Fitted Est."=	**2.70**
"Kappa": "Data Analysis Fitted Est."=	**0.13**

Figure 1


Cummulative Distribution Function for the Random Variable: "MinAvg",
[Minimum System Avg. Temp (Deg-F) on a Day over a Year]
1.0000
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
Prob[MinAvg < T} (CDF)
MinAvg for "1-in-10 Yr "Return Time or "1-in-10" Likelihood:
41.2
MinAvg for "1-in-35 Yr" Return Time or "1-in-35" Likelihood:
38.8
38.0 39.0 40.0 41.0 42.0 43.0 44.0 45.0 46.0 47.0 48.0 49.0 50.0 51.0 52.0 53.0 54.0
"MinAvg" (Deg-F) on a day
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) 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	50.3768	50.9922	-0.6154	0.3787
U	49.8793	50.2266	-0.3474	0.1207
U	49.3495	49.7719	-0.4225	0.1785
U	49.0383	49.4297	-0.3914	0.1532
U	48.8114	49.1474	-0.3360	0.1129
U	48.7163	48.9027	-0.1864	0.0347
U	48.6652	48.6838	-0.0187	0.0003
U	48.6176	48.4839	0.1336	0.0179
U	48.4115	48.2984	0.1131	0.0128
U	48.3607	48.1242	0.2365	0.0560
U	48.2742	47.9590	0.3153	0.0994
U	48.2675	47.8011	0.4664	0.2175
U	47.4024	47.6492	-0.2468	0.0609
U	47.2984	47.5024	-0.2040	0.0416
U	47.2724	47.3597	-0.0873	0.0076
U	47.1736	47.2205	-0.0469	0.0022
U	47.1589	47.0842	0.0747	0.0056
U	47.1264	46.9503	0.1762	0.0310
U	46.9387	46.8183	0.1204	0.0145
M	46.8395	46.6879	0.1516	0.0230
M	46.7472	46.5587	0.1885	0.0355
M	46.3200	46.4304	-0.1104	0.0122
M	46.1631	46.3027	-0.1396	0.0195
M	45.8405	46.1754	-0.3349	0.1122
M	45.8350	46.0481	-0.2131	0.0454
M	45.7944	45.9207	-0.1263	0.0159
M	45.7266	45.7928	-0.0662	0.0044
M	45.6944	45.6642	0.0301	0.0009
M	45.3700	45.5347	-0.1648	0.0271
M	45.2679	45.4040	-0.1361	0.0185
M	45.1652	45.2719	-0.1067	0.0114
M	45.1152	45.1381	-0.0228	0.0005
M	44.9600	45.0022	-0.0422	0.0018
M	44.9376	44.8640	0.0736	0.0054
M	44.8893	44.7231	0.1662	0.0276
M	44.8695	44.5793	0.2902	0.0842
M	44.8386	44.4319	0.4067	0.1654
M	44.6574	44.2807	0.3767	0.1419
L	44.5976	44.1251	0.4725	0.2233
L	43.6996	43.9644	-0.2649	0.0702
L	43.5032	43.7981	-0.2949	0.0870
L	43.4605	43.6253	-0.1648	0.0272
L	43.3276	43.4452	-0.1176	0.0138
L	43.1127	43.2565	-0.1438	0.0207
L	43.0357	43.0580	-0.0223	0.0005
L	43.0352	42.8480	0.1872	0.0350
L	42.6634	42.6245	0.0390	0.0015
L	42.3773	42.3847	-0.0074	0.0001
L	41.7090	42.1253	-0.4162	0.1733
L	41.4527	41.8414	-0.3888	0.1512
L	41.3919	41.5267	-0.1348	0.0182
L	40.9183	41.1714	-0.2531	0.0641
L	40.8227	40.7604	0.0623	0.0039
L	40.6646	40.2683	0.3963	0.1570
L	40.6421	39.6459	0.9962	0.9925
L	39.5106	38.7759	0.7347	0.5398
L	39.0510	37.2085	1.8425	3.3948
			Overall RMSE ($e_{[i]}$):	0.5 °F
			Lower 3rd RMSE ($e_{[i]}$):	0.6 °F
			Middle 3rd RMSE ($e_{[i]}$):	0.2 °F
			Upper 3rd RMSE ($e_{[i]}$):	0.3 °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) BiNomial(s, N, δ) = { N! / [(s!) (N-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\2009Bcap\SoCalGas\GEV4DlyTemp(NLReg2)_Scg4WP.sas"                                    */
/*                                                                                                              */
/*              Sep. 10th,2007 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.                      */
/*                                                                                                              */
/****************************************************************************************************************/

options mprint ;
/* %cour8p */
   %cour8l
MPRINT(COUR8L):   DM 'dlgprtsetup orient=landscape nodisplay';
MPRINT(COUR8L):   OPTIONS LS=158 PS=72;

 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\2009Bcap\SoCalGas\' ;
NOTE: Libref OUT2 was successfully assigned as follows:
      Engine:        V612
      Physical Name: S:\Weather\2009Bcap\SoCalGas

proc contents data=out2.DlySys_d ;
run ;

NOTE: The PROCEDURE CONTENTS used 0.12 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 21000 observations and 8 variables.
NOTE: The DATA statement used 0.51 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 690 observations and 10 variables.
```

```
NOTE: The PROCEDURE MEANS used 0.1 seconds.


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

NOTE: The data set WORK.MOSTAT has 690 observations and 10 variables.
NOTE: The PROCEDURE SORT used 0.12 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 690 observations and 14 variables.
NOTE: The DATA statement used 0.18 seconds.


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

proc transpose data=mostat out=AvTData prefix=AvT_ ;
   where (year < 2007) ;
   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 < 2007) ;
   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 < 2007) ;
   by year;
   id month ;
   var MxNegAvg ;
run ;

NOTE: The data set WORK.MXTDATA has 57 observations and 14 variables.
NOTE: The PROCEDURE TRANSPOSE used 0.11 seconds.


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

NOTE: The data set WORK.MXTDATA has 57 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 2006.';
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=57,PltValue=0.375) ;
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=2006) ;
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 Jan-Jul 2007 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 0.06 seconds.




proc print data=VarStat ;
run ;

NOTE: The PROCEDURE PRINT used 0.0 seconds.




data _null_ ;
   set VarStat ;

  call symput('gamma_Yr',meanYr) ;
  call symput('theta_Yr',stdevYr) ;

  call symput('gamma_12',mean12) ;
  call symput('theta_12',stdev12) ;

  call symput('gamma_11',mean11) ;
  call symput('theta_11',stdev11) ;

  call symput('gamma_10',mean10) ;
  call symput('theta_10',stdev10) ;

  call symput('gamma_9',mean9) ;
```

```
324    call symput('theta_9',stdev9) ;
325
326    call symput('gamma_8',mean8) ;
327    call symput('theta_8',stdev8) ;
328
329    call symput('gamma_7',mean7) ;
330    call symput('theta_7',stdev7) ;
331
332    call symput('gamma_6',mean6) ;
333    call symput('theta_6',stdev6) ;
334
335    call symput('gamma_5',mean5) ;
336    call symput('theta_5',stdev5) ;
337
338    call symput('gamma_4',mean4) ;
339    call symput('theta_4',stdev4) ;
340
341    call symput('gamma_3',mean3) ;
342    call symput('theta_3',stdev3) ;
343
344    call symput('gamma_2',mean2) ;
345    call symput('theta_2',stdev2) ;
346
347    call symput('gamma_1',mean1) ;
348    call symput('theta_1',stdev1) ;
349
350  run ;

NOTE: Numeric values have been converted to character values at the places given by: (Line):(Column).
      311:26   312:26   314:26   315:26   317:26   318:26   320:26   321:26   323:25   324:25   326:25   327:25
329:25   330:25   332:25   333:25   335:25   336:25   338:25   339:25   341:25   342:25
      344:25   345:25   347:25   348:25
NOTE: The DATA statement used 0.07 seconds.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356
357  *********<<< Analysis for "Annual" Data  (i.e., SUFIX "mm" = "_Yr"  >>>******************;
358
359
360
361
362
363  %RankIt(file=MxTData,var=MxTYr,rank=RankYr,prob=PrMxTYr,Nobser=57,PltValue=0.375) ;
MPRINT(RANKIT):   PROC SORT DATA=MXTDATA ;
MPRINT(RANKIT):   BY MXTYR ;
MPRINT(RANKIT):   RUN ;

NOTE: The data set WORK.MXTDATA has 57 observations and 15 variables.
NOTE: The PROCEDURE SORT used 0.07 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) / (57 +(1 - 2*ALPHA)) ;
MPRINT(RANKIT):   RUN ;

NOTE: The data set WORK.MXTDATA has 57 observations and 18 variables.
NOTE: The DATA statement used 0.14 seconds.


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

NOTE: The PROCEDURE PRINT used 0.0 seconds.


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373  %GEVfit(file=MxTData,ofile=MxTNL1,outfit=fit1,outest=est1,depvar=PrMxTYr,var=MxTYr,typeGEV=1,
374          KappaI=0.25,GammaI=&gamma_Yr,ThetaI=&theta_Yr,YrLo=1950,YrHi=2006) ;
MPRINT(GEVFIT):   PROC SORT DATA=MXTDATA ;
MPRINT(GEVFIT):   BY YEAR ;
MPRINT(GEVFIT):   RUN ;

NOTE: The data set WORK.MXTDATA has 57 observations and 18 variables.
NOTE: The PROCEDURE SORT used 0.1 seconds.


MPRINT(GEVFIT):   PROC MODEL DATA=MXTDATA CONVERGE=0.001 MAXIT=500 DW ;
MPRINT(GEVFIT):   OUTMODEL%MXTNL1 ;
MPRINT(GEVFIT):   RANGE YEAR = 1950 TO 2006 ;
MPRINT(GEVFIT):   **<< DROPPED JAN-JUL 2007 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 -45.28325702 THETA 2.7908621426 ;

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 171 observations and 6 variables.
NOTE: The data set WORK.EST1 has 4 observations and 6 variables.
375
376

NOTE: The PROCEDURE MODEL used 0.14 seconds.


377  proc print data=fit1 ;
378  run ;

NOTE: The PROCEDURE PRINT used 0.0 seconds.


379
380
381
382  proc transpose data=fit1 out=pred1 prefix=probP ;
383     where (_type_ = "PREDICT" ) ;
384     by year;
385     var prmxtyr ;
386  run ;

NOTE: The data set WORK.PRED1 has 57 observations and 3 variables.
NOTE: The PROCEDURE TRANSPOSE used 0.07 seconds.


387
388  data comb1 ;
389     merge MxTData pred1 ;
390    by year ;
391     ProbP = ProbP1 ;
392    keep year MxTYr PrMxTYr ProbP ;
393  run ;

NOTE: The data set WORK.COMB1 has 57 observations and 4 variables.
NOTE: The DATA statement used 0.09 seconds.


394
395
396  proc print data=comb1 ;
397  run ;

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

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

NOTE: The PROCEDURE PLOT used 0.0 seconds.

proc print data=est1 ;
run ;

NOTE: The PROCEDURE PRINT used 0.0 seconds.

/*****************
data out2.est1_Yr ;   ***<<< Save a copy of the "G.E.V. Model" estimation results!  >>>*** ;
  set est1 ;
run ;
*****************/

data comb  ;
   merge MxTData pred1 ;
  by year ;

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

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

   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 57 observations and 6 variables.
NOTE: The DATA statement used 0.09 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 0.0 seconds.


proc sort data=comb ;
  by Quantile ;
run ;

NOTE: The data set WORK.COMB has 57 observations and 6 variables.
NOTE: The PROCEDURE SORT used 0.09 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 0.0 seconds.


quit ;
```

IX. Attachment 2: SAS Program Output

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

CONTENTS PROCEDURE

Data Set Name:	OUT2.DLYSYS_D	Observations:	21000
Member Type:	DATA	Variables:	4
Engine:	V612	Indexes:	0
Created:	13:43 Friday, July 20, 2007	Observation Length:	32
Last Modified:	13:43 Friday, July 20, 2007	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:	83
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 2006.

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	-40.9183	-40.9183	-45.0309	-50.6980	-53.8151	-54.7181	-60.2020	-68.2032	-67.7307	-64.0708	-63.1306	-52.1389	-51.8156
1951	-44.5976	-46.2885	-44.6835	-46.0473	-54.1593	-55.4942	-62.0715	-68.0392	-64.4889	-65.6125	-55.7540	-49.1660	-44.5976
1952	-43.1127	-43.1127	-46.8780	-45.9001	-53.2172	-60.9574	-59.6656	-68.4091	-69.2871	-61.9533	-61.0544	-46.9622	-47.1245
1953	-45.6944	-48.5670	-45.6944	-45.8429	-50.5556	-53.9157	-58.8051	-72.1189	-65.4629	-64.5738	-57.3008	-50.5122	-49.2611
1954	-45.7266	-47.6747	-49.5010	-49.0421	-56.6919	-56.3848	-61.4700	-69.7204	-67.4059	-63.9522	-58.4575	-51.4478	-45.7266
1955	-45.8405	-46.1598	-45.9999	-51.4955	-53.7804	-52.8762	-58.5254	-66.2440	-71.0526	-63.4701	-58.0043	-49.7967	-45.8405
1956	-44.9376	-48.5611	-44.9376	-51.5237	-50.4258	-58.2291	-65.0088	-66.1543	-66.3468	-70.3272	-53.5182	-53.5197	-48.6827
1957	-39.5106	-39.5106	-49.0264	-51.1614	-51.2577	-57.6415	-65.1280	-71.1565	-66.5313	-67.5519	-57.1781	-52.2147	-52.8553
1958	-46.3200	-50.2357	-53.7443	-49.7749	-51.1693	-60.7190	-66.2454	-69.5691	-72.6722	-66.4429	-62.7581	-46.3200	-52.9509
1959	-48.2742	-51.5517	-48.2742	-57.6774	-59.6718	-58.2296	-66.5294	-74.3827	-68.4063	-65.9227	-60.1894	-58.6028	-48.7768
1960	-42.3773	-42.3773	-48.4002	-52.2086	-53.3744	-57.3592	-66.2734	-69.1094	-69.4832	-67.1967	-59.0686	-50.3970	-45.6696
1961	-47.2724	-50.8979	-53.3212	-53.4290	-54.5046	-58.9468	-60.4804	-69.1039	-68.6472	-64.2766	-55.7973	-51.8086	-47.2724
1962	-43.4605	-43.4605	-45.2642	-46.9431	-57.8712	-54.9372	-57.8178	-68.2038	-70.0797	-66.1326	-60.9339	-54.8585	-47.9104
1963	-42.6634	-42.6634	-52.8886	-48.0317	-51.2141	-60.4437	-60.5433	-68.2398	-70.3210	-67.4875	-62.4023	-53.0858	-48.9380
1964	-45.2679	-47.5898	-49.7929	-48.2096	-52.0983	-52.5155	-58.9257	-68.3026	-67.8691	-65.7274	-61.5203	-45.2679	-45.6579
1965	-44.8386	-44.8386	-47.8390	-51.7063	-48.2403	-57.5491	-58.9825	-68.2346	-71.1326	-64.2985	-60.8709	-51.6710	-46.3873
1966	-46.7472	-46.7472	-48.2209	-47.3474	-57.5673	-58.5316	-62.8474	-69.7731	-68.7017	-66.7299	-63.4473	-52.6452	-47.3241
1967	-40.8227	-49.5660	-52.8626	-51.1507	-48.1869	-57.8414	-58.8463	-72.1557	-74.6289	-70.2575	-64.7694	-51.6433	-40.8227
1968	-40.6646	-46.2174	-52.3831	-53.8226	-55.4464	-56.9789	-61.5246	-67.7807	-68.3734	-64.7656	-59.6491	-54.2979	-40.6646
1969	-44.8695	-44.8695	-47.3801	-48.6289	-53.6741	-55.6541	-62.6936	-68.6035	-72.0494	-67.1531	-59.2281	-56.3347	-48.8588
1970	-46.8395	-47.0105	-54.2545	-51.9971	-51.7666	-57.5537	-61.9765	-71.3083	-71.1595	-65.9486	-58.2075	-53.2640	-46.8395
1971	-43.0352	-43.0352	-48.9632	-48.7365	-52.7209	-55.7858	-58.4771	-68.6935	-70.5249	-62.7990	-49.2473	-52.4035	-44.7042
1972	-41.4527	-45.9910	-49.9478	-55.3826	-54.2799	-56.8509	-65.8108	-70.0259	-70.0547	-66.1924	-55.9821	-53.7719	-41.4527
1973	-45.1152	-45.1152	-52.1136	-49.1287	-55.3944	-58.0825	-63.6435	-67.2313	-67.9027	-65.8271	-61.9101	-49.7465	-50.8663
1974	-43.0357	-43.0357	-51.8365	-48.2493	-55.5989	-58.3259	-65.3704	-68.5846	-70.7465	-66.6510	-56.3246	-55.0899	-44.8741
1975	-44.6574	-44.6574	-47.9921	-49.7435	-47.3570	-56.3139	-61.2364	-69.2099	-68.4586	-67.2450	-59.1765	-47.8011	-48.6515
1976	-44.8893	-44.8893	-49.4852	-45.4270	-50.3203	-57.9625	-60.4401	-70.6023	-67.6337	-67.4457	-62.8448	-51.7497	-51.2957
1977	-48.4115	-48.4115	-51.9002	-48.6781	-53.4387	-53.9351	-64.6083	-69.2738	-72.8009	-65.6203	-60.4860	-54.1167	-53.2783
1978	-41.7090	-51.1514	-48.2519	-54.1496	-51.2672	-59.4244	-65.6986	-68.6657	-68.5766	-65.7315	-59.3326	-48.9885	-41.7090
1979	-41.3919	-41.3919	-45.8522	-49.7428	-56.2625	-58.7635	-63.8454	-66.4377	-69.7559	-69.1085	-59.9719	-51.6410	-49.5125
1980	-50.3768	-50.3768	-54.7678	-52.8708	-53.2038	-57.1815	-60.4939	-71.7167	-69.8779	-66.1002	-59.0129	-56.0461	-51.7200
1981	-49.3495	-49.3495	-52.2001	-52.3554	-54.8037	-61.3543	-68.1083	-72.8923	-72.7502	-68.1353	-58.0807	-50.8778	-53.0239
1982	-45.3700	-45.3700	-52.3062	-49.2748	-50.3162	-57.7777	-62.6896	-66.6740	-69.5272	-63.7542	-61.7388	-52.1082	-48.4154
1983	-48.7163	-48.7163	-51.6368	-54.5892	-52.4995	-57.6504	-62.5190	-68.9611	-70.3569	-63.9702	-65.4058	-49.4946	-49.4734
1984	-46.9387	-49.6055	-53.8744	-56.9148	-54.9328	-59.3652	-66.0078	-73.0291	-74.6374	-70.7266	-60.6443	-50.0103	-46.9387
1985	-45.1652	-47.4235	-45.1652	-49.0860	-54.8622	-58.9718	-62.8074	-71.4047	-69.3085	-64.6834	-61.8016	-47.5297	-46.8065
1986	-48.6176	-56.1532	-48.6176	-50.3428	-57.6992	-59.4629	-66.2437	-68.9688	-72.1164	-61.0838	-61.4565	-58.2226	-52.9465
1987	-43.5032	-44.3662	-46.0077	-50.7665	-56.2742	-59.9866	-66.4674	-66.9273	-68.0183	-67.0169	-62.0412	-52.7038	-43.5032
1988	-43.3276	-50.0196	-51.3240	-54.3772	-53.9840	-55.3539	-59.0162	-70.7512	-69.9194	-64.1953	-63.9406	-50.9867	-43.3276
1989	-40.6421	-42.9652	-40.6421	-52.1899	-55.3728	-58.1553	-64.2909	-71.1422	-69.3183	-62.7900	-59.7738	-56.1194	-51.9548
1990	-39.0510	-48.8377	-43.4403	-49.1345	-58.1469	-61.0587	-63.1220	-71.9270	-69.7638	-68.9071	-63.3810	-52.4093	-39.0510
1991	-48.6652	-51.7661	-56.1423	-48.6652	-57.4699	-55.7956	-63.6607	-67.8875	-70.2961	-66.5090	-57.6141	-52.6907	-50.5800
1992	-47.4024	-48.1599	-51.8713	-53.3449	-61.2215	-66.5537	-64.3894	-67.9333	-68.9651	-70.0242	-63.4069	-55.4792	-47.4024
1993	-46.1631	-46.1631	-50.8600	-53.4783	-60.3073	-63.4357	-59.6859	-70.9967	-70.0326	-67.4525	-63.2595	-54.9295	-50.1589
1994	-47.1736	-51.6097	-50.0541	-51.7135	-54.1858	-57.0848	-66.7722	-70.9065	-73.3826	-67.0793	-62.0435	-47.1736	-50.0169
1995	-49.8793	-49.9718	-54.1227	-52.5921	-52.0618	-56.5449	-57.7074	-69.7173	-71.6251	-67.2143	-62.7438	-60.5064	-49.8793
1996	-44.9600	-47.7931	-44.9600	-54.9768	-59.6587	-62.8110	-63.9200	-71.5748	-71.9000	-68.8149	-54.3917	-53.3720	-52.5625
1997	-48.3607	-48.3607	-53.5183	-53.2627	-55.7346	-66.8710	-64.7330	-70.4457	-71.8313	-71.7448	-62.3917	-54.8566	-49.0615
1998	-43.6996	-50.7301	-52.4312	-49.9064	-49.9848	-55.2384	-61.0526	-70.2079	-72.5190	-64.9650	-60.8509	-55.3366	-43.6996
1999	-49.0383	-49.0383	-49.9853	-50.1448	-50.2300	-57.5467	-57.2890	-69.1483	-68.8947	-67.6164	-64.4302	-54.9701	-52.0835
2000	-48.8114	-49.7875	-49.0202	-48.8114	-55.6612	-61.2809	-64.6786	-69.2288	-69.4263	-67.1507	-57.1913	-50.4226	-51.1616
2001	-47.1589	-47.3384	-47.1589	-51.9366	-50.0810	-62.8882	-66.4468	-69.2261	-70.3780	-68.8565	-62.9730	-51.7265	-49.1444
2002	-45.8350	-45.8350	-49.0274	-50.2363	-56.2738	-57.7097	-64.7967	-69.9058	-69.8958	-63.2328	-58.8869	-58.5578	-48.8063
2003	-47.1264	-54.6311	-52.8533	-53.0693	-53.4142	-58.5656	-62.9161	-73.0022	-73.4882	-70.1809	-57.5439	-53.0856	-47.1264
2004	-48.2675	-49.1275	-50.7909	-53.7009	-56.5720	-63.6295	-65.8962	-68.8128	-70.1843	-65.5951	-56.1447	-48.2675	-48.2971
2005	-47.2984	-47.2984	-54.0102	-53.5888	-57.5386	-60.9376	-65.3049	-70.7168	-70.7986	-65.7663	-60.5273	-55.2603	-50.6921
2006	-45.7944	-51.5953	-48.3804	-45.7944	-53.6916	-62.4372	-68.4140	-74.6936	-72.0289	-68.1588	-62.1909	-52.1181	-48.0708

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	57	-47.3488728	3.3751385	-56.1531833	-39.5106000
MXT_2	57	-49.6120792	3.3405536	-56.1423333	-40.6421000
MXT_3	57	-50.8596500	2.8398266	-57.6774333	-45.4270333
MXT_4	57	-54.0615754	3.1150843	-61.2214667	-47.3570000
MXT_5	57	-58.3959541	3.0029136	-66.8709500	-52.5155000
MXT_6	57	-62.8617947	2.9484778	-68.4139500	-57.2890333
MXT_7	57	-69.6900942	1.9448986	-74.6935667	-66.1542500
MXT_8	57	-69.9916719	2.1045850	-74.6374000	-64.4888500
MXT_9	57	-66.3543137	2.2864658	-71.7447667	-61.0837667
MXT_10	57	-60.0418085	3.1060017	-65.4058000	-49.2473000
MXT_11	57	-52.3951658	3.1802632	-60.5064000	-45.2679167
MXT_12	57	-48.0039453	3.4477349	-53.2783000	-39.0510333
MXTYR	57	-45.2832570	2.7908621	-50.3768000	-39.0510333

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	57	-47.3489	-49.6121	-50.8597	-54.0616	-58.3960	-62.8618	-69.6901	-69.9917	-66.3543	-60.0418	-52.3952	-48.0039

OBS	MEANYR	STDEV1	STDEV2	STDEV3	STDEV4	STDEV5	STDEV6	STDEV7	STDEV8	STDEV9	STDEV10	STDEV11	STDEV12	STDEVYR
1	-45.2833	3.37514	3.34055	2.83983	3.11508	3.00291	2.94848	1.94490	2.10459	2.28647	3.10600	3.18026	3.44773	2.79086

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	-50.3768	1	0.01092	0.375	1980
2	-49.8793	2	0.02838	0.375	1995
3	-49.3495	3	0.04585	0.375	1981
4	-49.0383	4	0.06332	0.375	1999
5	-48.8114	5	0.08079	0.375	2000
6	-48.7163	6	0.09825	0.375	1983
7	-48.6652	7	0.11572	0.375	1991
8	-48.6176	8	0.13319	0.375	1986
9	-48.4115	9	0.15066	0.375	1977
10	-48.3607	10	0.16812	0.375	1997
11	-48.2742	11	0.18559	0.375	1959
12	-48.2675	12	0.20306	0.375	2004
13	-47.4024	13	0.22052	0.375	1992
14	-47.2984	14	0.23799	0.375	2005
15	-47.2724	15	0.25546	0.375	1961
16	-47.1736	16	0.27293	0.375	1994
17	-47.1589	17	0.29039	0.375	2001
18	-47.1264	18	0.30786	0.375	2003
19	-46.9387	19	0.32533	0.375	1984
20	-46.8395	20	0.34279	0.375	1970
21	-46.7472	21	0.36026	0.375	1966
22	-46.3200	22	0.37773	0.375	1958
23	-46.1631	23	0.39520	0.375	1993
24	-45.8405	24	0.41266	0.375	1955
25	-45.8350	25	0.43013	0.375	2002
26	-45.7944	26	0.44760	0.375	2006
27	-45.7266	27	0.46507	0.375	1954
28	-45.6944	28	0.48253	0.375	1953
29	-45.3700	29	0.50000	0.375	1982
30	-45.2679	30	0.51747	0.375	1964
31	-45.1652	31	0.53493	0.375	1985
32	-45.1152	32	0.55240	0.375	1973
33	-44.9600	33	0.56987	0.375	1996
34	-44.9376	34	0.58734	0.375	1956
35	-44.8893	35	0.60480	0.375	1976
36	-44.8695	36	0.62227	0.375	1969
37	-44.8386	37	0.63974	0.375	1965
38	-44.6574	38	0.65721	0.375	1975
39	-44.5976	39	0.67467	0.375	1951
40	-43.6996	40	0.69214	0.375	1998
41	-43.5032	41	0.70961	0.375	1987
42	-43.4605	42	0.72707	0.375	1962
43	-43.3276	43	0.74454	0.375	1988
44	-43.1127	44	0.76201	0.375	1952
45	-43.0357	45	0.77948	0.375	1974
46	-43.0352	46	0.79694	0.375	1971
47	-42.6634	47	0.81441	0.375	1963
48	-42.3773	48	0.83188	0.375	1960
49	-41.7090	49	0.84934	0.375	1978
50	-41.4527	50	0.86681	0.375	1972
51	-41.3919	51	0.88428	0.375	1979
52	-40.9183	52	0.90175	0.375	1950
53	-40.8227	53	0.91921	0.375	1967
54	-40.6646	54	0.93668	0.375	1968
55	-40.6421	55	0.95415	0.375	1989
56	-39.5106	56	0.97162	0.375	1957
57	-39.0510	57	0.98908	0.375	1990

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	3

Model Variables: PRMXTYR

Parameters: GAMMA: -45.28 THETA: 2.791 KAPPA: 0.25 MXTNL1

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).

MODEL Procedure

The Equation to Estimate is:

PRMXTYR = F(GAMMA, THETA, KAPPA)

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	2006

Minimization Summary

Method	GAUSS
Iterations	4

Final Convergence	Criteria
R	0.00003406
PPC(KAPPA)	0.000061
RPC(KAPPA)	0.001778
Object	1.2881E-6
Trace(S)	0.00055178
Objective Value	0.00052274

Observations Processed

Read	57
Solved	57

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	54	0.02980	0.0005518	0.02349	0.9937	0.9934	1.841

Nonlinear OLS Parameter Estimates

Parameter	Estimate	Approx. Std Err	'T' Ratio	Approx. Prob>|T|
GAMMA	-46.502656	0.03471	-1339.56	0.0001
THETA	2.702588	0.05989	45.12	0.0001
KAPPA	0.126360	0.03430	3.68	0.0005

Number of Observations		Statistics for System	
Used	57	Objective	0.000523
Missing	0	Objective*N	0.0298

RANGE of Fit: YEAR = 1950 TO 2006

Correlations of Estimates

CorrB	GAMMA	THETA	KAPPA
GAMMA	1.0000	-0.0234	0.3840
THETA	-0.0234	1.0000	0.6189
KAPPA	0.3840	0.6189	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: -46.5(-1340) THETA: 2.703(45) KAPPA: 0.1264(3.7)

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	0.90175	-40.9183
2	1950	OLS	PREDICT	1	0.91283	-40.9183
3	1950	OLS	RESIDUAL	1	-0.01109	-40.9183
4	1951	OLS	ACTUAL	1	0.67467	-44.5976
5	1951	OLS	PREDICT	1	0.62007	-44.5976
6	1951	OLS	RESIDUAL	1	0.05461	-44.5976
7	1952	OLS	ACTUAL	1	0.76201	-43.1127
8	1952	OLS	PREDICT	1	0.77476	-43.1127
9	1952	OLS	RESIDUAL	1	-0.01275	-43.1127
10	1953	OLS	ACTUAL	1	0.48253	-45.6944
11	1953	OLS	PREDICT	1	0.47845	-45.6944
12	1953	OLS	RESIDUAL	1	0.00409	-45.6944
13	1954	OLS	ACTUAL	1	0.46507	-45.7266
14	1954	OLS	PREDICT	1	0.47407	-45.7266
15	1954	OLS	RESIDUAL	1	-0.00900	-45.7266
16	1955	OLS	ACTUAL	1	0.41266	-45.8405
17	1955	OLS	PREDICT	1	0.45856	-45.8405
18	1955	OLS	RESIDUAL	1	-0.04589	-45.8405
19	1956	OLS	ACTUAL	1	0.58734	-44.9376
20	1956	OLS	PREDICT	1	0.57807	-44.9376
21	1956	OLS	RESIDUAL	1	0.00926	-44.9376
22	1957	OLS	ACTUAL	1	0.97162	-39.5106
23	1957	OLS	PREDICT	1	0.95735	-39.5106
24	1957	OLS	RESIDUAL	1	0.01427	-39.5106
25	1958	OLS	ACTUAL	1	0.37773	-46.3200
26	1958	OLS	PREDICT	1	0.39283	-46.3200
27	1958	OLS	RESIDUAL	1	-0.01510	-46.3200
28	1959	OLS	ACTUAL	1	0.18559	-48.2742
29	1959	OLS	PREDICT	1	0.15302	-48.2742
30	1959	OLS	RESIDUAL	1	0.03257	-48.2742
31	1960	OLS	ACTUAL	1	0.83188	-42.3773
32	1960	OLS	PREDICT	1	0.83240	-42.3773
33	1960	OLS	RESIDUAL	1	-0.00052	-42.3773
34	1961	OLS	ACTUAL	1	0.25546	-47.2724
35	1961	OLS	PREDICT	1	0.26637	-47.2724
36	1961	OLS	RESIDUAL	1	-0.01091	-47.2724
37	1962	OLS	ACTUAL	1	0.72707	-43.4605
38	1962	OLS	PREDICT	1	0.74308	-43.4605
39	1962	OLS	RESIDUAL	1	-0.01601	-43.4605
40	1963	OLS	ACTUAL	1	0.81441	-42.6634
41	1963	OLS	PREDICT	1	0.81145	-42.6634
42	1963	OLS	RESIDUAL	1	0.00296	-42.6634
43	1964	OLS	ACTUAL	1	0.51747	-45.2679
44	1964	OLS	PREDICT	1	0.53546	-45.2679
45	1964	OLS	RESIDUAL	1	-0.01799	-45.2679
46	1965	OLS	ACTUAL	1	0.63974	-44.8386
47	1965	OLS	PREDICT	1	0.59051	-44.8386
48	1965	OLS	RESIDUAL	1	0.04923	-44.8386
49	1966	OLS	ACTUAL	1	0.36026	-46.7472
50	1966	OLS	PREDICT	1	0.33483	-46.7472
51	1966	OLS	RESIDUAL	1	0.02543	-46.7472
52	1967	OLS	ACTUAL	1	0.91921	-40.8227
53	1967	OLS	PREDICT	1	0.91675	-40.8227
54	1967	OLS	RESIDUAL	1	0.00247	-40.8227
55	1968	OLS	ACTUAL	1	0.93668	-40.6646
56	1968	OLS	PREDICT	1	0.92290	-40.6646
57	1968	OLS	RESIDUAL	1	0.01379	-40.6646
58	1969	OLS	ACTUAL	1	0.62227	-44.8695
59	1969	OLS	PREDICT	1	0.58665	-44.8695
60	1969	OLS	RESIDUAL	1	0.03562	-44.8695
61	1970	OLS	ACTUAL	1	0.34279	-46.8395
62	1970	OLS	PREDICT	1	0.32250	-46.8395
63	1970	OLS	RESIDUAL	1	0.02029	-46.8395

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	0.79694	-43.0352
65	1971	OLS	PREDICT	1	0.78143	-43.0352
66	1971	OLS	RESIDUAL	1	0.01552	-43.0352
67	1972	OLS	ACTUAL	1	0.86681	-41.4527
68	1972	OLS	PREDICT	1	0.88811	-41.4527
69	1972	OLS	RESIDUAL	1	-0.02130	-41.4527
70	1973	OLS	ACTUAL	1	0.55240	-45.1152
71	1973	OLS	PREDICT	1	0.55536	-45.1152
72	1973	OLS	RESIDUAL	1	-0.00296	-45.1152
73	1974	OLS	ACTUAL	1	0.77948	-43.0357
74	1974	OLS	PREDICT	1	0.78138	-43.0357
75	1974	OLS	RESIDUAL	1	-0.00191	-43.0357
76	1975	OLS	ACTUAL	1	0.65721	-44.6574
77	1975	OLS	PREDICT	1	0.61284	-44.6574
78	1975	OLS	RESIDUAL	1	0.04437	-44.6574
79	1976	OLS	ACTUAL	1	0.60480	-44.8893
80	1976	OLS	PREDICT	1	0.58416	-44.8893
81	1976	OLS	RESIDUAL	1	0.02064	-44.8893
82	1977	OLS	ACTUAL	1	0.15066	-48.4115
83	1977	OLS	PREDICT	1	0.13987	-48.4115
84	1977	OLS	RESIDUAL	1	0.01079	-48.4115
85	1978	OLS	ACTUAL	1	0.84934	-41.7090
86	1978	OLS	PREDICT	1	0.87440	-41.7090
87	1978	OLS	RESIDUAL	1	-0.02505	-41.7090
88	1979	OLS	ACTUAL	1	0.88428	-41.3919
89	1979	OLS	PREDICT	1	0.89118	-41.3919
90	1979	OLS	RESIDUAL	1	-0.00690	-41.3919
91	1980	OLS	ACTUAL	1	0.01092	-50.3768
92	1980	OLS	PREDICT	1	0.02390	-50.3768
93	1980	OLS	RESIDUAL	1	-0.01298	-50.3768
94	1981	OLS	ACTUAL	1	0.04585	-49.3495
95	1981	OLS	PREDICT	1	0.06799	-49.3495
96	1981	OLS	RESIDUAL	1	-0.02214	-49.3495
97	1982	OLS	ACTUAL	1	0.50000	-45.3700
98	1982	OLS	PREDICT	1	0.52199	-45.3700
99	1982	OLS	RESIDUAL	1	-0.02199	-45.3700
100	1983	OLS	ACTUAL	1	0.09825	-48.7163
101	1983	OLS	PREDICT	1	0.11302	-48.7163
102	1983	OLS	RESIDUAL	1	-0.01477	-48.7163
103	1984	OLS	ACTUAL	1	0.32533	-46.9387
104	1984	OLS	PREDICT	1	0.30938	-46.9387
105	1984	OLS	RESIDUAL	1	0.01594	-46.9387
106	1985	OLS	ACTUAL	1	0.53493	-45.1652
107	1985	OLS	PREDICT	1	0.54887	-45.1652
108	1985	OLS	RESIDUAL	1	-0.01394	-45.1652
109	1986	OLS	ACTUAL	1	0.13319	-48.6176
110	1986	OLS	PREDICT	1	0.12135	-48.6176
111	1986	OLS	RESIDUAL	1	0.01184	-48.6176
112	1987	OLS	ACTUAL	1	0.70961	-43.5032
113	1987	OLS	PREDICT	1	0.73900	-43.5032
114	1987	OLS	RESIDUAL	1	-0.02939	-43.5032
115	1988	OLS	ACTUAL	1	0.74454	-43.3276
116	1988	OLS	PREDICT	1	0.75553	-43.3276
117	1988	OLS	RESIDUAL	1	-0.01099	-43.3276
118	1989	OLS	ACTUAL	1	0.95415	-40.6421
119	1989	OLS	PREDICT	1	0.92374	-40.6421
120	1989	OLS	RESIDUAL	1	0.03041	-40.6421
121	1990	OLS	ACTUAL	1	0.98908	-39.0510
122	1990	OLS	PREDICT	1	0.96684	-39.0510
123	1990	OLS	RESIDUAL	1	0.02224	-39.0510
124	1991	OLS	ACTUAL	1	0.11572	-48.6652
125	1991	OLS	PREDICT	1	0.11729	-48.6652
126	1991	OLS	RESIDUAL	1	-0.00157	-48.6652

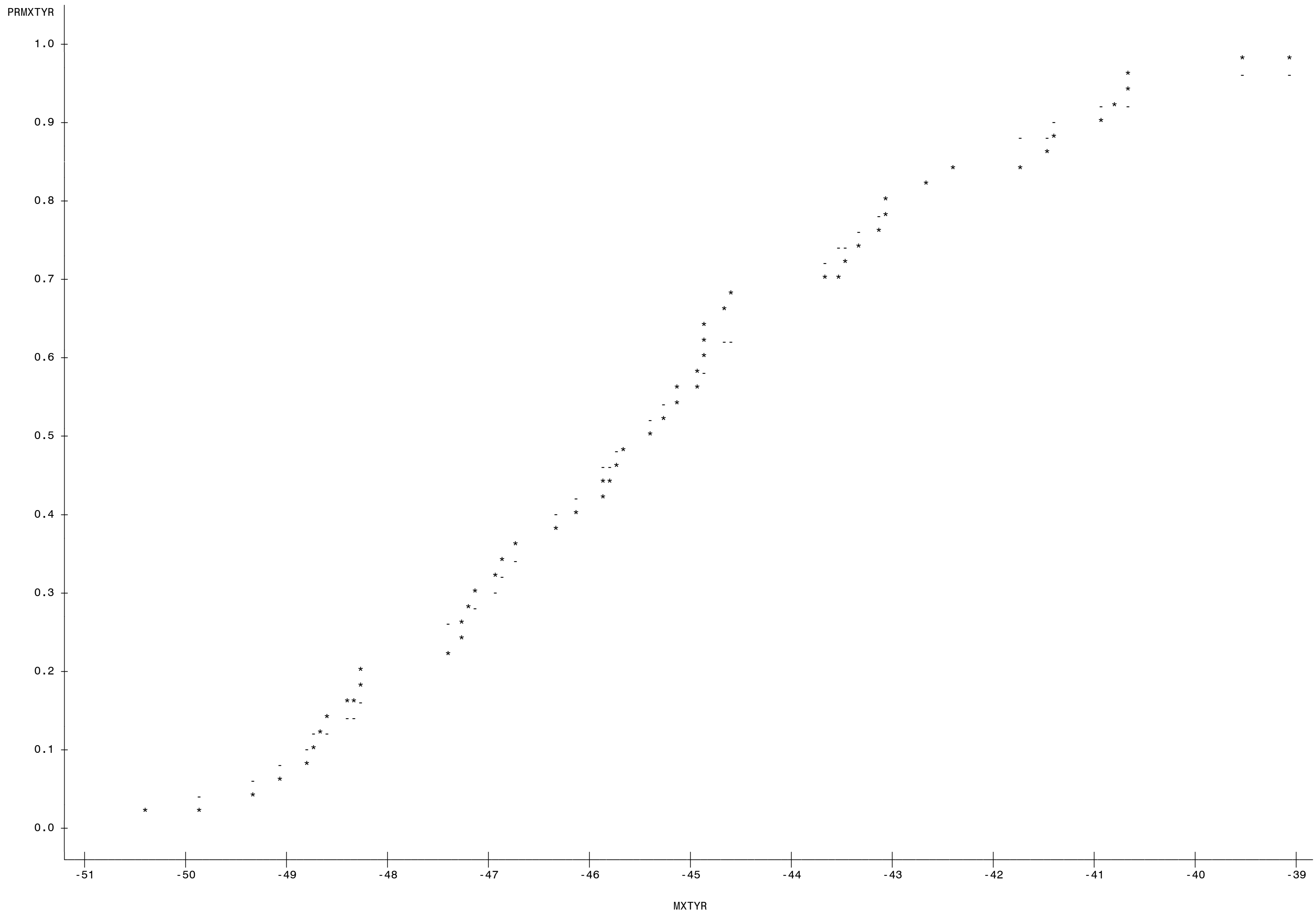
OBS	YEAR	_ESTYPE_	_TYPE_	_WEIGHT_	PRMXTYR	MXTYR
127	1992	OLS	ACTUAL	1	0.22052	-47.4024
128	1992	OLS	PREDICT	1	0.25018	-47.4024
129	1992	OLS	RESIDUAL	1	-0.02966	-47.4024
130	1993	OLS	ACTUAL	1	0.39520	-46.1631
131	1993	OLS	PREDICT	1	0.41435	-46.1631
132	1993	OLS	RESIDUAL	1	-0.01916	-46.1631
133	1994	OLS	ACTUAL	1	0.27293	-47.1736
134	1994	OLS	PREDICT	1	0.27889	-47.1736
135	1994	OLS	RESIDUAL	1	-0.00597	-47.1736
136	1995	OLS	ACTUAL	1	0.02838	-49.8793
137	1995	OLS	PREDICT	1	0.04117	-49.8793
138	1995	OLS	RESIDUAL	1	-0.01278	-49.8793
139	1996	OLS	ACTUAL	1	0.56987	-44.9600
140	1996	OLS	PREDICT	1	0.57524	-44.9600
141	1996	OLS	RESIDUAL	1	-0.00537	-44.9600
142	1997	OLS	ACTUAL	1	0.16812	-48.3607
143	1997	OLS	PREDICT	1	0.14466	-48.3607
144	1997	OLS	RESIDUAL	1	0.02346	-48.3607
145	1998	OLS	ACTUAL	1	0.69214	-43.6996
146	1998	OLS	PREDICT	1	0.71966	-43.6996
147	1998	OLS	RESIDUAL	1	-0.02752	-43.6996
148	1999	OLS	ACTUAL	1	0.06332	-49.0383
149	1999	OLS	PREDICT	1	0.08830	-49.0383
150	1999	OLS	RESIDUAL	1	-0.02498	-49.0383
151	2000	OLS	ACTUAL	1	0.08079	-48.8114
152	2000	OLS	PREDICT	1	0.10533	-48.8114
153	2000	OLS	RESIDUAL	1	-0.02454	-48.8114
154	2001	OLS	ACTUAL	1	0.29039	-47.1589
155	2001	OLS	PREDICT	1	0.28078	-47.1589
156	2001	OLS	RESIDUAL	1	0.00961	-47.1589
157	2002	OLS	ACTUAL	1	0.43013	-45.8350
158	2002	OLS	PREDICT	1	0.45930	-45.8350
159	2002	OLS	RESIDUAL	1	-0.02917	-45.8350
160	2003	OLS	ACTUAL	1	0.30786	-47.1264
161	2003	OLS	PREDICT	1	0.28495	-47.1264
162	2003	OLS	RESIDUAL	1	0.02291	-47.1264
163	2004	OLS	ACTUAL	1	0.20306	-48.2675
164	2004	OLS	PREDICT	1	0.15368	-48.2675
165	2004	OLS	RESIDUAL	1	0.04937	-48.2675
166	2005	OLS	ACTUAL	1	0.23799	-47.2984
167	2005	OLS	PREDICT	1	0.26311	-47.2984
168	2005	OLS	RESIDUAL	1	-0.02512	-47.2984
169	2006	OLS	ACTUAL	1	0.44760	-45.7944
170	2006	OLS	PREDICT	1	0.46484	-45.7944
171	2006	OLS	RESIDUAL	1	-0.01725	-45.7944

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	-40.9183	0.90175	0.91283
2	1951	-44.5976	0.67467	0.62007
3	1952	-43.1127	0.76201	0.77476
4	1953	-45.6944	0.48253	0.47845
5	1954	-45.7266	0.46507	0.47407
6	1955	-45.8405	0.41266	0.45856
7	1956	-44.9376	0.58734	0.57807
8	1957	-39.5106	0.97162	0.95735
9	1958	-46.3200	0.37773	0.39283
10	1959	-48.2742	0.18559	0.15302
11	1960	-42.3773	0.83188	0.83240
12	1961	-47.2724	0.25546	0.26637
13	1962	-43.4605	0.72707	0.74308
14	1963	-42.6634	0.81441	0.81145
15	1964	-45.2679	0.51747	0.53546
16	1965	-44.8386	0.63974	0.59051
17	1966	-46.7472	0.36026	0.33483
18	1967	-40.8227	0.91921	0.91675
19	1968	-40.6646	0.93668	0.92290
20	1969	-44.8695	0.62227	0.58665
21	1970	-46.8395	0.34279	0.32250
22	1971	-43.0352	0.79694	0.78143
23	1972	-41.4527	0.86681	0.88811
24	1973	-45.1152	0.55240	0.55536
25	1974	-43.0357	0.77948	0.78138
26	1975	-44.6574	0.65721	0.61284
27	1976	-44.8893	0.60480	0.58416
28	1977	-48.4115	0.15066	0.13987
29	1978	-41.7090	0.84934	0.87440
30	1979	-41.3919	0.88428	0.89118
31	1980	-50.3768	0.01092	0.02390
32	1981	-49.3495	0.04585	0.06799
33	1982	-45.3700	0.50000	0.52199
34	1983	-48.7163	0.09825	0.11302
35	1984	-46.9387	0.32533	0.30938
36	1985	-45.1652	0.53493	0.54887
37	1986	-48.6176	0.13319	0.12135
38	1987	-43.5032	0.70961	0.73900
39	1988	-43.3276	0.74454	0.75553
40	1989	-40.6421	0.95415	0.92374
41	1990	-39.0510	0.98908	0.96684
42	1991	-48.6652	0.11572	0.11729
43	1992	-47.4024	0.22052	0.25018
44	1993	-46.1631	0.39520	0.41435
45	1994	-47.1736	0.27293	0.27889
46	1995	-49.8793	0.02838	0.04117
47	1996	-44.9600	0.56987	0.57524
48	1997	-48.3607	0.16812	0.14466
49	1998	-43.6996	0.69214	0.71966
50	1999	-49.0383	0.06332	0.08830
51	2000	-48.8114	0.08079	0.10533
52	2001	-47.1589	0.29039	0.28078
53	2002	-45.8350	0.43013	0.45930
54	2003	-47.1264	0.30786	0.28495
55	2004	-48.2675	0.20306	0.15368
56	2005	-47.2984	0.23799	0.26311
57	2006	-45.7944	0.44760	0.46484

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: 22 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	57	-46.5027	2.70259	0.12636
2	GAMMA	OLS	57	0.0012	-0.00005	0.00046
3	THETA	OLS	57	-0.0000	0.00359	0.00127
4	KAPPA	OLS	57	0.0005	0.00127	0.00118

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	-40.9183	3	0.90175	0.91283	-0.01222
2	1951	-44.5976	3	0.67467	0.62007	0.08440
3	1952	-43.1127	3	0.76201	0.77476	-0.01659
4	1953	-45.6944	2	0.48253	0.47845	0.00850
5	1954	-45.7266	2	0.46507	0.47407	-0.01917
6	1955	-45.8405	2	0.41266	0.45856	-0.10545
7	1956	-44.9376	2	0.58734	0.57807	0.01590
8	1957	-39.5106	3	0.97162	0.95735	0.01479
9	1958	-46.3200	2	0.37773	0.39283	-0.03920
10	1959	-48.2742	1	0.18559	0.15302	0.19297
11	1960	-42.3773	3	0.83188	0.83240	-0.00063
12	1961	-47.2724	1	0.25546	0.26637	-0.04181
13	1962	-43.4605	3	0.72707	0.74308	-0.02178
14	1963	-42.6634	3	0.81441	0.81145	0.00364
15	1964	-45.2679	2	0.51747	0.53546	-0.03418
16	1965	-44.8386	2	0.63974	0.59051	0.08007
17	1966	-46.7472	2	0.36026	0.33483	0.07321
18	1967	-40.8227	3	0.91921	0.91675	0.00269
19	1968	-40.6646	3	0.93668	0.92290	0.01483
20	1969	-44.8695	2	0.62227	0.58665	0.05895
21	1970	-46.8395	2	0.34279	0.32250	0.06101
22	1971	-43.0352	3	0.79694	0.78143	0.01966
23	1972	-41.4527	3	0.86681	0.88811	-0.02427
24	1973	-45.1152	2	0.55240	0.55536	-0.00534
25	1974	-43.0357	3	0.77948	0.78138	-0.00244
26	1975	-44.6574	2	0.65721	0.61284	0.06990
27	1976	-44.8893	2	0.60480	0.58416	0.03473
28	1977	-48.4115	1	0.15066	0.13987	0.07430
29	1978	-41.7090	3	0.84934	0.87440	-0.02907
30	1979	-41.3919	3	0.88428	0.89118	-0.00777
31	1980	-50.3768	1	0.01092	0.02390	-0.78343
32	1981	-49.3495	1	0.04585	0.06799	-0.39400
33	1982	-45.3700	2	0.50000	0.52199	-0.04304
34	1983	-48.7163	1	0.09825	0.11302	-0.14002
35	1984	-46.9387	1	0.32533	0.30938	0.05025
36	1985	-45.1652	2	0.53493	0.54887	-0.02573
37	1986	-48.6176	1	0.13319	0.12135	0.09306
38	1987	-43.5032	3	0.70961	0.73900	-0.04059
39	1988	-43.3276	3	0.74454	0.75553	-0.01465
40	1989	-40.6421	3	0.95415	0.92374	0.03239
41	1990	-39.0510	3	0.98908	0.96684	0.02274
42	1991	-48.6652	1	0.11572	0.11729	-0.01349
43	1992	-47.4024	1	0.22052	0.25018	-0.12619
44	1993	-46.1631	2	0.39520	0.41435	-0.04733
45	1994	-47.1736	1	0.27293	0.27889	-0.02163
46	1995	-49.8793	1	0.02838	0.04117	-0.37180
47	1996	-44.9600	2	0.56987	0.57524	-0.00938
48	1997	-48.3607	1	0.16812	0.14466	0.15032
49	1998	-43.6996	3	0.69214	0.71966	-0.03898
50	1999	-49.0383	1	0.06332	0.08830	-0.33256
51	2000	-48.8114	1	0.08079	0.10533	-0.26529
52	2001	-47.1589	1	0.29039	0.28078	0.03367
53	2002	-45.8350	2	0.43013	0.45930	-0.06562
54	2003	-47.1264	1	0.30786	0.28495	0.07735
55	2004	-48.2675	1	0.20306	0.15368	0.27859
56	2005	-47.2984	1	0.23799	0.26311	-0.10033
57	2006	-45.7944	2	0.44760	0.46484	-0.03781

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)- GEV

N	Mean	Std Dev	Minimum	Maximum	Variance	USS
57	-0.0295413	0.1531354	-0.7834254	0.2785932	0.0234505	1.3629689

Fit GEV Probability Model to Empirical CDF using NL-OLS Regression Methods.

Stats By Quantile 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)- GEV

QUANTILE=1

N	Mean	Std Dev	Minimum	Maximum	Variance	USS
19	-0.0863177	0.2534104	-0.7834254	0.2785932	0.0642168	1.2974668

QUANTILE=2

N	Mean	Std Dev	Minimum	Maximum	Variance	USS
19	-0.0015774	0.0527769	-0.1054493	0.0800692	0.0027854	0.0501846

QUANTILE=3

N	Mean	Std Dev	Minimum	Maximum	Variance	USS
19	-0.000728883	0.0291618	-0.0405884	0.0844017	0.000850412	0.0153175

2010 CALIFORNIA GAS REPORT

GAS PRICE FORECAST
JULY 2010

The Gas Company

A Sempra Energy utility℠

Southern California Gas Company
2010 California Gas Report
AECO: Gas Price Forecasts Current $/MMBtu

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	
2010	5.69	5.33	5.18	5.12	5.15	5.26	5.41	5.48	5.47	5.52	5.78	6.11	5.46	NYMEX Malin
2011	6.33	6.29	6.01	5.42	5.37	5.39	5.43	5.47	5.56	5.72	5.92	6.16	5.76	EIA HH/PIRA/CEC/WM
2012	6.69	6.54	6.31	5.70	5.64	5.66	5.71	5.75	5.85	6.01	6.21	6.47	6.05	EIA HH/PIRA/CEC/WM
2013	6.89	6.86	6.63	5.98	5.93	5.95	6.00	6.04	6.14	6.31	6.52	6.79	6.34	EIA HH/PIRA/CEC/WM
2014	7.24	7.20	6.96	6.28	6.23	6.25	6.30	6.35	6.45	6.63	6.85	7.13	6.66	EIA HH/PIRA/CEC/WM
2015	7.26	7.56	7.30	6.60	6.54	6.57	6.62	6.67	6.77	6.95	7.19	7.49	6.96	EIA HH/PIRA/CEC/WM
2016	7.46	7.93	7.67	6.93	6.87	6.90	6.96	7.01	7.11	7.30	7.54	7.86	7.29	EIA HH/PIRA/CEC/WM
2017	7.66	8.33	8.05	7.28	7.21	7.24	7.31	7.36	7.47	7.66	7.92	8.25	7.64	EIA HH/PIRA/CEC/WM
2018	7.86	8.74	8.44	7.64	7.57	7.61	7.67	7.73	7.84	8.04	8.31	8.65	8.01	EIA HH/PIRA/CEC/WM
2019	8.07	9.17	8.86	8.02	7.95	7.99	8.06	8.12	8.23	8.44	8.72	9.08	8.39	EIA HH/PIRA/CEC/WM
2020	8.30	9.62	9.30	8.42	8.34	8.39	8.46	8.53	8.64	8.86	9.15	9.53	8.79	EIA HH/PIRA/CEC/WM
2021	8.54	10.09	9.76	8.83	8.76	8.80	8.88	8.95	9.07	9.29	9.60	10.00	9.21	EIA HH/PIRA/CEC/WM
2022	8.54	10.59	10.24	9.27	9.19	9.24	9.33	9.40	9.52	9.75	10.07	10.49	9.64	EIA HH/PIRA/CEC/WM
2023	8.77	11.11	10.74	9.73	9.65	9.70	9.79	9.87	9.99	10.23	10.57	11.00	10.10	EIA HH/PIRA/CEC/WM
2024	11.71	11.66	11.27	10.21	10.12	10.18	10.28	10.36	10.48	10.73	11.09	11.54	10.80	EIA HH/PIRA/CEC/WM
2025	12.28	12.23	11.82	10.71	10.62	10.69	10.79	10.87	11.00	11.26	11.63	12.11	11.33	EIA HH/PIRA/CEC/WM
2026	12.89	12.83	12.40	11.24	11.15	11.21	11.32	11.41	11.54	11.81	12.20	12.70	11.89	EIA HH/PIRA/CEC/WM
2027	13.52	13.45	13.01	11.80	11.69	11.77	11.88	11.98	12.11	12.39	12.80	13.32	12.48	EIA HH/PIRA/CEC/WM
2028	14.18	14.11	13.64	12.38	12.27	12.35	12.47	12.57	12.71	12.99	13.42	13.97	13.09	EIA HH/PIRA/CEC/WM
2029	14.87	14.80	14.31	12.98	12.87	12.96	13.08	13.19	13.33	13.63	14.08	14.66	13.73	EIA HH/PIRA/CEC/WM
2030	15.59	15.52	15.01	13.62	13.50	13.59	13.73	13.84	13.99	14.30	14.77	15.37	14.40	EIA HH/PIRA/CEC/WM

Southern California Gas Company
2010 California Gas Report
Malin: Gas Price Forecasts Current $/MMBtu

	-0.05	-0.09	-0.01	-0.04	-0.05	-0.08	-0.10	-0.11	-0.06	0.00	-0.01	-0.01	-0.05	
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Average**	
2010	5.93	5.57	5.421	5.362	5.388	5.495	5.649	5.717	5.712	5.764	6.023	6.351	5.70	NYMEX Malin
2011	6.57	6.53	6.25	5.66	5.61	5.63	5.67	5.71	5.80	5.96	6.16	6.40	6.00	EIA HH/PIRA/CEC/WM
2012	6.93	6.78	6.55	5.94	5.88	5.90	5.95	5.99	6.09	6.25	6.45	6.71	6.29	EIA HH/PIRA/CEC/WM
2013	7.13	7.10	6.87	6.22	6.17	6.19	6.24	6.28	6.38	6.55	6.76	7.03	6.58	EIA HH/PIRA/CEC/WM
2014	7.48	7.44	7.20	6.52	6.47	6.49	6.54	6.59	6.69	6.87	7.09	7.37	6.90	EIA HH/PIRA/CEC/WM
2015	7.50	7.80	7.54	6.84	6.78	6.81	6.86	6.91	7.01	7.19	7.43	7.73	7.20	EIA HH/PIRA/CEC/WM
2016	7.70	8.17	7.91	7.17	7.11	7.14	7.20	7.25	7.35	7.54	7.78	8.10	7.53	EIA HH/PIRA/CEC/WM
2017	7.90	8.57	8.29	7.52	7.45	7.48	7.55	7.60	7.71	7.90	8.16	8.49	7.88	EIA HH/PIRA/CEC/WM
2018	8.10	8.98	8.68	7.88	7.81	7.85	7.91	7.97	8.08	8.28	8.55	8.89	8.25	EIA HH/PIRA/CEC/WM
2019	8.31	9.41	9.10	8.26	8.19	8.23	8.30	8.36	8.47	8.68	8.96	9.32	8.63	EIA HH/PIRA/CEC/WM
2020	8.54	9.86	9.54	8.66	8.58	8.63	8.70	8.77	8.88	9.10	9.39	9.77	9.03	EIA HH/PIRA/CEC/WM
2021	8.78	10.33	10.00	9.07	9.00	9.04	9.12	9.19	9.31	9.53	9.84	10.24	9.45	EIA HH/PIRA/CEC/WM
2022	8.78	10.83	10.48	9.51	9.43	9.48	9.57	9.64	9.76	9.99	10.31	10.73	9.88	EIA HH/PIRA/CEC/WM
2023	9.01	11.35	10.98	9.97	9.89	9.94	10.03	10.11	10.23	10.47	10.81	11.24	10.34	EIA HH/PIRA/CEC/WM
2024	11.95	11.90	11.51	10.45	10.36	10.42	10.52	10.60	10.72	10.97	11.33	11.78	11.04	EIA HH/PIRA/CEC/WM
2025	12.52	12.47	12.06	10.95	10.86	10.93	11.03	11.11	11.24	11.50	11.87	12.35	11.57	EIA HH/PIRA/CEC/WM
2026	13.13	13.07	12.64	11.48	11.39	11.45	11.56	11.65	11.78	12.05	12.44	12.94	12.13	EIA HH/PIRA/CEC/WM
2027	13.76	13.69	13.25	12.04	11.93	12.01	12.12	12.22	12.35	12.63	13.04	13.56	12.72	EIA HH/PIRA/CEC/WM
2028	14.42	14.35	13.88	12.62	12.51	12.59	12.71	12.81	12.95	13.23	13.66	14.21	13.33	EIA HH/PIRA/CEC/WM
2029	15.11	15.04	14.55	13.22	13.11	13.20	13.32	13.43	13.57	13.87	14.32	14.90	13.97	EIA HH/PIRA/CEC/WM
2030	15.83	15.76	15.25	13.86	13.74	13.83	13.97	14.08	14.23	14.54	15.01	15.61	14.64	EIA HH/PIRA/CEC/WM
	1.014	0.976	0.962	0.943	0.948	0.965	0.995	1.006	1.007	1.007	1.060	1.116	1.000	

Southern California Gas Company
2010 California Gas Report
Opal: Gas Price Forecasts Current $/MMBtu

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	
2010	5.55	5.23	5.00	4.97	5.00	5.15	5.32	5.40	5.34	5.33	5.60	5.93	5.32	NYMEX CA Border
2011	6.15	6.11	5.83	5.27	5.23	5.28	5.34	5.39	5.43	5.53	5.73	5.98	5.61	EIA HH/PIRA/CEC/WM
2012	6.51	6.35	6.13	5.55	5.50	5.55	5.62	5.67	5.71	5.82	6.03	6.29	5.89	EIA HH/PIRA/CEC/WM
2013	6.71	6.68	6.44	5.84	5.78	5.84	5.91	5.97	6.01	6.12	6.34	6.61	6.19	EIA HH/PIRA/CEC/WM
2014	7.05	7.02	6.77	6.14	6.08	6.14	6.22	6.27	6.31	6.44	6.66	6.95	6.50	EIA HH/PIRA/CEC/WM
2015	7.07	7.37	7.12	6.45	6.40	6.46	6.53	6.59	6.64	6.77	7.00	7.30	6.81	EIA HH/PIRA/CEC/WM
2016	7.27	7.75	7.48	6.78	6.72	6.79	6.87	6.93	6.98	7.11	7.36	7.67	7.14	EIA HH/PIRA/CEC/WM
2017	7.47	8.14	7.86	7.13	7.07	7.13	7.22	7.28	7.33	7.47	7.73	8.06	7.49	EIA HH/PIRA/CEC/WM
2018	7.67	8.55	8.26	7.49	7.43	7.50	7.59	7.66	7.71	7.85	8.12	8.47	7.86	EIA HH/PIRA/CEC/WM
2019	7.88	8.98	8.68	7.87	7.80	7.88	7.97	8.04	8.10	8.25	8.53	8.90	8.24	EIA HH/PIRA/CEC/WM
2020	8.12	9.44	9.12	8.27	8.20	8.28	8.37	8.45	8.51	8.67	8.96	9.34	8.64	EIA HH/PIRA/CEC/WM
2021	8.35	9.91	9.57	8.69	8.61	8.69	8.80	8.88	8.94	9.10	9.42	9.81	9.06	EIA HH/PIRA/CEC/WM
2022	8.35	10.41	10.05	9.12	9.05	9.13	9.24	9.32	9.38	9.56	9.89	10.30	9.48	EIA HH/PIRA/CEC/WM
2023	8.58	10.93	10.56	9.58	9.50	9.59	9.70	9.79	9.86	10.04	10.38	10.82	9.94	EIA HH/PIRA/CEC/WM
2024	11.53	11.47	11.08	10.06	9.98	10.07	10.19	10.28	10.35	10.54	10.90	11.36	10.65	EIA HH/PIRA/CEC/WM
2025	12.10	12.04	11.64	10.57	10.48	10.58	10.70	10.80	10.87	11.07	11.45	11.92	11.18	EIA HH/PIRA/CEC/WM
2026	12.70	12.64	12.22	11.09	11.00	11.10	11.24	11.33	11.41	11.62	12.02	12.52	11.74	EIA HH/PIRA/CEC/WM
2027	13.33	13.27	12.82	11.65	11.55	11.66	11.79	11.90	11.98	12.20	12.61	13.14	12.33	EIA HH/PIRA/CEC/WM
2028	13.99	13.93	13.46	12.23	12.13	12.24	12.38	12.49	12.57	12.81	13.24	13.79	12.94	EIA HH/PIRA/CEC/WM
2029	14.68	14.62	14.13	12.84	12.73	12.85	13.00	13.11	13.20	13.44	13.90	14.47	13.58	EIA HH/PIRA/CEC/WM
2030	15.41	15.34	14.82	13.47	13.36	13.48	13.64	13.76	13.85	14.11	14.58	15.19	14.25	EIA HH/PIRA/CEC/WM

Southern California Gas Company
2010 California Gas Report
PG&E Citigate:Gas Price Forecasts Current $/MMBtu

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	
2010	6.29	5.88	5.80	5.75	5.75	5.88	5.90	6.08	6.09	6.16	6.43	6.77	6.07	NYMEX CA Border
2011	6.94	6.85	6.63	6.06	5.98	6.01	5.92	6.08	6.18	6.36	6.57	6.82	6.37	EIA HH/PIRA/CEC/WM
2012	7.30	7.09	6.93	6.33	6.25	6.29	6.20	6.36	6.46	6.64	6.86	7.13	6.65	EIA HH/PIRA/CEC/WM
2013	7.50	7.41	7.24	6.62	6.53	6.57	6.49	6.65	6.76	6.94	7.17	7.45	6.95	EIA HH/PIRA/CEC/WM
2014	7.84	7.76	7.57	6.92	6.83	6.87	6.80	6.96	7.07	7.26	7.50	7.79	7.26	EIA HH/PIRA/CEC/WM
2015	7.86	8.11	7.92	7.23	7.14	7.19	7.12	7.28	7.39	7.59	7.84	8.14	7.57	EIA HH/PIRA/CEC/WM
2016	8.06	8.49	8.28	7.56	7.47	7.52	7.45	7.62	7.73	7.93	8.19	8.52	7.90	EIA HH/PIRA/CEC/WM
2017	8.26	8.88	8.66	7.91	7.82	7.87	7.80	7.97	8.09	8.30	8.57	8.90	8.25	EIA HH/PIRA/CEC/WM
2018	8.46	9.29	9.06	8.27	8.18	8.23	8.17	8.34	8.46	8.67	8.96	9.31	8.62	EIA HH/PIRA/CEC/WM
2019	8.67	9.72	9.47	8.65	8.55	8.61	8.55	8.73	8.85	9.07	9.37	9.74	9.00	EIA HH/PIRA/CEC/WM
2020	8.90	10.18	9.91	9.05	8.95	9.01	8.96	9.13	9.26	9.49	9.80	10.19	9.40	EIA HH/PIRA/CEC/WM
2021	9.14	10.65	10.37	9.47	9.36	9.43	9.38	9.56	9.69	9.93	10.25	10.66	9.82	EIA HH/PIRA/CEC/WM
2022	9.14	11.14	10.85	9.90	9.80	9.86	9.82	10.01	10.14	10.38	10.72	11.15	10.24	EIA HH/PIRA/CEC/WM
2023	9.37	11.67	11.35	10.36	10.25	10.32	10.28	10.48	10.61	10.86	11.22	11.66	10.70	EIA HH/PIRA/CEC/WM
2024	12.31	12.21	11.88	10.84	10.73	10.80	10.77	10.97	11.10	11.37	11.74	12.20	11.41	EIA HH/PIRA/CEC/WM
2025	12.89	12.78	12.43	11.35	11.23	11.31	11.28	11.48	11.62	11.89	12.28	12.77	11.94	EIA HH/PIRA/CEC/WM
2026	13.49	13.38	13.01	11.88	11.75	11.84	11.82	12.02	12.16	12.44	12.85	13.36	12.50	EIA HH/PIRA/CEC/WM
2027	14.12	14.01	13.62	12.43	12.30	12.39	12.38	12.58	12.73	13.02	13.45	13.98	13.08	EIA HH/PIRA/CEC/WM
2028	14.78	14.67	14.26	13.01	12.87	12.97	12.96	13.18	13.32	13.63	14.08	14.63	13.70	EIA HH/PIRA/CEC/WM
2029	15.47	15.35	14.92	13.62	13.48	13.58	13.58	13.80	13.95	14.26	14.73	15.32	14.34	EIA HH/PIRA/CEC/WM
2030	16.20	16.08	15.62	14.25	14.11	14.22	14.22	14.45	14.60	14.93	15.42	16.03	15.01	EIA HH/PIRA/CEC/WM
	1.014	0.976	0.962	0.943	0.948	0.965	0.995	1.006	1.007	1.007	1.060	1.116	1.000	
	0.36	0.31	0.37	0.39	0.37	0.38	0.25	0.37	0.38	0.39	0.41	0.42	0.31	

Southern California Gas Company
2010 California Gas Report
San Juan Basin: Gas Price Forecasts Current $/MMBtu

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	
2010	5.73	5.41	5.18	5.15	5.18	5.33	5.50	5.58	5.52	5.51	5.78	6.11	5.50	NYMEX CA Border
2011	6.33	6.29	6.01	5.45	5.41	5.46	5.52	5.57	5.61	5.71	5.91	6.16	5.79	EIA HH/PIRA/CEC/WM
2012	6.69	6.53	6.31	5.73	5.68	5.73	5.80	5.85	5.89	6.00	6.21	6.47	6.07	EIA HH/PIRA/CEC/WM
2013	6.89	6.86	6.62	6.02	5.96	6.02	6.09	6.15	6.19	6.30	6.52	6.79	6.37	EIA HH/PIRA/CEC/WM
2014	7.23	7.20	6.95	6.32	6.26	6.32	6.40	6.45	6.49	6.62	6.84	7.13	6.68	EIA HH/PIRA/CEC/WM
2015	7.25	7.55	7.30	6.63	6.58	6.64	6.71	6.77	6.82	6.95	7.18	7.48	6.99	EIA HH/PIRA/CEC/WM
2016	7.45	7.93	7.66	6.96	6.90	6.97	7.05	7.11	7.16	7.29	7.54	7.85	7.32	EIA HH/PIRA/CEC/WM
2017	7.65	8.32	8.04	7.31	7.25	7.31	7.40	7.46	7.51	7.65	7.91	8.24	7.67	EIA HH/PIRA/CEC/WM
2018	7.85	8.73	8.44	7.67	7.61	7.68	7.77	7.84	7.89	8.03	8.30	8.65	8.04	EIA HH/PIRA/CEC/WM
2019	8.06	9.16	8.86	8.05	7.98	8.06	8.15	8.22	8.28	8.43	8.71	9.08	8.42	EIA HH/PIRA/CEC/WM
2020	8.30	9.62	9.30	8.45	8.38	8.46	8.55	8.63	8.69	8.85	9.14	9.52	8.82	EIA HH/PIRA/CEC/WM
2021	8.53	10.09	9.75	8.87	8.79	8.87	8.98	9.06	9.12	9.28	9.60	9.99	9.24	EIA HH/PIRA/CEC/WM
2022	8.53	10.59	10.23	9.30	9.23	9.31	9.42	9.50	9.56	9.74	10.07	10.48	9.66	EIA HH/PIRA/CEC/WM
2023	8.76	11.11	10.74	9.76	9.68	9.77	9.88	9.97	10.04	10.22	10.56	11.00	10.12	EIA HH/PIRA/CEC/WM
2024	11.71	11.65	11.26	10.24	10.16	10.25	10.37	10.46	10.53	10.72	11.08	11.54	10.83	EIA HH/PIRA/CEC/WM
2025	12.28	12.22	11.82	10.75	10.66	10.76	10.88	10.98	11.05	11.25	11.63	12.10	11.36	EIA HH/PIRA/CEC/WM
2026	12.88	12.82	12.40	11.27	11.18	11.28	11.42	11.51	11.59	11.80	12.20	12.70	11.92	EIA HH/PIRA/CEC/WM
2027	13.51	13.45	13.00	11.83	11.73	11.84	11.97	12.08	12.16	12.38	12.79	13.32	12.51	EIA HH/PIRA/CEC/WM
2028	14.17	14.11	13.64	12.41	12.31	12.42	12.56	12.67	12.75	12.99	13.42	13.97	13.12	EIA HH/PIRA/CEC/WM
2029	14.86	14.80	14.31	13.02	12.91	13.03	13.18	13.29	13.38	13.62	14.08	14.65	13.76	EIA HH/PIRA/CEC/WM
2030	15.59	15.52	15.00	13.65	13.54	13.66	13.82	13.94	14.03	14.29	14.76	15.37	14.43	EIA HH/PIRA/CEC/WM

Southern California Gas Company
2010 California Gas Report
SoCal Border: Gas Price Forecasts Current $/MMBtu

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average		Index GDP Inflation
2010	5.98	5.66	5.43	5.40	5.43	5.58	5.75	5.83	5.77	5.76	6.03	6.36	5.75	NYMEX CA Border	1.000
2011	6.58	6.54	6.26	5.70	5.66	5.71	5.77	5.82	5.86	5.96	6.16	6.41	6.02	EIA HH/PIRA/CEC/WM	1.015
2012	6.94	6.78	6.56	5.98	5.93	5.98	6.05	6.10	6.14	6.25	6.46	6.72	6.31	EIA HH/PIRA/CEC/WM	1.030
2013	7.14	7.11	6.87	6.27	6.21	6.27	6.34	6.40	6.44	6.55	6.77	7.04	6.62	EIA HH/PIRA/CEC/WM	1.048
2014	7.48	7.45	7.20	6.57	6.51	6.57	6.65	6.70	6.74	6.87	7.09	7.38	6.93	EIA HH/PIRA/CEC/WM	1.067
2015	7.50	7.80	7.55	6.88	6.83	6.89	6.96	7.02	7.07	7.20	7.43	7.73	7.27	EIA HH/PIRA/CEC/WM	1.086
2016	7.70	8.18	7.91	7.21	7.15	7.22	7.30	7.36	7.41	7.54	7.79	8.10	7.62	EIA HH/PIRA/CEC/WM	1.105
2017	7.90	8.57	8.29	7.56	7.50	7.56	7.65	7.71	7.76	7.90	8.16	8.49	7.98	EIA HH/PIRA/CEC/WM	1.125
2018	8.10	8.98	8.69	7.92	7.86	7.93	8.02	8.09	8.14	8.28	8.55	8.90	8.36	EIA HH/PIRA/CEC/WM	1.145
2019	8.31	9.41	9.11	8.30	8.23	8.31	8.40	8.47	8.53	8.68	8.96	9.33	8.77	EIA HH/PIRA/CEC/WM	1.165
2020	8.55	9.87	9.55	8.70	8.63	8.71	8.80	8.88	8.94	9.10	9.39	9.77	9.19	EIA HH/PIRA/CEC/WM	1.184
2021	8.78	10.34	10.00	9.12	9.04	9.12	9.23	9.31	9.37	9.53	9.85	10.24	9.63	EIA HH/PIRA/CEC/WM	1.204
2022	8.78	10.84	10.48	9.55	9.48	9.56	9.67	9.75	9.81	9.99	10.32	10.73	10.09	EIA HH/PIRA/CEC/WM	1.223
2023	9.01	11.36	10.99	10.01	9.93	10.02	10.13	10.22	10.29	10.47	10.81	11.25	10.57	EIA HH/PIRA/CEC/WM	1.243
2024	11.96	11.90	11.51	10.49	10.41	10.50	10.62	10.71	10.78	10.97	11.33	11.79	11.08	EIA HH/PIRA/CEC/WM	1.262
2025	12.53	12.47	12.07	11.00	10.91	11.01	11.13	11.23	11.30	11.50	11.88	12.35	11.61	EIA HH/PIRA/CEC/WM	1.283
2026	13.13	13.07	12.65	11.52	11.43	11.53	11.67	11.76	11.84	12.05	12.45	12.95	12.17	EIA HH/PIRA/CEC/WM	1.303
2027	13.76	13.70	13.25	12.08	11.98	12.09	12.22	12.33	12.41	12.63	13.04	13.57	12.76	EIA HH/PIRA/CEC/WM	1.325
2028	14.42	14.36	13.89	12.66	12.56	12.67	12.81	12.92	13.00	13.24	13.67	14.22	13.37	EIA HH/PIRA/CEC/WM	1.347
2029	15.11	15.05	14.56	13.27	13.16	13.28	13.43	13.54	13.63	13.87	14.33	14.90	14.01	EIA HH/PIRA/CEC/WM	1.370
2030	15.84	15.77	15.25	13.90	13.79	13.91	14.07	14.19	14.28	14.54	15.01	15.62	14.68	EIA HH/PIRA/CEC/WM	1.393
	1.0789	1.0740	1.0390	0.9469	0.9392	0.9477	0.9584	0.9666	0.9727	0.9901	1.0226	1.0638	1.0000		
			5.42130952	5.36204545	5.38784091	5.49545455	5.64945455	5.71675	5.71234091	5.76397727	6.02270455	6.35143182	6.57447727	6.534840909	

Southern California Gas Company
2010 California Gas Report
SoCal Citigate: Gas Price Forecasts Current $/MMBtu

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	
2010	6.01	5.69	5.46	5.43	5.46	5.61	5.78	5.86	5.80	5.79	6.06	6.39	5.78	NYMEX CA Border
2011	6.66	6.62	6.34	5.78	5.74	5.79	5.85	5.90	5.94	6.04	6.24	6.49	6.12	EIA HH/PIRA/CEC/WM
2012	7.02	6.86	6.64	6.06	6.01	6.06	6.13	6.18	6.22	6.33	6.54	6.80	6.40	EIA HH/PIRA/CEC/WM
2013	7.22	7.19	6.95	6.35	6.29	6.35	6.42	6.48	6.52	6.63	6.85	7.12	6.70	EIA HH/PIRA/CEC/WM
2014	7.56	7.53	7.28	6.65	6.59	6.65	6.73	6.78	6.82	6.95	7.17	7.46	7.01	EIA HH/PIRA/CEC/WM
2015	7.58	7.88	7.63	6.96	6.91	6.97	7.04	7.10	7.15	7.28	7.51	7.81	7.32	EIA HH/PIRA/CEC/WM
2016	7.78	8.26	7.99	7.29	7.23	7.30	7.38	7.44	7.49	7.62	7.87	8.18	7.65	EIA HH/PIRA/CEC/WM
2017	7.98	8.65	8.37	7.64	7.58	7.64	7.73	7.79	7.84	7.98	8.24	8.57	8.00	EIA HH/PIRA/CEC/WM
2018	8.18	9.06	8.77	8.00	7.94	8.01	8.10	8.17	8.22	8.36	8.63	8.98	8.37	EIA HH/PIRA/CEC/WM
2019	8.39	9.49	9.19	8.38	8.31	8.39	8.48	8.55	8.61	8.76	9.04	9.41	8.75	EIA HH/PIRA/CEC/WM
2020	8.63	9.95	9.63	8.78	8.71	8.79	8.88	8.96	9.02	9.18	9.47	9.85	9.15	EIA HH/PIRA/CEC/WM
2021	8.86	10.42	10.08	9.20	9.12	9.20	9.31	9.39	9.45	9.61	9.93	10.32	9.57	EIA HH/PIRA/CEC/WM
2022	8.86	10.92	10.56	9.63	9.56	9.64	9.75	9.83	9.89	10.07	10.40	10.81	9.99	EIA HH/PIRA/CEC/WM
2023	9.09	11.44	11.07	10.09	10.01	10.10	10.21	10.30	10.37	10.55	10.89	11.33	10.45	EIA HH/PIRA/CEC/WM
2024	12.04	11.98	11.59	10.57	10.49	10.58	10.70	10.79	10.86	11.05	11.41	11.87	11.16	EIA HH/PIRA/CEC/WM
2025	12.61	12.55	12.15	11.08	10.99	11.09	11.21	11.31	11.38	11.58	11.96	12.43	11.69	EIA HH/PIRA/CEC/WM
2026	13.21	13.15	12.73	11.60	11.51	11.61	11.75	11.84	11.92	12.13	12.53	13.03	12.25	EIA HH/PIRA/CEC/WM
2027	13.84	13.78	13.33	12.16	12.06	12.17	12.30	12.41	12.49	12.71	13.12	13.65	12.84	EIA HH/PIRA/CEC/WM
2028	14.50	14.44	13.97	12.74	12.64	12.75	12.89	13.00	13.08	13.32	13.75	14.30	13.45	EIA HH/PIRA/CEC/WM
2029	15.19	15.13	14.64	13.35	13.24	13.36	13.51	13.62	13.71	13.95	14.41	14.98	14.09	EIA HH/PIRA/CEC/WM
2030	15.92	15.85	15.33	13.98	13.87	13.99	14.15	14.27	14.36	14.62	15.09	15.70	14.76	EIA HH/PIRA/CEC/WM

Southern California Gas Company
2010 California Gas Report
Sumans: Gas Price Forecasts Current $/MMBtu

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average	
2010	5.64	5.21	5.40	5.20	5.10	5.16	5.56	5.75	5.74	5.78	6.26	7.04	5.73	NYMEX Malin/AECO
2011	6.73	6.66	6.23	5.50	5.33	5.29	5.58	5.74	5.83	5.98	6.39	7.10	6.03	EIA HH/PIRA/CEC/WM
2012	7.09	6.90	6.53	5.78	5.60	5.57	5.86	6.02	6.11	6.26	6.69	7.40	6.32	EIA HH/PIRA/CEC/WM
2013	7.29	7.23	6.85	6.06	5.88	5.85	6.15	6.32	6.41	6.56	7.00	7.73	6.61	EIA HH/PIRA/CEC/WM
2014	7.63	7.57	7.18	6.37	6.18	6.16	6.45	6.62	6.72	6.88	7.32	8.06	6.93	EIA HH/PIRA/CEC/WM
2015	7.65	7.93	7.52	6.68	6.49	6.47	6.77	6.95	7.04	7.21	7.66	8.42	7.23	EIA HH/PIRA/CEC/WM
2016	7.85	8.30	7.89	7.01	6.82	6.80	7.11	7.28	7.38	7.55	8.02	8.79	7.57	EIA HH/PIRA/CEC/WM
2017	8.05	8.69	8.27	7.36	7.17	7.15	7.46	7.64	7.73	7.92	8.39	9.18	7.92	EIA HH/PIRA/CEC/WM
2018	8.25	9.10	8.67	7.72	7.53	7.51	7.82	8.01	8.11	8.30	8.79	9.59	8.28	EIA HH/PIRA/CEC/WM
2019	8.46	9.54	9.08	8.10	7.90	7.89	8.21	8.39	8.50	8.69	9.20	10.01	8.66	EIA HH/PIRA/CEC/WM
2020	8.70	9.99	9.52	8.50	8.30	8.29	8.61	8.80	8.91	9.11	9.63	10.46	9.07	EIA HH/PIRA/CEC/WM
2021	8.93	10.46	9.98	8.92	8.71	8.71	9.03	9.23	9.34	9.55	10.08	10.93	9.49	EIA HH/PIRA/CEC/WM
2022	8.93	10.96	10.46	9.35	9.15	9.15	9.48	9.67	9.79	10.00	10.55	11.42	9.91	EIA HH/PIRA/CEC/WM
2023	9.16	11.48	10.96	9.81	9.60	9.61	9.94	10.14	10.26	10.48	11.05	11.94	10.37	EIA HH/PIRA/CEC/WM
2024	12.10	12.02	11.49	10.29	10.08	10.09	10.43	10.63	10.75	10.99	11.56	12.48	11.08	EIA HH/PIRA/CEC/WM
2025	12.68	12.59	12.04	10.80	10.58	10.59	10.94	11.15	11.27	11.51	12.11	13.04	11.61	EIA HH/PIRA/CEC/WM
2026	13.28	13.19	12.62	11.32	11.10	11.12	11.47	11.69	11.81	12.06	12.68	13.64	12.17	EIA HH/PIRA/CEC/WM
2027	13.91	13.82	13.23	11.88	11.65	11.67	12.03	12.25	12.38	12.64	13.28	14.26	12.75	EIA HH/PIRA/CEC/WM
2028	14.57	14.48	13.86	12.46	12.22	12.25	12.62	12.84	12.97	13.25	13.90	14.91	13.36	EIA HH/PIRA/CEC/WM
2029	15.26	15.17	14.53	13.06	12.83	12.86	13.23	13.46	13.60	13.88	14.56	15.59	14.00	EIA HH/PIRA/CEC/WM
2030	15.99	15.89	15.23	13.70	13.46	13.50	13.88	14.11	14.25	14.55	15.25	16.31	14.68	EIA HH/PIRA/CEC/WM

2010 CALIFORNIA GAS REPORT

Alternate Fuels
JULY 2010

The Gas Company

A Sempra Energy utility℠

LONG TERM OUTLOOK for "SPOT" Gas: Southern California Gas
($/Dth Price @ California Border Spot Price)
($/Dth Difference, SoCal Border Basis to Price at Henry Hub

04/14/2008

	1	2	3	4	5	6	7	8	9	10	11	12	
YEAR	**Supply Compo**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**YR. AVG.**
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

LONG TERM OUTLOOK for "SPOT" Gas: Southern California Gas ($/Dth Price @ California Border Spot Price) ($/Dth Difference, SoCal Border Basis to Price at Henry Hub														04/14/2008
	1	2	3	4	5	6	7	8	9	10	11	12		
YEAR	**Supply Compo**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**YR. AVG.**
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	**5.98**	**5.66**	**5.43**	**5.40**	**5.43**	**5.58**	**5.75**	**5.83**	**5.77**	**5.76**	**6.03**	**6.36**	5.75
	Difference	-0.02	0.06	-0.01	-0.05	-0.06	0.02	0.12	0.12	0.01	-0.13	-0.25	-0.31	-0.04
2011	CBSP	**6.58**	**6.54**	**6.26**	**5.70**	**5.66**	**5.71**	**5.77**	**5.82**	**5.86**	**5.96**	**6.16**	**6.41**	6.04
	Difference	-0.32	-0.35	-0.48	-0.58	-0.60	-0.60	-0.60	-0.61	-0.60	-0.61	-0.68	-0.71	-0.56
2012	CBSP	**6.94**	**6.78**	**6.56**	**5.98**	**5.93**	**5.98**	**6.05**	**6.10**	**6.14**	**6.25**	**6.46**	**6.72**	6.32
	Difference	-0.39	-0.53	-0.53	-0.47	-0.47	-0.47	-0.47	-0.47	-0.47	-0.47	-0.50	-0.49	-0.48
2013	CBSP	**7.14**	**7.11**	**6.87**	**6.27**	**6.21**	**6.27**	**6.34**	**6.40**	**6.44**	**6.55**	**6.77**	**7.04**	6.62
	Difference	-0.25	-0.05	0.32	-0.24	-0.34	-0.35	-0.34	-0.32	-0.39	-0.54	-0.58	-0.51	-0.30
2014	CBSP	**7.48**	**7.45**	**7.20**	**6.57**	**6.51**	**6.57**	**6.65**	**6.70**	**6.74**	**6.87**	**7.09**	**7.38**	6.93
	Difference	-0.07	-0.09	-0.11	-0.16	-0.16	-0.17	-0.17	-0.18	-0.17	-0.16	-0.19	-0.18	-0.15
2015	CBSP	7.50	7.80	7.55	6.88	6.83	6.89	6.96	7.02	7.07	7.20	7.43	7.73	7.24
	Difference	-0.26	0.05	0.02	-0.05	-0.06	-0.06	-0.06	-0.06	-0.05	-0.03	-0.06	-0.03	-0.05
2016	CBSP	**7.70**	**8.18**	**7.91**	**7.21**	**7.15**	**7.22**	**7.30**	**7.36**	**7.41**	**7.54**	**7.79**	**8.10**	7.57
	Difference	-0.26	0.22	0.19	0.11	0.10	0.10	0.10	0.09	0.11	0.14	0.13	0.16	0.10
2017	CBSP	**7.90**	**8.57**	**8.29**	**7.56**	**7.50**	**7.56**	**7.65**	**7.71**	**7.76**	**7.90**	**8.16**	**8.49**	7.92
	Difference	-0.25	0.42	0.38	0.28	0.26	0.25	0.25	0.26	0.28	0.33	0.32	0.35	0.26
2018	CBSP	**8.10**	**8.98**	**8.69**	**7.92**	**7.86**	**7.93**	**8.02**	**8.09**	**8.14**	**8.28**	**8.55**	**8.90**	8.29
	Difference	-0.26	0.62	0.56	0.44	0.41	0.40	0.40	0.41	0.44	0.50	0.50	0.54	0.41
2019	CBSP	**8.31**	**9.41**	**9.11**	**8.30**	**8.23**	**8.31**	**8.40**	**8.47**	**8.53**	**8.68**	**8.96**	**9.33**	8.67
	Difference	-0.28	0.83	0.75	0.61	0.59	0.58	0.58	0.59	0.62	0.68	0.68	0.73	0.58
2020	CBSP	**8.55**	**9.87**	**9.55**	**8.70**	**8.63**	**8.71**	**8.80**	**8.88**	**8.94**	**9.10**	**9.39**	**9.77**	9.07
	Difference	-0.28	1.04	0.95	0.80	0.77	0.77	0.78	0.80	0.84	0.91	0.91	0.94	0.77
2021	CBSP	**8.78**	**10.34**	**10.00**	**9.12**	**9.04**	**9.12**	**9.23**	**9.31**	**9.37**	**9.53**	**9.85**	**10.24**	9.49
	Difference	-0.28	1.29	1.19	0.99	0.97	0.98	1.00	1.02	1.07	1.15	1.15	1.18	0.98
2022	CBSP	**8.78**	**10.84**	**10.48**	**9.55**	**9.48**	**9.56**	**9.67**	**9.75**	**9.81**	**9.99**	**10.32**	**10.73**	9.91
	Difference	-0.51	1.55	1.44	1.23	1.19	1.21	1.23	1.27	1.31	1.40	1.42	1.47	1.18
2023	CBSP	9.01	11.36	10.99	10.01	9.93	10.02	10.13	10.22	10.29	10.47	10.81	11.25	10.37
	Difference	-0.51	1.55	1.44	1.23	1.19	1.21	1.23	1.27	1.31	1.40	1.42	1.47	1.18
2024	CBSP	**11.96**	**11.90**	**11.51**	**10.49**	**10.41**	**10.50**	**10.62**	**10.71**	**10.78**	**10.97**	**11.33**	**11.79**	11.08
	Difference	-0.51	1.55	1.44	1.23	1.19	1.21	1.23	1.27	1.31	1.40	1.42	1.47	1.18
2025	CBSP	**12.53**	**12.47**	**12.07**	**11.00**	**10.91**	**11.01**	**11.13**	**11.23**	**11.30**	**11.50**	**11.88**	**12.35**	11.61
	Difference	-0.51	1.55	1.44	1.23	1.19	1.21	1.23	1.27	1.31	1.40	1.42	1.47	1.18
2026	CBSP	**13.13**	**13.07**	**12.65**	**11.52**	**11.43**	**11.53**	**11.67**	**11.76**	**11.84**	**12.05**	**12.45**	**12.95**	12.17
	Difference	-0.51	1.55	1.44	1.23	1.19	1.21	1.23	1.27	1.31	1.40	1.42	1.47	1.18

LONG TERM OUTLOOK for "SPOT" Gas: Southern California Gas
($/Dth Price @ California Border Spot Price)
($/Dth Difference, SoCal Border Basis to Price at Henry Hub

04/14/2008

	1	2	3	4	5	6	7	8	9	10	11	12	
YEAR	**Supply Compo**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**YR. AVG.**
2027	CBSP	**13.76**	**13.70**	**13.25**	**12.08**	**11.98**	**12.09**	**12.22**	**12.33**	**12.41**	**12.63**	**13.04**	**13.57**	12.76
	Difference	-0.51	1.55	1.44	1.23	1.19	1.21	1.23	1.27	1.31	1.40	1.42	1.47	1.18
2028	CBSP	**14.42**	**14.36**	**13.89**	**12.66**	**12.56**	**12.67**	**12.81**	**12.92**	**13.00**	**13.24**	**13.67**	**14.22**	13.37
	Difference	-0.51	1.55	1.44	1.23	1.19	1.21	1.23	1.27	1.31	1.40	1.42	1.47	1.18
2029	CBSP	**15.11**	**15.05**	**14.56**	**13.27**	**13.16**	**13.28**	**13.43**	**13.54**	**13.63**	**13.87**	**14.33**	**14.90**	14.01
	Difference	-0.51	1.55	1.44	1.23	1.19	1.21	1.23	1.27	1.31	1.40	1.42	1.47	1.18
2030	CBSP	**15.84**	**15.77**	**15.25**	**13.90**	**13.79**	**13.91**	**14.07**	**14.19**	**14.28**	**14.54**	**15.01**	**15.62**	14.68
	Difference	-0.51	1.55	1.44	1.23	1.19	1.21	1.23	1.27	1.31	1.40	1.42	1.47	1.18

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.

Southern California Gas Company
2010 California Gas Report
Propane

Year	Propane $/Dth
2010	12.07
2011	13.19
2012	11.33
2013	11.92
2014	12.94
2015	13.82
2016	13.82
2017	13.89
2018	13.96
2019	14.03
2020	14.11
2021	14.18
2022	14.40
2023	14.69
2024	14.98
2025	15.28
2026	16.00
2027	16.73
2028	17.46
2029	17.76
2030	18.19

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	12.59	11.58	10.09	9.58	9.76	10.05	10.26	10.43	10.86	11.82	13.31	13.92	11.19
2011	13.76	12.65	11.02	10.46	10.66	10.99	11.21	11.40	11.87	12.92	14.54	15.21	12.23
2012	11.82	10.87	9.47	8.99	9.16	9.44	9.63	9.80	10.20	11.10	12.49	13.07	10.50
2013	12.43	11.43	9.96	9.45	9.63	9.92	10.13	10.30	10.73	11.67	13.14	13.74	11.05
2014	13.50	12.41	10.81	10.26	10.46	10.78	11.00	11.19	11.64	12.67	14.26	14.92	11.99
2015	14.41	13.25	11.55	10.96	11.17	11.50	11.74	11.94	12.43	13.53	15.23	15.93	12.80
2016	14.41	13.25	11.55	10.96	11.17	11.50	11.74	11.94	12.43	13.53	15.23	15.93	12.80
2017	14.49	13.32	11.61	11.02	11.22	11.57	11.81	12.01	12.50	13.60	15.31	16.02	12.87
2018	14.56	13.39	11.67	11.07	11.28	11.63	11.87	12.07	12.56	13.67	15.39	16.10	12.94
2019	14.64	13.46	11.73	11.13	11.34	11.69	11.93	12.13	12.63	13.75	15.47	16.19	13.01
2020	14.71	13.53	11.79	11.19	11.40	11.75	11.99	12.20	12.70	13.82	15.55	16.27	13.07
2021	14.79	13.60	11.85	11.25	11.46	11.81	12.05	12.26	12.76	13.89	15.63	16.35	13.14
2022	15.02	13.81	12.03	11.42	11.64	11.99	12.24	12.45	12.96	14.10	15.87	16.61	13.34
2023	15.32	14.09	12.28	11.65	11.87	12.23	12.49	12.70	13.22	14.39	16.19	16.94	13.62
2024	15.63	14.37	12.52	11.89	12.11	12.48	12.74	12.95	13.48	14.67	16.52	17.28	13.89
2025	15.93	14.65	12.77	12.12	12.34	12.72	12.98	13.20	13.75	14.96	16.84	17.62	14.16
2026	16.69	15.35	13.38	12.70	12.93	13.33	13.61	13.84	14.40	15.68	17.64	18.46	14.83
2027	17.45	16.05	13.99	13.27	13.52	13.94	14.23	14.47	15.06	16.39	18.45	19.30	15.51

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YR. AVG.
2028	18.22	16.75	14.60	13.85	14.11	14.54	14.85	15.10	15.72	17.10	19.25	20.14	16.19
2029	18.52	17.03	14.84	14.09	14.35	14.79	15.09	15.35	15.98	17.39	19.57	20.48	16.46
2030	18.98	17.45	15.21	14.43	14.70	15.15	15.47	15.73	16.37	17.82	20.06	20.98	16.86

NOTES:

1/ Jan. '95-Mar '08 reported monthly actuals from data reported in "Butane/Propane News" publications.

1	2	3	4	5	6	7	8	9	10	11	12	
105.32172	96.855335	84.390386	80.101942	81.610633	84.093909	85.840315	87.293298	90.877832	98.901065	111.30728	116.46044	93.587847
1.1253782	1.0349136	0.9017238	0.8559011	0.8720217	0.8985559	0.9172165	0.9327418	0.9710431	1.0567725	1.1893348	1.2443971	1

Regression	Confidential Information			
S/BBL Kern	S/BBL WTI	1% GC	No. 2	Year
28.27	39.39	34.16	44.31	**2000**
20.74	32.63	27.41	36.42	**2001**
19.76	31.75	27.36	33.89	**2002**
26.03	37.38	34.01	40.96	**2003**
38.38	48.46	34.19	53.58	**2004**
56.05	64.32	49.90	77.96	**2005**
65.72	73.00	52.21	83.94	**2006**
69.95	76.80	59.43	90.20	**2007**
99.67	103.48	81.03	122.84	**2008**
53.31	61.86	58.71	68.28	**2009**
71.34	78.05	72.68	85.21	**2010**
79.90	85.73	77.38	94.00	**2011**
65.72	73.00	61.14	81.03	**2012**
70.17	77.00	65.93	85.35	**2013**
77.97	84.00	71.92	93.06	**2014**
84.65	90.00	77.06	99.67	**2015**
84.65	90.00	77.06	99.61	**2016**
85.21	90.50	77.49	100.12	**2017**
85.77	91.00	77.91	100.62	**2018**
86.32	91.50	78.34	101.12	**2019**
86.88	92.00	78.77	101.62	**2020**
87.44	92.50	79.38	102.18	**2021**
89.11	94.00	80.85	103.83	**2022**
91.34	96.00	82.69	106.04	**2023**
93.56	98.00	84.61	108.25	**2024**
95.79	100.00	86.54	110.46	**2025**
101.36	105.00	90.87	115.98	**2026**
106.93	110.00	95.19	121.51	**2027**
112.50	115.00	99.52	127.03	**2028**
114.73	117.00	101.25	129.24	**2029**
118.07	120.00	103.85	132.55	**2030**

2010 CALIFORNIA GAS REPORT

SERVICE AREA ECONOMIC FORECAST
JULY 2010

The Gas Company
A Sempra Energy utility℠

SOUTHERN CALIFORNIA GAS COMPANY SERVICE AREA ECONOMIC FORECAST

(based on Global Insight's February 2010 Regional Forecast)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EMPLOYMENT (1000's)													
Total	8,217.7	8,398.5	8,444.7	8,307.6	7,978.2	7,927.1	8,089.7	8,316.1	8,521.2	8,649.7	8,737.1	8,816.0	8,896.7
Agriculture	215.5	218.5	221.6	227.9	230.0	225.7	230.3	237.4	243.1	247.2	252.0	257.2	262.4
Total Non-farm	8,002.2	8,180.0	8,223.1	8,079.8	7,748.2	7,701.4	7,859.4	8,078.7	8,278.2	8,402.5	8,485.1	8,558.7	8,634.3
Mining	16.6	18.3	19.0	19.7	19.4	18.6	18.1	18.4	18.7	18.5	18.2	17.7	17.3
Construction	458.7	485.1	459.8	402.1	340.0	303.5	307.2	342.3	383.5	406.8	422.7	432.7	441.7
Manufacturing	890.783	884.85	865.692	829.3	765.725	745.539	758.708	781.713	802.015	810.121	811.672	810.975	809.828
Transportation, Information, Utilities	573.7	577.9	585.0	581.1	549.6	538.3	556.2	573.8	586.8	598.1	608.4	617.4	627.1
Trade	1,404.6	1,444.5	1,461.5	1,427.6	1,354.1	1,353.5	1,390.4	1,421.0	1,437.6	1,450.8	1,462.4	1,470.0	1,479.6
Retail	985.3	1,010.2	1,014.3	985.6	933.3	932.9	966.6	988.4	999.3	1,008.4	1,017.4	1,022.8	1,030.0
Wholesale (including warehousing)	419.3	434.3	447.2	442.0	420.8	420.6	423.8	432.6	438.3	442.4	444.9	447.3	449.6
Restaurants	554.6	575.0	589.1	590.3	572.0	571.7	592.4	605.7	612.4	618.0	623.5	626.8	631.2
Finance, Insurance & Real Estate	499.5	507.7	490.8	458.7	436.7	447.2	455.9	467.8	477.3	475.8	469.9	466.3	461.4
Services	2,192.5	2,258.1	2,296.4	2,288.2	2,234.1	2,267.8	2,344.9	2,415.7	2,474.4	2,514.3	2,545.0	2,585.3	2,626.0
Accomodation	102.3	104.1	106.7	106.4	98.9	98.4	98.8	99.8	101.2	102.0	102.6	103.2	103.8
Personal & Laundry Services	81.3	82.9	84.6	85.7	82.0	82.2	82.7	82.7	83.0	83.5	83.6	83.6	83.5
Professional & Business Services	1,088.7	1,135.8	1,143.4	1,107.9	1,057.8	1,081.1	1,143.7	1,198.5	1,244.6	1,270.9	1,288.1	1,313.6	1,339.9
Health & Social Services	694.1	706.4	727.5	749.4	759.1	769.3	781.3	796.4	806.6	817.4	829.7	844.2	858.0
Misc. Services	226.1	228.9	234.3	238.8	236.3	236.9	238.3	238.3	239.1	240.5	240.9	240.8	240.8
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%	0.6%	1.7%	2.1%	2.1%	1.9%	2.3%	2.2%	2.1%
Inflation--US Gross Domestic Product**	3.3%	3.3%	2.9%	2.1%	1.2%	1.1%	1.5%	1.5%	1.7%	1.8%	1.8%	1.7%	1.8%

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

** Chained Price Index--US GDP. Through 2020 from Global Insight Feb 2010 US forecast; after 2020 from Global Insight 3rd Quarter 2009 (12-4-09) US long-term forecast.

SOUTHERN CALIFORNIA GAS COMPANY SERVICE AREA ECONOMIC FORECAST

(based on Global Insight's February 2010 Regional Forecast)

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
EMPLOYMENT (1000's)													
Total	8,983.3	9,071.9	9,160.5	9,248.8	9,340.5	9,433.2	9,526.2	9,620.1	9,711.1	9,805.8	9,898.5	9,986.9	10,076.1
Agriculture	267.4	272.0	275.1	278.4	282.0	285.7	289.5	293.3	297.1	301.3	305.4	309.4	313.4
Total Non-farm	8,715.9	8,799.9	8,885.5	8,970.4	9,058.5	9,147.4	9,236.8	9,326.9	9,414.1	9,504.5	9,593.0	9,677.5	9,762.7
Mining	16.7	16.2	15.8	15.5	15.3	15.0	14.7	14.5	14.4	14.3	14.3	14.3	14.2
Construction	451.5	462.5	475.4	488.8	500.8	511.6	522.0	531.8	541.6	552.6	561.5	568.5	574.3
Manufacturing	809.0	806.3	800.7	794.9	788.1	780.2	773.9	767.7	760.8	754.3	748.4	743.1	738.8
Transportation, Information, Utilities	634.8	638.7	641.2	647.6	656.7	666.7	677.0	686.6	695.0	702.9	710.1	713.5	715.6
Trade	1,489.2	1,497.1	1,504.4	1,513.0	1,524.2	1,534.9	1,544.7	1,555.0	1,563.4	1,573.3	1,583.6	1,593.2	1,600.8
Retail	1,036.7	1,041.4	1,047.2	1,055.3	1,063.1	1,070.5	1,076.9	1,083.9	1,091.3	1,099.8	1,108.8	1,117.3	1,124.8
Wholesale (including warehousing)	452.5	455.7	457.2	457.7	461.1	464.4	467.8	471.0	472.1	473.5	474.8	475.8	475.9
Restaurants	635.3	638.2	641.8	646.8	651.5	656.1	660.0	664.3	668.8	674.0	679.5	684.8	689.4
Finance, Insurance & Real Estate	457.1	455.6	455.4	454.7	455.9	458.3	460.0	461.7	464.6	467.9	469.9	472.2	474.9
Services	2,671.3	2,722.9	2,773.3	2,824.5	2,868.4	2,914.4	2,963.0	3,012.1	3,060.3	3,109.0	3,158.9	3,211.1	3,264.5
Accomodation	104.4	105.2	106.0	106.8	107.7	108.7	109.6	110.5	111.5	112.5	113.6	114.7	115.7
Personal & Laundry Services	83.5	83.4	83.6	84.0	84.5	85.0	85.5	86.0	86.6	87.1	87.7	88.2	88.6
Professional & Business Services	1,370.7	1,408.7	1,447.7	1,486.4	1,517.9	1,550.4	1,585.0	1,620.5	1,654.1	1,687.1	1,721.4	1,757.9	1,796.4
Health & Social Services	872.3	885.2	895.3	905.2	914.7	925.4	936.4	947.2	958.6	971.1	983.5	996.3	1,008.2
Misc. Services	240.5	240.4	240.8	242.1	243.6	245.0	246.4	247.9	249.6	251.1	252.6	254.1	255.5
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*	2.0%	1.9%	1.7%	1.7%	1.8%	1.8%	1.9%	1.9%	1.9%	2.0%	2.0%	2.0%	2.0%
Inflation--US Gross Domestic Product**	1.8%	1.8%	1.7%	1.6%	1.6%	1.6%	1.6%	1.6%	1.6%	1.7%	1.7%	1.7%	1.7%

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

** Chained Price Index--US GDP. Through 2020 from Global Insight Feb 2010 US forecast; after 2020 from Global Insight 3rd Quarter 2009 (12-4-09) US long-term forecast.