Triennial Cost Allocation Proceeding Workpapers

Southern California Gas Company

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Triennial Cost Allocation Proceeding

FORECAST OF REQUIREMENTS

The Gas Company

A Sempra Energy utility™

Triennial Cost Allocation Proceeding

CUSTOMER FORECAST

Southern California Gas Company: Customer Forecast

2013 TCAP

Southern California Gas Customer/Meter Forecast Models

SoCalGas uses econometric models to produce its customer/meter forecasts. The factor driving the residential market growth is residential new building permits. On the other hand, the commercial and industrial (manufacturing and Mining) customer growth is explained by commercial and industrial employment growth in SoCalGas' service area. The customer growth estimation was performed using the "Proc autoreg" method from Statistical Analysis System (SAS). The historical quarterly data used in the forecast is from 1980Q1 to 2008Q4 period.

Southern California Gas Company: Meter Model

Variable Definition

ActCom	Active--All Commercial Meter Counts
ActInd	Active--All Industrial Meter Counts
ActMF	Active--Residential Multi-Family Meter Counts
ActMM	Active--Residential Master-Metered Meter Counts
ActRES	Active--All Residential Meter Counts
ActSF	Active--Residential Single-Family Meter Counts
BldgMFO	Multi-family residential new building permits
BldgSFO	Single-family residential new building permits
BldgTTO	Total Residential new building permits
ConnCom	Connected--Commercial Meter Counts
ConnInd	Connected--Industrial Meter Counts
ConnMF	Connected--Residential Multi-Family Meter Counts
ConnMM	Connected--Residential Master-Metered Meter Counts
ConnRES	Connected--All Residential Meter Counts
ConnSF	Connected--Residential Single-Family Meter Counts
Diff(ConnSF)	ConnSF(t) - ConnSF(t-1)
Diff(ConnMF)	ConnMF(t) - ConnMF(t-1)
Dte	Date by quarter of the year
DUM8102	Dummy variable, =1 when dte=198102, =0 otherwise
DUM8601	Dummy variable, =1 when dte=198601, =0 otherwise
DUM9603	Dummy variable, =1 when dte=199603, =0 otherwise
DUM0303	Dummy variable, =1 when dte=200303, =0 otherwise
DUM0503	Dummy variable, =1 when dte=200503, =0 otherwise
DUM0708	Dummy variable, =1 when 200702<=dte<=200804, =0 otherwise
DUM9704	Dummy variable, =1 when dte=199704, =0 otherwise
EmpCom	"Commercial" employment in service area (all nonfarm--less mining and manufacturing)
EmpInd	"Industrial" employment in service area (mining plus manufacturing)
InactCom	Inactive--Commercial Meter Counts
InactIND	Inactive--Industrial Meter Counts
InactMF	Inactive--Residential Multi-Family Meter Counts
InactMM	Inactive--Residential Master-Metered Meter Counts
InactRES	Inactive--All Residential Meter Counts
InactSF	Inactive--Residential Single-Family Meter Counts
Ln(ConnCom)	Natural logarithm of ConnCom
Ln(ConnInd)	Natural logarithm of ConnInd
NETCG	Net Connected Meter Gain (Newsets+Resets-Removes)
NEWSETS	New Meter Sets
PCTINACTCOM	Proportion of connected commercial meters which are inactive (manually set factor)
PCTINACTIND	Proportion of conneced industrial meters which are inactive (manually set factor)
PCTINACTM	Proportion of connected multi-family meters which are inactive (manually set factor)
PCTINACTS	Proportion of connected single-family meters which are inactive (manually set factor)
REMOVES	Meters Removed
RESETS	Meters Re-set
RESETSSEAS	Meter Re-set Seasonal Pattern
SEA1	Seasonal Dummy - Spring
SEA2	Seasonal Dummy - Summer
SEA3	Seasonal Dummy - Fall
SEA4	Seasonal Dummy - Winter
TOTACT	Total Active Meter Counts
TOTCONN	Total Connected Meter ountrs
TOTINACT	Total Inactive Meter Counts

1) Residential Single Family

a. Connected Meter: ConnSF (1981Q1 to 2008Q4)

Diff (ConnSF) = 3529.931217 + 0.102119 * BldgSFO (t -1)
(2.165) (2.429)

+ 0.201534 * BldgSFO (t-2) + 0.130330 * BldgSFO (t -3)
(4.568) (2.495)

+ 840.200369 * SEA1 - 3658.788891 * DUM8102
(2.961) (-3.731)

+ 3076.658551 * DUM8601 - 7593.321779 * DUM9603
(3.248) (-8.158)

+ 4696.240901 * DUM0503 - 2148.215803 * DUM0708
(5.001) (-2.076)

* t-value is in the parenthesis.

SSE	1.2069E8	DFE	99
MSE	1219042	Root MSE	1104.102
Total Rsq	0.9243	Durbin-Watson	1.8287

b. In-Active Meter: InActSF

InActSF (Qi) = ConnSF (Qi) * PCTInactS(Qi)

Where i =1, 2, 3, and 4

Q1: 2.49%, Q2: 2.69%, Q3: 2.93% and Q4: 2.97%

c. Active Meter: ActSF

ActSF = ConnSF – InActSF

2) Residential Multi-Family

a. Connected Meter: ConnMF (1982Q1 to 2008Q4)

Diff (ConnMF) = 1130.231576 + 0.150927 * BldgMFO (t -2)
(0.979) (3.159)

+ 0.157683 * BldgMFO (t -3) + 0.178282 * BldgMFO (t -5)
(3.366) (3.972)

+ 0.166917 * BldgMFO (t -7) - 2885.261356 * DUM9603
(3.578) (-3.216)

+ 3564.290387 DUM0303
(3.939)

* t-value is in the parenthesis.

SSE	1.0942E8	DFE	97
MSE	1128048	Root MSE	1062.096
Total Rsq	0.9613	Durbin-Watson	2.1536

b. In-Active Meter: InActMF

InActMF (Qi) = ConnMF (Qi) * PCTInActM(Qi)

Where i =1, 2, 3, and 4

Q1: 5.23%, Q2: 5.41%, Q3: 5.90% and Q4: 6.10%

c. Active Meter: ActMF

ActMF = ConnMF – InActMF

3) **Residential Master Meter**

a. Master Meter: ConnMM

ConnMM (t) = (1-0.0084) * ConnMM (t-4)

b. Active Meter: ActMM

ActMM (t) = (1-0.0088) * ActMM (t-4)

c. In-Active Meter: InActMM

InActMM = ConnMM – ActMM

Total Residential Meter

ConnRES = ConnSF + ConnMF + ConnMM

ActReES = ActSF + ActMF + ActMM

InActRES = InActSF + InActMF + InActMM

4) Commercial Meter

a. Connected Meter: ConnCom (1981Q1 to 2008Q4)

Ln (ConnCom) = 8.839989 + 0.218525 * Ln (EmpCom (t -1))
(42.383) (13.352)

+ 0.180503 * Ln (EmpCom (t -2)) + 0.002267 * SEA1
(11.461) (2.752)

+ 0.003330 * SEA2 + 0.002612 * SEA3
(3.916) (3.681)

*t-value is in the parenthesis.

SSE	0.000689	DFE	103
MSE	6.694E-6	Root MSE	0.002587
Rsq	0.9985	Durbin-Watson	1.2938

b. In-Active Meter: InActCom

InActCom (Qi) = ConnCom (Qi) * PCTInactCom(Qi)

Where i = 1, 2, 3, and 4

Q1: 20.50%, Q2: 21.23%, Q3: 21.88% and Q4: 22.10%

c. Active Meter: ActCom

ActCom = ConnCom – InActCom

5) <u>Industrial Meter</u>

a. Connected Meter: ConnIND (1992Q1 to 2008Q4)

Ln (ConnInd) = 9.576290 + 0.099010 * Ln(EmpInd)
(40.590) (2.890)

- 0.011599 * DUM9704 – 0.001454* SEA3
(-4.780) (-2.061)

- 0.001951 * SEA4
(-2.703)

*t-value is in the parenthesis.

SSE	0.000665	DFE	62
MSE	0.000011	Root MSE	0.003274
Total Rsq	0.9032	Durbin-Watson	1.3268

b. In-active Meter: InActInd

InActInd (Qi) = ConnInd (Qi) * PCTInActInd(Qi)

Where i =1, 2, 3, and 4

Q1: 29.14%, Q2: 29.94%, Q3: 30.66% and Q4: 31.12%

c. Active Meter: ActInd

ActInd = ConnInd – InActInd

Aggregated Meter and Meter Gain

Total Connected Meter:
TotConn = ConnRes + ConnCom + ConnInd

Total Active Meter:
TotAct = ActRes + ActCom + ActInd

Total In-Active Meter:
TotInAct = InActRes + InActCom + InActInd

Net Connected Meter Gain:
NetCG = Diff (TotConn)

Meter Removed:
ReMoves = 0.0006 * TotConn

Meter Reset:
ReSets = Removes + ReSetsSeas

New Meter Sets:
NewSets = NetCG – ReSets + Removes

SoCalGas Connected Meter Forecast for 2013TCAP

Year	Connected SF	Connected MF	Connected MM	Connected Tot Res	Connected Com	Connected Ind	Connected Total
1980	2,522,092	1,090,214	24,357	3,636,663	189,442	29,890	3,855,995
1981	2,544,814	1,124,490	31,024	3,700,329	192,727	30,175	3,923,230
1982	2,560,854	1,153,825	32,759	3,747,438	196,013	30,098	3,973,549
1983	2,574,496	1,182,284	35,241	3,792,020	198,630	29,488	4,020,138
1984	2,596,748	1,215,455	36,982	3,849,185	200,941	29,203	4,079,329
1985	2,623,340	1,257,903	38,888	3,920,130	207,483	29,067	4,156,680
1986	2,659,716	1,314,005	40,461	4,014,182	208,344	28,438	4,250,964
1987	2,705,242	1,385,069	41,631	4,131,942	209,701	27,603	4,369,246
1988	2,754,749	1,454,026	43,080	4,251,856	211,495	27,301	4,490,652
1989	2,810,902	1,509,881	43,943	4,364,726	213,502	27,490	4,605,717
1990	2,864,996	1,553,537	44,265	4,462,798	212,425	28,905	4,704,128
1991	2,904,892	1,589,020	44,643	4,538,555	212,277	29,152	4,779,984
1992	2,937,305	1,611,826	45,269	4,594,400	211,617	28,344	4,834,362
1993	2,964,963	1,627,336	45,847	4,638,146	211,894	27,862	4,877,901
1994	2,994,232	1,636,076	46,122	4,676,430	214,923	28,040	4,919,393
1995	3,025,284	1,643,093	46,332	4,714,709	217,826	28,269	4,960,803
1996	3,061,418	1,653,357	46,417	4,761,192	218,876	28,215	5,008,283
1997	3,093,697	1,659,240	46,236	4,799,172	220,918	28,427	5,048,517
1998	3,130,605	1,664,720	46,064	4,841,389	223,349	28,937	5,093,675
1999	3,171,852	1,669,435	45,905	4,887,193	226,051	28,847	5,142,090
2000	3,216,122	1,674,027	45,607	4,935,755	228,320	28,725	5,192,800
2001	3,265,670	1,678,626	45,223	4,989,519	230,468	28,653	5,248,640
2002	3,318,980	1,684,653	44,899	5,048,532	232,864	28,323	5,309,720
2003	3,372,732	1,695,409	44,524	5,112,666	234,585	28,195	5,375,446
2004	3,429,816	1,710,554	44,160	5,184,529	236,312	28,309	5,449,150
2005	3,492,924	1,720,189	43,802	5,256,916	237,831	28,277	5,523,023
2006	3,555,620	1,734,729	43,337	5,333,686	239,463	28,207	5,601,356
2007	3,600,301	1,755,752	43,040	5,399,093	240,947	28,330	5,668,370
2008	3,625,746	1,776,760	42,699	5,445,205	242,314	28,502	5,716,020
2009	3,640,755	1,793,706	42,414	5,476,875	243,427	28,589	5,748,890
2010	3,653,320	1,807,003	42,186	5,502,509	243,937	28,641	5,775,086
2011	3,684,640	1,822,737	41,843	5,549,220	244,585	28,629	5,822,434
2012	3,722,895	1,842,226	41,494	5,606,614	244,588	28,659	5,879,861
2013	3,766,525	1,864,630	41,147	5,672,302	245,277	28,671	5,946,250
2014	3,813,085	1,892,186	40,803	5,746,074	246,148	28,661	6,020,883
2015	3,860,873	1,926,254	40,462	5,827,589	247,231	28,638	6,103,458
2016	3,909,075	1,965,617	40,124	5,914,815	248,531	28,617	6,191,962

Note: Years from 1980 to 2010: are recorded data; and
Years from 2011 to 2016: the forecasted meter counts were adjusted based on the recorded 2009 and 2010 data.

SoCalGas Active Meter Forecast for 2013TCAP

Year	Active SF	Active MF	Active MM	Active tot Res	Active Com	Active Ind	Active Total
1980	2,481,605	1,045,229	24,218	3,551,052	171,908	29,887	3,752,847
1981	2,507,007	1,079,570	30,857	3,617,434	174,157	30,174	3,821,765
1982	2,523,769	1,108,610	32,547	3,664,925	177,190	30,095	3,872,210
1983	2,532,579	1,134,228	34,970	3,701,777	177,859	29,486	3,909,122
1984	2,554,436	1,167,717	36,675	3,758,828	180,696	29,202	3,968,726
1985	2,581,520	1,206,708	38,554	3,826,783	187,006	29,065	4,042,854
1986	2,618,804	1,258,278	40,118	3,917,200	185,909	28,429	4,131,537
1987	2,665,714	1,320,553	41,270	4,027,537	187,423	27,590	4,242,549
1988	2,713,806	1,382,979	42,707	4,139,492	189,302	27,286	4,356,080
1989	2,767,384	1,437,461	43,555	4,248,400	191,337	27,189	4,466,926
1990	2,820,947	1,478,293	43,876	4,343,116	192,841	26,805	4,562,762
1991	2,860,021	1,502,559	44,259	4,406,839	192,545	26,031	4,625,415
1992	2,885,859	1,506,284	44,811	4,436,954	189,788	24,793	4,651,536
1993	2,903,272	1,501,832	45,288	4,450,392	188,081	24,122	4,662,596
1994	2,924,340	1,496,300	45,275	4,465,916	186,573	23,617	4,676,106
1995	2,952,715	1,504,445	45,372	4,502,531	185,635	23,292	4,711,458
1996	2,988,044	1,523,124	45,605	4,556,773	183,463	22,898	4,763,134
1997	3,018,440	1,536,022	45,380	4,599,841	181,886	22,583	4,804,311
1998	3,054,942	1,559,133	45,216	4,659,291	183,057	22,753	4,865,101
1999	3,103,998	1,582,528	45,104	4,731,630	185,146	22,523	4,939,300
2000	3,158,252	1,597,527	44,860	4,800,639	185,845	22,071	5,008,555
2001	3,210,899	1,604,796	44,487	4,860,183	187,676	21,859	5,069,718
2002	3,268,930	1,612,709	44,215	4,925,855	189,804	21,396	5,137,054
2003	3,322,120	1,621,230	43,861	4,987,211	190,114	20,848	5,198,173
2004	3,377,588	1,633,083	43,540	5,054,210	191,291	20,734	5,266,235
2005	3,434,786	1,637,608	43,177	5,115,570	192,270	20,590	5,328,430
2006	3,488,997	1,647,654	42,695	5,179,346	192,321	20,307	5,391,974
2007	3,524,381	1,665,905	42,386	5,232,672	192,862	20,257	5,445,791
2008	3,531,044	1,681,864	42,026	5,254,934	191,906	20,140	5,466,979
2009	3,547,653	1,681,251	41,710	5,270,615	190,000	19,699	5,480,314
2010	3,570,361	1,697,335	41,485	5,309,182	188,141	19,346	5,516,668
2011	3,595,695	1,719,548	41,189	5,356,431	191,083	19,765	5,567,279
2012	3,633,026	1,737,931	40,895	5,411,852	191,085	19,786	5,622,723
2013	3,675,604	1,759,064	40,603	5,475,270	191,623	19,794	5,686,687
2014	3,721,040	1,785,053	40,313	5,546,406	192,303	19,788	5,758,497
2015	3,767,674	1,817,187	40,026	5,624,886	193,149	19,771	5,837,806
2016	3,814,712	1,854,317	39,740	5,708,769	194,164	19,757	5,922,690

SoCalGas Data for 2013TCAP

DATE	BLdgSFO	BLdgMFO	BLdgTTO	EmpCom ('000)	EmpInd ('000)	ActMM	ActCom	ActInd	ActMF	ActRes	ActSF	ConMM
198001	8,131	9,501	17,632	4,221	1,206	23,296	173,655	29,945	1,037,994	3,533,941	2,472,651	23,415
198002	6,741	8,116	14,857	4,274	1,201	24,102	172,097	30,014	1,041,431	3,543,867	2,478,334	24,230
198003	9,956	10,746	20,702	4,222	1,184	24,546	169,644	29,643	1,043,594	3,549,830	2,481,689	24,697
198004	9,594	10,150	19,744	4,369	1,197	24,929	172,236	29,947	1,057,898	3,576,572	2,493,744	25,086
198101	6,372	8,701	15,073	4,329	1,186	31,579	175,632	30,504	1,072,483	3,608,559	2,504,497	31,743
198102	9,676	11,014	20,690	4,372	1,212	31,304	174,367	30,256	1,076,559	3,611,789	2,503,925	31,462
198103	6,970	5,169	12,139	4,307	1,215	29,962	172,022	29,902	1,078,044	3,612,724	2,504,718	30,131
198104	4,567	4,019	8,586	4,397	1,199	30,582	174,608	30,033	1,091,195	3,636,664	2,514,887	30,761
198201	3,126	4,235	7,361	4,312	1,157	31,608	178,996	30,466	1,104,139	3,658,304	2,522,557	31,782
198202	5,599	6,540	12,139	4,330	1,152	32,353	177,726	30,302	1,106,965	3,662,841	2,523,523	32,554
198203	4,870	5,781	10,651	4,254	1,141	32,855	174,644	29,749	1,106,280	3,660,581	2,521,446	33,081
198204	4,960	6,614	11,574	4,353	1,120	33,370	177,395	29,863	1,117,054	3,677,975	2,527,551	33,618
198301	5,871	8,792	14,663	4,317	1,115	34,187	179,985	30,084	1,128,021	3,694,455	2,532,247	34,436
198302	10,554	16,600	27,154	4,371	1,140	34,798	177,939	29,607	1,130,694	3,695,477	2,529,985	35,047
198303	11,502	11,918	23,420	4,310	1,151	35,248	175,196	29,053	1,132,083	3,696,772	2,529,441	35,534
198304	10,803	12,548	23,351	4,458	1,157	35,646	178,317	29,199	1,146,114	3,720,405	2,538,645	35,945
198401	12,823	14,788	27,611	4,445	1,156	36,193	181,432	29,619	1,160,271	3,744,971	2,548,507	36,487
198402	16,540	17,315	33,855	4,526	1,170	36,557	179,359	29,356	1,163,851	3,752,128	2,551,720	36,857
198403	16,012	12,872	28,884	4,560	1,179	36,760	177,994	28,795	1,165,279	3,755,147	2,553,108	37,078
198404	16,276	12,424	28,700	4,715	1,186	37,190	183,999	29,037	1,181,469	3,783,068	2,564,409	37,507
198501	15,866	13,991	29,857	4,704	1,167	37,774	189,323	29,678	1,197,646	3,810,517	2,575,098	38,077
198502	20,673	15,151	35,824	4,794	1,185	38,360	186,775	29,218	1,202,079	3,817,821	2,577,382	38,691
198503	27,504	13,423	40,927	4,798	1,196	38,852	184,468	28,543	1,207,655	3,828,173	2,581,666	39,205
198504	20,652	13,331	33,983	4,952	1,203	39,231	187,458	28,822	1,219,454	3,850,619	2,591,934	39,577
198601	22,920	15,259	38,179	4,909	1,194	39,720	189,650	29,332	1,243,939	3,893,499	2,609,840	40,046
198602	23,063	20,877	43,940	4,991	1,210	40,005	186,389	28,649	1,250,360	3,903,795	2,613,430	40,343
198603	22,014	18,124	40,138	4,989	1,221	40,247	182,863	27,912	1,258,323	3,916,592	2,618,022	40,614
198604	28,910	22,996	51,906	5,171	1,229	40,501	184,733	27,823	1,280,489	3,954,912	2,633,922	40,841
198701	20,009	19,298	39,307	5,115	1,215	40,826	190,574	28,347	1,302,803	3,995,536	2,651,907	41,155
198702	19,817	18,356	38,173	5,228	1,228	41,162	188,043	27,850	1,312,358	4,012,747	2,659,227	41,515
198703	16,537	17,353	33,890	5,176	1,236	41,404	184,712	27,136	1,322,235	4,031,152	2,667,513	41,784
198704	15,386	15,146	30,532	5,371	1,252	41,688	186,362	27,028	1,344,814	4,070,712	2,684,209	42,070
198801	12,829	19,419	32,248	5,348	1,251	42,125	193,364	28,016	1,368,689	4,111,630	2,700,817	42,480
198802	14,763	26,196	40,959	5,450	1,264	42,559	189,501	27,463	1,375,679	4,125,501	2,707,263	42,932
198803	14,899	21,680	36,579	5,433	1,262	42,956	186,425	26,836	1,383,026	4,141,255	2,715,273	43,329
198804	14,866	20,682	35,548	5,613	1,272	43,189	187,920	26,831	1,404,520	4,179,581	2,731,872	43,580
198901	10,885	20,393	31,278	5,561	1,260	43,391	194,649	27,845	1,426,757	4,222,026	2,751,878	43,759
198902	13,506	25,711	39,217	5,630	1,269	43,486	191,744	27,450	1,433,180	4,237,672	2,761,007	43,875
198903	9,709	22,518	32,227	5,578	1,259	43,620	188,764	26,723	1,437,164	4,250,622	2,769,838	44,022
198904	12,471	19,890	32,361	5,781	1,260	43,722	190,190	26,736	1,452,744	4,283,280	2,786,814	44,117
199001	10,228	16,021	26,249	5,727	1,236	43,795	195,521	27,459	1,469,487	4,319,686	2,806,404	44,180
199002	12,322	15,603	27,925	5,773	1,239	43,874	193,678	27,049	1,477,152	4,337,799	2,816,773	44,251
199003	5,694	10,670	16,364	5,718	1,225	43,875	190,725	26,424	1,477,648	4,345,044	2,823,521	44,282
199004	5,442	8,273	13,715	5,801	1,207	43,959	191,440	26,289	1,488,886	4,369,935	2,837,090	44,349
199101	3,961	7,748	11,709	5,668	1,167	44,067	195,816	26,806	1,500,306	4,396,466	2,852,093	44,430
199102	5,888	11,230	17,118	5,686	1,161	44,178	192,800	26,244	1,501,548	4,402,089	2,856,363	44,541
199103	4,115	8,981	13,096	5,629	1,148	44,331	190,390	25,597	1,501,017	4,406,958	2,861,610	44,702
199104	4,129	8,077	12,206	5,691	1,134	44,460	191,174	25,475	1,507,364	4,421,843	2,870,019	44,899
199201	2,686	8,540	11,226	5,524	1,098	44,659	194,234	25,572	1,511,631	4,438,190	2,881,900	45,110
199202	2,838	11,530	14,368	5,559	1,093	44,776	190,425	24,935	1,509,746	4,439,479	2,884,957	45,208
199203	2,800	8,340	11,140	5,504	1,081	44,881	187,121	24,407	1,501,504	4,431,619	2,885,233	45,321
199204	3,618	9,179	12,797	5,582	1,058	44,929	187,373	24,258	1,502,255	4,438,531	2,891,347	45,436
199301	2,149	8,400	10,549	5,480	1,032	45,095	192,344	24,799	1,509,962	4,456,201	2,901,144	45,599
199302	1,788	9,703	11,491	5,503	1,026	45,287	188,806	24,168	1,504,861	4,452,018	2,901,871	45,783
199303	1,798	7,593	9,391	5,478	1,018	45,391	185,433	23,757	1,494,730	4,441,120	2,900,999	45,974
199304	1,225	7,413	8,638	5,546	1,007	45,379	185,741	23,765	1,497,777	4,452,230	2,909,075	46,034
199401	1,620	8,711	10,331	5,493	990	45,293	189,533	24,061	1,501,719	4,467,000	2,919,988	46,039
199402	4,567	11,280	15,847	5,556	1,003	45,312	186,951	23,663	1,497,561	4,465,684	2,922,811	46,120
199403	2,137	9,106	11,243	5,548	1,007	45,281	184,468	23,364	1,489,713	4,458,251	2,923,257	46,156
199404	3,279	8,004	11,283	5,653	1,009	45,215	185,339	23,379	1,496,208	4,472,729	2,931,306	46,171
199501	1,932	6,861	8,793	5,606	1,002	45,232	188,744	23,741	1,503,171	4,493,203	2,944,800	46,200
199502	2,336	9,453	11,789	5,676	1,010	45,294	186,059	23,440	1,503,779	4,499,152	2,950,079	46,267
199503	1,920	9,123	11,043	5,651	1,014	45,434	184,028	23,066	1,501,523	4,500,409	2,953,451	46,394
199504	2,226	7,914	10,140	5,753	1,011	45,526	183,708	22,923	1,509,305	4,517,360	2,962,528	46,467
199601	2,251	8,060	10,311	5,682	1,016	45,628	185,874	23,175	1,521,741	4,544,977	2,977,608	46,470
199602	2,366	10,339	12,705	5,761	1,032	45,686	183,496	22,956	1,524,504	4,556,289	2,986,099	46,426
199603	1,590	9,473	11,063	5,734	1,036	45,587	181,701	22,686	1,518,795	4,552,726	2,988,345	46,403
199604	2,360	7,878	10,238	5,852	1,042	45,519	182,782	22,776	1,527,454	4,573,098	3,000,125	46,369
199701	1,761	8,502	10,263	5,818	1,040	45,466	184,554	23,014	1,537,124	4,593,585	3,010,996	46,302
199702	3,434	10,770	14,204	5,925	1,060	45,379	181,809	22,608	1,535,612	4,595,709	3,014,719	46,265
199703	2,724	10,538	13,262	5,901	1,071	45,380	180,213	22,353	1,531,641	4,595,433	3,018,413	46,232
199704	2,939	9,773	12,712	6,031	1,068	45,295	180,969	22,358	1,539,710	4,614,637	3,029,632	46,144

199801	1,664	9,439	11,103	5,997	1,074	45,304	184,313	22,975	1,552,596	4,642,333	3,044,433	46,138
199802	3,292	12,581	15,873	6,102	1,088	45,215	183,095	22,803	1,558,746	4,653,634	3,049,673	46,063
199803	3,084	11,856	14,940	6,105	1,084	45,190	181,986	22,581	1,557,412	4,657,881	3,055,279	46,070
199804	3,481	10,033	13,514	6,249	1,078	45,156	182,834	22,653	1,567,776	4,683,316	3,070,384	45,986
199901	3,316	10,872	14,188	6,197	1,062	45,141	185,911	22,866	1,579,502	4,711,782	3,087,139	45,941
199902	2,830	14,511	17,341	6,311	1,074	45,093	185,272	22,599	1,582,432	4,724,775	3,097,250	45,895
199903	3,933	12,238	16,171	6,323	1,071	45,091	184,391	22,339	1,580,597	4,732,846	3,107,158	45,909
199904	5,542	10,829	16,371	6,476	1,069	45,090	185,012	22,289	1,587,582	4,757,117	3,124,445	45,877
200001	5,351	10,492	15,843	6,424	1,062	45,009	187,065	22,394	1,596,479	4,783,335	3,141,847	45,763
200002	5,391	13,892	19,283	6,537	1,071	44,871	185,888	22,115	1,597,475	4,794,660	3,152,314	45,608
200003	4,252	12,298	16,550	6,514	1,073	44,820	184,558	21,844	1,594,370	4,800,050	3,160,859	45,569
200004	3,632	11,648	15,280	6,650	1,062	44,739	185,867	21,932	1,601,783	4,824,510	3,177,989	45,486
200101	4,587	12,609	17,196	6,631	1,051	44,651	188,600	22,199	1,608,491	4,848,704	3,195,562	45,353
200102	4,338	15,406	19,744	6,688	1,039	44,479	187,803	21,927	1,605,712	4,853,652	3,203,461	45,228
200103	3,436	12,830	16,266	6,627	1,017	44,412	186,703	21,679	1,599,657	4,856,912	3,212,843	45,186
200104	6,303	12,362	18,665	6,729	985	44,407	187,598	21,630	1,605,326	4,881,462	3,231,730	45,125
200201	4,197	12,631	16,828	6,656	962	44,367	190,614	21,742	1,613,507	4,909,394	3,251,520	45,045
200202	4,577	15,671	20,248	6,750	965	44,270	189,849	21,476	1,613,461	4,920,956	3,263,225	44,947
200203	6,277	16,712	22,989	6,695	953	44,153	189,150	21,237	1,609,426	4,926,280	3,272,701	44,850
200204	7,503	15,776	23,279	6,828	940	44,072	189,601	21,127	1,614,441	4,946,789	3,288,275	44,754
200301	7,084	17,538	24,622	6,735	923	44,006	191,116	21,184	1,618,408	4,968,702	3,306,288	44,691
200302	7,106	19,813	26,919	6,803	918	43,897	190,214	20,867	1,619,931	4,980,658	3,316,830	44,560
200303	4,863	17,193	22,056	6,755	911	43,776	189,309	20,673	1,620,392	4,988,299	3,324,131	44,451
200304	7,659	16,533	24,192	6,891	903	43,763	189,817	20,670	1,626,189	5,011,183	3,341,231	44,395
200401	7,824	19,654	27,478	6,834	900	43,703	192,352	20,910	1,634,655	5,039,238	3,360,880	44,299
200402	8,206	23,204	31,410	6,933	907	43,577	191,276	20,734	1,633,439	5,047,519	3,370,503	44,202
200403	6,971	19,835	26,806	6,891	908	43,454	190,237	20,584	1,629,435	5,053,248	3,380,359	44,096
200404	11,831	17,976	29,807	7,045	897	43,425	191,297	20,709	1,634,803	5,076,837	3,398,609	44,043
200501	6,238	19,294	25,532	6,981	889	43,352	193,383	21,017	1,640,393	5,100,901	3,417,155	43,949
200502	7,376	25,200	32,576	7,092	893	43,237	192,475	20,558	1,637,890	5,108,554	3,427,427	43,855
200503	7,725	24,603	32,328	7,070	894	43,143	191,563	20,387	1,633,767	5,116,843	3,439,933	43,786
200504	6,629	17,978	24,607	7,236	887	42,975	191,659	20,396	1,638,381	5,135,984	3,454,628	43,619
200601	9,261	18,716	27,977	7,195	885	42,863	193,017	20,672	1,645,822	5,162,385	3,473,701	43,497
200602	7,553	23,328	30,881	7,288	889	42,773	192,834	20,354	1,649,620	5,178,701	3,486,307	43,395
200603	6,550	13,602	20,152	7,249	888	42,603	191,607	20,103	1,644,433	5,178,505	3,491,469	43,272
200604	7,752	10,633	18,385	7,375	877	42,542	191,825	20,100	1,650,740	5,197,794	3,504,512	43,182
200701	7,713	12,288	20,001	7,296	870	42,520	194,375	20,455	1,662,142	5,225,228	3,520,565	43,140
200702	5,910	12,492	18,402	7,351	870	42,421	193,127	20,346	1,665,832	5,232,489	3,524,236	43,071
200703	7,664	7,915	15,579	7,298	870	42,318	191,843	20,123	1,664,141	5,230,094	3,524,100	43,018
200704	5,846	5,773	11,619	7,408	853	42,285	192,101	20,106	1,671,506	5,242,412	3,528,621	42,931
200801	4,728	4,421	9,149	7,269	840	42,207	193,912	20,397	1,681,412	5,257,468	3,533,850	42,845
200802	5,344	6,215	11,559	7,304	840	42,072	192,245	20,213	1,683,528	5,256,988	3,531,389	42,736
200803	3,411	3,940	7,351	7,166	835	41,951	190,856	20,028	1,680,646	5,250,571	3,527,974	42,645
200804	4,780	2,772	7,552	7,185	809	41,875	190,609	19,923	1,681,869	5,254,669	3,530,962	42,572
200901	3,743	2,518	6,260	7,109	803	41,783	191,757	20,008	1,685,200	5,268,718	3,541,735	42,482
200902	3,530	2,712	6,242	7,087	787	41,740	190,262	19,759	1,684,061	5,272,434	3,546,633	42,438
200903	3,669	3,397	7,066	6,949	768	41,674	189,256	19,590	1,676,356	5,265,381	3,547,351	42,396
200904	4,356	4,065	8,421	7,035	746	41,643	188,725	19,440	1,679,389	5,275,926	3,554,894	42,340
201001	5,021	5,553	10,574	7,046	753	41,599	189,781	19,565	1,690,235	5,297,499	3,565,665	42,287
201002	5,803	7,204	13,007	7,123	754	41,546	188,284	19,404	1,696,798	5,308,012	3,569,668	42,226
201003	6,145	8,085	14,230	7,059	753	41,428	187,159	19,219	1,697,647	5,309,477	3,570,402	42,150
201004	5,886	9,181	15,067	7,184	745	41,368	187,339	19,195	1,704,660	5,321,738	3,575,710	42,081
201101	5,978	10,423	16,401	7,199	761	41,302	192,775	20,033	1,721,121	5,344,860	3,582,437	41,985
201102	6,213	11,248	17,461	7,260	769	41,249	191,526	19,842	1,722,017	5,355,321	3,592,055	41,879
201103	6,612	12,271	18,883	7,167	773	41,133	190,457	19,645	1,717,120	5,356,307	3,598,055	41,791
201104	6,801	13,195	19,995	7,274	766	41,072	189,574	19,540	1,717,933	5,369,238	3,610,232	41,719
201201	7,129	13,885	21,014	7,289	784	41,007	192,742	20,054	1,738,550	5,397,007	3,617,450	41,634
201202	7,423	14,912	22,334	7,362	791	40,955	191,412	19,866	1,740,134	5,409,775	3,628,687	41,529
201203	7,766	15,742	23,507	7,282	792	40,839	190,439	19,666	1,735,872	5,412,866	3,636,155	41,441
201204	8,217	16,159	24,376	7,404	783	40,779	189,748	19,557	1,737,169	5,427,760	3,649,811	41,370
201301	9,092	16,469	25,561	7,419	799	40,714	193,133	20,068	1,758,592	5,457,687	3,658,380	41,286
201302	10,058	16,911	26,969	7,489	805	40,662	191,946	19,875	1,760,803	5,472,324	3,670,858	41,182
201303	10,849	17,385	28,234	7,402	804	40,548	191,037	19,673	1,757,285	5,477,158	3,679,325	41,095
201304	11,267	17,574	28,841	7,515	793	40,488	190,376	19,560	1,759,573	5,493,913	3,693,852	41,024
201401	11,710	17,763	29,473	7,527	807	40,424	193,776	20,067	1,782,500	5,525,973	3,703,050	40,941
201402	12,247	17,877	30,124	7,592	811	40,372	192,605	19,870	1,786,066	5,542,551	3,716,112	40,837
201403	12,878	18,057	30,935	7,499	809	40,258	191,731	19,664	1,783,934	5,549,220	3,725,028	40,752
201404	13,608	18,175	31,782	7,608	797	40,199	191,098	19,549	1,787,713	5,567,881	3,739,969	40,682
201501	14,004	18,240	32,244	7,623	810	40,135	194,534	20,055	1,812,459	5,601,993	3,749,399	40,599
201502	14,226	18,322	32,548	7,689	812	40,084	193,415	19,855	1,817,575	5,620,346	3,762,687	40,496
201503	14,434	18,462	32,896	7,598	810	39,971	192,608	19,646	1,816,803	5,628,514	3,771,741	40,411
201504	14,580	18,400	32,980	7,710	798	39,912	192,037	19,529	1,821,909	5,648,692	3,786,871	40,342
201601	14,736	18,373	33,109	7,721	811	39,849	195,552	20,035	1,848,250	5,684,478	3,796,380	40,260
201602	14,620	18,303	32,924	7,784	815	39,798	194,445	19,838	1,854,399	5,703,955	3,809,757	40,158
201603	14,632	18,249	32,881	7,688	813	39,686	193,622	19,633	1,854,395	5,712,873	3,818,792	40,073
201604	14,662	18,133	32,794	7,797	802	39,628	193,037	19,520	1,860,225	5,733,772	3,833,919	40,004

SoCalGas Data for 2013TCAP

DATE	ConCom	ConInd	ConMF	ConRes	ConSF	InactMM	InactCom	InactInd	InactMF	InactRes	InactSF
198001	187,947	29,949	1,076,885	3,609,899	2,509,598	119	14,292	4	38,891	75,958	36,947
198002	189,288	30,018	1,085,343	3,627,683	2,518,110	128	17,191	3	43,912	83,816	39,776
198003	189,860	29,646	1,094,447	3,645,414	2,526,270	151	20,216	3	50,852	95,584	44,581
198004	190,673	29,948	1,104,182	3,663,657	2,534,389	157	18,437	2	46,283	87,085	40,645
198101	191,756	30,504	1,113,039	3,685,041	2,540,259	163	16,123	0	40,556	76,481	35,762
198102	192,842	30,256	1,120,924	3,694,032	2,541,646	157	18,475	1	44,365	82,243	37,721
198103	193,137	29,903	1,128,137	3,703,942	2,545,674	169	21,116	1	50,093	91,218	40,956
198104	193,171	30,035	1,135,861	3,718,300	2,551,678	179	18,563	2	44,666	81,636	36,791
198201	195,127	30,468	1,143,617	3,731,531	2,556,132	174	16,131	2	39,478	73,227	33,576
198202	196,109	30,304	1,150,513	3,742,658	2,559,591	201	18,383	2	43,548	79,817	36,068
198203	196,181	29,752	1,157,101	3,752,250	2,562,068	226	21,537	3	50,821	91,669	40,622
198204	196,634	29,867	1,164,070	3,763,314	2,565,626	248	19,239	4	47,016	85,339	38,075
198301	197,766	30,090	1,171,468	3,774,855	2,568,951	249	17,781	6	43,447	80,400	36,704
198302	198,576	29,610	1,178,057	3,784,431	2,571,326	249	20,637	3	47,363	88,954	41,342
198303	198,967	29,054	1,185,677	3,797,322	2,576,111	286	23,772	1	53,594	100,550	46,670
198304	199,210	29,199	1,193,933	3,811,473	2,581,594	299	20,893	0	47,819	91,068	42,949
198401	199,562	29,619	1,202,899	3,827,374	2,587,988	294	18,131	-	42,628	82,403	39,481
198402	199,640	29,357	1,210,847	3,841,796	2,594,092	300	20,280	1	46,996	89,668	42,372
198403	200,945	28,796	1,219,044	3,855,409	2,599,287	319	22,951	1	53,765	100,262	46,179
198404	203,617	29,038	1,229,031	3,872,161	2,605,623	317	19,619	1	47,562	89,093	41,214
198501	206,126	29,678	1,240,563	3,891,179	2,612,539	303	16,804	0	42,917	80,662	37,441
198502	207,173	29,218	1,252,269	3,909,929	2,618,969	331	20,398	1	50,190	92,107	41,587
198503	208,667	28,547	1,264,693	3,931,109	2,627,211	353	24,199	4	57,038	102,936	45,545
198504	207,966	28,825	1,274,087	3,948,303	2,634,639	347	20,507	3	54,633	97,685	42,705
198601	207,892	29,337	1,291,752	3,977,948	2,646,149	326	18,242	5	47,813	84,448	36,309
198602	208,707	28,658	1,304,602	3,998,769	2,653,824	338	22,318	9	54,243	94,974	40,393
198603	208,638	27,923	1,321,020	4,025,542	2,663,907	367	25,775	11	62,697	108,950	45,886
198604	208,138	27,834	1,338,645	4,054,471	2,674,985	340	23,405	11	58,156	99,559	41,063
198701	209,297	28,359	1,357,743	4,086,916	2,688,018	329	18,723	12	54,940	91,380	36,111
198702	210,135	27,864	1,375,695	4,115,974	2,698,764	354	22,092	14	63,337	103,228	39,537
198703	210,053	27,149	1,393,988	4,146,352	2,710,580	380	25,342	14	71,753	115,200	43,067
198704	209,320	27,039	1,412,851	4,178,526	2,723,605	382	22,958	12	68,037	107,815	39,396
198801	211,115	28,026	1,431,008	4,209,742	2,736,255	355	17,751	10	62,319	98,112	35,438
198802	211,878	27,478	1,446,245	4,236,806	2,747,629	374	22,377	15	70,566	111,305	40,366
198803	211,737	26,853	1,461,772	4,265,413	2,760,311	373	25,312	17	78,747	124,158	45,038
198804	211,251	26,845	1,477,080	4,295,463	2,774,803	391	23,331	14	72,559	115,882	42,932
198901	213,036	27,854	1,491,608	4,325,396	2,790,029	368	18,387	9	64,851	103,370	38,151
198902	214,071	27,462	1,503,773	4,351,224	2,803,576	389	22,327	12	70,593	113,551	42,569
198903	213,857	27,087	1,516,455	4,378,240	2,817,763	402	25,093	364	79,291	127,618	47,926
198904	213,043	27,555	1,527,687	4,404,043	2,832,238	395	22,852	818	74,943	120,762	45,425
199001	213,256	28,605	1,538,257	4,429,540	2,847,103	385	17,735	1,146	68,770	109,854	40,699
199002	212,932	28,943	1,548,197	4,451,879	2,859,431	377	19,254	1,893	71,045	114,081	42,659
199003	212,146	29,004	1,558,661	4,474,196	2,871,253	407	21,421	2,580	81,014	129,152	47,732
199004	211,367	29,070	1,569,031	4,495,575	2,882,195	390	19,926	2,781	80,144	125,640	45,105
199101	212,776	29,359	1,578,685	4,515,838	2,892,723	364	16,961	2,553	78,379	119,372	40,629
199102	212,479	29,325	1,585,226	4,529,316	2,899,549	363	19,679	3,082	83,678	127,227	43,186
199103	212,028	29,086	1,592,815	4,547,067	2,909,550	372	21,638	3,489	91,798	140,109	47,939
199104	211,826	28,838	1,599,356	4,561,999	2,917,745	439	20,652	3,363	91,992	140,156	47,726
199201	212,836	28,614	1,605,648	4,578,511	2,927,753	451	18,601	3,042	94,017	140,321	45,853
199202	212,521	28,520	1,609,530	4,588,493	2,933,755	432	22,096	3,584	99,784	149,014	48,798
199203	211,168	28,292	1,614,333	4,600,253	2,940,598	440	24,046	3,885	112,829	168,634	55,365
199204	209,945	27,952	1,617,793	4,610,344	2,947,115	507	22,572	3,693	115,539	171,814	55,768
199301	211,971	27,984	1,622,983	4,623,722	2,955,141	503	19,627	3,184	113,021	167,521	53,997
199302	212,034	27,801	1,625,981	4,633,091	2,961,327	496	23,229	3,633	121,121	181,073	59,457
199303	211,703	27,815	1,628,994	4,642,760	2,967,791	584	26,269	4,058	134,264	201,640	66,793
199304	211,866	27,847	1,631,384	4,653,009	2,975,591	655	26,126	4,082	133,607	200,779	66,517
199401	213,927	27,906	1,633,936	4,663,896	2,983,921	745	24,394	3,845	132,217	196,896	63,934
199402	214,869	28,018	1,635,446	4,672,323	2,990,756	808	27,918	4,355	137,885	206,639	67,945
199403	215,040	28,102	1,636,299	4,680,520	2,998,066	875	30,572	4,738	146,586	222,269	74,809
199404	215,855	28,133	1,638,623	4,688,980	3,004,186	957	30,516	4,755	142,415	216,252	72,880
199501	217,670	28,240	1,639,364	4,699,545	3,013,981	968	28,926	4,500	136,192	206,342	69,181
199502	217,826	28,348	1,641,896	4,709,878	3,021,715	973	31,767	4,908	138,117	210,727	71,637
199503	217,793	28,282	1,644,230	4,719,551	3,028,927	960	33,764	5,216	142,707	219,143	75,476
199504	218,014	28,205	1,646,880	4,729,862	3,036,514	941	34,305	5,282	137,575	212,502	73,986
199601	218,640	28,140	1,650,665	4,745,530	3,048,395	841	32,766	4,965	128,924	200,553	70,787
199602	218,594	28,179	1,653,824	4,761,408	3,061,158	740	35,098	5,223	129,319	205,118	75,059
199603	218,830	28,258	1,653,652	4,763,704	3,063,648	817	37,129	5,572	134,857	210,977	75,303
199604	219,440	28,284	1,655,288	4,774,126	3,072,469	850	36,657	5,509	127,834	201,029	72,345
199701	220,479	28,407	1,657,156	4,784,404	3,080,946	836	35,926	5,393	120,032	190,818	69,950
199702	220,864	28,455	1,658,583	4,793,847	3,088,999	886	39,055	5,847	122,971	198,138	74,280
199703	221,120	28,517	1,659,839	4,803,629	3,097,558	853	40,907	6,163	128,198	208,195	79,145
199704	221,208	28,331	1,661,381	4,814,809	3,107,284	849	40,239	5,974	121,671	200,172	77,652

199801	222,737	28,842	1,663,079	4,826,113	3,116,896	834	38,423	5,867	110,483	183,780	72,464
199802	223,102	28,939	1,664,297	4,836,096	3,125,735	848	40,007	6,136	105,551	182,461	76,062
199803	223,543	28,970	1,665,237	4,846,087	3,134,780	880	41,556	6,390	107,825	188,206	79,501
199804	224,016	28,997	1,666,266	4,857,260	3,145,007	831	41,182	6,344	98,490	173,943	74,623
199901	225,169	28,939	1,667,744	4,869,520	3,155,835	799	39,259	6,073	88,242	157,737	68,696
199902	225,792	28,832	1,668,939	4,881,087	3,166,253	802	40,521	6,233	86,507	156,312	69,003
199903	226,291	28,833	1,669,901	4,892,684	3,176,875	818	41,900	6,495	89,304	159,839	69,717
199904	226,952	28,783	1,671,157	4,905,479	3,188,446	787	41,940	6,494	83,574	148,362	64,001
200001	227,898	28,745	1,672,110	4,917,648	3,199,775	754	40,833	6,350	75,631	134,313	57,928
200002	228,203	28,725	1,673,490	4,929,245	3,210,148	737	42,315	6,610	76,015	134,585	57,834
200003	228,299	28,706	1,674,705	4,940,921	3,220,647	749	43,741	6,861	80,335	140,872	59,787
200004	228,881	28,725	1,675,802	4,955,205	3,233,917	748	43,013	6,793	74,019	130,695	55,928
200101	229,826	28,732	1,676,450	4,968,449	3,246,646	702	41,226	6,534	67,960	119,745	51,084
200102	230,307	28,656	1,677,728	4,981,854	3,258,898	749	42,504	6,728	72,016	128,202	55,437
200103	230,583	28,623	1,679,462	4,996,289	3,271,641	774	43,880	6,944	79,805	139,377	58,798
200104	231,156	28,602	1,680,863	5,011,483	3,285,495	719	43,557	6,973	75,537	130,021	53,765
200201	232,152	28,481	1,682,493	5,027,317	3,299,778	679	41,538	6,739	68,986	117,923	48,258
200202	232,680	28,343	1,684,068	5,041,293	3,312,278	677	42,831	6,867	70,607	120,337	49,053
200203	233,049	28,266	1,685,287	5,054,914	3,324,776	698	43,899	7,029	75,861	128,634	52,075
200204	233,576	28,201	1,686,762	5,070,605	3,339,089	682	43,975	7,075	72,321	123,817	50,814
200301	234,176	28,179	1,688,173	5,087,363	3,354,499	685	43,060	6,995	69,765	118,661	48,211
200302	234,430	28,157	1,691,800	5,102,799	3,366,439	663	44,215	7,291	71,869	122,141	49,609
200303	234,653	28,195	1,698,946	5,120,930	3,377,532	675	45,344	7,522	78,554	132,631	53,401
200304	235,080	28,250	1,702,718	5,139,572	3,392,458	632	45,262	7,580	76,529	128,389	51,227
200401	235,942	28,341	1,706,683	5,158,231	3,407,249	596	43,590	7,431	72,028	118,993	46,368
200402	236,150	28,260	1,709,744	5,175,548	3,421,602	625	44,874	7,526	76,305	128,029	51,099
200403	236,379	28,286	1,711,623	5,192,624	3,436,905	643	46,142	7,703	82,188	139,376	56,545
200404	236,775	28,349	1,714,166	5,211,715	3,453,507	618	45,478	7,640	79,363	134,878	54,898
200501	237,307	28,463	1,716,613	5,229,466	3,468,904	597	43,924	7,446	76,220	128,565	51,749
200502	237,764	28,205	1,718,240	5,245,507	3,483,412	618	45,289	7,646	80,350	136,953	55,985
200503	238,002	28,207	1,721,898	5,267,964	3,502,280	643	46,438	7,820	88,130	151,121	62,347
200504	238,249	28,232	1,724,006	5,284,726	3,517,101	644	46,590	7,835	85,626	148,742	62,473
200601	238,774	28,381	1,728,103	5,305,737	3,534,137	634	45,757	7,709	82,281	143,352	60,436
200602	239,380	28,185	1,732,341	5,325,124	3,549,389	622	46,546	7,831	82,720	146,423	63,081
200603	239,694	28,113	1,736,811	5,342,860	3,562,776	669	48,087	8,010	92,378	164,355	71,307
200604	240,001	28,149	1,741,663	5,361,024	3,576,179	640	48,177	8,050	90,923	163,230	71,668
200701	240,569	28,270	1,748,077	5,379,414	3,588,197	619	46,194	7,815	85,935	154,186	67,632
200702	240,764	28,366	1,753,258	5,392,644	3,596,315	649	47,636	8,020	87,426	160,154	72,079
200703	240,970	28,341	1,758,177	5,405,490	3,604,296	699	49,127	8,218	94,036	175,396	80,196
200704	241,485	28,342	1,763,497	5,418,824	3,612,396	645	49,384	8,236	91,991	176,412	83,776
200801	242,084	28,444	1,768,672	5,430,253	3,618,736	638	48,172	8,047	87,260	172,784	84,886
200802	242,168	28,497	1,773,994	5,440,026	3,623,296	664	49,923	8,284	90,466	183,037	91,908
200803	242,338	28,518	1,779,737	5,450,581	3,628,198	694	51,482	8,489	99,091	200,010	100,224
200804	242,664	28,547	1,784,639	5,459,921	3,632,752	696	52,056	8,624	102,770	205,252	101,790
200901	243,245	28,583	1,787,967	5,466,701	3,636,252	698	51,488	8,575	102,768	197,983	94,517
200902	243,471	28,595	1,792,067	5,473,407	3,638,903	698	53,209	8,836	108,006	200,973	92,269
200903	243,402	28,593	1,795,984	5,480,582	3,642,202	722	54,146	9,003	119,628	215,201	94,851
200904	243,589	28,584	1,798,805	5,486,808	3,645,663	697	54,864	9,143	119,417	210,882	90,769
201001	243,806	28,615	1,802,483	5,493,637	3,648,867	688	54,025	9,050	112,248	196,138	83,201
201002	243,905	28,662	1,805,613	5,499,719	3,651,880	680	55,621	9,258	108,815	191,707	82,211
201003	243,942	28,647	1,808,846	5,505,856	3,654,860	722	56,783	9,428	111,199	196,378	84,458
201004	244,093	28,639	1,811,071	5,510,824	3,657,672	713	56,754	9,444	106,411	189,086	81,962
201101	244,251	28,608	1,816,096	5,530,107	3,672,025	683	51,476	8,575	94,975	185,247	89,588
201102	244,786	28,656	1,820,420	5,542,435	3,680,136	630	53,260	8,814	98,403	187,114	88,081
201103	244,978	28,632	1,824,816	5,555,313	3,688,706	658	54,521	8,987	107,697	199,006	90,651
201104	244,323	28,619	1,829,614	5,569,027	3,697,694	646	54,750	9,079	111,681	199,789	87,462
201201	244,208	28,637	1,834,487	5,584,035	3,707,914	627	51,467	8,583	95,937	187,028	90,464
201202	244,640	28,690	1,839,572	5,598,767	3,717,666	574	53,229	8,824	99,438	188,992	88,979
201203	244,955	28,663	1,844,745	5,613,952	3,727,766	602	54,516	8,997	108,873	201,086	91,611
201204	244,548	28,644	1,850,101	5,629,703	3,738,232	591	54,800	9,087	112,932	201,943	88,421
201301	244,704	28,657	1,855,636	5,646,789	3,749,867	572	51,571	8,589	97,043	189,102	91,487
201302	245,323	28,704	1,861,423	5,663,476	3,760,872	519	53,377	8,829	100,620	191,152	90,013
201303	245,724	28,673	1,867,502	5,680,620	3,772,023	547	54,687	9,000	110,216	203,462	92,699
201304	245,357	28,649	1,873,961	5,698,325	3,783,339	536	54,981	9,089	114,388	204,412	89,488
201401	245,520	28,656	1,880,862	5,717,458	3,795,654	518	51,743	8,589	98,362	191,484	92,604
201402	246,166	28,696	1,888,130	5,736,202	3,807,235	465	53,560	8,826	102,063	193,652	91,123
201403	246,617	28,660	1,895,822	5,755,451	3,818,878	493	54,886	8,996	111,888	206,231	93,850
201404	246,287	28,632	1,903,930	5,775,186	3,830,574	482	55,190	9,084	116,217	207,305	90,605
201501	246,480	28,638	1,912,475	5,796,236	3,843,162	464	51,946	8,584	100,016	194,243	93,763
201502	247,201	28,674	1,921,439	5,816,887	3,854,952	412	53,786	8,819	103,864	196,541	92,265
201503	247,746	28,634	1,930,752	5,837,930	3,866,768	440	55,137	8,988	113,949	209,416	95,027
201504	247,498	28,604	1,940,350	5,859,303	3,878,612	429	55,461	9,074	118,441	210,611	91,741
201601	247,769	28,610	1,950,240	5,881,818	3,891,318	411	52,217	8,575	101,991	197,340	94,938
201602	248,517	28,651	1,960,367	5,903,702	3,903,177	360	54,072	8,812	105,968	199,747	93,419
201603	249,050	28,615	1,970,701	5,925,779	3,915,005	388	55,427	8,982	116,307	212,907	96,212
201604	248,786	28,590	1,981,157	5,947,962	3,926,800	377	55,750	9,070	120,931	214,189	92,881

SoCalGas Data for 2013TCAP

DATE	NetCG	NewSets	ReMoves	RESETSSEAS	RESETS	TotAct	TotConn	TotInAct	SEA1	SEA2	SEA3	SEA4
198001	18,882	21,333	6,168	-2451	3,717	3,737,541	3,827,795	90,254	1	0	0	0
198002	16,979	19,338	5,325	-2359	2,966	3,745,978	3,846,989	101,011	0	1	0	0
198003	18,471	21,939	6,213	-3468	2,745	3,749,117	3,864,920	115,804	0	0	1	0
198004	20,471	23,129	6,838	-2658	4,180	3,778,754	3,884,278	105,524	0	0	0	1
198101	14,008	17,155	7,014	-3147	3,867	3,814,695	3,907,300	92,605	1	0	0	0
198102	14,319	17,792	6,374	-3473	2,901	3,816,412	3,917,131	100,719	0	1	0	0
198103	11,874	15,765	6,503	-3891	2,612	3,814,648	3,926,983	112,335	0	0	1	0
198104	14,788	17,992	7,857	-3204	4,653	3,841,305	3,941,506	100,201	0	0	0	1
198201	12,809	14,145	5,968	-1336	4,632	3,867,765	3,957,126	89,360	1	0	0	0
198202	10,248	13,200	6,450	-2952	3,498	3,870,869	3,969,071	98,202	0	1	0	0
198203	9,699	12,069	5,943	-2370	3,573	3,864,975	3,978,183	113,209	0	0	1	0
198204	14,209	14,432	5,880	-223	5,657	3,885,233	3,989,815	104,582	0	0	0	1
198301	11,402	12,333	5,656	-931	4,725	3,904,524	4,002,711	98,187	1	0	0	0
198302	12,046	13,791	5,807	-1745	4,062	3,903,023	4,012,616	109,594	0	1	0	0
198303	12,172	15,318	6,524	-3146	3,378	3,901,021	4,025,344	124,323	0	0	1	0
198304	17,156	18,075	7,401	-919	6,482	3,927,921	4,039,882	111,961	0	0	0	1
198401	12,907	16,273	8,553	-3366	5,187	3,956,022	4,056,556	100,534	1	0	0	0
198402	15,177	18,922	7,951	-3745	4,206	3,960,843	4,070,793	109,950	0	1	0	0
198403	15,746	19,212	7,989	-3466	4,523	3,961,936	4,085,150	123,215	0	0	1	0
198404	24,112	23,271	6,610	841	7,451	3,996,103	4,104,816	108,713	0	0	0	1
198501	22,347	21,723	5,256	624	5,880	4,029,518	4,126,984	97,466	1	0	0	0
198502	23,237	23,988	5,173	-751	4,422	4,033,814	4,146,320	112,506	0	1	0	0
198503	25,459	26,327	5,529	-868	4,661	4,041,185	4,168,323	127,138	0	0	1	0
198504	24,745	26,484	8,607	-1739	6,868	4,066,899	4,185,094	118,195	0	0	0	1
198601	21,092	23,674	7,589	-2582	5,007	4,112,482	4,215,177	102,695	1	0	0	0
198602	22,754	27,267	8,577	-4513	4,064	4,118,833	4,236,134	117,302	0	1	0	0
198603	28,026	32,856	8,879	-4830	4,049	4,127,366	4,262,103	134,736	0	0	1	0
198604	32,952	36,766	9,399	-3814	5,585	4,167,468	4,290,443	122,975	0	0	0	1
198701	29,255	32,092	8,787	-2837	5,950	4,214,456	4,324,572	110,116	1	0	0	0
198702	30,430	34,815	7,849	-4385	3,464	4,228,639	4,353,973	125,334	0	1	0	0
198703	30,979	35,697	8,427	-4718	3,709	4,243,000	4,383,555	140,555	0	0	1	0
198704	34,402	36,794	8,922	-2392	6,530	4,284,102	4,414,886	130,784	0	0	0	1
198801	27,789	30,892	7,830	-3103	4,727	4,333,010	4,448,883	115,873	1	0	0	0
198802	28,650	33,237	8,280	-4587	3,693	4,342,465	4,476,162	133,697	0	1	0	0
198803	28,392	33,102	8,277	-4710	3,567	4,354,515	4,504,003	149,487	0	0	1	0
198804	32,238	34,047	7,600	-1809	5,791	4,394,332	4,533,559	139,228	0	0	0	1
198901	27,984	30,177	7,593	-2193	5,400	4,444,520	4,566,286	121,766	1	0	0	0
198902	25,978	29,854	7,053	-3876	3,177	4,456,866	4,592,757	135,890	0	1	0	0
198903	26,100	31,020	8,160	-4920	3,240	4,466,109	4,619,184	153,075	0	0	1	0
198904	28,781	31,416	7,957	-2635	5,322	4,500,207	4,644,640	144,433	0	0	0	1
199001	21,933	26,991	9,753	-5058	4,695	4,542,666	4,671,402	128,736	1	0	0	0
199002	22,511	26,826	7,675	-4315	3,360	4,558,526	4,693,754	135,228	0	1	0	0
199003	19,675	24,351	7,806	-4676	3,130	4,562,193	4,715,345	153,153	0	0	1	0
199004	23,239	25,054	7,441	-1815	5,626	4,587,665	4,736,011	148,347	0	0	0	1
199101	16,571	18,875	6,942	-2304	4,638	4,619,088	4,757,973	138,885	1	0	0	0
199102	14,431	19,436	8,533	-5005	3,528	4,621,133	4,771,120	149,987	0	1	0	0
199103	15,285	18,929	7,126	-3644	3,482	4,622,945	4,788,180	165,235	0	0	1	0
199104	17,621	18,578	6,406	-957	5,449	4,638,493	4,802,664	164,171	0	0	0	1
199201	10,803	13,365	7,265	-2562	4,703	4,657,996	4,819,961	161,965	1	0	0	0
199202	10,394	14,397	7,483	-4003	3,480	4,654,839	4,829,533	174,694	0	1	0	0
199203	9,561	13,417	7,342	-3856	3,486	4,643,147	4,839,713	196,566	0	0	1	0
199204	14,206	14,748	7,087	-542	6,545	4,650,162	4,848,241	198,079	0	0	0	1
199301	9,499	10,867	6,323	-1368	4,955	4,673,344	4,863,677	190,332	1	0	0	0
199302	9,802	11,402	5,050	-1600	3,450	4,664,992	4,872,927	207,935	0	1	0	0
199303	9,932	11,662	5,190	-1730	3,460	4,650,310	4,882,278	231,967	0	0	1	0
199304	13,754	13,116	4,345	638	4,983	4,661,736	4,892,722	230,987	0	0	0	1
199401	8,993	9,823	5,057	-830	4,227	4,680,595	4,905,730	225,135	1	0	0	0
199402	9,261	10,536	4,260	-1275	2,985	4,676,298	4,915,210	238,912	0	1	0	0
199403	9,157	11,051	4,511	-1894	2,617	4,666,084	4,923,663	257,579	0	0	1	0
199404	13,981	12,132	2,581	1849	4,430	4,681,447	4,932,969	251,522	0	0	0	1
199501	9,077	9,161	3,723	-84	3,639	4,705,688	4,945,455	239,767	1	0	0	0
199502	9,196	9,927	4,400	-731	3,669	4,708,650	4,956,052	247,402	0	1	0	0
199503	9,693	10,272	4,023	-579	3,444	4,707,503	4,965,626	258,123	0	0	1	0
199504	11,941	11,658	3,360	283	3,643	4,723,991	4,976,080	252,090	0	0	0	1
199601	9,693	9,801	3,450	-108	3,342	4,754,027	4,992,310	238,283	1	0	0	0
199602	11,189	10,995	2,901	194	3,095	4,762,742	5,008,181	245,439	0	1	0	0
199603	12,053	12,207	3,089	-154	2,935	4,757,113	5,010,792	253,678	0	0	1	0
199604	12,266	11,669	2,475	597	3,072	4,778,656	5,021,850	243,195	0	0	0	1
199701	10,301	10,289	2,834	12	2,846	4,801,153	5,033,290	232,137	1	0	0	0
199702	9,694	10,146	2,706	-452	2,254	4,800,126	5,043,165	243,039	0	1	0	0
199703	10,319	10,955	2,734	-636	2,098	4,798,000	5,053,265	255,265	0	0	1	0
199704	13,383	12,493	2,051	890	2,941	4,817,963	5,064,348	246,385	0	0	0	1

199801	10,629	10,536	2,522	93	2,615	4,849,621	5,077,692	228,071	1	0	0	0
199802	10,412	11,169	2,661	-757	1,904	4,859,532	5,088,136	228,604	0	1	0	0
199803	10,295	11,233	2,737	-938	1,799	4,862,448	5,098,600	236,152	0	0	1	0
199804	13,592	13,225	2,225	367	2,592	4,888,804	5,110,273	221,469	0	0	0	1
199901	11,704	11,882	2,513	-178	2,335	4,920,559	5,123,628	203,069	1	0	0	0
199902	12,335	12,799	1,999	-464	1,535	4,932,646	5,135,711	203,065	0	1	0	0
199903	12,165	12,869	2,362	-704	1,658	4,939,575	5,147,808	208,233	0	0	1	0
199904	14,382	14,610	2,069	-228	1,841	4,964,418	5,161,214	196,796	0	0	0	1
200001	11,359	11,798	2,244	-439	1,805	4,992,795	5,174,291	181,496	1	0	0	0
200002	11,455	12,572	2,619	-1117	1,502	5,002,663	5,186,173	183,510	0	1	0	0
200003	12,286	13,250	2,435	-964	1,471	5,006,452	5,197,926	191,474	0	0	1	0
200004	16,382	16,715	2,198	-333	1,865	5,032,310	5,212,811	180,501	0	0	0	1
200101	11,915	12,500	2,228	-585	1,643	5,059,503	5,227,008	167,505	1	0	0	0
200102	14,682	15,585	2,359	-903	1,456	5,063,383	5,240,817	177,435	0	1	0	0
200103	14,230	15,128	2,111	-898	1,213	5,065,294	5,255,495	190,201	0	0	1	0
200104	16,638	16,683	2,011	-45	1,966	5,090,690	5,271,241	180,551	0	0	0	1
200201	14,761	15,029	2,260	-268	1,992	5,121,750	5,287,950	166,200	1	0	0	0
200202	13,966	14,585	2,400	-619	1,781	5,132,281	5,302,316	170,034	0	1	0	0
200203	14,252	15,453	2,468	-1201	1,267	5,136,667	5,316,229	179,562	0	0	1	0
200204	17,038	17,549	2,297	-511	1,786	5,157,516	5,332,383	174,867	0	0	0	1
200301	15,285	16,526	2,911	-1241	1,670	5,181,002	5,349,719	168,717	1	0	0	0
200302	16,819	18,538	3,207	-1719	1,488	5,191,739	5,365,386	173,647	0	1	0	0
200303	19,111	20,340	2,565	-1229	1,336	5,198,281	5,383,778	185,497	0	0	1	0
200304	18,391	20,073	3,208	-1682	1,526	5,221,671	5,402,902	181,231	0	0	0	1
200401	17,959	19,101	3,188	-1142	2,046	5,252,501	5,422,514	170,013	1	0	0	0
200402	17,965	19,346	3,075	-1381	1,694	5,259,529	5,439,957	180,428	0	1	0	0
200403	17,748	19,406	3,183	-1658	1,525	5,264,068	5,457,289	193,221	0	0	1	0
200404	21,499	22,423	3,071	-924	2,147	5,288,843	5,476,840	187,996	0	0	0	1
200501	15,517	17,134	3,218	-1617	1,601	5,315,301	5,495,237	179,936	1	0	0	0
200502	16,963	19,079	3,637	-2116	1,521	5,321,587	5,511,476	189,888	0	1	0	0
200503	19,996	21,645	3,260	-1649	1,611	5,328,794	5,534,173	205,379	0	0	1	0
200504	22,458	23,615	2,903	-1157	1,746	5,348,039	5,551,207	203,168	0	0	0	1
200601	20,841	22,274	3,385	-1433	1,952	5,376,074	5,572,892	196,818	1	0	0	0
200602	19,474	21,395	3,597	-1921	1,676	5,391,889	5,592,689	200,800	0	1	0	0
200603	17,317	19,414	3,592	-2097	1,495	5,390,215	5,610,667	220,452	0	0	1	0
200604	19,777	21,530	3,523	-1753	1,770	5,409,718	5,629,175	219,457	0	0	0	1
200701	16,404	18,398	3,959	-1994	1,965	5,440,058	5,648,253	208,195	1	0	0	0
200702	13,784	15,685	3,469	-1901	1,568	5,445,963	5,661,773	215,811	0	1	0	0
200703	13,231	15,168	3,454	-1937	1,517	5,442,060	5,674,801	232,740	0	0	1	0
200704	14,221	16,035	3,489	-1814	1,675	5,454,618	5,688,651	234,033	0	0	0	1
200801	10,389	11,889	3,049	-1500	1,549	5,471,777	5,700,780	229,003	1	0	0	0
200802	10,354	11,655	2,842	-1301	1,541	5,469,447	5,710,691	241,244	0	1	0	0
200803	10,828	11,954	2,791	-1126	1,665	5,461,456	5,721,436	259,981	0	0	1	0
200804	9,142	10,337	2,653	-1195	1,458	5,465,201	5,731,132	265,932	0	0	0	1
200901	6,305	7,404	2,582	-1099	1,483	5,480,484	5,738,530	258,046	1	0	0	0
200902	7,587	8,604	2,339	-1017	1,322	5,482,455	5,745,473	263,018	0	1	0	0
200903	7,332	8,550	2,406	-1218	1,188	5,474,227	5,752,577	278,351	0	0	1	0
200904	6,580	7,270	1,991	-690	1,301	5,484,091	5,758,981	274,890	0	0	0	1
201001	6,376	7,003	1,912	-627	1,285	5,506,845	5,766,058	259,213	1	0	0	0
201002	6,660	7,412	2,005	-752	1,253	5,515,701	5,772,286	256,586	0	1	0	0
201003	5,863	6,461	1,825	-598	1,227	5,515,855	5,778,445	262,590	0	0	1	0
201004	5,269	5,709	1,684	-440	1,244	5,528,272	5,783,556	255,284	0	0	0	1
201101	19,410	20,037	3,482	-627	2,855	5,557,669	5,802,966	245,297	1	0	0	0
201102	12,911	13,663	3,490	-752	2,738	5,566,690	5,815,878	249,188	0	1	0	0
201103	13,045	13,643	3,497	-598	2,899	5,566,409	5,828,923	262,514	0	0	1	0
201104	13,046	13,486	3,505	-440	3,065	5,578,351	5,841,969	263,618	0	0	0	1
201201	14,912	15,539	3,514	-627	2,887	5,609,802	5,856,881	247,078	1	0	0	0
201202	15,217	15,969	3,523	-752	2,771	5,621,053	5,872,098	251,045	0	1	0	0
201203	15,473	16,071	3,533	-598	2,935	5,622,971	5,887,571	264,600	0	0	1	0
201204	15,323	15,763	3,542	-440	3,102	5,637,064	5,902,894	265,830	0	0	0	1
201301	17,256	17,883	3,552	-627	2,925	5,670,887	5,920,150	249,263	1	0	0	0
201302	17,352	18,104	3,563	-752	2,811	5,684,145	5,937,503	253,358	0	1	0	0
201303	17,515	18,113	3,573	-598	2,975	5,687,868	5,955,018	267,150	0	0	1	0
201304	17,313	17,753	3,583	-440	3,143	5,703,849	5,972,330	268,482	0	0	0	1
201401	19,303	19,930	3,595	-627	2,968	5,739,817	5,991,634	251,817	1	0	0	0
201402	19,430	20,182	3,607	-752	2,855	5,755,026	6,011,064	256,038	0	1	0	0
201403	19,664	20,262	3,618	-598	3,020	5,760,615	6,030,728	270,113	0	0	1	0
201404	19,378	19,818	3,630	-440	3,190	5,778,528	6,050,106	271,578	0	0	0	1
201501	21,249	21,876	3,643	-627	3,016	5,816,582	6,071,355	254,772	1	0	0	0
201502	21,407	22,159	3,656	-752	2,904	5,833,616	6,092,762	259,146	0	1	0	0
201503	21,548	22,146	3,669	-598	3,071	5,840,769	6,114,310	273,541	0	0	1	0
201504	21,094	21,534	3,681	-440	3,241	5,860,259	6,135,405	275,146	0	0	0	1
201601	22,793	23,420	3,695	-627	3,068	5,900,065	6,158,198	258,133	1	0	0	0
201602	22,672	23,424	3,709	-752	2,957	5,918,238	6,180,870	262,631	0	1	0	0
201603	22,574	23,172	3,722	-598	3,124	5,926,128	6,203,444	277,316	0	0	1	0
201604	21,893	22,333	3,735	-440	3,295	5,946,329	6,225,338	279,009	0	0	0	1

SOUTHERN CALIFORNIA GAS COMPANY: CUSTOMER FORECAST
2013 TCAP
(annual averages)

	2010	2011	2012	2013	2014	2015	2016
Residential							
Single-Family							
Active	3,570,361	3,595,695	3,633,026	3,675,604	3,721,040	3,767,674	3,814,712
Inactive	82,958	88,946	89,869	90,922	92,046	93,199	94,363
Connected	3,653,320	3,684,640	3,722,895	3,766,525	3,813,085	3,860,873	3,909,075
Multi-Family							
Active	1,697,335	1,719,548	1,737,931	1,759,064	1,785,053	1,817,187	1,854,317
Inactive	109,668	103,189	104,295	105,567	107,133	109,067	111,299
Connected	1,807,003	1,822,737	1,842,226	1,864,630	1,892,186	1,926,254	1,965,617
Master-Meter							
Active	41,485	41,189	40,895	40,603	40,313	40,026	39,740
Inactive	701	654	599	544	490	436	384
Connected	42,186	41,843	41,494	41,147	40,803	40,462	40,124
Total Residential							
Active	5,309,182	5,356,431	5,411,852	5,475,270	5,546,406	5,624,886	5,708,769
Inactive	193,327	192,789	194,762	197,032	199,668	202,703	206,046
Connected	5,502,509	5,549,220	5,606,614	5,672,302	5,746,074	5,827,589	5,914,815
Commercial							
Active	188,141	191,083	191,085	191,623	192,303	193,149	194,164
Inactive	55,796	53,502	53,503	53,654	53,845	54,082	54,367
Connected	243,937	244,585	244,588	245,277	246,148	247,231	248,531
Industrial							
Active	19,346	19,765	19,786	19,794	19,788	19,771	19,757
Inactive	9,295	8,864	8,873	8,877	8,874	8,866	8,860
Connected	28,641	28,629	28,659	28,671	28,661	28,638	28,617
TOTAL							
Active	5,516,668	5,567,279	5,622,723	5,686,687	5,758,497	5,837,806	5,922,690
Inactive	258,418	255,154	257,138	259,563	262,386	265,651	269,272
Connected	5,775,086	5,822,434	5,879,861	5,946,250	6,020,883	6,103,458	6,191,962
Net Active Gain	36,354	50,611	55,443	63,964	71,810	79,310	84,884
Active Meter Growth	0.66%	0.92%	1.00%	1.14%	1.26%	1.38%	1.45%

Triennial Cost Allocation Proceeding

EUFORECASTER

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

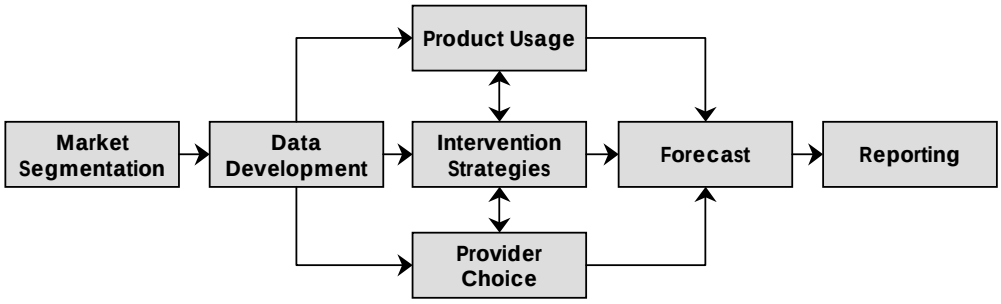
End Use Forecaster has other dimensions that capture factors affecting product demands. Perhaps the most important of these is End Use Forecaster's "vintaging" capability. Vintaging refers to product or service turnover that is a function of either physical lives or contract period. Accurate assessments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

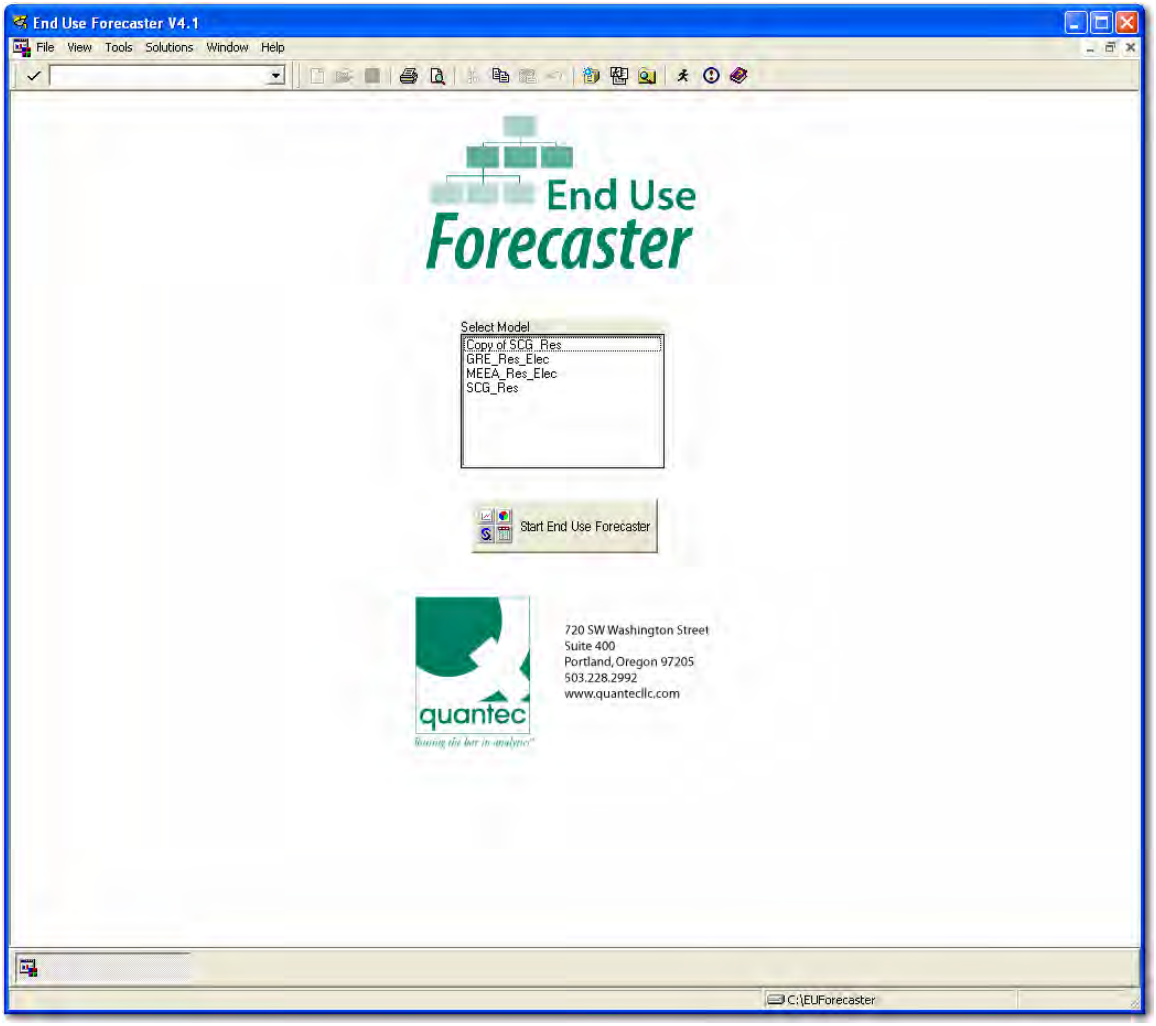
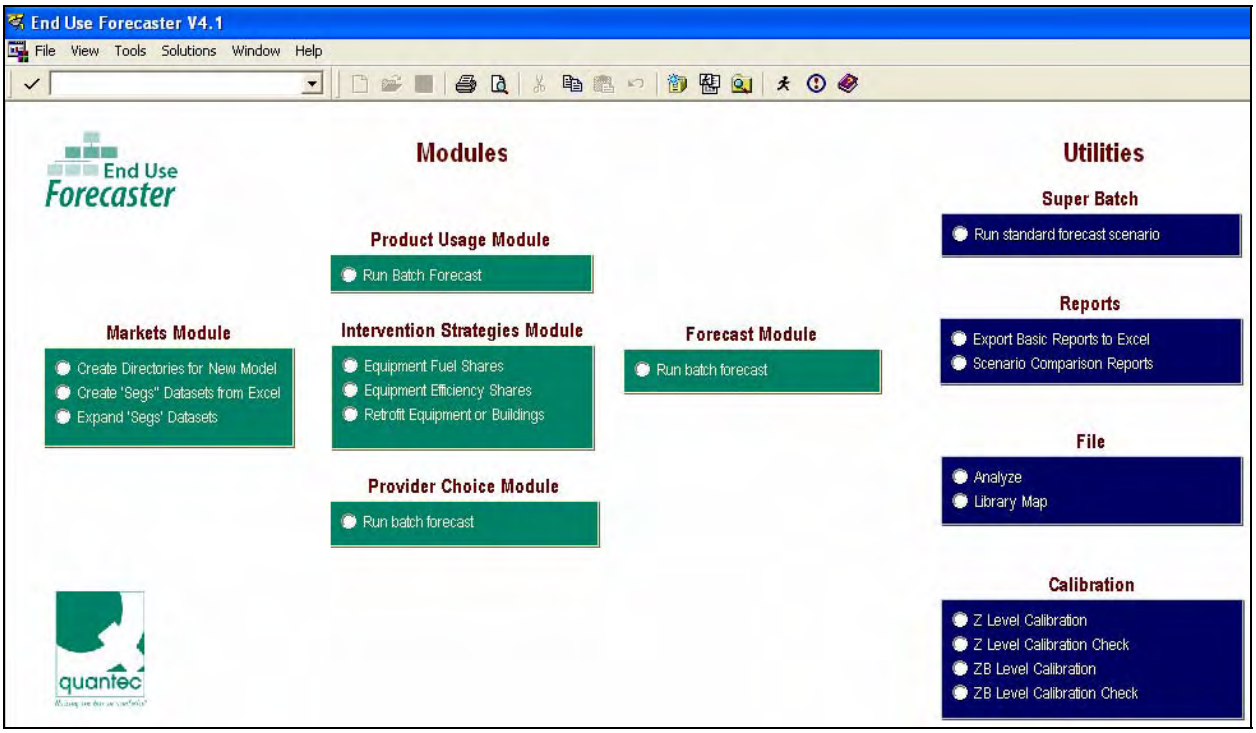


Figure 3. Main Dashboard



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.

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

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

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

Average versus Marginal Shares

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

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

Intervention Strategies Module: Analyzing Marketing Scenarios and DSM Potential

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

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

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

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

Forecast Module: Putting It All Together

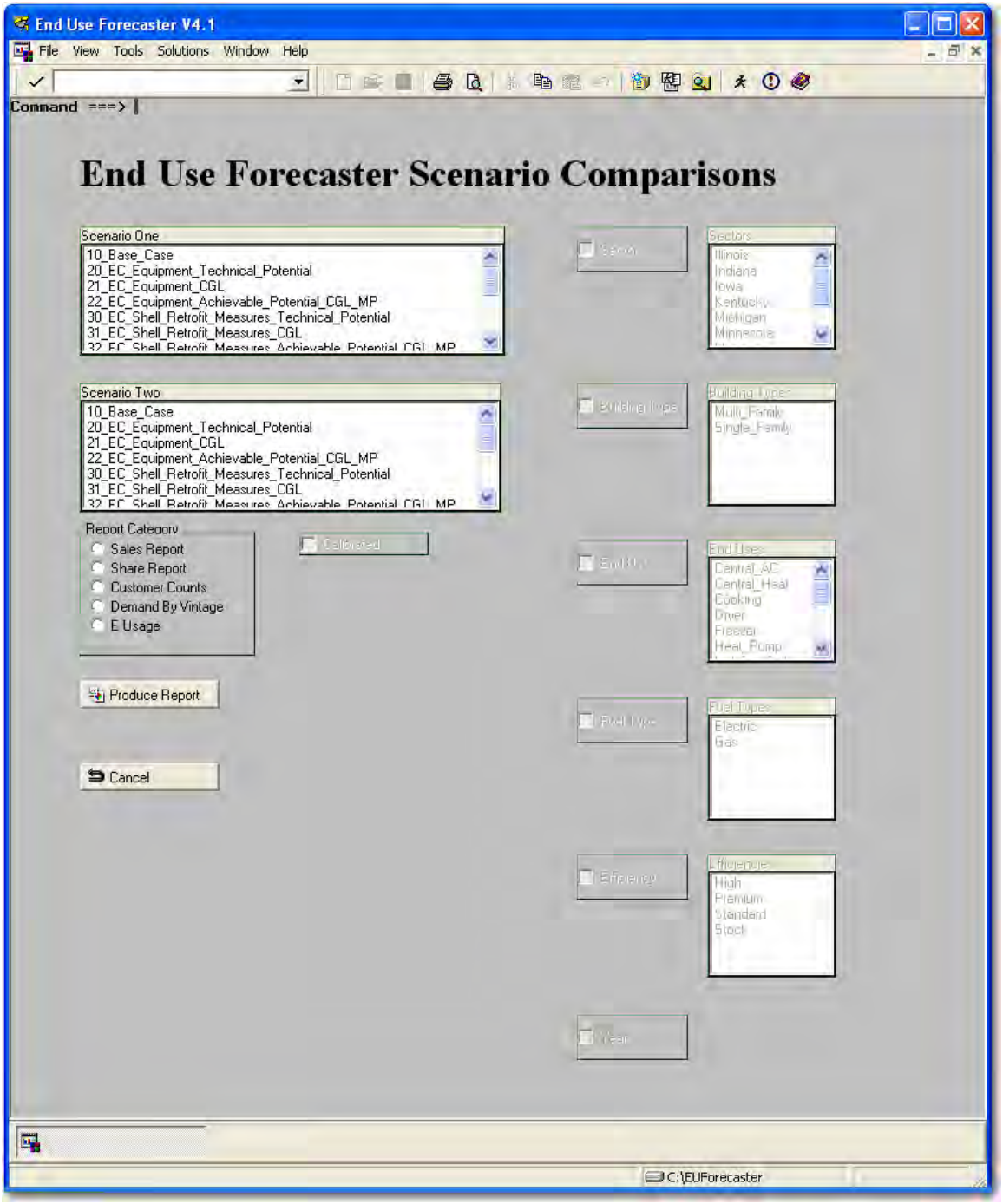
The Forecast Module incorporates all the information compiled from the other modules – Usage, Choice, and Intervention Strategies – related to the overall economic growth of the market segment and equipment lifetime (decay) functions to create the final forecast for a given scenario.

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

Reporting: Getting the Projections Out to Decision-Makers

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

Figure 4. Report Customization



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

II. Application Structure

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

Hardware and Software

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

Hardware

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

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

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

Software

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

- Base SAS

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

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

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

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

Conventions

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

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

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

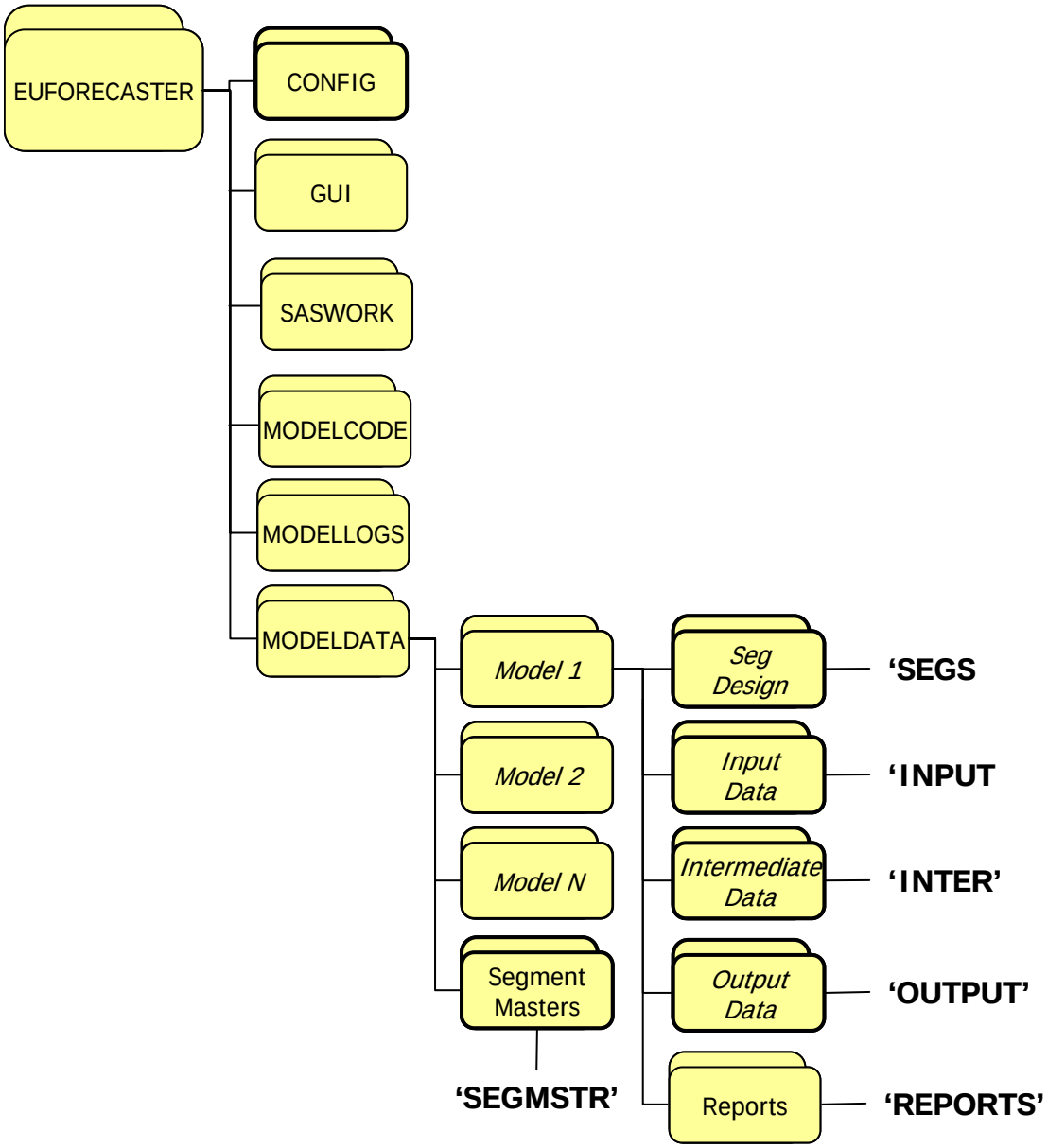
cases, where the documentation does not refer to a specific scenario, datasets are referred to with an **"_xx**" suffix, such as **saturations_xx**.

Model Organization

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

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

Figure 5. End Use Forecaster Folder Structure



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

Table 2. End Use Forecaster Folders

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

III. Market Segmentation and Data Entry Modules

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

Development of Market Segmentation Design

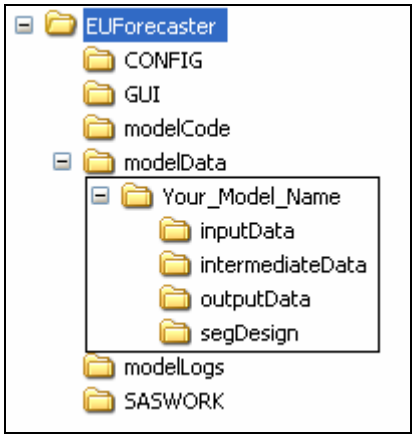
The execution of the first task – creation of a customized market segmentation design – is based on four steps, listed briefly below and then described in greater detail.

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

Creation of Model Data Folders

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

Figure 6. Data Folder Structure



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

Population of Seg_Design_Template.xls

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

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

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

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

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

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

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

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

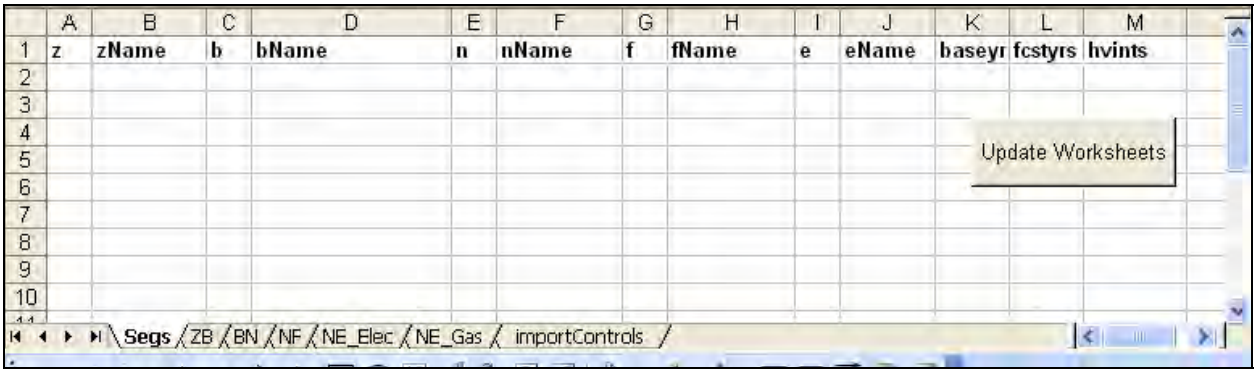
Table 3 summarizes the intended use of each of these dimensions. Note that while the model must include all five dimension, you are not required to use all of them. For example, suppose you want a design with alternative providers at Dimension 4 and do not wish to complicate the model with product/service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

Table 3. End Use Forecaster Dimension Use Summary

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

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

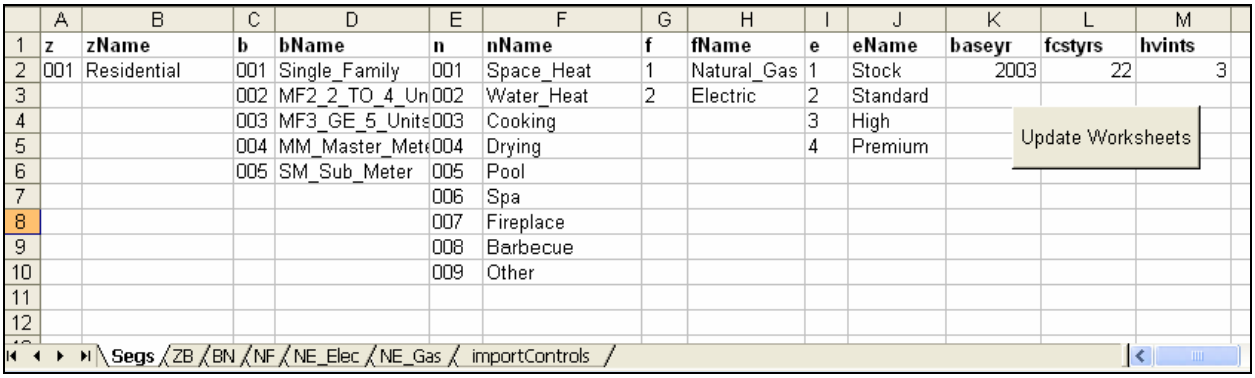
Figure 7. Empty "Segs" Tab in Seg_Design_Template.xls



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

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

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



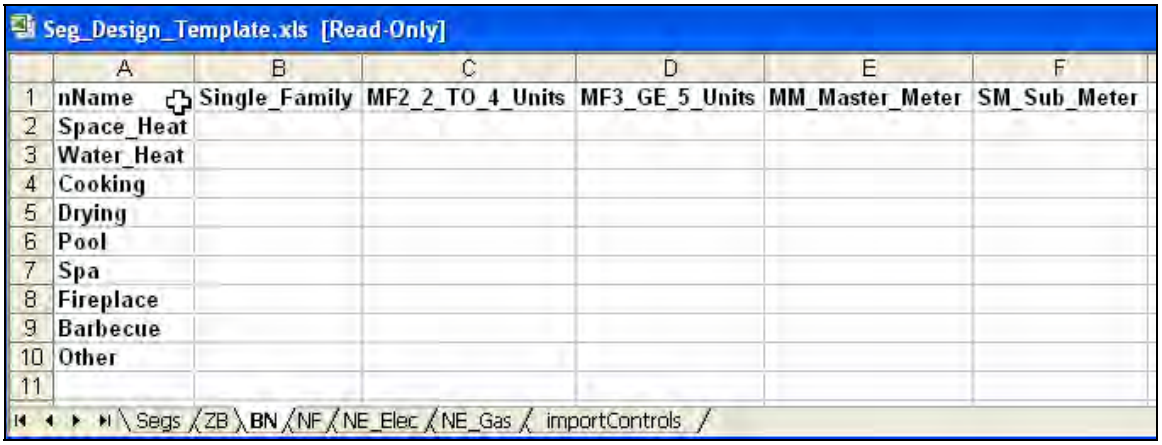
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	z	zName	b	bName	n	nName	f	fName	e	eName	baseyr	fcstyrs	hvints
2	001	Residential	001	Single_Family	001	Space_Heat	1	Natural_Gas	1	Stock	2003	22	3
3			002	MF2_2_TO_4_Un	002	Water_Heat	2	Electric	2	Standard			
4			003	MF3_GE_5_Units	003	Cooking			3	High			
5			004	MM_Master_Met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

Update Worksheets

Segs | ZB | BN | NF | NE_Elec | NE_Gas | importControls

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

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



Seg_Design_Template.xls [Read-Only]

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

Segs | ZB | BN | NF | NE_Elec | NE_Gas | importControls

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

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

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

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

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

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

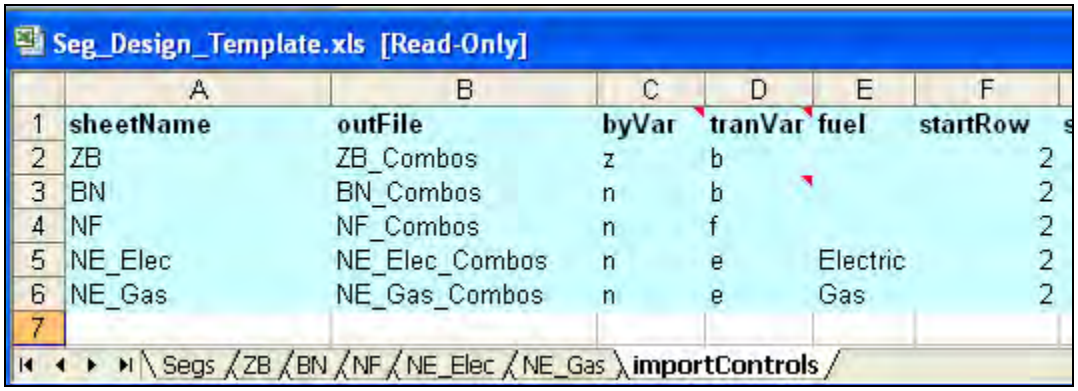
Segs | ZB | BN | NF | NE_Elec | NE_Gas | imp

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

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

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

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



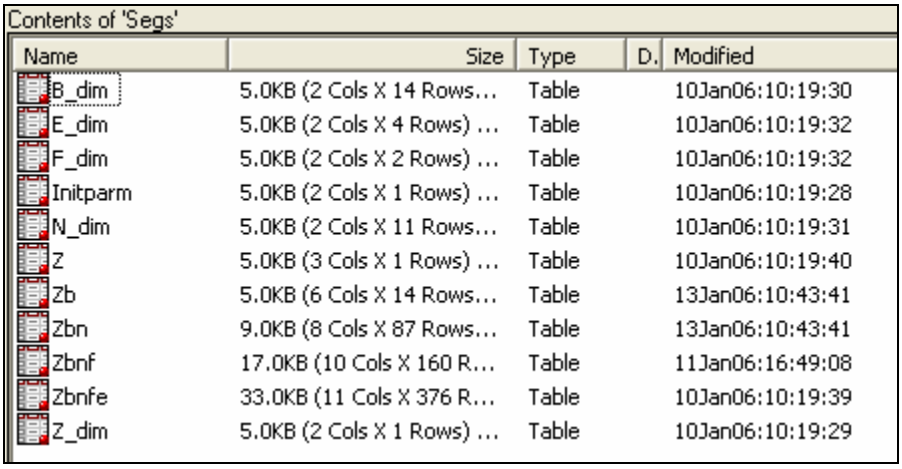
	A	B	C	D	E	F
1	**sheetName**	**outFile**	**byVar**	**tranVar**	**fuel**	**startRow**
2	ZB	ZB_Combos	z	b		2
3	BN	BN_Combos	n	b		2
4	NF	NF_Combos	n	f		2
5	NE_Elec	NE_Elec_Combos	n	e	Electric	2
6	NE_Gas	NE_Gas_Combos	n	e	Gas	2
7						

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

Creation of the Segs Library Datasets

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

Figure 12. Contents of Segs Library

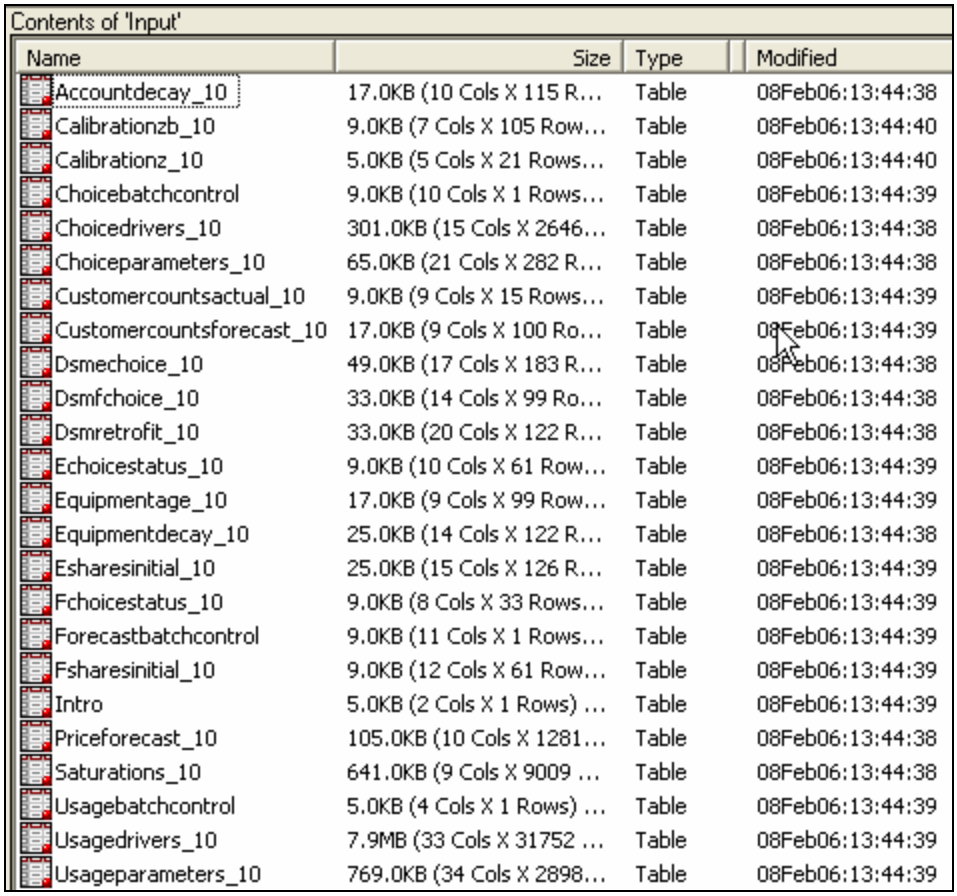

Contents of 'Segs'

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



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"

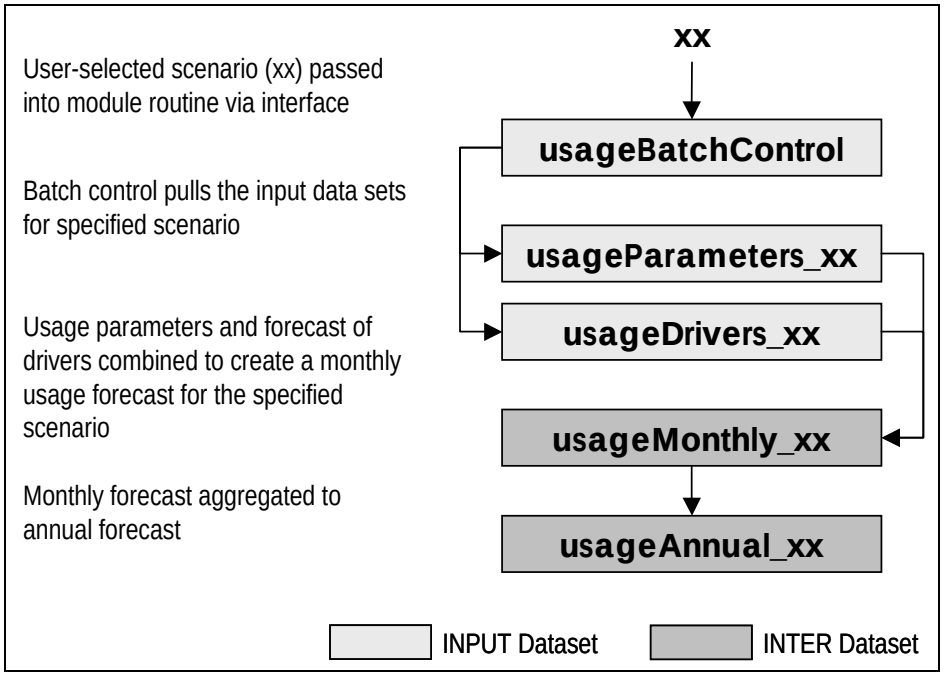


Table 5. Product Usage Module Data Library

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

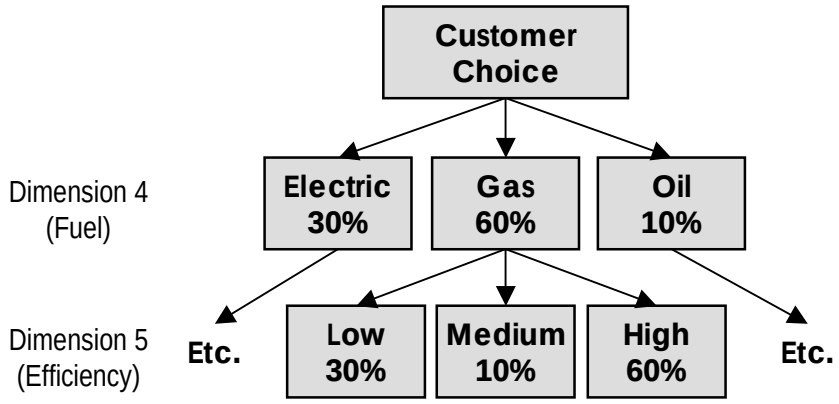
V. Provider Choice Module

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

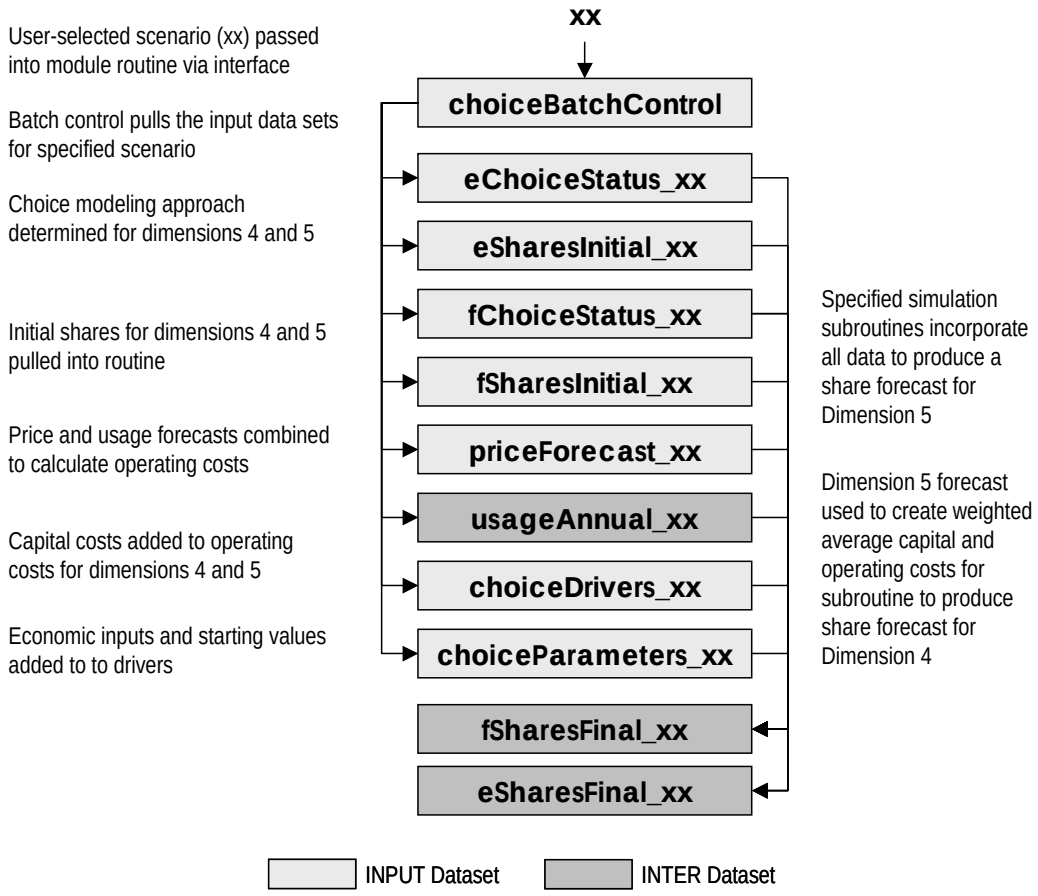
Figure 17 shows the data and analysis flow through the Provider Choice Module.

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**).

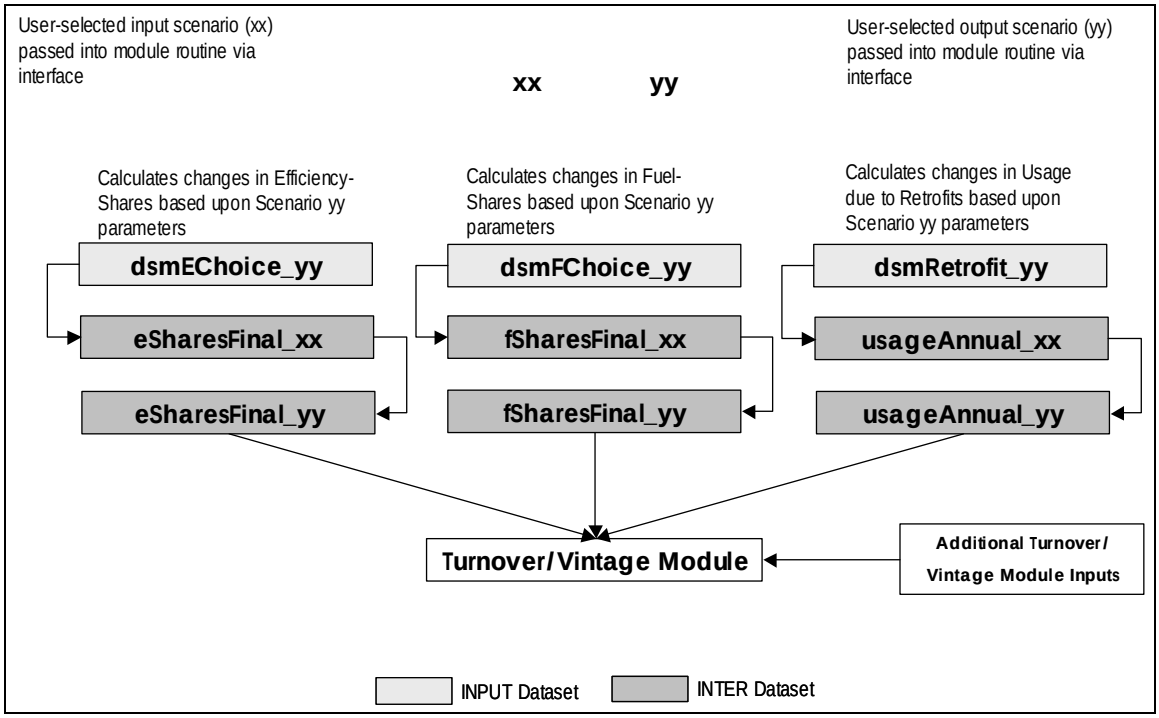
The Market Segmentation module creates base case files ("_10" files) where there is no intervention for each of these program categories. These files serve as templates that allow the user to create different scenarios of interest. To create strategies, you must copy these files to another scenario number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

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

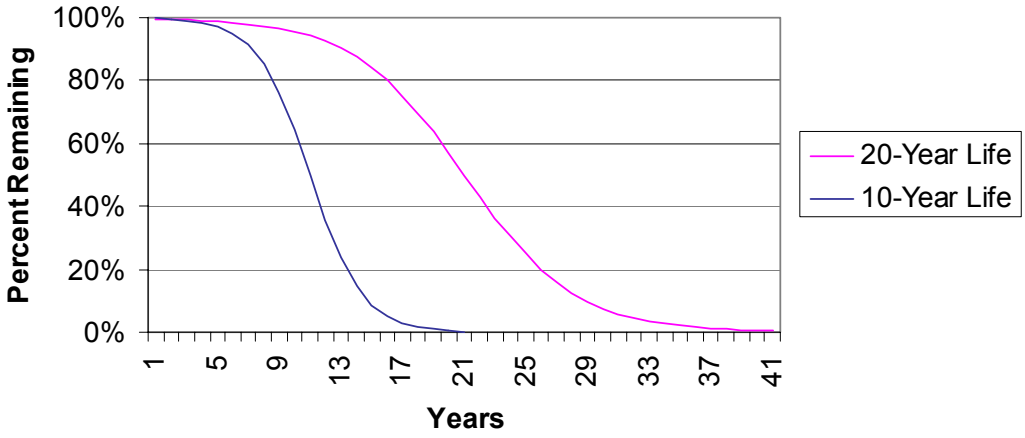
[3] These are discrete analogs to the continuous time distributions.

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:

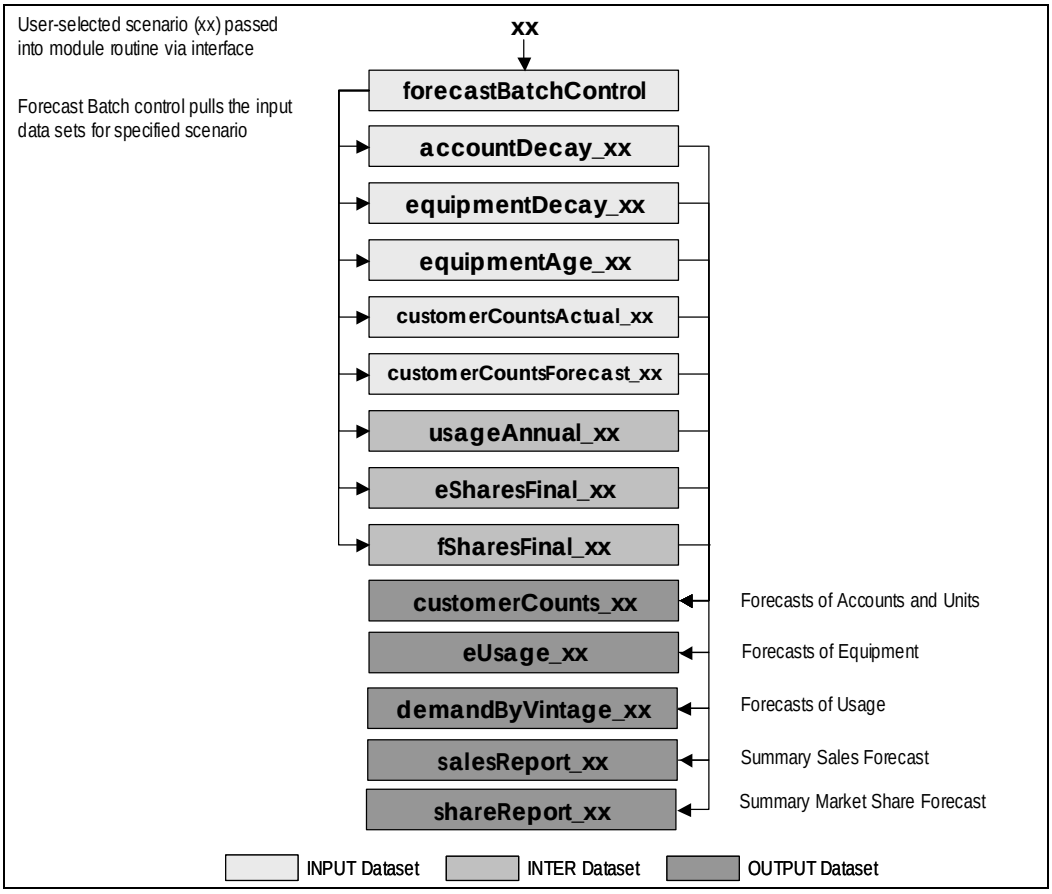
1. Merges all input data across Dimensions 1-3, including:
   - Existing accounts, plus a distribution of accounts across historical building vintages
   - New construction forecast, plus capture rates for new and conversion buildings
   - Dimension 3 saturation, equal to the number of Dimension 2 customers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

RESIDENTIAL DEMAND FORECAST

Core Residential End-Use Model

Introduction:

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

The model separates the residential market into five building types (B-level). These groups are identified by the premise code classification found in the company billing files. The five residential groups are:

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

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

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

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

- Natural gas; and
- Electricity.

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

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

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

A set of post-model adjustments were applied to the model's annual demand forecast. The first adjustment calibrates to the recorded 2010 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 2-5 illustrate the monthly forecasts for each weather scenario.

Data Sources:

The information used to perform the modeling and to generate the forecast includes historical 2010 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 2010 data is in Figure 6.

Meter Counts, Growth and Decay:

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

Use Per Customer by Vintage and UEC:

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

Fuel Costs and Price Elasticity:

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

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

Electric Price Data:

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.

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 10 illustrates the electricity price forecasts.

Price elasticities for each building type were based on the SoCalGas Residential Econometric Demand Forecasting Model. See Figure 6 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 11 and 12 for gas and electric appliance equipment cost.

Building and Equipment Lives and Decay:

Building decay rates are based on the building shell lifetimes, where the lifetime is defined as the length of time it takes for either a demolition or a major renovation to occur. For single-family residential buildings, an exponential rate of decay of 0.3% per year was assumed. See Figure 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 13 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 2009 RASS Update. Please see Figures 15-18 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
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

ResAvg

Southern California Gas Company

Figure 2: Average Temperature Year Demand Forecast

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2010	34,642	29,289	26,682	20,868	15,194	11,909	11,293	11,260	11,099	14,095	22,570	36,038	244,940
2011	36,065	30,493	27,779	21,725	15,819	12,398	11,757	11,723	11,555	14,674	23,498	37,519	255,005
2012	35,794	30,264	27,570	21,562	15,700	12,305	11,669	11,635	11,468	14,564	23,322	37,238	253,091
2013	35,232	29,789	27,138	21,224	15,453	12,112	11,486	11,452	11,288	14,335	22,955	36,653	249,118
2014	35,111	29,687	27,044	21,151	15,400	12,070	11,446	11,413	11,249	14,286	22,877	36,527	248,263
2015	35,008	29,600	26,965	21,089	15,355	12,035	11,413	11,379	11,216	14,244	22,810	36,420	247,535
2016	34,967	29,564	26,933	21,064	15,337	12,021	11,399	11,366	11,203	14,227	22,782	36,377	247,241

ResCol

Southern California Gas Company

Figure 3: Cold Temperature Year Demand Forecast

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2010	39,234	32,824	29,689	23,379	16,102	12,148	11,359	11,317	11,222	14,854	25,395	40,639	268,163
2011	40,846	34,173	30,909	24,339	16,764	12,647	11,825	11,782	11,683	15,465	26,439	42,309	279,182
2012	40,540	33,917	30,677	24,157	16,638	12,552	11,737	11,694	11,595	15,349	26,240	41,991	277,087
2013	39,903	33,384	30,195	23,778	16,377	12,355	11,552	11,510	11,413	15,108	25,829	41,332	272,737
2014	39,766	33,270	30,092	23,696	16,321	12,312	11,513	11,471	11,374	15,056	25,740	41,190	271,801
2015	39,650	33,172	30,003	23,626	16,273	12,276	11,479	11,437	11,341	15,012	25,664	41,070	271,003
2016	39,603	33,133	29,968	23,598	16,254	12,262	11,465	11,424	11,327	14,994	25,634	41,021	270,681

ResHot

Southern California Gas Company

Figure 4: Hot Temperature Year Demand Forecast

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2010	29,705	25,106	23,400	19,106	14,416	11,693	11,292	11,268	11,073	13,598	20,437	30,631	221,726
2011	30,926	26,137	24,361	19,891	15,009	12,174	11,757	11,731	11,528	14,157	21,276	31,890	230,837
2012	30,694	25,941	24,178	19,742	14,896	12,082	11,668	11,643	11,442	14,051	21,117	31,650	229,104
2013	30,212	25,534	23,799	19,432	14,662	11,893	11,485	11,460	11,262	13,830	20,785	31,154	225,508
2014	30,108	25,446	23,717	19,365	14,612	11,852	11,446	11,421	11,223	13,783	20,714	31,047	224,734
2015	30,020	25,372	23,648	19,309	14,569	11,817	11,412	11,387	11,191	13,742	20,653	30,955	224,074
2016	29,984	25,341	23,619	19,286	14,552	11,803	11,399	11,374	11,177	13,726	20,629	30,919	223,808

ResBas

Southern California Gas Company

Figure 5: Base Temperature Year Demand Forecast

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2010	10,945	10,119	11,025	11,344	10,956	10,616	11,160	11,128	10,737	11,499	10,552	11,004	131,084
2011	11,394	10,535	11,478	11,810	11,406	11,052	11,619	11,585	11,178	11,972	10,986	11,456	136,471
2012	11,309	10,456	11,392	11,721	11,321	10,969	11,532	11,498	11,094	11,882	10,904	11,370	135,446
2013	11,131	10,292	11,213	11,537	11,143	10,797	11,350	11,317	10,920	11,696	10,732	11,192	133,320
2014	11,093	10,256	11,175	11,498	11,105	10,760	11,312	11,279	10,882	11,655	10,696	11,153	132,862
2015	11,061	10,226	11,142	11,464	11,072	10,728	11,278	11,245	10,850	11,621	10,664	11,121	132,473
2016	11,047	10,214	11,129	11,450	11,059	10,715	11,265	11,232	10,837	11,607	10,652	11,107	132,315

Southern California Gas Company
Figure 6: 2010 Historical Data

	Single Family	Multi Family 2-4 Units	Multi Family > 4 units	Master Meter	Sub Meter
Total Therm Sales	1,724,369,515	175,158,295	340,122,642	158,969,112	50,780,824
Meter Count					
Pre 1979 Customers	2,410,213	410,349	706,214	34,677	1,697
1979-2004 Customers	1,201,308	128,516	435,425	4,067	106
2005-2010 Customers	11,856	2,575	7,643	42	1
TOTAL					
Use Per Customer (UPC, Therms)					
Pre 1979	501	341	317	4,008	28,891
1979-2004	459	291	266	5,707	31,234
2005-2010	374	250	229	4,910	26,875
Price Elasticity	-0.105	-0.112	-0.071	-0.069	-0.105

Southern California Gas Company
Figure 7: Meter Count Forecast

Year	Total	Single Family	Multi Family 2-4 Units	Multi Family >4 units	Master Meter	Sub Meter
2010	3,623,377	541,440	1,149,282	38,786	1,804	
2011	3,654,698	546,562	1,159,894	38,786	1,804	
2012	3,692,952	552,906	1,173,039	38,786	1,804	
2013	3,736,583	560,199	1,188,150	38,786	1,804	
2014	3,783,143	569,169	1,206,736	38,786	1,804	
2015	3,830,931	580,259	1,229,714	38,786	1,804	
2016	3,879,132	593,072	1,256,263	38,786	1,804	

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

Southern California Gas Company
Figure 8: Appliance Unit Energy Consumption (Gas in therms, Electric in Kwh)

End-Use	Vintage	Single Family Gas	Single Family Electric	Multi-Family 2 - 4 Units Gas	Multi-Family 2 - 4 Units Electric	Multi-Family > 4 Units Gas	Multi-Family > 4 Units Electric	Master Meter Gas	Master Meter Electric	Sub Meter Gas	Sub Meter 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	-

Southern California Gas Company
Triennial Cost Allocation Proceeding
Figure 9: Average and Marginal Gas Prices ($/therm)

Year	Res Price Deflator	R SF Average Price	R SF Marginal Price	R MF2 Average Price	R MF2 Marginal Price	R MF3 Average Price	R MF3 Marginal Price	R MM Average Price	R MM Marginal Price	R SM Average Price	R SM Marginal Price
2010	**100.0**	**0.9038**	**1.1438**	**0.9838**	**1.1438**	**0.9876**	**1.1438**	**0.9603**	**1.1438**	**0.9740**	**1.1438**
2011	**101.7**	**0.4637**	**0.6148**	**0.4235**	**0.6148**	**0.4275**	**0.6148**	**0.3991**	**0.6148**	**0.4134**	**0.6148**
2012	103.7	**0.4874**	**0.6652**	**0.4456**	**0.6652**	**0.4497**	**0.6652**	**0.4202**	**0.6652**	**0.4351**	**0.6652**
2013	106.1	**0.5858**	**0.8369**	**0.5399**	**0.8369**	**0.5444**	**0.8369**	**0.5119**	**0.8369**	**0.5283**	**0.8369**
2014	**108.6**	**0.6144**	**0.8718**	**0.5686**	**0.8718**	**0.5731**	**0.8718**	**0.5407**	**0.8718**	**0.5570**	**0.8718**
2015	**111.1**	**0.6489**	**0.9126**	**0.6036**	**0.9126**	**0.6080**	**0.9126**	**0.5759**	**0.9126**	**0.5921**	**0.9126**
2016	**113.7**	**0.6725**	**0.9413**	**0.6279**	**0.9413**	**0.6323**	**0.9413**	**0.6008**	**0.9413**	**0.6167**	**0.9413**

Southern California Gas Company
Figure 10: Average and Marginal Electricity Prices (Cents/KWh)

Year	R SF Average Price	R SF Marginal Price	R MF2 Average Price	R MF2 Marginal Price	R MF3 Average Price	R MF3 Marginal Price	R MM Average Price	R MM Marginal Price	R SM Average Price	R SM Marginal Price
2010	18.60	28.14	17.90	27.08	17.96	27.18	17.47	18.06	17.72	19.94
2011	19.99	30.25	18.26	27.64	18.43	27.89	17.21	17.79	17.82	20.06
2012	20.06	30.35	18.34	27.75	18.51	28.00	17.29	17.88	17.90	20.15
2013	21.97	33.24	20.25	30.64	20.42	30.89	19.20	19.85	19.81	22.29
2014	22.55	34.12	20.87	31.58	21.03	31.83	19.84	20.52	20.44	23.01
2015	23.03	34.84	21.42	32.41	21.58	32.65	20.44	21.13	21.01	23.64
2016	23.42	35.43	21.86	33.09	22.02	33.32	20.92	21.63	21.47	24.16

Southern California Gas Company
Figure 11: 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

Southern California Gas Company
Figure 12: 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

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

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

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

End-Use	Vintage	Single Family Max	Single Family Average	Single Family Max	Multi-Family 2 - 4 Units Average	Multi-Family 2 - 4 Units Max	Multi-Family > 4 Units Average	Multi-Family > 4 Units Max	Master Meter Average	Master Meter Max	Sub Meter Average	Sub Meter 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

Southern California Gas Company
Figure 15: End Use Saturations
(based on 2009 RASS)

End Use	Vintage	Single Family	Multi Family 2-4 Units	Multi Family >4 Units	Master Meter	Sub Meter
Space Heat						
	Pre 1979	0.9847	0.9672	0.9178	0.7296	0.8173
	1979-2004	0.9915	0.9668	0.9424	0.7803	0.8853
	2005-2010	0.9985	0.9691	0.8323	0.8271	N/A
Water Heat						
	Pre 1979	0.9753	0.9064	0.6048	0.9658	0.9835
	1979-2004	0.9831	0.8911	0.6488	0.9935	1
	2005-2010	0.9612	0.8758	0.7649	0.9082	N/A
Cooking						
	Pre 1979	0.8089	0.7929	0.8623	0.5657	0.8728
	1979-2004	0.8606	0.8016	0.791	0.4696	0.866
	2005-2010	0.9465	0.8665	0.8996	0.3434	N/A
Drying						
	Pre 1979	0.6816	0.4894	0.1177	0.1616	0.4546
	1979-2004	0.7246	0.494	0.2484	0.0726	0.4868
	2005-2010	0.764	0.5434	0.4821	0.1922	N/A
Pool						
	Pre 1979	0.0664	0.0521	0.1045	0.1179	0.1179
	1979-2004	0.109	0.1308	0.1941	0.0053	0.0053
	2005-2010	0.0911	0.1308	0.1941	0.0053	N/A
Spa						
	Pre 1979	0.069	0.0526	0.0668	0.1329	0.1329
	1979-2004	0.1486	0.1923	0.2896	0.2012	0.2012
	2005-2010	0.1199	0.1923	0.2896	0.2012	N/A
Fireplace						
	Pre 1979	0.1193	0.2634	0.1519	0.1894	0.1894
	1979-2004	0.1663	0.6261	0.4775	0.4156	0.4156
	2005-2010	0.2179	0.6261	0.4775	0.4156	N/A
Barbecue						
	Pre 1979	0.1286	0.263	0.076	0.1875	0.0554
	1979-2004	0.2416	0.4739	0.0797	0.0797	0.1532
	2005-2010	0.3044	0.4405	0.1759	0.1759	N/A

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

End Use	Single Family	Multi Family 2-4 Units	Multi Family >4 Units	Master Meter	Sub Meter
Space Heating	0.9573	0.9399	0.8249	0.961	0.961
Water Heating	0.9876	0.9803	0.9627	0.9614	0.9614
Cooking	0.8075	0.8183	0.8151	0.8744	0.8744
Drying	0.7924	0.7416	0.7445	0.719	0.5657
Pool	0.8247	0.8247	0.8247	0.8247	0.8247
Spa	0.5819	0.5819	0.5819	0.5819	0.5819
Fireplace	0.5816	0.5816	0.5816	0.5816	0.5816
Barbecue	0.2759	0.2663	0.2978	0.1251	0.0364

Southern California Gas Company

Figure 17: Gas Efficiency Shares

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

Southern California Gas Company
Figure 18: Electric Efficiency Shares

Electric End-use	Efficiency Level	Single Family		Multi-Family 2 - 4 Units		Multi-Family > 4 Units		Master Meter		Sub Meter	
		Existing	New	Existing	New	Existing	New	Existing	New	Existing	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

CORE COMMERCIAL AND INDUSTRIAL DEMAND FORECAST

Core Commercial and Industrial End Use Model

Introduction

The G10 commercial and industrial gas demand forecast used the EUForecaster model to generate annual gas demand forecasts.
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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 AMI and the EE savings provided by the EE group. An addition adjustment to the load associated with (existing) G10 commercial and industrial customers who install electric self-generation equipment was included. This program was established initially by the State of California through AB970 and is now known as SGIP. Other adjustments to the load consist of the anticipated core to non-core migration expected after the year 2010 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 2010 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 2010 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 2011 and is based on Global Insight's latest US Economic Forecast. The historical 2010 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.

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

To impute each year's average and marginal electricity prices to each core commercial and core industrial business type, we simply calculated the ratio of the average (or marginal) gas price to the overall core commercial or core industrial gas price for each business type, then multiplied by the overall average (or marginal) electricity price.

E. Building and Equipment Decay Rates:

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

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

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

Commercial:

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

Industrial:

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

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

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

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

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

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

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

G. DSM Forecast:

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

Gas Air Conditioning and Gas Engines

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

AMI

Annual conservation benefits associated with AMI are estimated by SoCalGas to represent 1% of core gas throughput in the post-deployment period 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
Triennial Cost Allocation Proceeding
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
Incremental Meter Forecast by Business Type

	Office	Restaurant	Retail	Laundry	Warehouse	School	College	Health	Lodging	Misc	Governmer	TCU	Construction	Agriculture
Actual Meters														
2009	40544	36825	27213	4656	7927	6742	2587	7995	4938	34943	3713	7556	6008	1607
2010	40460	36898	26526	4550	7813	6745	2602	7868	4953	35042	3720	7347	5852	1557
						Incremental Meter Forecast by business Type								
2010	-84	73	-687	-106	-114	3	15	-127	15	99	7	-209	-156	-50
2011	1083.14	132.2689869	217.1655	37.997	189.1603219	-252.493	-84.1644	566.7214	83.73145	105.1324	-298.3918	513.3646	147.4226408	71.67239937
2012	318.8093	36.7768177	60.61902	-24.4439	86.36527168	-365.713	-121.904	107.98	-16.1428	-67.5458	-450.0551	432.1682	117.3556983	-112.140274
2013	764.0828	-81.17457043	-132.883	-32.649	45.83653642	-147.364	-49.3012	-26.5514	-36.4887	-89.7932	-272.2226	70.28661	680.2903636	-145.031331
2014	860.4267	-121.1590614	-198.385	-32.4523	60.62737149	-33.1266	-10.7739	15.80417	-41.2491	-90.2774	-156.7137	-18.9352	556.8321809	-98.708818
2015	412.7783	-96.16563094	-157.718	-30.5475	103.1633096	-50.2685	-16.932	122.8387	-40.7023	-84.2328	-138.0929	252.3142	645.530973	-61.0823425
2016	242.8284	-65.64358031	-107.395	-18.604	132.0879255	32.45988	11.08035	353.7535	-29.9601	-51.1495	-37.03669	173.3982	464.404908	-67.1298782

File: Electric Prices Average Marginal Workpaper 3 SCG Core Comm.xls(Elec Price Forecast ST)

Southern California Gas Company
Average Electric Prices (Cents/KWh)

Year	Agriculture Average Price	College Average Price	Construction Average Price	Government Average Price	Health Average Price	Laundry Average Price	Lodging Average Price	Misc Average Price	Office Average Price	Restaurant Average Price	Retail Average Price	School Average Price	TCU Average Price	Warehouse Average Price
2010	19.36	18.48	19.07	17.16	17.56	17.61	15.48	16.69	16.74	19.19	16.51	16.25	19.76	14.71
2011	19.47	18.53	19.16	17.18	17.63	17.65	15.48	16.71	16.76	19.29	16.53	16.28	19.89	14.70
2012	20.60	19.66	20.29	18.35	18.81	18.82	16.72	17.91	17.95	20.42	17.74	17.49	21.02	15.96
2013	21.35	20.42	21.05	19.13	19.58	19.58	17.50	18.68	18.73	21.18	18.51	18.27	21.77	16.75
2014	21.88	20.96	21.58	19.68	20.13	20.13	18.07	19.24	19.28	21.71	19.07	18.83	22.30	17.33
2015	22.13	21.28	21.85	20.11	20.53	20.53	18.65	19.72	19.76	21.97	19.57	19.35	22.51	17.98
2016	22.52	21.69	22.25	20.54	20.95	20.95	19.10	20.15	20.19	22.37	20.00	19.79	22.90	18.44

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

Year	Agriculture Marginal Price	College Marginal Price	Construction Marginal Price	Government Marginal Price	Health Marginal Price	Laundry Marginal Price	Lodging Marginal Price	Misc Marginal Price	Office Marginal Price	Restaurant Marginal Price	Retail Marginal Price	School Marginal Price	TCU Marginal Price	Warehouse Marginal Price
2010	18.59125464	18.85143	18.65868158	17.98378749	17.14195	17.52346	15.90675	17.08286	17.07963	18.5285179	16.73516	16.59033	18.4759	15.4302769
2011	18.66375635	18.92912	18.73252534	18.04407565	17.18538	17.57453	15.9254	17.12509	17.12179	18.59976293	16.77042	16.62269	18.5461	15.4393611
2012	19.78229223	20.03439	19.84762417	19.19358296	18.3778	18.7475	17.18079	18.32053	18.31739	19.72149718	17.98359	17.84324	19.67052	16.7190512
2013	20.53576478	20.78446	20.60021373	19.95501215	19.15026	19.51496	17.96943	19.09376	19.09066	20.47579139	18.76137	18.62292	20.4255	17.5139247
2014	21.06853497	21.31336	21.13198235	20.49680761	19.70456	20.0636	18.54208	19.64894	19.64589	21.00949362	19.32172	19.18542	20.95998	18.0936562
2015	21.37093648	21.59065	21.42787425	20.85786749	20.1469	20.4691	19.10369	20.09699	20.09426	21.31795268	19.80334	19.68102	21.27352	18.7012758
2016	21.77176231	21.98683	21.82749709	21.26953352	20.57359	20.88898	19.55242	20.52473	20.52206	21.71989796	20.23729	20.11755	21.67641	19.1585066

Southern California Gas Company
Average Gas Prices ($/Therm)

Year	Com Price Deflator	CAgriculture Average Price	College Average Price	Construction Average Price	Government Average Price	Health Average Price	Laundry Average Price	Lodging Average Price	Misc Average Price	Office Average Price	Restaurant Average Price	Retail Average Price	School Average Price	TCU Average Price	Warehouse Average Price
2010	100.00	0.8917	0.8509	0.8784	0.7901	0.8089	0.8110	0.7128	0.7686	0.7710	0.8838	0.7604	0.7485	0.9101	0.6777
2011	101.20	0.8566	0.8154	0.8431	0.7559	0.7755	0.7766	0.6809	0.7352	0.7374	0.8488	0.7274	0.7160	0.8752	0.6466
2012	102.96	0.9181	0.8765	0.9045	0.8182	0.8385	0.8388	0.7451	0.7983	0.8003	0.9103	0.7907	0.7798	0.9370	0.7115
2013	104.98	0.9581	0.9165	0.9445	0.8583	0.8786	0.8788	0.7853	0.8384	0.8404	0.9503	0.8308	0.8199	0.9770	0.7517
2014	107.37	0.9881	0.9464	0.9745	0.8884	0.9089	0.9089	0.8158	0.8687	0.8706	0.9803	0.8611	0.8503	1.0070	0.7824
2015	109.91	1.0937	1.0519	1.0801	0.9942	1.0148	1.0146	0.9220	0.9746	0.9765	1.0859	0.9671	0.9564	1.1127	0.8887
2016	112.45	1.1275	1.0857	1.1139	1.0282	1.0489	1.0486	0.9563	1.0088	1.0106	1.1198	1.0013	0.9907	1.1465	0.9232

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

Year	Com Price Deflator	Agriculture Marginal Price	College Marginal Price	Construction Marginal Price	Government Marginal Price	Health Marginal Price	Laundry Marginal Price	Lodging Marginal Price	Misc Marginal Price	Office Marginal Price	Restaurant Marginal Price	Retail Marginal Price	School Marginal Price	TCU Marginal Price	Warehouse Marginal Price
2010	100.00	0.7552	0.7658	0.7580	0.7305	0.6963	0.7118	0.6462	0.6939	0.6938	0.7527	0.6798	0.6739	0.7505	0.6268
2011	101.20	0.7217	0.7319	0.7243	0.6977	0.6645	0.6795	0.6158	0.6622	0.6620	0.7192	0.6485	0.6427	0.7171	0.5970
2012	102.96	0.7845	0.7945	0.7871	0.7612	0.7288	0.7435	0.6814	0.7266	0.7264	0.7821	0.7132	0.7076	0.7801	0.6630
2013	104.98	0.8246	0.8346	0.8272	0.8013	0.7690	0.7836	0.7215	0.7667	0.7666	0.8222	0.7533	0.7478	0.8202	0.7033
2014	107.37	0.8548	0.8648	0.8574	0.8316	0.7995	0.8141	0.7523	0.7972	0.7971	0.8524	0.7840	0.7784	0.8504	0.7341
2015	109.91	0.9607	0.9706	0.9633	0.9377	0.9057	0.9202	0.8588	0.9035	0.9033	0.9583	0.8903	0.8848	0.9563	0.8407
2016	112.45	0.9948	1.0047	0.9974	0.9719	0.9401	0.9545	0.8934	0.9378	0.9377	0.9925	0.9247	0.9192	0.9905	0.8754

Southern California Gas Company
2010 Historical Data

Segment	2010 Therm Sales	2010Meter Count	2010 Meter Count, Existing/Old customers	2010 Meter Count New Customers	Avg Use Per Meter Existing Customers	Avg Use Per Meter New Customers	Price Elasticity
Office	67,510,207	40,460	40,231	229	1,663	232	-0.072
Restaurant	238,060,073	36,898	36,465	433	6,443	439	-0.001
Retail	57,474,501	26,526	26,366	160	2,159	162	-0.032
Laundry	61,488,219	4,550	4,528	22	13,480	22	-0.026
Warehouse	18,010,933	7,813	7,766	47	2,313	48	-0.00000001
School	40,377,064	6,745	6,705	40	5,967	41	-0.103
College	26,842,213	2,602	2,576	26	10,341	26	-0.09
Health	55,928,879	7,868	7,844	24	7,060	24	-0.052
Lodging	56,822,029	4,953	4,926	27	11,458	27	-0.013
Misc	71,566,520	35,042	34,765	277	2,025	281	-0.03
Government	26,217,187	3,720	3,686	34	7,019	34	-0.061
TCU	33,878,691	7,347	735	42	42,413	393	-0.062
Construction	7,235,720	5,852	5,799	53	1,199	54	-0.179
Agriculture	36,235,084	1,557	1,552	5	23,268	5	-0.059
Total	797,647,320	193,254					

Southern California Gas Company
Average Use Per Meter (Therms/Meter)

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

Southern California Gas Company
Triennial Cost Allocation Proceeding
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
Triennial Cost Allocation Proceeding
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

Southern California Gas Company
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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

Triennial Cost Allocation Proceeding
Saturation Rate

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

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

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

Southern California Gas Company
Triennial Cost Allocation Proceeding
Equipment Cost Data

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

b	n	f	e	bname	nname	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	2.373
10	2	2	2	Misc	Water_Heat	2.5883

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

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

Southern California Gas Company
Employment (in Millions)

YEAR	Office	Restaurant	Retail	Laundry	Warehouse	School	College	Health	Lodging	Misc	Government	TCU	Construction	Agriculture	Total
2010	1.02739	0.55081	0.90206	0.08063	0.41260	0.59274	0.1975809	0.78668	0.12470	0.22299	0.61751	0.53804	0.28656	0.22063	6.56093
2011	1.05411	0.56062	0.91814	0.08098	0.42209	0.58854	0.1961796	0.80272	0.12603	0.22396	0.61062	0.56205	0.29524	0.21994	6.66121
2012	1.09329	0.56772	0.92977	0.08123	0.43139	0.59369	0.1978956	0.81621	0.12695	0.22467	0.61154	0.57479	0.32578	0.21853	6.79345
2013	1.14864	0.57261	0.93778	0.08136	0.44087	0.60233	0.200777	0.83039	0.12751	0.22502	0.61582	0.58365	0.35219	0.21845	6.93740
2014	1.18848	0.57623	0.94371	0.08123	0.45041	0.60808	0.2026933	0.84565	0.12758	0.22466	0.61839	0.60071	0.38131	0.21890	7.06805
2015	1.21909	0.57914	0.94847	0.08128	0.45975	0.61508	0.2050255	0.86726	0.12763	0.22481	0.62280	0.61306	0.40280	0.21838	7.18459
2016	1.24542	0.58358	0.95574	0.08133	0.46376	0.62413	0.2080418	0.88398	0.12798	0.22494	0.62969	0.62431	0.41715	0.22216	7.29222

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

	G10 Post AMI	EE	G10 Post AMI and EE	SGIP	Migration Core to Noncore	VERNON	Total (post Adjustments)
2010	79,765	0	79,765	0	0	0	79,765
2011	81,473	436	81,037	0	229	0	80,808
2012	82,312	899	81,413	70	451	32	81,000
2013	83,051	1,362	81,690	105	671	64	81,059
2014	84,023	1,825	82,198	139	890	96	81,351
2015	84,465	2,288	82,177	139	1,108	128	81,080
2016	85,266	2,751	82,515	139	1,108	128	81,418

Com10Avg

Southern California Gas Company
Average Year G10 Load Forecast (monthly) Mdth

YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2009	8,973.5	8,302.9	7,300.5	6,406.9	6,097.3	5,561.9	5,015.8	4,896.5	5,256.8	5,379.3	7,602.5	9,148.6	79,942.5
2010	8,937.0	8,270.3	7,273.4	6,384.7	6,077.6	5,545.6	5,003.0	4,885.3	5,261.8	5,385.0	7,600.1	9,140.9	79,764.7
2011	9,059.3	8,380.1	7,365.2	6,457.2	6,155.4	5,611.2	5,063.3	4,945.4	5,336.4	5,460.7	7,705.9	9,267.6	80,807.5
2012	9,085.1	8,400.8	7,379.2	6,462.2	6,168.8	5,618.3	5,071.1	4,954.3	5,355.4	5,479.4	7,730.1	9,295.4	81,000.1
2013	9,096.8	8,408.4	7,381.4	6,456.4	6,171.7	5,615.8	5,069.9	4,954.2	5,364.9	5,488.5	7,741.8	9,309.0	81,058.8
2014	9,134.8	8,440.2	7,404.9	6,469.3	6,192.4	5,629.5	5,083.4	4,968.5	5,389.8	5,513.3	7,775.9	9,349.2	81,351.2
2015	9,110.6	8,414.3	7,377.3	6,437.1	6,170.0	5,603.6	5,060.8	4,947.6	5,376.9	5,499.6	7,756.6	9,326.0	81,080.5
2016	9,148.4	8,449.4	7,408.1	6,464.2	6,195.8	5,627.1	5,082.0	4,968.3	5,399.2	5,522.4	7,788.8	9,364.8	81,418.3

Com10Col

	Southern California Gas Company												
	Cold Year G10 Load Forecast (monthly) Mdth												
YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2009	9,787.4	8,981.8	7,777.8	6,705.4	6,336.4	5,694.2	5,036.6	4,896.2	5,352.5	5,499.3	8,173.4	10,033.9	84,275.0
2010	9,765.7	8,961.9	7,760.5	6,690.5	6,322.3	5,681.6	5,025.4	4,885.3	5,340.6	5,487.1	8,155.2	10,011.5	84,087.6
2011	9,901.2	9,082.6	7,860.0	6,767.9	6,404.0	5,749.3	5,086.0	4,945.4	5,416.5	5,564.4	8,269.9	10,152.1	85,199.3
2012	9,930.9	9,106.6	7,876.4	6,774.3	6,418.5	5,757.1	5,094.0	4,954.3	5,435.9	5,583.6	8,296.7	10,184.1	85,412.3
2013	9,945.6	9,116.6	7,880.2	6,769.5	6,422.3	5,755.0	5,092.9	4,954.2	5,445.6	5,593.0	8,310.4	10,200.6	85,486.0
2014	9,988.8	9,152.8	7,906.8	6,784.4	6,444.6	5,769.6	5,106.5	4,968.5	5,471.0	5,618.5	8,348.0	10,246.5	85,805.9
2015	9,964.3	9,126.8	7,879.1	6,752.2	6,422.1	5,743.7	5,083.9	4,947.6	5,458.1	5,604.7	8,328.6	10,223.0	85,534.1
2016	10,005.7	9,164.7	7,912.0	6,780.5	6,448.9	5,767.7	5,105.2	4,968.3	5,480.7	5,628.0	8,363.1	10,265.4	85,890.2

Com10Hot

	Southern California Gas Company												
	Hot Year G10 Load Forecast (monthly) Mdth												
YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2009	8,127.8	7,595.7	6,800.1	6,091.3	5,845.9	5,426.6	4,991.7	4,896.2	5,194.6	5,294.7	7,060.6	8,290.1	75,615.3
2010	8,109.7	7,578.8	6,785.0	6,077.7	5,832.9	5,414.5	4,980.6	4,885.3	5,183.0	5,282.9	7,044.9	8,271.7	75,447.1
2011	8,218.8	7,677.5	6,869.0	6,145.4	5,906.8	5,478.0	5,040.5	4,945.4	5,256.4	5,357.0	7,141.9	8,384.5	76,421.1
2012	8,240.7	7,695.0	6,880.8	6,148.8	5,919.0	5,484.5	5,048.2	4,954.3	5,275.0	5,375.2	7,163.4	8,408.2	76,593.3
2013	8,249.6	7,700.2	6,881.2	6,142.0	5,921.1	5,481.5	5,047.0	4,954.2	5,284.2	5,383.9	7,173.3	8,418.8	76,637.0
2014	8,282.3	7,727.6	6,901.6	6,153.0	5,940.3	5,494.4	5,060.3	4,968.5	5,308.6	5,408.1	7,203.8	8,453.5	76,901.9
2015	8,258.3	7,701.9	6,874.1	6,120.9	5,917.9	5,468.6	5,037.7	4,947.6	5,295.7	5,394.4	7,184.7	8,430.5	76,632.3
2016	8,292.6	7,734.0	6,902.9	6,146.6	5,942.6	5,491.5	5,058.8	4,968.3	5,317.7	5,416.8	7,214.5	8,465.6	76,951.8

Com10Bas

	Southern California Gas Company												
	Base Year G10 Load Forecast (monthly) Mdth												
YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2009	4,896.2	4,896.2	4,896.2	4,896.2	4,896.2	4,896.2	4,896.2	4,896.2	4,896.2	4,896.2	4,896.2	4,896.2	58,754.7
2010	4,885.3	4,885.3	4,885.3	4,885.3	4,885.3	4,885.3	4,885.3	4,885.3	4,885.3	4,885.3	4,885.3	4,885.3	58,624.0
2011	4,943.0	4,941.1	4,939.0	4,933.9	4,944.1	4,940.3	4,943.7	4,945.4	4,953.9	4,953.1	4,947.9	4,944.2	59,329.7
2012	4,949.7	4,945.9	4,941.8	4,931.8	4,951.9	4,944.4	4,951.0	4,954.3	4,971.1	4,969.4	4,959.2	4,951.9	59,422.4
2013	4,947.4	4,941.7	4,935.7	4,920.8	4,950.7	4,939.5	4,949.4	4,954.2	4,979.3	4,976.8	4,961.6	4,950.7	59,407.9
2014	4,959.5	4,951.9	4,943.9	4,924.2	4,963.8	4,949.0	4,962.1	4,968.5	5,001.8	4,998.4	4,978.3	4,963.9	59,565.5
2015	4,936.4	4,926.9	4,917.0	4,892.4	4,941.7	4,923.3	4,939.6	4,947.6	4,989.0	4,984.8	4,959.8	4,941.8	59,300.3
2016	4,957.1	4,947.6	4,937.7	4,913.1	4,962.4	4,944.0	4,960.3	4,968.3	5,009.7	5,005.5	4,980.5	4,962.5	59,548.6

Southern California Gas Company
Gas AC Meters

Meter | For TCAP2013 | GAC | 3/30/2011

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	15	15	15	12	15	12	14	14	14	12	12	12	14
2010	12	12	13	10	12	10	12	12	12	12	12	12	12
2011	11	11	11	11	11	11	11	11	11	11	11	11	11
2012	10	10	10	10	10	10	10	10	10	10	10	10	10
2013	9	9	9	9	9	9	9	9	9	9	9	9	9
2014	9	9	9	9	9	9	9	9	9	9	9	9	9
2015	8	8	8	8	8	8	8	8	8	8	8	8	8
2016	7	7	7	7	7	7	7	7	7	7	7	7	7

Southern California Gas Company
GAS AC Forecast (Mdth)

Mdth

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	4.50	10.52	5.68	0.00	15.90	0.14	8.84	11.44	9.52	11.08	8.11	5.71	91.43
2010	4.93	4.80	6.36	6.36	6.56	7.95	8.95	9.08	8.08	7.37	6.37	4.91	81.72
2011	3.65	5.39	4.74	3.46	8.10	4.15	7.70	9.13	8.15	7.69	6.26	4.57	73.00
2012	3.32	4.90	4.31	3.15	7.36	3.77	7.00	8.30	7.41	6.99	5.69	4.15	66.36
2013	2.99	4.41	3.88	2.83	6.63	3.40	6.30	7.47	6.67	6.29	5.12	3.74	59.72
2014	2.99	4.41	3.88	2.83	6.63	3.40	6.30	7.47	6.67	6.29	5.12	3.74	59.72
2015	2.65	3.92	3.45	2.52	5.89	3.02	5.60	6.64	5.93	5.59	4.55	3.32	53.09
2016	2.32	3.43	3.02	2.20	5.15	2.64	4.90	5.81	5.19	4.90	3.98	2.91	46.45

Southern California Gas Company
Gas Engine Meters

Meter		For TCAP2011		GAS EngineAC								3/30/2011	
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	811	806	810	791	796	780	786	773	761	756	748	734	779
2010	730	720	726	710	718	704	709	706	713	708	710	708	714
2011	725	721	725	714	717	707	711	707	706	702	697	688	710
2012	722	718	721	711	714	704	708	704	703	699	694	685	707
2013	718	713	717	707	710	700	704	700	699	695	691	681	703
2014	715	710	714	704	707	697	701	698	696	692	688	678	700
2015	711	706	710	699	703	693	697	694	692	688	684	674	696
2016	708	703	707	696	700	690	694	691	689	685	681	672	693

Southern California Gas Company
Gas Engine Forecast (Mdth)

Mdth													
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
2009	48.30	74.64	114.72	179.82	223.37	258.34	259.59	265.91	276.26	172.84	109.12	84.21	2067.11
2010	50.92	28.83	74.16	120.92	152.47	194.58	221.07	190.68	214.68	148.04	86.25	62.46	1545.06
2011	44.87	49.63	93.11	153.15	188.65	228.43	241.60	233.60	237.52	156.37	100.10	63.90	1790.94
2012	44.68	49.42	92.71	152.50	187.86	227.47	240.58	232.61	236.52	155.71	99.68	63.63	1783.37
2013	44.43	65.42	94.90	117.01	168.91	217.96	266.05	289.93	254.51	155.22	110.24	89.18	1873.75
2014	44.24	48.94	91.80	150.99	186.00	225.21	238.19	230.31	234.18	154.17	98.69	63.00	1765.71
2015	43.98	48.66	91.27	150.13	184.93	223.93	236.83	228.99	232.84	153.28	98.13	62.64	1755.62
2016	43.79	48.45	90.88	149.48	184.14	222.96	235.81	228.00	231.84	152.62	97.71	62.37	1748.05

G10 INDUSTRIAL DATA TABLES

Southern California Gas Company
2013 TCAP - 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
2013 TCAP - 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
2010	13.374	13.611	13.361	13.698	13.926	13.020	14.550	14.055	14.613	14.443	15.442
2011	13.319	13.559	13.306	13.651	13.880	12.958	14.516	14.010	14.580	14.411	15.430
2012	14.341	14.569	14.327	14.657	14.874	13.996	15.481	14.996	15.542	15.384	16.357
2013	15.003	15.228	14.989	15.316	15.529	14.662	16.129	15.650	16.189	16.034	16.994
2014	15.485	15.706	15.471	15.793	16.003	15.148	16.595	16.122	16.654	16.501	17.448
2015	15.889	16.087	15.877	16.166	16.354	15.588	16.883	16.459	16.936	16.800	17.649
2016	16.269	16.463	16.257	16.540	16.724	15.973	17.243	16.827	17.295	17.162	17.994

(b) Marginal Price Forecasat

Year	Chemical	Fab_Metal	Food	Mining	Petroleum	Prim_Metal	Stone	Textile	Transport	Wood_Paper	Misc
2010	10.808	10.914	10.775	10.910	11.009	10.576	11.249	10.966	11.268	11.298	11.759
2011	10.770	10.878	10.736	10.874	10.975	10.534	11.219	10.931	11.238	11.268	11.737
2012	11.566	11.668	11.535	11.664	11.759	11.344	11.988	11.718	12.006	12.035	12.475
2013	12.086	12.186	12.055	12.183	12.276	11.868	12.501	12.235	12.519	12.547	12.980
2014	12.463	12.561	12.433	12.558	12.649	12.249	12.871	12.610	12.888	12.916	13.341
2015	12.758	12.845	12.731	12.842	12.923	12.568	13.120	12.888	13.135	13.160	13.537
2016	13.054	13.138	13.027	13.136	13.215	12.868	13.407	13.181	13.422	13.446	13.814

Southern California Gas Company
2013 TCAP - 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
2010	100.00	0.6545	0.6661	0.6539	0.6704	0.6816	0.6372	0.7121	0.6879	0.7152	0.7068	0.7558
2011	101.74	0.6241	0.6353	0.6234	0.6396	0.6504	0.6071	0.6802	0.6564	0.6832	0.6753	0.7230
2012	103.73	0.6896	0.7006	0.6890	0.7048	0.7153	0.6730	0.7444	0.7211	0.7474	0.7398	0.7865
2013	106.10	0.7298	0.7407	0.7291	0.7450	0.7554	0.7132	0.7846	0.7613	0.7875	0.7799	0.8266
2014	108.61	0.7606	0.7715	0.7599	0.7757	0.7861	0.7441	0.8151	0.7919	0.8180	0.8105	0.8570
2015	111.12	0.8671	0.8779	0.8664	0.8821	0.8924	0.8506	0.9213	0.8982	0.9242	0.9168	0.9631
2016	113.71	0.9017	0.9124	0.9010	0.9167	0.9269	0.8853	0.9557	0.9326	0.9585	0.9512	0.9973

(b) Marginal Price Forecasat

Year	Price Deflator	Chemical	Fabricated Metal	Food	Mining	Petroleum	Primary Metal	Stone	Textile	Transport	Wood Paper	Misc
2010	100.00	0.6158	0.6218	0.6139	0.6216	0.6273	0.6026	0.6410	0.6248	0.6420	0.6437	0.6700
2011	101.74	0.5863	0.5921	0.5844	0.5920	0.5974	0.5734	0.6107	0.5951	0.6117	0.6134	0.6389
2012	103.73	0.6526	0.6583	0.6508	0.6581	0.6635	0.6401	0.6764	0.6612	0.6774	0.6790	0.7039
2013	106.10	0.6928	0.6985	0.6910	0.6984	0.7037	0.6803	0.7166	0.7014	0.7176	0.7192	0.7441
2014	108.61	0.7238	0.7294	0.7220	0.7293	0.7346	0.7113	0.7474	0.7323	0.7484	0.7500	0.7747
2015	111.12	0.8304	0.8360	0.8286	0.8359	0.8411	0.8180	0.8539	0.8389	0.8549	0.8565	0.8811
2016	113.71	0.8652	0.8708	0.8634	0.8706	0.8759	0.8529	0.8886	0.8736	0.8896	0.8911	0.9156

Southern California Gas Company
2013 TCAP - Industrial G10
Historical Throughput and Customer Counts

Business Type	therms_ 2010	meters_ 2010	meters_ 2010_ ExCust	meters_ 2010_ NewCust	avgUse_ 2010_ ExCust	avgUse_ 2010_ NewCust	Price Elasticity	Employment Elasticity
Mining	5355949.83	236	234	2	22126.48	89176.79	0.000000	0.321451
Food	70254926.46	2798	2750	48	25497.13	2871.22	-0.190795	1.242506
Textile	18132955.39	637	636	1	28507.50	2187.90	0.000000	0.033325
Wood_Paper	7734907.74	563	561	2	13787.05	186.14	0.000000	0.508272
Chemical	18736798.59	995	988	7	18953.45	1541.88	-0.080517	0.650067
Petroleum	8101189.71	145	143	2	56617.37	2453.17	-0.180563	0.084537
Stone	5716154.85	533	529	4	10796.83	1157.66	0.000000	0.416909
Prim_Metal	10279470.09	381	381	0	26980.24	0.00	0.000000	0.956685
Fab_Metal	25340452.07	2350	2340	10	10826.75	585.60	-0.137441	1.023881
Transport	15198610.58	2038	2036	2	7464.69	247.36	0.000000	0.402505
Misc	41352915.28	8448	8407	41	4910.17	1783.76	-0.108307	0.879307
Total	226204330.60	19124						

Southern California Gas Company
2013 TCAP - 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
2013 TCAP - 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
2013 TCAP - 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
2013 TCAP - 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
2013 TCAP - 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
2013 TCAP - 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
2013 TCAP - 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
2013 TCAP - Industrial G10
Employment Forecast (in thousands)

YEAR	Mining	Food	Textile	Wood_Paper	Chemical	Petroleum	Stone	Primary_Metal	Fabricated_Metal	Transportation	Miscellaneous	Total
2010	18.5683	111.8050	39.4492	19.1275	34.3767	5.9450	16.4883	7.5017	75.5650	69.6750	332.9542	731.4517
2011	19.5250	113.1467	38.9367	19.2142	34.7250	5.8658	16.5492	7.7600	77.3500	72.6942	342.1050	747.8725
2012	20.6767	113.9692	40.3192	21.2008	35.5333	5.7533	17.5675	7.9350	79.1358	76.2550	350.3417	768.6858
2013	20.7600	114.7725	41.2942	22.9350	36.0108	5.6692	18.8467	7.9325	83.8758	77.8817	359.0400	789.0125
2014	20.6492	115.0367	41.1883	23.5375	36.3700	5.5508	19.4083	8.1533	89.2350	79.0492	358.8450	797.0250
2015	20.2125	114.9892	40.3717	23.9158	37.0175	5.3908	19.5858	8.3642	93.2183	79.4800	361.1958	803.7433
2016	19.4325	114.7508	39.4550	24.0692	37.6158	5.2525	19.6642	8.4217	95.8667	78.4942	361.4708	804.4925

Southern California Gas Company
2013 TCAP - Industrial G10
Core Industrial Demand Forecast (Mdth)
Average Temperature

Model Output

	G10-Ind	EE/DSM	AB970	City of Vernon	AMI	C2NC Migration	Final
2010	22620.4	0.0	0.0	0.00	0.00	0.00	22620.4
2011	23022.1	325.7	0.0	0.00	0.00	407.33	22289.0
2012	23090.0	674.4	31.8	68.25	0.00	801.41	21577.8
2013	23273.0	1023.1	47.7	136.50	2.07	1193.13	20965.9
2014	23361.0	1371.8	63.6	204.76	5.97	1582.50	20259.6
2015	23146.3	1720.5	63.6	273.01	9.77	1969.53	19237.2
2016	23099.5	2069.2	63.6	273.01	13.60	1969.53	18837.8

Southern California Gas Company
2013 TCAP - Industrial G10
Core Industrial Demand Forecast (Mdth)
Cold Temperature

YEAR	Model Output G10-Ind	EE/DSM	AB970	City of Vernon	AMI	C2NC Migration	Final
2010	23097.5	0.0	0.00	0.00	0.00	0.00	23097.5
2011	23507.6	332.6	0.00	0.00	0.00	407.33	22767.7
2012	23576.9	688.6	31.80	68.25	0.00	801.41	22050.5
2013	23763.8	1044.7	47.70	136.50	2.11	1193.13	21435.1
2014	23853.7	1400.7	63.60	204.76	6.09	1582.50	20723.2
2015	23634.5	1756.7	63.60	273.01	9.97	1969.53	19688.8
2016	23586.6	2112.8	63.60	273.01	13.88	1969.53	19281.0

Southern California Gas Company
2013 TCAP - Industrial G10
Core Industrial Demand Forecast (Mdth)
Hot Temperature

YEAR	Model Output G10-Ind	EE/DSM	AB970	City of Vernon	AMI	C2NC Migration	Final
2010	22143.4	0.0	0.00	0.00	0.00	0.00	22143.4
2011	22536.5	318.8	0.00	0.00	0.00	407.33	21810.4
2012	22603.1	660.2	31.80	68.25	0.00	801.41	21105.0
2013	22782.2	1001.5	47.70	136.50	2.03	1193.13	20496.7
2014	22868.4	1342.8	63.60	204.76	5.85	1582.50	19796.0
2015	22658.2	1684.2	63.60	273.01	9.57	1969.53	18785.5
2016	22612.3	2025.5	63.60	273.01	13.32	1969.53	18394.5

Southern California Gas Company
2013 TCAP - Industrial G10
Core Industrial Demand Forecast (Mdth)
Base Temperature

YEAR	Model Output G10-Ind	EE/DSM	AB970	City of Vernon	AMI	C2NC Migration	Final
2010	20286.1	0.0	0.00	0.00	0.00	0.00	20286.1
2011	20646.3	292.1	0.00	0.00	0.00	407.33	19946.9
2012	20707.2	604.8	31.80	68.25	0.00	801.41	19264.6
2013	20871.3	917.5	47.70	136.50	1.88	1193.13	18670.0
2014	20950.3	1230.2	63.60	204.76	5.38	1582.50	17991.1
2015	20757.8	1542.9	63.60	273.01	8.79	1969.53	17027.1
2016	20715.7	1855.6	63.60	273.01	12.23	1969.53	16668.9

Triennial Cost Allocation Proceeding

NATURAL GAS VEHICLES

The Gas Company

A Sempra Energy utility™

Workpaper NGV-1

#REF!

2. Description - Summary of SoCalGas forecasted annual volumes and stations from 2011-2016

3. Data

Table 1 - SoCalGas CNG Station and Volume Forecasts

Year	Volumetric Growth Rate	Uncompressed [1]		Compressed [2]		Total Volume
		stations	MDtherms	stations	MDtherms	MDtherms
2010	-	233	9,769	19	132	9,901
2011	3.95%	244	11,722	19	137	11,859
2012	3.83%	254	12,158	20	142	12,301
2013	3.72%	265	12,598	20	148	12,745
2014	3.61%	276	13,039	20	153	13,192
2015	3.50%	287	13,478	20	158	13,636
2016	3.40%	299	13,918	20	164	14,082

[1] Uncompressed volume is the total volume delivered to non-utility owned CNG stations. Station growth assumes constant number of stations added each year based on expected 2011 CNG station construction.

[2] Compressed volume is the total volume delivered at utility-owned CNG stations.

4. Source - Workpaper NGV-2

#REF!

2. Description - SoCalGas throughput growth forecast, and growth methodolgy determination.

3. Data

Table 1 - SoCalGas Volume Forecast Growth

Years	Total Volume	Transit Customer Volume	Total Volume Less Transit Customer Volume		Yearly growth	Average growth 2008 through 2011
			Total	Volume Increase		
	MM CCF	MM CCF	MM CCF	MM CCF	%	%
2011 prorated	99.236	69.636	29.6	3.196	3.23	3.95
End 2010	99.054	72.65	26.404	4.927	5.18	
End 2009	95.14	73.663	21.477	3	3.45	
End 2008	87.067	68.59	18.477	n/a		
Compounded Annual growth rate = -2.933% (declining)						

Table 2 - SoCalGas Monthly Volumes

Year	January	February	March	April	May	June	July	August	September	October	November	December	Annual
Compressed Volumes (M decatherms)													
2010	9	9	11	10	11	11	11	12	12	13	12	12	132
2011	10	9	11	10	11	11	11	12	13	13	13	12	137
2012	10	9	12	11	11	12	12	13	13	14	13	13	142
2013	10	10	12	11	12	12	12	13	14	14	14	13	148
2014	11	10	13	12	12	12	13	14	14	15	14	14	153
2015	11	10	13	12	13	13	13	14	15	15	15	14	158
2016	11	11	14	12	13	13	14	14	15	16	15	15	164
Uncompressed Volumes (M Decatherms)													
2010	758	738	848	823	813	853	811	836	803	848	807	832	9769
2011	788	818	849	882	916	951	987	1025	1064	1105	1147	1191	11722
2012	818	848	881	915	950	986	1024	1063	1104	1146	1190	1235	12158
2013	848	879	913	947	984	1021	1061	1101	1143	1187	1233	1280	12598
2014	879	910	944	981	1018	1057	1098	1140	1183	1229	1276	1325	13039
2015	910	940	976	1014	1052	1093	1135	1178	1223	1270	1319	1369	13478
2016	940	971	1008	1047	1087	1128	1171	1216	1263	1311	1362	1414	13918

4. Source - Historical monthly throughput provided by Diane DeHart of Billing Services.

ENERGY EFFICIENCY

SoCalGas	Reported 2006 Therms	Reported 2007 Therms	Reported 2008 Therms	Reported 2009 Therms	Reported 2010 Therms	Forecast 2011 Therms	Forecast 2012 Therms	Forecast 2013	Forecast 2014	Forecast 2015	Forecast 2016
SoCalGas EE Program TOTAL	**11,062,485**	**29,194,539**	**27,113,756**	**24,591,452**	**27,413,193**	**38,796,258**	**38,527,092**				
PUC Goal	**14,700,000**	**19,300,000**	**23,300,000**	**27,200,000**	**28,000,000**	**30,000,000**	**32,000,000**	32,000,000	32,000,000	32,000,000	32,000,000
Difference	**(3,637,515)**	**9,894,539**	**3,813,756**	**(2,608,548)**	**(586,807)**	**8,796,258**	**6,527,092**				

SoCalGas	2006 therms	2007 therms	2008 therms	2009 therms	2010 therms	2011 therms	2012 therms
Core Residential	2,185,663	3,300,334	2,294,755	6,334,588	9,072,268	12,063,281	11,890,291
Core Commercial	3,609,253	10,528,400	10,091,230	7,423,112	7,457,290	5,636,754	5,574,605
Core Industrial	1,097,965	3,202,828	3,069,837	2,258,173	2,268,570	4,211,801	4,198,190
NonCore Commercial	515,069	1,502,486	1,440,098	1,059,337	1,064,214	9,230,858	9,217,247
NonCore Industrial retail	1,201,827	3,505,800	3,360,229	2,471,785	2,483,166	3,629,606	3,622,801
NonCore Industrial refinery	2,452,708	7,154,691	6,857,607	5,044,458	5,067,684	4,023,958	4,023,958
Total	**11,062,485**	**29,194,539**	**27,113,756**	**24,591,452**	**27,413,193**	**38,796,258**	**38,527,092**

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

ANNUAL NET SAVINGS	2006 Mdth	2007 Mdth	2008 Mdth	2009 Mdth	2010 Mdth	2011 Mdth	2012 Mdth	2013 Mdth	2014 Mdth	2015 Mdth	2016 Mdth
Core Residential	219	330	229	633	907	933	988	988	988	988	988
Core Commercial	361	1,053	1,009	742	746	436	463	463	463	463	463
Core Industrial	110	320	307	226	227	326	349	349	349	349	349
NonCore Commercial	52	150	144	106	106	714	766	766	766	766	766
NonCore Industrial retail	120	351	336	247	248	281	301	301	301	301	301
NonCore Industrial refinery	245	715	686	504	507	311	334	334	334	334	334
Total	**1,106**	**2,919**	**2,711**	**2,459**	**2,741**	**3,000**	**3,200**	**3,200**	**3,200**	**3,200**	**3,200**

Cumulative Savings Mdth	2011 Mdth	2012 Mdth	2013 Mdth	2014 Mdth	2015 Mdth	2016 Mdth
Core Residential	**933**	**1,920**	**2,908**	**3,896**	**4,883**	**5,871**
Core Commercial	**436**	**899**	**1,362**	**1,825**	**2,288**	**2,751**
Core Industrial	**326**	**674**	**1,023**	**1,372**	**1,720**	**2,069**
NonCore Commercial	**714**	**1,479**	**2,245**	**3,011**	**3,776**	**4,542**
NonCore Industrial regular	**281**	**582**	**882**	**1,183**	**1,484**	**1,785**
NonCore Industrial refinery	**311**	**645**	**980**	**1,314**	**1,648**	**1,982**
Total Load Impacts	**3,000**	**6,200**	**9,400**	**12,600**	**15,800**	**19,000**

MMCF factor: **1.0235**

Cumulative Savings MMCF	2011 Mmcf	2012 Mmcf	2013 Mmcf	2014 Mmcf	2015 Mmcf	2016 Mmcf
Core Residential	911	1,876	2,841	3,806	4,771	5,736
Core Commercial	426	878	1,331	1,783	2,235	2,688
Core Industrial	318	659	1,000	1,340	1,681	2,022
NonCore Commercial	697	1,445	2,193	2,941	3,689	4,437
NonCore Industrial regular	274	568	862	1,156	1,450	1,744
NonCore Industrial refinery	304	631	957	1,284	1,610	1,937
Total Cumulative Load	**2,931**	**6,058**	**9,184**	**12,311**	**15,437**	**18,564**
Forecast Year ====>	1	2	3	4	5	6

NOTES:
2010 Reported data is preliminary pending CPUC review.

Triennial Cost Allocation Proceeding

EXCHANGE DEMAND FORECAST

The Gas Company

A Sempra Energy utility™

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 2008 to 2010 formed the forecasts for the exchange gas load. Exchange load is expected to remain stable as has been in the past years. Table 1 summarizes the forecast for SCG gas deliveries under the Master Exchange Agreement. Note the table shows unilateral flows and not the net transactions.

Southern California Gas Company
Exchange Forecast (deliveries to PG&E)

MARKET	RATE	YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
E	G40	2010	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
I	G30	2010	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
E	G40	2011	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
I	G30	2011	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
E	G40	2012	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
I	G30	2012	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
E	G40	2013	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
I	G30	2013	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
E	G40	2014	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
I	G30	2014	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
E	G40	2015	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
I	G30	2015	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00
E	G40	2016	0.07	0.00	0.40	0.05	0.00	0.00	0.00	0.10	0.04	0.03	0.00	0.30	1.00
I	G30	2016	73.48	53.39	43.66	26.34	21.01	17.90	16.06	14.01	15.32	20.32	36.11	63.38	401.00

Triennial Cost Allocation Proceeding

SUPPORTING DATA

Triennial Cost Allocation Proceeding

SERVICE AREA ECONOMIC FORECAST

The Gas Company

A Sempra Energy utility™

Based on monthly data from eco1103m.xls, March 2011 forecast -- based on Global Insight's March 2011 Regional forecast
(Scott Wilder's workpapers for 2013 TCAP)

SOUTHERN CALIFORNIA GAS COMPANY SERVICE AREA ECONOMIC FORECAST

(forecast based on Global Insight's March 2011 Regional Forecasts)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
EMPLOYMENT (1000's)												
Total	8,217.7	8,398.5	8,444.7	8,308.8	7,781.1	7,672.4	7,720.5	7,848.6	8,016.9	8,171.4	8,304.8	8,416.2
Agriculture	215.5	218.5	221.6	227.1	210.3	219.9	220.6	219.9	218.5	218.4	218.9	218.4
Total Non-farm	8,002.2	8,180.0	8,223.1	8,081.7	7,570.8	7,452.5	7,499.9	7,628.7	7,798.4	7,952.9	8,085.9	8,197.8
Mining	16.6	18.3	19.0	19.9	18.5	18.6	19.5	20.7	20.8	20.6	20.2	19.4
Construction	458.7	485.1	459.8	403.0	319.0	283.7	286.6	295.2	325.8	352.2	381.3	402.8
Manufacturing	890.8	884.9	865.7	830.8	739.1	712.9	728.3	748.0	768.3	776.4	783.5	785.1
Transportation, Information, Utilities	566.3	570.5	577.5	572.9	528.7	524.0	538.0	562.0	574.8	583.7	600.7	613.1
Trade	1,411.9	1,451.8	1,468.9	1,433.4	1,323.9	1,311.1	1,314.7	1,340.2	1,361.2	1,378.7	1,394.1	1,408.2
Retail	985.3	1,010.2	1,014.3	984.6	910.2	901.9	902.1	918.1	929.8	937.8	943.7	948.5
Wholesale (including warehousing)	426.6	441.6	454.6	448.8	413.7	409.3	412.6	422.1	431.4	440.9	450.4	459.8
Restaurants	537.9	557.4	570.9	573.5	551.3	550.7	550.8	560.6	567.7	572.6	576.2	579.1
Finance, Insurance & Real Estate	497.6	505.4	488.2	456.0	423.3	411.7	411.7	418.7	434.4	436.9	433.0	427.1
Services	2,211.3	2,278.1	2,317.4	2,310.0	2,195.1	2,197.0	2,242.4	2,287.8	2,342.3	2,412.9	2,467.6	2,520.1
Accomodation	124.0	126.8	130.3	131.2	123.6	122.7	124.7	126.0	126.9	127.5	127.6	127.6
Personal & Laundry Services	81.3	82.9	84.6	85.2	80.3	79.9	80.6	81.0	81.2	81.4	81.2	81.3
Professional & Business Services	1,088.7	1,135.9	1,143.6	1,106.2	1,005.0	1,000.4	1,027.4	1,054.1	1,093.3	1,148.6	1,188.5	1,219.1
Health & Social Services	696.1	708.6	729.9	754.5	762.3	772.9	786.7	802.7	816.2	830.4	845.7	867.3
Misc. Services	221.3	223.8	229.0	232.9	223.9	221.1	223.0	224.0	224.7	225.0	224.7	224.8
Government & Education	1,411.1	1,428.7	1,455.7	1,482.2	1,471.8	1,442.7	1,407.8	1,395.3	1,403.1	1,418.9	1,429.2	1,442.9
OTHER												
Southern California Area Consumer Inflation*	4.5%	4.3%	3.3%	3.5%	-0.8%	1.2%	1.7%	2.0%	2.3%	2.4%	2.3%	2.3%

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