Triennial Cost Allocation Proceeding Workpapers

Southern California Gas Company

Table of Contents

Triennial Cost Allocation Proceeding

FORECAST OF REQUIREMENTS

Triennial Cost Allocation Proceeding

CUSTOMER FORECAST

Southern California Gas Company: Customer Forecast

2017 TCAP (Phase II)

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 housing starts. 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 1979Q2 to 2013Q4 period.

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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
HSSF	Residential Single Family Housing Starts
HSSFL1	Residential Single Family Housing Starts Lagged 1 Quarter
HSSFL2	Residential Single Family Housing Starts Lagged 2 Quarters
HSSFL3	Residential Single Family Housing Starts Lagged 3 Quarters
HSSFL4	Residential Single Family Housing Starts Lagged 4 Quarters
HSSFL5	Residential Single Family Housing Starts Lagged 5 Quarters
HSSFL6	Residential Single Family Housing Starts Lagged 6 Quarters
HSSFL7	Residential Single Family Housing Starts Lagged 7 Quarters
HSSFL8	Residential Single Family Housing Starts Lagged 8 Quarters
HSMF	Residential Multi Family Housing Starts
HSMFL1	Residential Multi Family Housing Starts Lagged 1 Quarter
HSMFL2	Residential Multi Family Housing Starts Lagged 2 Quarters
HSMFL3	Residential Multi Family Housing Starts Lagged 3 Quarters
HSMFL4	Residential Multi Family Housing Starts Lagged 4 Quarters
HSMFL5	Residential Multi Family Housing Starts Lagged 5 Quarters
HSMFL6	Residential Multi Family Housing Starts Lagged 6 Quarters
HSMFL7	Residential Multi Family Housing Starts Lagged 7 Quarters
HSMFL8	Residential Multi Family Housing Starts Lagged 8 Quarters
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
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
DUM8604	Dummy variable, =1 when dte=198604, =0 otherwise
DUM0711	Dummy variable, =1 when 200702<=dte<=201104, =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
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

1) Residential Single Family

a. Connected Meter: ConnSF (1979Q2 to 2013Q4)

$$\begin{aligned}\text{Diff (ConnSF)} = {} & \underset{(1.75)}{3255} + \underset{(5.86)}{0.0757} * \text{HSSFL1 (t -1)} \\ & + \underset{(2.06)}{0.0249} * \text{HSSFL8 (t-8)} - \underset{(-5.26)}{1494} * \text{SEA2} \\ & - \underset{(-2.85)}{807.039} * \text{SEA3} - \underset{(-7.44)}{7664} * \text{DUM9603} \\ & + \underset{(4.58)}{4760} * \text{DUM0503} - \underset{(-2.19)}{1630} * \text{DUM0711}\end{aligned}$$

* t-value is in the parenthesis.

SSE	176901959	DFE	120
MSE	1474183	Root MSE	1214
Total Rsq	0.9272	Durbin-Watson	2.0011

b. In-Active Meter: InActSF

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

Where i =1, 2, 3, and 4

Q1: 1.96%, Q2: 1.96%, Q3: 2.05% and Q4: 1.98%

c. Active Meter: ActSF

ActSF = ConnSF – InActSF

2) Residential Multi-Family

a. Connected Meter: ConnMF (1979Q1 to 2013Q4)

Diff (ConnMF) = 1888 + 0.0777 * HSMFL4(t -4)
(1.69) (5.45)

+ 0.0585 HSMFL8 (t -8) + 895.9268 DUM8604
(4.33) (1.48)

-2919 * DUM9603 - 4576* DUM0303
(-3.66) (5.74)

* t-value is in the parenthesis.

SSE	113324782	DFE	123
MSE	921340	Root MSE	959.86
Total Rsq	.9630	Durbin-Watson	2.0305

b. In-Active Meter: InActMF

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

Where i =1, 2, 3, and 4

Q1: 5.06%, Q2: 4.98%, Q3: 5.27% and Q4: 5.08%

c. Active Meter: ActMF

ActMF = ConnMF – InActMF

3) Residential Master Meter

a. Master Meter: ConnMM

ConnMM (t) = (1-0.0051) * ConnMM (t-4)

b. Active Meter: ActMM

ActMM (t) = ConnMM(t)-InActMM(t)

c. In-Active Meter: InActMM

InActMM(Qi) = PCTInActMM(Qi)* ConnMM

Where i= 1, 2, 3, and 4
Q1=1.63%; Q2= 1.62%; Q3= 1.65%, and Q4= 1.64%

Total Residential Meter

ConnRES = ConnSF + ConnMF + ConnMM

ActReES = ActSF + ActMF + ActMM

InActRES = InActSF + InActMF + InActMM

4) Commercial Meter

a. Connected Meter: ConnCom (1979Q1 to 2013Q4)

Ln (ConnCom) = 10.6874 + 0.1007 * Ln (EmpCom (t -1))
(25.70) (3.82)

+ 0.0831 * Ln (EmpCom (t -2)) + 0.002755 * SEA1dum
(3.15) (3.57)

+ 0.003026 * SEA2dum + 0.001790 * SEA3dum
(3.76) (2.70)

*t-value is in the parenthesis.

SSE	0.00085024	DFE	128
MSE	6.6425E-6	Root MSE	0.00258
Rsq	0.9989	Durbin-Watson	1.2998

b. In-Active Meter: InActCom

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

Where i = 1, 2, 3, and 4

Q1: 23.06%, Q2: 23.44%, Q3: 23.86% and Q4: 23.79%

c. Active Meter: ActCom

ActCom = ConnCom – InActCom

5) Industrial Meter

a. Active Meter: ACTIND (1979Q2 to 2013Q4)

Ln (ACTIND) = 7.4670 +0.3796 * Ln(EmpInd)(t-1) -0.0173*SEA3 +
(20.45) (7.45) (-14.99)

-0.0167*SEA4
(-14.60)

*t-value is in the parenthesis.

SSE	.00835232	DFE	133
MSE	0.0000628	Root MSE	0.00792
Total Rsq	0.9975	Durbin-Watson	1.2435

b. In-active Meter: InActInd

InActInd (Qi) = ACTIND (Qi) * PCTInActInd(Qi)

Where i =1, 2, 3, and 4

Q1: 48.83%, Q2: 49.86%, Q3: 51.02% and Q4: 50.98%

c. CONNECTED Meter: ConnInd

ConnInd = ActInd + InActInd

6) 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 = 0.0001 * TotConn

Meter Reset:
ReSets = Removes + ReSetsSeas

New Meter Sets:
NewSets = NetCG – ReSets + Removes

Southern California Gas Company

FORECAST 2017 for TCAP

Year	Active SF	Active MF	Active MM	Active tot Res	Active Com	Active Ind	Active Total	Growth
2000	3,158,252	1,597,527	44,860	4,800,639	185,845	22,071	5,008,555	69,255
2001	3,210,899	1,604,796	44,487	4,860,183	187,676	21,859	5,069,718	61,163
2002	3,268,930	1,612,709	44,215	4,925,855	189,804	21,396	5,137,054	67,336
2003	3,322,120	1,621,230	43,861	4,987,211	190,114	20,848	5,198,173	61,119
2004	3,377,588	1,633,083	43,540	5,054,210	191,291	20,734	5,266,235	68,062
2005	3,434,786	1,637,608	43,177	5,115,570	192,270	20,590	5,328,430	62,195
2006	3,488,997	1,647,654	42,695	5,179,346	192,321	20,307	5,391,974	63,544
2007	3,524,381	1,665,905	42,386	5,232,672	192,862	20,257	5,445,791	53,817
2008	3,531,044	1,681,864	42,026	5,254,934	191,906	20,140	5,466,979	21,188
2009	3,547,653	1,681,251	41,710	5,270,615	190,000	19,699	5,480,314	13,335
2010	3,570,361	1,697,335	41,485	5,309,182	188,141	19,346	5,516,668	36,354
2011	3,585,183	1,716,280	41,242	5,342,705	187,337	19,135	5,549,177	32,509
2012	3,598,669	1,730,663	41,038	5,370,370	186,996	18,989	5,576,355	27,178
2013	3,614,927	1,743,855	40,895	5,399,678	187,544	18,891	5,606,113	29,758
2014	3,632,536	1,759,124	40,697	5,432,357	187,320	18,703	5,638,380	32,267
2015	3,645,823	1,771,533	40,454	5,457,810	188,470	19,159	5,665,439	27,059
2016	3,667,357	1,796,593	40,248	5,504,197	188,979	19,238	5,712,414	46,975
2017	3,689,926	1,828,441	40,042	5,558,410	189,405	19,286	5,767,101	54,687
2018	3,713,212	1,864,279	39,838	5,617,329	189,592	19,332	5,826,252	59,151
2019	3,737,197	1,900,855	39,635	5,677,687	189,601	19,375	5,886,663	60,411
2020	3,761,526	1,937,062	39,433	5,738,021	189,572	19,378	5,946,970	60,307

SoCalGas Meter Data

OBS	DTE	YEAR	QUARTER	CONNMM	CONNCOM	CONNIND	CONNMF	DConnMF	CONNRES	CONNSF
1	197902	1979	2	21858	183720	29175	1044831		3542050	2475361
2	197903	1979	3	22243	184640	28998	1056084	11253	3566581	2488253
3	197904	1979	4	22568	186131	29325	1067481	11397	3590558	2500509
4	198001	1980	1	23415	187947	29949	1076885	9404	3609899	2509598
5	198002	1980	2	24230	189288	30018	1085343	8458	3627683	2518110
6	198003	1980	3	24697	189860	29646	1094447	9104	3645414	2526270
7	198004	1980	4	25086	190673	29948	1104182	9735	3663657	2534389
8	198101	1981	1	31743	191756	30504	1113039	8857	3685041	2540259
9	198102	1981	2	31462	192842	30256	1120924	7885	3694032	2541646
10	198103	1981	3	30131	193137	29903	1128137	7213	3703942	2545674
11	198104	1981	4	30761	193171	30035	1135861	7724	3718300	2551678
12	198201	1982	1	31782	195127	30468	1143617	7756	3731531	2556132
13	198202	1982	2	32554	196109	30304	1150513	6896	3742658	2559591
14	198203	1982	3	33081	196181	29752	1157101	6588	3752250	2562068
15	198204	1982	4	33618	196634	29867	1164070	6969	3763314	2565626
16	198301	1983	1	34436	197766	30090	1171468	7398	3774855	2568951
17	198302	1983	2	35047	198576	29610	1178057	6589	3784431	2571326
18	198303	1983	3	35534	198967	29054	1185677	7620	3797322	2576111
19	198304	1983	4	35945	199210	29199	1193933	8256	3811473	2581594
20	198401	1984	1	36487	199562	29619	1202899	8966	3827374	2587988
21	198402	1984	2	36857	199640	29357	1210847	7948	3841796	2594092
22	198403	1984	3	37078	200945	28796	1219044	8197	3855409	2599287
23	198404	1984	4	37507	203617	29038	1229031	9987	3872161	2605623
24	198501	1985	1	38077	206126	29678	1240563	11532	3891179	2612539
25	198502	1985	2	38691	207173	29218	1252269	11706	3909929	2618969
26	198503	1985	3	39205	208667	28547	1264693	12424	3931109	2627211
27	198504	1985	4	39577	207966	28825	1274087	9394	3948303	2634639
28	198601	1986	1	40046	207892	29337	1291752	17665	3977948	2646149
29	198602	1986	2	40343	208707	28658	1304602	12850	3998769	2653824
30	198603	1986	3	40614	208638	27923	1321020	16418	4025542	2663907
31	198604	1986	4	40841	208138	27834	1338645	17625	4054471	2674985
32	198701	1987	1	41155	209297	28359	1357743	19098	4086916	2688018
33	198702	1987	2	41515	210135	27864	1375695	17952	4115974	2698764
34	198703	1987	3	41784	210053	27149	1393988	18293	4146352	2710580
35	198704	1987	4	42070	209320	27039	1412851	18863	4178526	2723605
36	198801	1988	1	42480	211115	28026	1431008	18157	4209742	2736255
37	198802	1988	2	42932	211878	27478	1446245	15237	4236806	2747629

OBS	DTE	YEAR	QUARTER	CONNMM	CONNCOM	CONNIND	CONNMF	DConnMF	CONNRES	CONNSF
38	198803	1988	3	43329	211737	26853	1461772	15527	4265413	2760311
39	198804	1988	4	43580	211251	26845	1477080	15308	4295463	2774803
40	198901	1989	1	43759	213036	27854	1491608	14528	4325396	2790029
41	198902	1989	2	43875	214071	27462	1503773	12165	4351224	2803576
42	198903	1989	3	44022	213857	27087	1516455	12682	4378240	2817763
43	198904	1989	4	44117	213043	27555	1527687	11232	4404043	2832238
44	199001	1990	1	44180	213256	28605	1538257	10570	4429540	2847103
45	199002	1990	2	44251	212932	28943	1548197	9940	4451879	2859431
46	199003	1990	3	44282	212146	29004	1558661	10464	4474196	2871253
47	199004	1990	4	44349	211367	29070	1569031	10370	4495575	2882195
48	199101	1991	1	44430	212776	29359	1578685	9654	4515838	2892723
49	199102	1991	2	44541	212479	29325	1585226	6541	4529316	2899549
50	199103	1991	3	44702	212028	29086	1592815	7589	4547067	2909550
51	199104	1991	4	44899	211826	28838	1599356	6541	4561999	2917745
52	199201	1992	1	45110	212836	28614	1605648	6292	4578511	2927753
53	199202	1992	2	45208	212521	28520	1609530	3882	4588493	2933755
54	199203	1992	3	45321	211168	28292	1614333	4803	4600253	2940598
55	199204	1992	4	45436	209945	27952	1617793	3460	4610344	2947115
56	199301	1993	1	45599	211971	27984	1622983	5190	4623722	2955141
57	199302	1993	2	45783	212034	27801	1625981	2998	4633091	2961327
58	199303	1993	3	45974	211703	27815	1628994	3013	4642760	2967791
59	199304	1993	4	46034	211866	27847	1631384	2390	4653009	2975591
60	199401	1994	1	46039	213927	27906	1633936	2552	4663896	2983921
61	199402	1994	2	46120	214869	28018	1635446	1510	4672323	2990756
62	199403	1994	3	46156	215040	28102	1636299	853	4680520	2998066
63	199404	1994	4	46171	215855	28133	1638623	2324	4688980	3004186
64	199501	1995	1	46200	217670	28240	1639364	741	4699545	3013981
65	199502	1995	2	46267	217826	28348	1641896	2532	4709878	3021715
66	199503	1995	3	46394	217793	28282	1644230	2334	4719551	3028927
67	199504	1995	4	46467	218014	28205	1646880	2650	4729862	3036514
68	199601	1996	1	46470	218640	28140	1650665	3785	4745530	3048395
69	199602	1996	2	46426	218594	28179	1653824	3159	4761408	3061158
70	199603	1996	3	46403	218830	28258	1653652	-172	4763704	3063648
71	199604	1996	4	46369	219440	28284	1655288	1636	4774126	3072469
72	199701	1997	1	46302	220479	28407	1657156	1868	4784404	3080946
73	199702	1997	2	46265	220864	28455	1658583	1427	4793847	3088999
74	199703	1997	3	46232	221120	28517	1659839	1256	4803629	3097558
75	199704	1997	4	46144	221208	28331	1661381	1542	4814809	3107284

OBS	DTE	YEAR	QUARTER	CONNMM	CONNCOM	CONNIND	CONNMF	DConnMF	CONNRES	CONNSF
76	199801	1998	1	46138	222737	28842	1663079	1698	4826113	3116896
77	199802	1998	2	46063	223102	28939	1664297	1218	4836096	3125735
78	199803	1998	3	46070	223543	28970	1665237	940	4846087	3134780
79	199804	1998	4	45986	224016	28997	1666266	1029	4857260	3145007
80	199901	1999	1	45941	225169	28939	1667744	1478	4869520	3155835
81	199902	1999	2	45895	225792	28832	1668939	1195	4881087	3166253
82	199903	1999	3	45909	226291	28833	1669901	962	4892684	3176875
83	199904	1999	4	45877	226952	28783	1671157	1256	4905479	3188446
84	200001	2000	1	45763	227898	28745	1672110	953	4917648	3199775
85	200002	2000	2	45608	228203	28725	1673490	1380	4929245	3210148
86	200003	2000	3	45569	228299	28706	1674705	1215	4940921	3220647
87	200004	2000	4	45486	228881	28725	1675802	1097	4955205	3233917
88	200101	2001	1	45353	229826	28732	1676450	648	4968449	3246646
89	200102	2001	2	45228	230307	28656	1677728	1278	4981854	3258898
90	200103	2001	3	45186	230583	28623	1679462	1734	4996289	3271641
91	200104	2001	4	45125	231156	28602	1680863	1401	5011483	3285495
92	200201	2002	1	45045	232152	28481	1682493	1630	5027317	3299778
93	200202	2002	2	44947	232680	28343	1684068	1575	5041293	3312278
94	200203	2002	3	44850	233049	28266	1685287	1219	5054914	3324776
95	200204	2002	4	44754	233576	28201	1686762	1475	5070605	3339089
96	200301	2003	1	44691	234176	28179	1688173	1411	5087363	3354499
97	200302	2003	2	44560	234430	28157	1691800	3627	5102799	3366439
98	200303	2003	3	44451	234653	28195	1698946	7146	5120930	3377532
99	200304	2003	4	44395	235080	28250	1702718	3772	5139572	3392458
100	200401	2004	1	44299	235942	28341	1706683	3965	5158231	3407249
101	200402	2004	2	44202	236150	28260	1709744	3061	5175548	3421602
102	200403	2004	3	44096	236379	28286	1711623	1879	5192624	3436905
103	200404	2004	4	44043	236775	28349	1714166	2543	5211715	3453507
104	200501	2005	1	43949	237307	28463	1716613	2447	5229466	3468904
105	200502	2005	2	43855	237764	28205	1718240	1627	5245507	3483412
106	200503	2005	3	43786	238002	28207	1721898	3658	5267964	3502280
107	200504	2005	4	43619	238249	28232	1724006	2108	5284726	3517101
108	200601	2006	1	43497	238774	28381	1728103	4097	5305737	3534137
109	200602	2006	2	43395	239380	28185	1732341	4238	5325124	3549389
110	200603	2006	3	43272	239694	28113	1736811	4470	5342860	3562776
111	200604	2006	4	43182	240001	28149	1741663	4852	5361024	3576179
112	200701	2007	1	43140	240569	28270	1748077	6414	5379414	3588197
113	200702	2007	2	43071	240764	28366	1753258	5181	5392644	3596315

OBS	DTE	YEAR	QUARTER	CONNMM	CONNCOM	CONNIND	CONNMF	DConnMF	CONNRES	CONNSF
114	200703	2007	3	43018	240970	28341	1758177	4919	5405490	3604296
115	200704	2007	4	42931	241485	28342	1763497	5320	5418824	3612396
116	200801	2008	1	42845	242084	28444	1768672	5175	5430253	3618736
117	200802	2008	2	42736	242168	28497	1773994	5322	5440026	3623296
118	200803	2008	3	42645	242338	28518	1779737	5743	5450581	3628198
119	200804	2008	4	42572	242664	28547	1784639	4902	5459921	3632752
120	200901	2009	1	42482	243245	28583	1787967	3328	5466701	3636252
121	200902	2009	2	42438	243471	28595	1792067	4100	5473407	3638903
122	200903	2009	3	42396	243402	28593	1795984	3917	5480582	3642202
123	200904	2009	4	42340	243589	28584	1798805	2821	5486808	3645663
124	201001	2010	1	42287	243806	28615	1802483	3678	5493637	3648867
125	201002	2010	2	42226	243905	28662	1805613	3130	5499719	3651880
126	201003	2010	3	42150	243942	28647	1808846	3233	5505856	3654860
127	201004	2010	4	42081	244093	28639	1811071	2225	5510824	3657672
128	201101	2011	1	42016	244440	28639	1812395	1324	5514278	3659867
129	201102	2011	2	41970	244381	28613	1813744	1349	5517458	3661744
130	201103	2011	3	41924	244362	28622	1815364	1620	5521303	3664015
131	201104	2011	4	41870	244521	28603	1817304	1940	5525545	3666372
132	201201	2012	1	41805.66667	244844	28633	1819593.333	2289	5529770	3668371
133	201202	2012	2	41756.33333	244818	28587	1821788.667	2195	5533768	3670223
134	201203	2012	3	41698	244896	28533	1823985.333	2197	5538189	3672506
135	201204	2012	4	41656.66667	245148	28473	1825912.667	1927	5542899	3675330
136	201301	2013	1	41609.33333	245430	28432	1828289	2376	5548363	3678464
137	201302	2013	2	41570.33333	245540	28452	1830694.333	2405	5553641	3681376
138	201303	2013	3	41529.33333	245474	28449	1833309.667	2615	5559483	3684644
139	201304	2013	4	41487.66667	245546	28426	1835372.667	2063	5565205	3688345
140	201401	2014	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
141	201402	2014	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
142	201403	2014	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
143	201404	2014	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
144	201501	2015	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
145	201502	2015	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
146	201503	2015	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
147	201504	2015	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
148	201601	2016	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
149	201602	2016	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
150	201603	2016	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
151	201604	2016	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
152	201701	2017	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

OBS	DTE	YEAR	QUARTER	CONNMM	CONNCOM	CONNIND	CONNMF	DConnMF	CONNRES	CONNSF
153	201702	2017	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
154	201703	2017	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
155	201704	2017	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
156	201801	2018	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
157	201802	2018	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
158	201803	2018	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
159	201804	2018	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
160	201901	2019	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
161	201902	2019	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
162	201903	2019	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
163	201904	2019	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
164	202001	2020	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
165	202002	2020	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
166	202003	2020	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
167	202004	2020	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
168	202101	2021	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
169	202102	2021	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
170	202103	2021	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
171	202104	2021	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
172	202201	2022	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
173	202202	2022	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
174	202203	2022	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
175	202204	2022	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
176	202301	2023	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
177	202302	2023	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
178	202303	2023	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
179	202304	2023	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
180	202401	2024	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
181	202402	2024	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
182	202403	2024	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
183	202404	2024	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
184	202501	2025	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
185	202502	2025	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
186	202503	2025	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
187	202504	2025	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
188	202601	2026	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
189	202602	2026	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
190	202603	2026	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
191	202604	2026	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

OBS	DTE	YEAR	QUARTER	CONNMM	CONNCOM	CONNIND	CONNMF	DConnMF	CONNRES	CONNSF
192	202701	2027	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
193	202702	2027	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
194	202703	2027	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
195	202704	2027	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
196	202801	2028	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
197	202802	2028	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
198	202803	2028	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
199	202804	2028	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
200	202901	2029	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
201	202902	2029	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
202	202903	2029	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
203	202904	2029	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
204	203001	2030	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
205	203002	2030	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
206	203003	2030	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
207	203004	2030	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
208	203101	2031	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
209	203102	2031	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
210	203103	2031	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
211	203104	2031	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
212	203201	2032	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
213	203202	2032	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
214	203203	2032	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
215	203204	2032	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
216	203301	2033	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
217	203302	2033	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
218	203303	2033	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
219	203304	2033	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
220	203401	2034	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
221	203402	2034	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
222	203403	2034	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
223	203404	2034	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
224	203501	2035	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
225	203502	2035	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
226	203503	2035	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
227	203504	2035	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
228	203601	2036	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
229	203602	2036	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
230	203603	2036	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

OBS	DTE	YEAR	QUARTER	CONNMM	CONNCOM	CONNIND	CONNMF	DConnMF	CONNRES	CONNSF
231	203604	2036	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
232	203701	2037	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
233	203702	2037	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
234	203703	2037	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
235	203704	2037	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
236	203801	2038	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
237	203802	2038	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
238	203803	2038	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
239	203804	2038	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
240	203901	2039	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
241	203902	2039	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
242	203903	2039	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
243	203904	2039	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
244	204001	2040	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
245	204002	2040	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
246	204003	2040	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
247	204004	2040	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
248	204101	2041	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
249	204102	2041	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
250	204103	2041	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
251	204104	2041	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

OBS	DTE	YEAR	QUARTER	DCONNSF	DCONNMF	DCONNMM	CONNSFL	CONNMFL	CONNMML
1	197902	1979	2	.	.	.	.	.	.
2	197903	1979	3	12892	11253	385	2475361	1044831	21858
3	197904	1979	4	12256	11397	325	2488253	1056084	22243
4	198001	1980	1	9089	9404	847	2500509	1067481	22568
5	198002	1980	2	8512	8458	815	2509598	1076885	23415
6	198003	1980	3	8160	9104	467	2518110	1085343	24230
7	198004	1980	4	8119	9735	389	2526270	1094447	24697
8	198101	1981	1	5870	8857	6657	2534389	1104182	25086
9	198102	1981	2	1387	7885	-281	2540259	1113039	31743
10	198103	1981	3	4028	7213	-1331	2541646	1120924	31462
11	198104	1981	4	6004	7724	630	2545674	1128137	30131
12	198201	1982	1	4454	7756	1021	2551678	1135861	30761

OBS	DTE	YEAR	QUARTER	DCONNSF	DCONNMF	DCONNMM	CONNSFL	CONNMFL	CONNMML
13	198202	1982	2	3459	6896	772	2556132	1143617	31782
14	198203	1982	3	2477	6588	527	2559591	1150513	32554
15	198204	1982	4	3558	6969	537	2562068	1157101	33081
16	198301	1983	1	3325	7398	818	2565626	1164070	33618
17	198302	1983	2	2375	6589	611	2568951	1171468	34436
18	198303	1983	3	4785	7620	487	2571326	1178057	35047
19	198304	1983	4	5483	8256	411	2576111	1185677	35534
20	198401	1984	1	6394	8966	542	2581594	1193933	35945
21	198402	1984	2	6104	7948	370	2587988	1202899	36487
22	198403	1984	3	5195	8197	221	2594092	1210847	36857
23	198404	1984	4	6336	9987	429	2599287	1219044	37078
24	198501	1985	1	6916	11532	570	2605623	1229031	37507
25	198502	1985	2	6430	11706	614	2612539	1240563	38077
26	198503	1985	3	8242	12424	514	2618969	1252269	38691
27	198504	1985	4	7428	9394	372	2627211	1264693	39205
28	198601	1986	1	11510	17665	469	2634639	1274087	39577
29	198602	1986	2	7675	12850	297	2646149	1291752	40046
30	198603	1986	3	10083	16418	271	2653824	1304602	40343
31	198604	1986	4	11078	17625	227	2663907	1321020	40614
32	198701	1987	1	13033	19098	314	2674985	1338645	40841
33	198702	1987	2	10746	17952	360	2688018	1357743	41155
34	198703	1987	3	11816	18293	269	2698764	1375695	41515
35	198704	1987	4	13025	18863	286	2710580	1393988	41784
36	198801	1988	1	12650	18157	410	2723605	1412851	42070
37	198802	1988	2	11374	15237	452	2736255	1431008	42480
38	198803	1988	3	12682	15527	397	2747629	1446245	42932
39	198804	1988	4	14492	15308	251	2760311	1461772	43329
40	198901	1989	1	15226	14528	179	2774803	1477080	43580
41	198902	1989	2	13547	12165	116	2790029	1491608	43759
42	198903	1989	3	14187	12682	147	2803576	1503773	43875
43	198904	1989	4	14475	11232	95	2817763	1516455	44022
44	199001	1990	1	14865	10570	63	2832238	1527687	44117
45	199002	1990	2	12328	9940	71	2847103	1538257	44180
46	199003	1990	3	11822	10464	31	2859431	1548197	44251
47	199004	1990	4	10942	10370	67	2871253	1558661	44282
48	199101	1991	1	10528	9654	81	2882195	1569031	44349
49	199102	1991	2	6826	6541	111	2892723	1578685	44430
50	199103	1991	3	10001	7589	161	2899549	1585226	44541
51	199104	1991	4	8195	6541	197	2909550	1592815	44702

OBS	DTE	YEAR	QUARTER	DCONNSF	DCONNMF	DCONNMM	CONNSFL	CONNMFL	CONNMML
52	199201	1992	1	10008	6292	211	2917745	1599356	44899
53	199202	1992	2	6002	3882	98	2927753	1605648	45110
54	199203	1992	3	6843	4803	113	2933755	1609530	45208
55	199204	1992	4	6517	3460	115	2940598	1614333	45321
56	199301	1993	1	8026	5190	163	2947115	1617793	45436
57	199302	1993	2	6186	2998	184	2955141	1622983	45599
58	199303	1993	3	6464	3013	191	2961327	1625981	45783
59	199304	1993	4	7800	2390	60	2967791	1628994	45974
60	199401	1994	1	8330	2552	5	2975591	1631384	46034
61	199402	1994	2	6835	1510	81	2983921	1633936	46039
62	199403	1994	3	7310	853	36	2990756	1635446	46120
63	199404	1994	4	6120	2324	15	2998066	1636299	46156
64	199501	1995	1	9795	741	29	3004186	1638623	46171
65	199502	1995	2	7734	2532	67	3013981	1639364	46200
66	199503	1995	3	7212	2334	127	3021715	1641896	46267
67	199504	1995	4	7587	2650	73	3028927	1644230	46394
68	199601	1996	1	11881	3785	3	3036514	1646880	46467
69	199602	1996	2	12763	3159	-44	3048395	1650665	46470
70	199603	1996	3	2490	-172	-23	3061158	1653824	46426
71	199604	1996	4	8821	1636	-34	3063648	1653652	46403
72	199701	1997	1	8477	1868	-67	3072469	1655288	46369
73	199702	1997	2	8053	1427	-37	3080946	1657156	46302
74	199703	1997	3	8559	1256	-33	3088999	1658583	46265
75	199704	1997	4	9726	1542	-88	3097558	1659839	46232
76	199801	1998	1	9612	1698	-6	3107284	1661381	46144
77	199802	1998	2	8839	1218	-75	3116896	1663079	46138
78	199803	1998	3	9045	940	7	3125735	1664297	46063
79	199804	1998	4	10227	1029	-84	3134780	1665237	46070
80	199901	1999	1	10828	1478	-45	3145007	1666266	45986
81	199902	1999	2	10418	1195	-46	3155835	1667744	45941
82	199903	1999	3	10622	962	14	3166253	1668939	45895
83	199904	1999	4	11571	1256	-32	3176875	1669901	45909
84	200001	2000	1	11329	953	-114	3188446	1671157	45877
85	200002	2000	2	10373	1380	-155	3199775	1672110	45763
86	200003	2000	3	10499	1215	-39	3210148	1673490	45608
87	200004	2000	4	13270	1097	-83	3220647	1674705	45569
88	200101	2001	1	12729	648	-133	3233917	1675802	45486
89	200102	2001	2	12252	1278	-125	3246646	1676450	45353
90	200103	2001	3	12743	1734	-42	3258898	1677728	45228

OBS	DTE	YEAR	QUARTER	DCONNSF	DCONNMF	DCONNMM	CONNSFL	CONNMFL	CONNMML
91	200104	2001	4	13854	1401	-61	3271641	1679462	45186
92	200201	2002	1	14283	1630	-80	3285495	1680863	45125
93	200202	2002	2	12500	1575	-98	3299778	1682493	45045
94	200203	2002	3	12498	1219	-97	3312278	1684068	44947
95	200204	2002	4	14313	1475	-96	3324776	1685287	44850
96	200301	2003	1	15410	1411	-63	3339089	1686762	44754
97	200302	2003	2	11940	3627	-131	3354499	1688173	44691
98	200303	2003	3	11093	7146	-109	3366439	1691800	44560
99	200304	2003	4	14926	3772	-56	3377532	1698946	44451
100	200401	2004	1	14791	3965	-96	3392458	1702718	44395
101	200402	2004	2	14353	3061	-97	3407249	1706683	44299
102	200403	2004	3	15303	1879	-106	3421602	1709744	44202
103	200404	2004	4	16602	2543	-53	3436905	1711623	44096
104	200501	2005	1	15397	2447	-94	3453507	1714166	44043
105	200502	2005	2	14508	1627	-94	3468904	1716613	43949
106	200503	2005	3	18868	3658	-69	3483412	1718240	43855
107	200504	2005	4	14821	2108	-167	3502280	1721898	43786
108	200601	2006	1	17036	4097	-122	3517101	1724006	43619
109	200602	2006	2	15252	4238	-102	3534137	1728103	43497
110	200603	2006	3	13387	4470	-123	3549389	1732341	43395
111	200604	2006	4	13403	4852	-90	3562776	1736811	43272
112	200701	2007	1	12018	6414	-42	3576179	1741663	43182
113	200702	2007	2	8118	5181	-69	3588197	1748077	43140
114	200703	2007	3	7981	4919	-53	3596315	1753258	43071
115	200704	2007	4	8100	5320	-87	3604296	1758177	43018
116	200801	2008	1	6340	5175	-86	3612396	1763497	42931
117	200802	2008	2	4560	5322	-109	3618736	1768672	42845
118	200803	2008	3	4902	5743	-91	3623296	1773994	42736
119	200804	2008	4	4554	4902	-73	3628198	1779737	42645
120	200901	2009	1	3500	3328	-90	3632752	1784639	42572
121	200902	2009	2	2651	4100	-44	3636252	1787967	42482
122	200903	2009	3	3299	3917	-42	3638903	1792067	42438
123	200904	2009	4	3461	2821	-56	3642202	1795984	42396
124	201001	2010	1	3204	3678	-53	3645663	1798805	42340
125	201002	2010	2	3013	3130	-61	3648867	1802483	42287
126	201003	2010	3	2980	3233	-76	3651880	1805613	42226
127	201004	2010	4	2812	2225	-69	3654860	1808846	42150
128	201101	2011	1	2195	1324	-65	3657672	1811071	42081
129	201102	2011	2	1877	1349	-46	3659867	1812395	42016

OBS	DTE	YEAR	QUARTER	DCONNSF	DCONNMF	DCONNMM	CONNSFL	CONNMFL	CONNMML
130	201103	2011	3	2271	1620	-46	3661744	1813744	41970
131	201104	2011	4	2357	1940	-54	3664015	1815364	41924
132	201201	2012	1	1999	2289	-64	3666372	1817304	41870
133	201202	2012	2	1852	2195	-49	3668371	1819593	41806
134	201203	2012	3	2282	2197	-58	3670223	1821789	41756
135	201204	2012	4	2824	1927	-41	3672506	1823985	41698
136	201301	2013	1	3135	2376	-47	3675330	1825913	41657
137	201302	2013	2	2912	2405	-39	3678464	1828289	41609
138	201303	2013	3	3268	2615	-41	3681376	1830694	41570
139	201304	2013	4	3701	2063	-42	3684644	1833310	41529
140	201401	2014	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
141	201402	2014	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
142	201403	2014	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
143	201404	2014	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
144	201501	2015	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
145	201502	2015	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
146	201503	2015	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
147	201504	2015	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
148	201601	2016	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
149	201602	2016	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
150	201603	2016	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
151	201604	2016	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
152	201701	2017	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
153	201702	2017	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
154	201703	2017	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
155	201704	2017	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
156	201801	2018	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
157	201802	2018	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
158	201803	2018	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
159	201804	2018	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
160	201901	2019	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
161	201902	2019	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
162	201903	2019	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
163	201904	2019	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
164	202001	2020	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
165	202002	2020	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
166	202003	2020	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
167	202004	2020	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
168	202101	2021	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

OBS	DTE	YEAR	QUARTER	DCONNSF	DCONNMF	DCONNMM	CONNSFL	CONNMFL	CONNMML
169	202102	2021	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
170	202103	2021	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
171	202104	2021	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
172	202201	2022	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
173	202202	2022	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
174	202203	2022	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
175	202204	2022	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
176	202301	2023	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
177	202302	2023	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
178	202303	2023	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
179	202304	2023	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
180	202401	2024	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
181	202402	2024	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
182	202403	2024	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
183	202404	2024	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
184	202501	2025	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
185	202502	2025	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
186	202503	2025	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
187	202504	2025	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
188	202601	2026	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
189	202602	2026	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
190	202603	2026	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
191	202604	2026	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
192	202701	2027	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
193	202702	2027	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
194	202703	2027	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
195	202704	2027	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
196	202801	2028	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
197	202802	2028	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
198	202803	2028	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
199	202804	2028	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
200	202901	2029	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
201	202902	2029	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
202	202903	2029	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
203	202904	2029	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
204	203001	2030	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
205	203002	2030	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
206	203003	2030	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
207	203004	2030	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

OBS	DTE	YEAR	QUARTER	DCONNSF	DCONNMF	DCONNMM	CONNSFL	CONNMFL	CONNMML
208	203101	2031	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
209	203102	2031	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
210	203103	2031	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
211	203104	2031	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
212	203201	2032	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
213	203202	2032	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
214	203203	2032	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
215	203204	2032	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
216	203301	2033	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
217	203302	2033	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
218	203303	2033	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
219	203304	2033	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
220	203401	2034	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
221	203402	2034	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
222	203403	2034	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
223	203404	2034	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
224	203501	2035	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
225	203502	2035	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
226	203503	2035	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
227	203504	2035	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
228	203601	2036	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
229	203602	2036	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
230	203603	2036	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
231	203604	2036	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
232	203701	2037	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
233	203702	2037	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
234	203703	2037	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
235	203704	2037	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
236	203801	2038	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
237	203802	2038	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
238	203803	2038	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
239	203804	2038	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
240	203901	2039	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
241	203902	2039	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
242	203903	2039	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
243	203904	2039	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
244	204001	2040	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
245	204002	2040	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
246	204003	2040	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

OBS	DTE	YEAR	QUARTER	DCONNSF	DCONNMF	DCONNMM	CONNSFL	CONNMFL	CONNMML
247	204004	2040	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
248	204101	2041	1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
249	204102	2041	2	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
250	204103	2041	3	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
251	204104	2041	4	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A

OBS	DTE	YEAR	QUARTER	HSMF	HSMFL1	HSMFL2	HSMFL3	HSMFL4	HSSF	HSSFL1
1	197902	1979	2	44808.01337					68518.25334	
2	197903	1979	3	41461.18751	44808.013				64910.01276	68518.25
3	197904	1979	4	43742.01434	41461.188	44808.01337			54917.23079	64910.01
4	198001	1980	1	33673.57974	43742.014	41461.18751	44808.01337		45762.28758	54917.23
5	198002	1980	2	25028.61526	33673.58	43742.01434	41461.18751	44808.01337	32749.31115	45762.29
6	198003	1980	3	27336.49457	25028.615	33673.57974	43742.01434	41461.18751	41728.36932	32749.31
7	198004	1980	4	31016.37109	27336.495	25028.61526	33673.57974	43742.01434	46676.80278	41728.37
8	198101	1981	1	24950.37298	31016.371	27336.49457	25028.61526	33673.57974	39574.02365	46676.8
9	198102	1981	2	24365.27858	24950.373	31016.37109	27336.49457	25028.61526	41776.7275	39574.02
10	198103	1981	3	18653.62173	24365.279	24950.37298	31016.37109	27336.49457	23206.81937	41776.73
11	198104	1981	4	17023.1623	18653.622	24365.27858	24950.37298	31016.37109	21077.65931	23206.82
12	198201	1982	1	11376.4703	17023.162	18653.62173	24365.27858	24950.37298	22277.80605	21077.66
13	198202	1982	2	15169.93948	11376.47	17023.1623	18653.62173	24365.27858	22068.61295	22277.81
14	198203	1982	3	16699.46124	15169.939	11376.4703	17023.1623	18653.62173	23307.88811	22068.61
15	198204	1982	4	15089.5618	16699.461	15169.93948	11376.4703	17023.1623	30486.66218	23307.89
16	198301	1983	1	23378.5328	15089.562	16699.46124	15169.93948	11376.4703	41957.6425	30486.66
17	198302	1983	2	28808.06941	23378.533	15089.5618	16699.46124	15169.93948	55111.5887	41957.64
18	198303	1983	3	35342.49696	28808.069	23378.5328	15089.5618	16699.46124	56643.00942	55111.59
19	198304	1983	4	37261.24168	35342.497	28808.06941	23378.5328	15089.5618	62425.00937	56643.01
20	198401	1984	1	61170.39726	37261.242	35342.49696	28808.06941	23378.5328	72460.155	62425.01
21	198402	1984	2	50721.26506	61170.397	37261.24168	35342.49696	28808.06941	62754.10599	72460.16
22	198403	1984	3	53245.724	50721.265	61170.39726	37261.24168	35342.49696	52840.16114	62754.11
23	198404	1984	4	53728.60141	53245.724	50721.26506	61170.39726	37261.24168	56294.39311	52840.16
24	198501	1985	1	68584.96899	53728.601	53245.724	50721.26506	61170.39726	68235.00075	56294.39
25	198502	1985	2	68922.73118	68584.969	53728.60141	53245.724	50721.26506	59737.13249	68235
26	198503	1985	3	74459.39188	68922.731	68584.96899	53728.60141	53245.724	58446.64816	59737.13
27	198504	1985	4	90539.25573	74459.392	68922.73118	68584.96899	53728.60141	62241.34532	58446.65
28	198601	1986	1	91434.67252	90539.256	74459.39188	68922.73118	68584.96899	69343.36266	62241.35
29	198602	1986	2	90754.4208	91434.673	90539.25573	74459.39188	68922.73118	76234.99228	69343.36
30	198603	1986	3	78064.44668	90754.421	91434.67252	90539.25573	74459.39188	70494.17561	76234.99

OBS	DTE	YEAR	QUARTER	HSMF	HSMFL1	HSMFL2	HSMFL3	HSMFL4	HSSF	HSSFL1
31	198604	1986	4	102910.6933	78064.447	90754.4208	91434.67252	90539.25573	85702.05245	70494.18
32	198701	1987	1	88329.0399	102910.69	78064.44668	90754.4208	91434.67252	93748.39487	85702.05
33	198702	1987	2	69537.4639	88329.04	102910.6933	78064.44668	90754.4208	73633.53179	93748.39
34	198703	1987	3	69074.46111	69537.464	88329.0399	102910.6933	78064.44668	72942.38849	73633.53
35	198704	1987	4	60126.00595	69074.461	69537.4639	88329.0399	102910.6933	70428.57142	72942.39
36	198801	1988	1	54751.07622	60126.006	69074.46111	69537.4639	88329.0399	90520.81689	70428.57
37	198802	1988	2	50094.1218	54751.076	60126.00595	69074.46111	69537.4639	83024.045	90520.82
38	198803	1988	3	49384.75365	50094.122	54751.07622	60126.00595	69074.46111	89657.2361	83024.05
39	198804	1988	4	55459.8315	49384.754	50094.1218	54751.07622	60126.00595	96932.73572	89657.24
40	198901	1989	1	49105.65078	55459.832	49384.75365	50094.1218	54751.07622	90057.56226	96932.74
41	198902	1989	2	42991.55532	49105.651	55459.8315	49384.75365	50094.1218	92820.76544	90057.56
42	198903	1989	3	38276.56686	42991.555	49105.65078	55459.8315	49384.75365	89624.21432	92820.77
43	198904	1989	4	39504.0224	38276.567	42991.55532	49105.65078	55459.8315	89669.27671	89624.21
44	199001	1990	1	45349.52511	39504.022	38276.56686	42991.55532	49105.65078	80090.42144	89669.28
45	199002	1990	2	35116.17477	45349.525	39504.0224	38276.56686	42991.55532	56586.4542	80090.42
46	199003	1990	3	32110.8421	35116.175	45349.52511	39504.0224	38276.56686	49079.14466	56586.45
47	199004	1990	4	20373.16988	32110.842	35116.17477	45349.52511	39504.0224	40147.93447	49079.14
48	199101	1991	1	12961.10469	20373.17	32110.8421	35116.17477	45349.52511	33439.52342	40147.93
49	199102	1991	2	17283.0623	12961.105	20373.16988	32110.8421	35116.17477	41986.13461	33439.52
50	199103	1991	3	16632.64502	17283.062	12961.10469	20373.16988	32110.8421	40378.31071	41986.13
51	199104	1991	4	15906.88144	16632.645	17283.0623	12961.10469	20373.16988	40231.01488	40378.31
52	199201	1992	1	11852.39249	15906.881	16632.64502	17283.0623	12961.10469	42207.11616	40231.01
53	199202	1992	2	9174.76777	11852.392	15906.88144	16632.64502	17283.0623	43960.9033	42207.12
54	199203	1992	3	9553.84666	9174.7678	11852.39249	15906.88144	16632.64502	40259.95023	43960.9
55	199204	1992	4	9162.87655	9553.8467	9174.76777	11852.39249	15906.88144	41932.31231	40259.95
56	199301	1993	1	7875.76761	9162.8766	9553.84666	9174.76777	11852.39249	37619.82089	41932.31
57	199302	1993	2	6765.0825	7875.7676	9162.87655	9553.84666	9174.76777	41330.08532	37619.82
58	199303	1993	3	5779.8666	6765.0825	7875.76761	9162.87655	9553.84666	34341.67323	41330.09
59	199304	1993	4	3252.10738	5779.8666	6765.0825	7875.76761	9162.87655	37631.34237	34341.67
60	199401	1994	1	5919.74661	3252.1074	5779.8666	6765.0825	7875.76761	43817.32103	37631.34
61	199402	1994	2	7320.67359	5919.7466	3252.10738	5779.8666	6765.0825	40869.94341	43817.32
62	199403	1994	3	9911.20978	7320.6736	5919.74661	3252.10738	5779.8666	42009.25714	40869.94
63	199404	1994	4	12204.76155	9911.2098	7320.67359	5919.74661	3252.10738	36895.3248	42009.26
64	199501	1995	1	8444.24243	12204.762	9911.20978	7320.67359	5919.74661	35178.40195	36895.32
65	199502	1995	2	6911.70407	8444.2424	12204.76155	9911.20978	7320.67359	33240.8534	35178.4
66	199503	1995	3	7032.2603	6911.7041	8444.24243	12204.76155	9911.20978	36244.77905	33240.85
67	199504	1995	4	6873.17937	7032.2603	6911.70407	8444.24243	12204.76155	35369.81743	36244.78
68	199601	1996	1	9463.74525	6873.1794	7032.2603	6911.70407	8444.24243	38633.97964	35369.82
69	199602	1996	2	9535.86386	9463.7453	6873.17937	7032.2603	6911.70407	38329.13939	38633.98

OBS	DTE	YEAR	QUARTER	HSMF	HSMFL1	HSMFL2	HSMFL3	HSMFL4	HSSF	HSSFL1
70	199603	1996	3	5467.29227	9535.8639	9463.74525	6873.17937	7032.2603	37391.8262	38329.14
71	199604	1996	4	8043.1922	5467.2923	9535.86386	9463.74525	6873.17937	33545.94544	37391.83
72	199701	1997	1	6412.84833	8043.1922	5467.29227	9535.86386	9463.74525	43333.95026	33545.95
73	199702	1997	2	12076.77545	6412.8483	8043.1922	5467.29227	9535.86386	38919.23002	43333.95
74	199703	1997	3	7474.42428	12076.775	6412.84833	8043.1922	5467.29227	38503.45071	38919.23
75	199704	1997	4	10374.5378	7474.4243	12076.77545	6412.84833	8043.1922	44298.14993	38503.45
76	199801	1998	1	7046.39885	10374.538	7474.42428	12076.77545	6412.84833	44195.86365	44298.15
77	199802	1998	2	10619.00048	7046.3989	10374.5378	7474.42428	12076.77545	43575.24988	44195.86
78	199803	1998	3	10399.02561	10619	7046.39885	10374.5378	7474.42428	47326.62852	43575.25
79	199804	1998	4	10584.95861	10399.026	10619.00048	7046.39885	10374.5378	43504.09521	47326.63
80	199901	1999	1	12644.54387	10584.959	10399.02561	10619.00048	7046.39885	47206.1354	43504.1
81	199902	1999	2	8471.21676	12644.544	10584.95861	10399.02561	10619.00048	47999.24649	47206.14
82	199903	1999	3	13969.49787	8471.2168	12644.54387	10584.95861	10399.02561	49165.18169	47999.25
83	199904	1999	4	13791.36122	13969.498	8471.21676	12644.54387	10584.95861	47007.23978	49165.18
84	200001	2000	1	17379.07574	13791.361	13969.49787	8471.21676	12644.54387	48660.72957	47007.24
85	200002	2000	2	17038.59844	17379.076	13791.36122	13969.49787	8471.21676	37232.96638	48660.73
86	200003	2000	3	19304.58093	17038.598	17379.07574	13791.36122	13969.49787	44817.17154	37232.97
87	200004	2000	4	10547.16692	19304.581	17038.59844	17379.07574	13791.36122	51901.68925	44817.17
88	200101	2001	1	16505.5265	10547.167	19304.58093	17038.59844	17379.07574	53249.06231	51901.69
89	200102	2001	2	16074.71719	16505.527	10547.16692	19304.58093	17038.59844	53544.00998	53249.06
90	200103	2001	3	14282.40719	16074.717	16505.5265	10547.16692	19304.58093	49637.27174	53544.01
91	200104	2001	4	13194.75157	14282.407	16074.71719	16505.5265	10547.16692	53131.00661	49637.27
92	200201	2002	1	13914.32281	13194.752	14282.40719	16074.71719	16505.5265	61032.27644	53131.01
93	200202	2002	2	12378.27435	13914.323	13194.75157	14282.40719	16074.71719	57453.57714	61032.28
94	200203	2002	3	13115.77705	12378.274	13914.32281	13194.75157	14282.40719	62596.47844	57453.58
95	200204	2002	4	21953.17327	13115.777	12378.27435	13914.32281	13194.75157	66613.28857	62596.48
96	200301	2003	1	19767.88257	21953.173	13115.77705	12378.27435	13914.32281	72660.54551	66613.29
97	200302	2003	2	22295.40366	19767.883	21953.17327	13115.77705	12378.27435	77011.8652	72660.55
98	200303	2003	3	16645.45172	22295.404	19767.88257	21953.17327	13115.77705	64647.59896	77011.87
99	200304	2003	4	19686.79982	16645.452	22295.40366	19767.88257	21953.17327	80965.41311	64647.6
100	200401	2004	1	21156.64829	19686.8	16645.45172	22295.40366	19767.88257	82059.1731	80965.41
101	200402	2004	2	22130.01663	21156.648	19686.79982	16645.45172	22295.40366	81261.51279	82059.17
102	200403	2004	3	25129.80125	22130.017	21156.64829	19686.79982	16645.45172	80419.30961	81261.51
103	200404	2004	4	21789.66445	25129.801	22130.01663	21156.64829	19686.79982	80636.16549	80419.31
104	200501	2005	1	27559.74848	21789.664	25129.80125	22130.01663	21156.64829	79790.26088	80636.17
105	200502	2005	2	19548.49259	27559.748	21789.66445	25129.80125	22130.01663	85813.81206	79790.26
106	200503	2005	3	22739.31443	19548.493	27559.74848	21789.66445	25129.80125	93603.61985	85813.81
107	200504	2005	4	15783.8765	22739.314	19548.49259	27559.74848	21789.66445	81917.16074	93603.62
108	200601	2006	1	25033.42556	15783.877	22739.31443	19548.49259	27559.74848	84891.37086	81917.16

OBS	DTE	YEAR	QUARTER	HSMF	HSMFL1	HSMFL2	HSMFL3	HSMFL4	HSSF	HSSFL1
109	200602	2006	2	21952.99205	25033.426	15783.8765	22739.31443	19548.49259	76961.03129	84891.37
110	200603	2006	3	18624.52322	21952.992	25033.42556	15783.8765	22739.31443	62493.49984	76961.03
111	200604	2006	4	22764.1772	18624.523	21952.99205	25033.42556	15783.8765	53017.00782	62493.5
112	200701	2007	1	21849.83867	22764.177	18624.52322	21952.99205	25033.42556	49090.64446	53017.01
113	200702	2007	2	19207.34564	21849.839	22764.1772	18624.52322	21952.99205	47171.20501	49090.64
114	200703	2007	3	19235.55443	19207.346	21849.83867	22764.1772	18624.52322	34659.35502	47171.21
115	200704	2007	4	17700.48264	19235.554	19207.34564	21849.83867	22764.1772	25966.84852	34659.36
116	200801	2008	1	17599.18453	17700.483	19235.55443	19207.34564	21849.83867	24097.91667	25966.85
117	200802	2008	2	17751.77436	17599.185	17700.48264	19235.55443	19207.34564	21915.88673	24097.92
118	200803	2008	3	9039.66712	17751.774	17599.18453	17700.48264	19235.55443	17584.21906	21915.89
119	200804	2008	4	10039.18121	9039.6671	17751.77436	17599.18453	17700.48264	13975.82455	17584.22
120	200901	2009	1	9241.58876	10039.181	9039.66712	17751.77436	17599.18453	11113.2261	13975.82
121	200902	2009	2	6264.82913	9241.5888	10039.18121	9039.66712	17751.77436	16181.89595	11113.23
122	200903	2009	3	4013.25244	6264.8291	9241.58876	10039.18121	9039.66712	16634.26267	16181.9
123	200904	2009	4	3102.9287	4013.2524	6264.82913	9241.58876	10039.18121	15636.69952	16634.26
124	201001	2010	1	5560.83419	3102.9287	4013.25244	6264.82913	9241.58876	16947.90628	15636.7
125	201002	2010	2	4175.39695	5560.8342	3102.9287	4013.25244	6264.82913	14033.07554	16947.91
126	201003	2010	3	10973.71628	4175.397	5560.83419	3102.9287	4013.25244	13696.62328	14033.08
127	201004	2010	4	6502.53362	10973.716	4175.39695	5560.83419	3102.9287	15847.43737	13696.62
128	201101	2011	1	4651.68846	6502.5336	10973.71628	4175.39695	5560.83419	14952.668	15847.44
129	201102	2011	2	16858.97801	4651.6885	6502.53362	10973.71628	4175.39695	12307.62464	14952.67
130	201103	2011	3	13225.38666	16858.978	4651.68846	6502.53362	10973.71628	11220.87581	12307.62
131	201104	2011	4	11754.9059	13225.387	16858.97801	4651.68846	6502.53362	11832.17184	11220.88
132	201201	2012	1	12522.1812	11754.906	13225.38666	16858.97801	4651.68846	12361.1151	11832.17
133	201202	2012	2	18517.71771	12522.181	11754.9059	13225.38666	16858.97801	13035.16788	12361.12
134	201203	2012	3	13623.15528	18517.718	12522.1812	11754.9059	13225.38666	14904.89683	13035.17
135	201204	2012	4	12872.80708	13623.155	18517.71771	12522.1812	11754.9059	19073.21659	14904.9
136	201301	2013	1	18510.47369	12872.807	13623.15528	18517.71771	12522.1812	19547.93734	19073.22
137	201302	2013	2	15949.82511	18510.474	12872.80708	13623.15528	18517.71771	18271.83258	19547.94
138	201303	2013	3	17156.06076	15949.825	18510.47369	12872.80708	13623.15528	20403.39279	18271.83
139	201304	2013	4	21542.52762	17156.061	15949.82511	18510.47369	12872.80708	22383.63489	20403.39
140	201401	2014	1	21089.97961	21542.528	17156.06076	15949.82511	18510.47369	22372.62498	22383.63
141	201402	2014	2	22241.02817	21089.98	21542.52762	17156.06076	15949.82511	25858.72031	22372.62
142	201403	2014	3	22189.92804	22241.028	21089.97961	21542.52762	17156.06076	29712.68729	25858.72
143	201404	2014	4	24665.41159	22189.928	22241.02817	21089.97961	21542.52762	32840.14495	29712.69
144	201501	2015	1	26011.28471	24665.412	22189.92804	22241.02817	21089.97961	36340.94713	32840.14
145	201502	2015	2	27666.93414	26011.285	24665.41159	22189.92804	22241.02817	40550.4618	36340.95
146	201503	2015	3	29381.7514	27666.934	26011.28471	24665.41159	22189.92804	44965.58043	40550.46
147	201504	2015	4	31320.34926	29381.751	27666.93414	26011.28471	24665.41159	48200.02818	44965.58

OBS	DTE	YEAR	QUARTER	HSMF	HSMFL1	HSMFL2	HSMFL3	HSMFL4	HSSF	HSSFL1
148	201601	2016	1	31569.93335	31320.349	29381.7514	27666.93414	26011.28471	51330.30752	48200.03
149	201602	2016	2	31564.33147	31569.933	31320.34926	29381.7514	27666.93414	53881.53419	51330.31
150	201603	2016	3	31687.57132	31564.331	31569.93335	31320.34926	29381.7514	55896.52516	53881.53
151	201604	2016	4	31872.10915	31687.571	31564.33147	31569.93335	31320.34926	56846.14115	55896.53
152	201701	2017	1	32756.29534	31872.109	31687.57132	31564.33147	31569.93335	57830.04346	56846.14
153	201702	2017	2	32543.38278	32756.295	31872.10915	31687.57132	31564.33147	57508.9618	57830.04
154	201703	2017	3	32358.10766	32543.383	32756.29534	31872.10915	31687.57132	57085.5764	57508.96
155	201704	2017	4	32605.91295	32358.108	32543.38278	32756.29534	31872.10915	57028.56651	57085.58
156	201801	2018	1	33276.77334	32605.913	32358.10766	32543.38278	32756.29534	56771.92475	57028.57
157	201802	2018	2	33261.61561	33276.773	32605.91295	32358.10766	32543.38278	56508.10441	56771.92
158	201803	2018	3	33931.16985	33261.616	33276.77334	32605.91295	32358.10766	56538.64417	56508.1
159	201804	2018	4	35251.45864	33931.17	33261.61561	33276.77334	32605.91295	56393.2031	56538.64
160	201901	2019	1	35655.68877	35251.459	33931.16985	33261.61561	33276.77334	56369.53736	56393.2
161	201902	2019	2	35659.38839	35655.689	35251.45864	33931.16985	33261.61561	56011.1686	56369.54
162	201903	2019	3	35934.76451	35659.388	35655.68877	35251.45864	33931.16985	56063.74091	56011.17
163	201904	2019	4	35971.27502	35934.765	35659.38839	35655.68877	35251.45864	56083.65372	56063.74
164	202001	2020	1	35499.3141	35971.275	35934.76451	35659.38839	35655.68877	55725.96712	56083.65
165	202002	2020	2	35192.00181	35499.314	35971.27502	35934.76451	35659.38839	55229.27893	55725.97
166	202003	2020	3	34961.74359	35192.002	35499.3141	35971.27502	35934.76451	54957.55431	55229.28
167	202004	2020	4	34732.54532	34961.744	35192.00181	35499.3141	35971.27502	54472.35255	54957.55
168	202101	2021	1	34051.6318	34732.545	34961.74359	35192.00181	35499.3141	53981.02823	54472.35
169	202102	2021	2	33928.96138	34051.632	34732.54532	34961.74359	35192.00181	53307.66235	53981.03
170	202103	2021	3	33971.43628	33928.961	34051.6318	34732.54532	34961.74359	52883.59174	53307.66
171	202104	2021	4	33798.5629	33971.436	33928.96138	34051.6318	34732.54532	52408.8878	52883.59
172	202201	2022	1	33834.13198	33798.563	33971.43628	33928.96138	34051.6318	52043.40046	52408.89
173	202202	2022	2	33784.72249	33834.132	33798.5629	33971.43628	33928.96138	51660.6168	52043.4
174	202203	2022	3	33934.0355	33784.722	33834.13198	33798.5629	33971.43628	51395.27234	51660.62
175	202204	2022	4	33823.89721	33934.035	33784.72249	33834.13198	33798.5629	51280.90455	51395.27
176	202301	2023	1	33942.57795	33823.897	33934.0355	33784.72249	33834.13198	51375.96186	51280.9
177	202302	2023	2	33843.17858	33942.578	33823.89721	33934.0355	33784.72249	51141.39451	51375.96
178	202303	2023	3	34146.80164	33843.179	33942.57795	33823.89721	33934.0355	50907.32862	51141.39
179	202304	2023	4	34316.77401	34146.802	33843.17858	33942.57795	33823.89721	50472.80129	50907.33
180	202401	2024	1	34784.87758	34316.774	34146.80164	33843.17858	33942.57795	50427.41783	50472.8
181	202402	2024	2	35425.45367	34784.878	34316.77401	34146.80164	33843.17858	50305.37268	50427.42
182	202403	2024	3	36093.74857	35425.454	34784.87758	34316.77401	34146.80164	50021.21006	50305.37
183	202404	2024	4	36519.8269	36093.749	35425.45367	34784.87758	34316.77401	50265.13291	50021.21
184	202501	2025	1	37021.28795	36519.827	36093.74857	35425.45367	34784.87758	50676.36134	50265.13
185	202502	2025	2	37237.9848	37021.288	36519.8269	36093.74857	35425.45367	50903.19373	50676.36
186	202503	2025	3	37602.72898	37237.985	37021.28795	36519.8269	36093.74857	50987.39411	50903.19

OBS	DTE	YEAR	QUARTER	HSMF	HSMFL1	HSMFL2	HSMFL3	HSMFL4	HSSF	HSSFL1
187	202504	2025	4	37984.37159	37602.729	37237.9848	37021.28795	36519.8269	51028.01945	50987.39
188	202601	2026	1	38538.62422	37984.372	37602.72898	37237.9848	37021.28795	50994.9299	51028.02
189	202602	2026	2	38686.67821	38538.624	37984.37159	37602.72898	37237.9848	50739.0818	50994.93
190	202603	2026	3	38842.42426	38686.678	38538.62422	37984.37159	37602.72898	50560.71944	50739.08
191	202604	2026	4	38800.77505	38842.424	38686.67821	38538.62422	37984.37159	50154.55894	50560.72
192	202701	2027	1	38900.22549	38800.775	38842.42426	38686.67821	38538.62422	50318.61399	50154.56
193	202702	2027	2	38846.58209	38900.225	38800.77505	38842.42426	38686.67821	50045.29949	50318.61
194	202703	2027	3	38717.70124	38846.582	38900.22549	38800.77505	38842.42426	49489.05913	50045.3
195	202704	2027	4	38341.24067	38717.701	38846.58209	38900.22549	38800.77505	48899.77431	49489.06
196	202801	2028	1	38922.8924	38341.241	38717.70124	38846.58209	38900.22549	48454.2958	48899.77
197	202802	2028	2	39289.51171	38922.892	38341.24067	38717.70124	38846.58209	48031.41157	48454.3
198	202803	2028	3	39543.16886	39289.512	38922.8924	38341.24067	38717.70124	47578.79069	48031.41
199	202804	2028	4	39561.03731	39543.169	39289.51171	38922.8924	38341.24067	47203.63119	47578.79
200	202901	2029	1	40006.39173	39561.037	39543.16886	39289.51171	38922.8924	47371.14944	47203.63
201	202902	2029	2	40152.34167	40006.392	39561.03731	39543.16886	39289.51171	47466.19077	47371.15
202	202903	2029	3	40159.58391	40152.342	40006.39173	39561.03731	39543.16886	47528.33869	47466.19
203	202904	2029	4	40066.92761	40159.584	40152.34167	40006.39173	39561.03731	47580.43072	47528.34
204	203001	2030	1	40792.5498	40066.928	40159.58391	40152.34167	40006.39173	47499.38405	47580.43
205	203002	2030	2	40988.71943	40792.55	40066.92761	40159.58391	40152.34167	47399.9578	47499.38
206	203003	2030	3	40880.89381	40988.719	40792.5498	40066.92761	40159.58391	47639.92527	47399.96
207	203004	2030	4	40922.79588	40880.894	40988.71943	40792.5498	40066.92761	47718.65421	47639.93
208	203101	2031	1	41310.22575	40922.796	40880.89381	40988.71943	40792.5498	47661.83191	47718.65
209	203102	2031	2	40858.30054	41310.226	40922.79588	40880.89381	40988.71943	46880.62142	47661.83
210	203103	2031	3	40707.46872	40858.301	41310.22575	40922.79588	40880.89381	46327.72724	46880.62
211	203104	2031	4	40778.50178	40707.469	40858.30054	41310.22575	40922.79588	45968.8905	46327.73
212	203201	2032	1	41172.97314	40778.502	40707.46872	40858.30054	41310.22575	45689.43741	45968.89
213	203202	2032	2	40670.85264	41172.973	40778.50178	40707.46872	40858.30054	44987.26343	45689.44
214	203203	2032	3	40474.43592	40670.853	41172.97314	40778.50178	40707.46872	44459.15804	44987.26
215	203204	2032	4	40524.53733	40474.436	40670.85264	41172.97314	40778.50178	44355.83323	44459.16
216	203301	2033	1	40945.26981	40524.537	40474.43592	40670.85264	41172.97314	44602.23165	44355.83
217	203302	2033	2	40587.98941	40945.27	40524.53733	40474.43592	40670.85264	44638.78063	44602.23
218	203303	2033	3	40439.48051	40587.989	40945.26981	40524.53733	40474.43592	44702.08498	44638.78
219	203304	2033	4	40518.5508	40439.481	40587.98941	40945.26981	40524.53733	44938.58947	44702.08
220	203401	2034	1	40978.87342	40518.551	40439.48051	40587.98941	40945.26981	45192.18789	44938.59
221	203402	2034	2	40534.16958	40978.873	40518.5508	40439.48051	40587.98941	45025.25372	45192.19
222	203403	2034	3	40767.00717	40534.17	40978.87342	40518.5508	40439.48051	44982.59684	45025.25
223	203404	2034	4	40758.18777	40767.007	40534.16958	40978.87342	40518.5508	45311.01616	44982.6
224	203501	2035	1	41115.38371	40758.188	40767.00717	40534.16958	40978.87342	45760.13902	45311.02
225	203502	2035	2	40667.30036	41115.384	40758.18777	40767.00717	40534.16958	45901.71257	45760.14

OBS	DTE	YEAR	QUARTER	HSMF	HSMFL1	HSMFL2	HSMFL3	HSMFL4	HSSF	HSSFL1
226	203503	2035	3	40803.83744	40667.3	41115.38371	40758.18777	40767.00717	45997.27254	45901.71
227	203504	2035	4	40757.54432	40803.837	40667.30036	41115.38371	40758.18777	46162.47834	45997.27
228	203601	2036	1	41145.75443	40757.544	40803.83744	40667.30036	41115.38371	46174.93893	46162.48
229	203602	2036	2	40711.02226	41145.754	40757.54432	40803.83744	40667.30036	45864.00793	46174.94
230	203603	2036	3	40918.52473	40711.022	41145.75443	40757.54432	40803.83744	45613.88708	45864.01
231	203604	2036	4	40917.11513	40918.525	40711.02226	41145.75443	40757.54432	45623.99982	45613.89
232	203701	2037	1	41217.1563	40917.115	40918.52473	40711.02226	41145.75443	45830.48526	45624
233	203702	2037	2	41068.57652	41217.156	40917.11513	40918.52473	40711.02226	45926.58296	45830.49
234	203703	2037	3	41164.867	41068.577	41217.1563	40917.11513	40918.52473	46106.93194	45926.58
235	203704	2037	4	41041.47744	41164.867	41068.57652	41217.1563	40917.11513	46311.14282	46106.93
236	203801	2038	1	41198.45396	41041.477	41164.867	41068.57652	41217.1563	46581.56514	46311.14
237	203802	2038	2	41062.02143	41198.454	41041.47744	41164.867	41068.57652	46526.20489	46581.57
238	203803	2038	3	41039.65746	41062.021	41198.45396	41041.47744	41164.867	46412.05275	46526.2
239	203804	2038	4	40928.08066	41039.657	41062.02143	41198.45396	41041.47744	46359.09843	46412.05
240	203901	2039	1	41097.83731	40928.081	41039.65746	41062.02143	41198.45396	46415.2983	46359.1
241	203902	2039	2	40967.27373	41097.837	40928.08066	41039.65746	41062.02143	46138.49262	46415.3
242	203903	2039	3	40956.88931	40967.274	41097.83731	40928.08066	41039.65746	45966.5962	46138.49
243	203904	2039	4	40770.98707	40956.889	40967.27373	41097.83731	40928.08066	46087.03909	45966.6
244	204001	2040	1	41119.6592	40770.987	40956.88931	40967.27373	41097.83731	46405.35574	46087.04
245	204002	2040	2	41104.51534	41119.659	40770.98707	40956.88931	40967.27373	46566.24978	46405.36
246	204003	2040	3	40430.59639	41104.515	41119.6592	40770.98707	40956.88931	46696.86433	46566.25
247	204004	2040	4	41318.74535	40430.596	41104.51534	41119.6592	40770.98707	46890.22753	46696.86
248	204101	2041	1	41543.75713	41318.745	40430.59639	41104.51534	41119.6592	47100.47399	46890.23
249	204102	2041	2	41641.17814	41543.757	41318.74535	40430.59639	41104.51534	47053.86468	47100.47
250	204103	2041	3	41778.77703	41641.178	41543.75713	41318.74535	40430.59639	46976.68293	47053.86
251	204104	2041	4	41909.92946	41778.777	41641.17814	41543.75713	41318.74535	46889.72985	46976.68

OBS	DTE	YEAR	QUARTER	HSSFL2	HSSFL3	HSSFL4	HSTOT	HSTOTL1	HSTOTL2	HSTOTL3
1	197902	1979	2				113326.2667			
2	197903	1979	3				106371.2003	113326.2667		
3	197904	1979	4	68518.25334			98659.24513	106371.2003	113326.2667	
4	198001	1980	1	64910.01276	68518.253		79435.86732	98659.24513	106371.2003	113326.3
5	198002	1980	2	54917.23079	64910.013	68518.25334	57777.92641	79435.86732	98659.24513	106371.2
6	198003	1980	3	45762.28758	54917.231	64910.01276	69064.86389	57777.92641	79435.86732	98659.25
7	198004	1980	4	32749.31115	45762.288	54917.23079	77693.17387	69064.86389	57777.92641	79435.87
8	198101	1981	1	41728.36932	32749.311	45762.28758	64524.39663	77693.17387	69064.86389	57777.93

9	198102	1981	2	46676.80278	41728.369	32749.31115	66142.00608	64524.39663	77693.17387	69064.86
10	198103	1981	3	39574.02365	46676.803	41728.36932	41860.4411	66142.00608	64524.39663	77693.17
11	198104	1981	4	41776.7275	39574.024	46676.80278	38100.82161	41860.4411	66142.00608	64524.4
12	198201	1982	1	23206.81937	41776.728	39574.02365	33654.27635	38100.82161	41860.4411	66142.01
13	198202	1982	2	21077.65931	23206.819	41776.7275	37238.55243	33654.27635	38100.82161	41860.44
14	198203	1982	3	22277.80605	21077.659	23206.81937	40007.34935	37238.55243	33654.27635	38100.82
15	198204	1982	4	22068.61295	22277.806	21077.65931	45576.22398	40007.34935	37238.55243	33654.28
16	198301	1983	1	23307.88811	22068.613	22277.80605	65336.1753	45576.22398	40007.34935	37238.55
17	198302	1983	2	30486.66218	23307.888	22068.61295	83919.65811	65336.1753	45576.22398	40007.35
18	198303	1983	3	41957.6425	30486.662	23307.88811	91985.50638	83919.65811	65336.1753	45576.22
19	198304	1983	4	55111.5887	41957.643	30486.66218	99686.25105	91985.50638	83919.65811	65336.18
20	198401	1984	1	56643.00942	55111.589	41957.6425	133630.5523	99686.25105	91985.50638	83919.66
21	198402	1984	2	62425.00937	56643.009	55111.5887	113475.3711	133630.5523	99686.25105	91985.51
22	198403	1984	3	72460.155	62425.009	56643.00942	106085.8851	113475.3711	133630.5523	99686.25
23	198404	1984	4	62754.10599	72460.155	62425.00937	110022.9945	106085.8851	113475.3711	133630.6
24	198501	1985	1	52840.16114	62754.106	72460.155	136819.9697	110022.9945	106085.8851	113475.4
25	198502	1985	2	56294.39311	52840.161	62754.10599	128659.8637	136819.9697	110022.9945	106085.9
26	198503	1985	3	68235.00075	56294.393	52840.16114	132906.04	128659.8637	136819.9697	110023
27	198504	1985	4	59737.13249	68235.001	56294.39311	152780.6011	132906.04	128659.8637	136820
28	198601	1986	1	58446.64816	59737.132	68235.00075	160778.0352	152780.6011	132906.04	128659.9
29	198602	1986	2	62241.34532	58446.648	59737.13249	166989.4131	160778.0352	152780.6011	132906
30	198603	1986	3	69343.36266	62241.345	58446.64816	148558.6223	166989.4131	160778.0352	152780.6
31	198604	1986	4	76234.99228	69343.363	62241.34532	188612.7458	148558.6223	166989.4131	160778
32	198701	1987	1	70494.17561	76234.992	69343.36266	182077.4348	188612.7458	148558.6223	166989.4
33	198702	1987	2	85702.05245	70494.176	76234.99228	143170.9957	182077.4348	188612.7458	148558.6
34	198703	1987	3	93748.39487	85702.052	70494.17561	142016.8496	143170.9957	182077.4348	188612.7
35	198704	1987	4	73633.53179	93748.395	85702.05245	130554.5774	142016.8496	143170.9957	182077.4
36	198801	1988	1	72942.38849	73633.532	93748.39487	145271.8931	130554.5774	142016.8496	143171
37	198802	1988	2	70428.57142	72942.388	73633.53179	133118.1668	145271.8931	130554.5774	142016.8
38	198803	1988	3	90520.81689	70428.571	72942.38849	139041.9898	133118.1668	145271.8931	130554.6
39	198804	1988	4	83024.045	90520.817	70428.57142	152392.5672	139041.9898	133118.1668	145271.9
40	198901	1989	1	89657.2361	83024.045	90520.81689	139163.213	152392.5672	139041.9898	133118.2
41	198902	1989	2	96932.73572	89657.236	83024.045	135812.3208	139163.213	152392.5672	139042
42	198903	1989	3	90057.56226	96932.736	89657.2361	127900.7812	135812.3208	139163.213	152392.6
43	198904	1989	4	92820.76544	90057.562	96932.73572	129173.2991	127900.7812	135812.3208	139163.2
44	199001	1990	1	89624.21432	92820.765	90057.56226	125439.9466	129173.2991	127900.7812	135812.3
45	199002	1990	2	89669.27671	89624.214	92820.76544	91702.62897	125439.9466	129173.2991	127900.8
46	199003	1990	3	80090.42144	89669.277	89624.21432	81189.98676	91702.62897	125439.9466	129173.3
47	199004	1990	4	56586.4542	80090.421	89669.27671	60521.10435	81189.98676	91702.62897	125439.9

OBS	DTE	YEAR	QUARTER	HSSFL2	HSSFL3	HSSFL4	HSTOT	HSTOTL1	HSTOTL2	HSTOTL3
48	199101	1991	1	49079.14466	56586.454	80090.42144	46400.62811	60521.10435	81189.98676	91702.63
49	199102	1991	2	40147.93447	49079.145	56586.4542	59269.19691	46400.62811	60521.10435	81189.99
50	199103	1991	3	33439.52342	40147.934	49079.14466	57010.95573	59269.19691	46400.62811	60521.1
51	199104	1991	4	41986.13461	33439.523	40147.93447	56137.89632	57010.95573	59269.19691	46400.63
52	199201	1992	1	40378.31071	41986.135	33439.52342	54059.50865	56137.89632	57010.95573	59269.2
53	199202	1992	2	40231.01488	40378.311	41986.13461	53135.67107	54059.50865	56137.89632	57010.96
54	199203	1992	3	42207.11616	40231.015	40378.31071	49813.79689	53135.67107	54059.50865	56137.9
55	199204	1992	4	43960.9033	42207.116	40231.01488	51095.18886	49813.79689	53135.67107	54059.51
56	199301	1993	1	40259.95023	43960.903	42207.11616	45495.5885	51095.18886	49813.79689	53135.67
57	199302	1993	2	41932.31231	40259.95	43960.9033	48095.16782	45495.5885	51095.18886	49813.8
58	199303	1993	3	37619.82089	41932.312	40259.95023	40121.53983	48095.16782	45495.5885	51095.19
59	199304	1993	4	41330.08532	37619.821	41932.31231	40883.44975	40121.53983	48095.16782	45495.59
60	199401	1994	1	34341.67323	41330.085	37619.82089	49737.06764	40883.44975	40121.53983	48095.17
61	199402	1994	2	37631.34237	34341.673	41330.08532	48190.617	49737.06764	40883.44975	40121.54
62	199403	1994	3	43817.32103	37631.342	34341.67323	51920.46692	48190.617	49737.06764	40883.45
63	199404	1994	4	40869.94341	43817.321	37631.34237	49100.08635	51920.46692	48190.617	49737.07
64	199501	1995	1	42009.25714	40869.943	43817.32103	43622.64438	49100.08635	51920.46692	48190.62
65	199502	1995	2	36895.3248	42009.257	40869.94341	40152.55747	43622.64438	49100.08635	51920.47
66	199503	1995	3	35178.40195	36895.325	42009.25714	43277.03935	40152.55747	43622.64438	49100.09
67	199504	1995	4	33240.8534	35178.402	36895.3248	42242.9968	43277.03935	40152.55747	43622.64
68	199601	1996	1	36244.77905	33240.853	35178.40195	48097.72489	42242.9968	43277.03935	40152.56
69	199602	1996	2	35369.81743	36244.779	33240.8534	47865.00325	48097.72489	42242.9968	43277.04
70	199603	1996	3	38633.97964	35369.817	36244.77905	42859.11847	47865.00325	48097.72489	42243
71	199604	1996	4	38329.13939	38633.98	35369.81743	41589.13764	42859.11847	47865.00325	48097.72
72	199701	1997	1	37391.8262	38329.139	38633.97964	49746.79859	41589.13764	42859.11847	47865
73	199702	1997	2	33545.94544	37391.826	38329.13939	50996.00547	49746.79859	41589.13764	42859.12
74	199703	1997	3	43333.95026	33545.945	37391.8262	45977.87499	50996.00547	49746.79859	41589.14
75	199704	1997	4	38919.23002	43333.95	33545.94544	54672.68773	45977.87499	50996.00547	49746.8
76	199801	1998	1	38503.45071	38919.23	43333.95026	51242.2625	54672.68773	45977.87499	50996.01
77	199802	1998	2	44298.14993	38503.451	38919.23002	54194.25036	51242.2625	54672.68773	45977.87
78	199803	1998	3	44195.86365	44298.15	38503.45071	57725.65413	54194.25036	51242.2625	54672.69
79	199804	1998	4	43575.24988	44195.864	44298.14993	54089.05382	57725.65413	54194.25036	51242.26
80	199901	1999	1	47326.62852	43575.25	44195.86365	59850.67927	54089.05382	57725.65413	54194.25
81	199902	1999	2	43504.09521	47326.629	43575.24988	56470.46325	59850.67927	54089.05382	57725.65
82	199903	1999	3	47206.1354	43504.095	47326.62852	63134.67956	56470.46325	59850.67927	54089.05
83	199904	1999	4	47999.24649	47206.135	43504.09521	60798.601	63134.67956	56470.46325	59850.68
84	200001	2000	1	49165.18169	47999.246	47206.1354	66039.80531	60798.601	63134.67956	56470.46
85	200002	2000	2	47007.23978	49165.182	47999.24649	54271.56482	66039.80531	60798.601	63134.68
86	200003	2000	3	48660.72957	47007.24	49165.18169	64121.75247	54271.56482	66039.80531	60798.6

OBS	DTE	YEAR	QUARTER	HSSFL2	HSSFL3	HSSFL4	HSTOT	HSTOTL1	HSTOTL2	HSTOTL3
87	200004	2000	4	37232.96638	48660.73	47007.23978	62448.85617	64121.75247	54271.56482	66039.81
88	200101	2001	1	44817.17154	37232.966	48660.72957	69754.58881	62448.85617	64121.75247	54271.56
89	200102	2001	2	51901.68925	44817.172	37232.96638	69618.72717	69754.58881	62448.85617	64121.75
90	200103	2001	3	53249.06231	51901.689	44817.17154	63919.67893	69618.72717	69754.58881	62448.86
91	200104	2001	4	53544.00998	53249.062	51901.68925	66325.75818	63919.67893	69618.72717	69754.59
92	200201	2002	1	49637.27174	53544.01	53249.06231	74946.59925	66325.75818	63919.67893	69618.73
93	200202	2002	2	53131.00661	49637.272	53544.00998	69831.85149	74946.59925	66325.75818	63919.68
94	200203	2002	3	61032.27644	53131.007	49637.27174	75712.25549	69831.85149	74946.59925	66325.76
95	200204	2002	4	57453.57714	61032.276	53131.00661	88566.46184	75712.25549	69831.85149	74946.6
96	200301	2003	1	62596.47844	57453.577	61032.27644	92428.42808	88566.46184	75712.25549	69831.85
97	200302	2003	2	66613.28857	62596.478	57453.57714	99307.26886	92428.42808	88566.46184	75712.26
98	200303	2003	3	72660.54551	66613.289	62596.47844	81293.05068	99307.26886	92428.42808	88566.46
99	200304	2003	4	77011.8652	72660.546	66613.28857	100652.2129	81293.05068	99307.26886	92428.43
100	200401	2004	1	64647.59896	77011.865	72660.54551	103215.8214	100652.2129	81293.05068	99307.27
101	200402	2004	2	80965.41311	64647.599	77011.8652	103391.5294	103215.8214	100652.2129	81293.05
102	200403	2004	3	82059.1731	80965.413	64647.59896	105549.1109	103391.5294	103215.8214	100652.2
103	200404	2004	4	81261.51279	82059.173	80965.41311	102425.8299	105549.1109	103391.5294	103215.8
104	200501	2005	1	80419.30961	81261.513	82059.1731	107350.0094	102425.8299	105549.1109	103391.5
105	200502	2005	2	80636.16549	80419.31	81261.51279	105362.3047	107350.0094	102425.8299	105549.1
106	200503	2005	3	79790.26088	80636.165	80419.30961	116342.9343	105362.3047	107350.0094	102425.8
107	200504	2005	4	85813.81206	79790.261	80636.16549	97701.03724	116342.9343	105362.3047	107350
108	200601	2006	1	93603.61985	85813.812	79790.26088	109924.7964	97701.03724	116342.9343	105362.3
109	200602	2006	2	81917.16074	93603.62	85813.81206	98914.02334	109924.7964	97701.03724	116342.9
110	200603	2006	3	84891.37086	81917.161	93603.61985	81118.02306	98914.02334	109924.7964	97701.04
111	200604	2006	4	76961.03129	84891.371	81917.16074	75781.18502	81118.02306	98914.02334	109924.8
112	200701	2007	1	62493.49984	76961.031	84891.37086	70940.48313	75781.18502	81118.02306	98914.02
113	200702	2007	2	53017.00782	62493.5	76961.03129	66378.55065	70940.48313	75781.18502	81118.02
114	200703	2007	3	49090.64446	53017.008	62493.49984	53894.90945	66378.55065	70940.48313	75781.19
115	200704	2007	4	47171.20501	49090.644	53017.00782	43667.33116	53894.90945	66378.55065	70940.48
116	200801	2008	1	34659.35502	47171.205	49090.64446	41697.1012	43667.33116	53894.90945	66378.55
117	200802	2008	2	25966.84852	34659.355	47171.20501	39667.66109	41697.1012	43667.33116	53894.91
118	200803	2008	3	24097.91667	25966.849	34659.35502	26623.88618	39667.66109	41697.1012	43667.33
119	200804	2008	4	21915.88673	24097.917	25966.84852	24015.00576	26623.88618	39667.66109	41697.1
120	200901	2009	1	17584.21906	21915.887	24097.91667	20354.81486	24015.00576	26623.88618	39667.66
121	200902	2009	2	13975.82455	17584.219	21915.88673	22446.72508	20354.81486	24015.00576	26623.89
122	200903	2009	3	11113.2261	13975.825	17584.21906	20647.51511	22446.72508	20354.81486	24015.01
123	200904	2009	4	16181.89595	11113.226	13975.82455	18739.62822	20647.51511	22446.72508	20354.81
124	201001	2010	1	16634.26267	16181.896	11113.2261	22508.74047	18739.62822	20647.51511	22446.73
125	201002	2010	2	15636.69952	16634.263	16181.89595	18208.47249	22508.74047	18739.62822	20647.52

OBS	DTE	YEAR	QUARTER	HSSFL2	HSSFL3	HSSFL4	HSTOT	HSTOTL1	HSTOTL2	HSTOTL3
126	201003	2010	3	16947.90628	15636.7	16634.26267	24670.33956	18208.47249	22508.74047	18739.63
127	201004	2010	4	14033.07554	16947.906	15636.69952	22349.97099	24670.33956	18208.47249	22508.74
128	201101	2011	1	13696.62328	14033.076	16947.90628	19604.35646	22349.97099	24670.33956	18208.47
129	201102	2011	2	15847.43737	13696.623	14033.07554	29166.60265	19604.35646	22349.97099	24670.34
130	201103	2011	3	14952.668	15847.437	13696.62328	24446.26247	29166.60265	19604.35646	22349.97
131	201104	2011	4	12307.62464	14952.668	15847.43737	23587.07774	24446.26247	29166.60265	19604.36
132	201201	2012	1	11220.87581	12307.625	14952.668	24883.2963	23587.07774	24446.26247	29166.6
133	201202	2012	2	11832.17184	11220.876	12307.62464	31552.88559	24883.2963	23587.07774	24446.26
134	201203	2012	3	12361.1151	11832.172	11220.87581	28528.05211	31552.88559	24883.2963	23587.08
135	201204	2012	4	13035.16788	12361.115	11832.17184	31946.02367	28528.05211	31552.88559	24883.3
136	201301	2013	1	14904.89683	13035.168	12361.1151	38058.41103	31946.02367	28528.05211	31552.89
137	201302	2013	2	19073.21659	14904.897	13035.16788	34221.65769	38058.41103	31946.02367	28528.05
138	201303	2013	3	19547.93734	19073.217	14904.89683	37559.45355	34221.65769	38058.41103	31946.02
139	201304	2013	4	18271.83258	19547.937	19073.21659	43926.16251	37559.45355	34221.65769	38058.41
140	201401	2014	1	20403.39279	18271.833	19547.93734	43462.60459	43926.16251	37559.45355	34221.66
141	201402	2014	2	22383.63489	20403.393	18271.83258	48099.74848	43462.60459	43926.16251	37559.45
142	201403	2014	3	22372.62498	22383.635	20403.39279	51902.61533	48099.74848	43462.60459	43926.16
143	201404	2014	4	25858.72031	22372.625	22383.63489	57505.55654	51902.61533	48099.74848	43462.6
144	201501	2015	1	29712.68729	25858.72	22372.62498	62352.23184	57505.55654	51902.61533	48099.75
145	201502	2015	2	32840.14495	29712.687	25858.72031	68217.39594	62352.23184	57505.55654	51902.62
146	201503	2015	3	36340.94713	32840.145	29712.68729	74347.33183	68217.39594	62352.23184	57505.56
147	201504	2015	4	40550.4618	36340.947	32840.14495	79520.37744	74347.33183	68217.39594	62352.23
148	201601	2016	1	44965.58043	40550.462	36340.94713	82900.24087	79520.37744	74347.33183	68217.4
149	201602	2016	2	48200.02818	44965.58	40550.4618	85445.86566	82900.24087	79520.37744	74347.33
150	201603	2016	3	51330.30752	48200.028	44965.58043	87584.09648	85445.86566	82900.24087	79520.38
151	201604	2016	4	53881.53419	51330.308	48200.02818	88718.2503	87584.09648	85445.86566	82900.24
152	201701	2017	1	55896.52516	53881.534	51330.30752	90586.3388	88718.2503	87584.09648	85445.87
153	201702	2017	2	56846.14115	55896.525	53881.53419	90052.34458	90586.3388	88718.2503	87584.1
154	201703	2017	3	57830.04346	56846.141	55896.52516	89443.68406	90052.34458	90586.3388	88718.25
155	201704	2017	4	57508.9618	57830.043	56846.14115	89634.47946	89443.68406	90052.34458	90586.34
156	201801	2018	1	57085.5764	57508.962	57830.04346	90048.69809	89634.47946	89443.68406	90052.34
157	201802	2018	2	57028.56651	57085.576	57508.9618	89769.72002	90048.69809	89634.47946	89443.68
158	201803	2018	3	56771.92475	57028.567	57085.5764	90469.81402	89769.72002	90048.69809	89634.48
159	201804	2018	4	56508.10441	56771.925	57028.56651	91644.66174	90469.81402	89769.72002	90048.7
160	201901	2019	1	56538.64417	56508.104	56771.92475	92025.22613	91644.66174	90469.81402	89769.72
161	201902	2019	2	56393.2031	56538.644	56508.10441	91670.55699	92025.22613	91644.66174	90469.81
162	201903	2019	3	56369.53736	56393.203	56538.64417	91998.50542	91670.55699	92025.22613	91644.66
163	201904	2019	4	56011.1686	56369.537	56393.2031	92054.92874	91998.50542	91670.55699	92025.23
164	202001	2020	1	56063.74091	56011.169	56369.53736	91225.28122	92054.92874	91998.50542	91670.56

OBS	DTE	YEAR	QUARTER	HSSFL2	HSSFL3	HSSFL4	HSTOT	HSTOTL1	HSTOTL2	HSTOTL3
165	202002	2020	2	56083.65372	56063.741	56011.1686	90421.28074	91225.28122	92054.92874	91998.51
166	202003	2020	3	55725.96712	56083.654	56063.74091	89919.2979	90421.28074	91225.28122	92054.93
167	202004	2020	4	55229.27893	55725.967	56083.65372	89204.89787	89919.2979	90421.28074	91225.28
168	202101	2021	1	54957.55431	55229.279	55725.96712	88032.66003	89204.89787	89919.2979	90421.28
169	202102	2021	2	54472.35255	54957.554	55229.27893	87236.62373	88032.66003	89204.89787	89919.3
170	202103	2021	3	53981.02823	54472.353	54957.55431	86855.02802	87236.62373	88032.66003	89204.9
171	202104	2021	4	53307.66235	53981.028	54472.35255	86207.4507	86855.02802	87236.62373	88032.66
172	202201	2022	1	52883.59174	53307.662	53981.02823	85877.53244	86207.4507	86855.02802	87236.62
173	202202	2022	2	52408.8878	52883.592	53307.66235	85445.33929	85877.53244	86207.4507	86855.03
174	202203	2022	3	52043.40046	52408.888	52883.59174	85329.30784	85445.33929	85877.53244	86207.45
175	202204	2022	4	51660.6168	52043.4	52408.8878	85104.80176	85329.30784	85445.33929	85877.53
176	202301	2023	1	51395.27234	51660.617	52043.40046	85318.53981	85104.80176	85329.30784	85445.34
177	202302	2023	2	51280.90455	51395.272	51660.6168	84984.57309	85318.53981	85104.80176	85329.31
178	202303	2023	3	51375.96186	51280.905	51395.27234	85054.13026	84984.57309	85318.53981	85104.8
179	202304	2023	4	51141.39451	51375.962	51280.90455	84789.5753	85054.13026	84984.57309	85318.54
180	202401	2024	1	50907.32862	51141.395	51375.96186	85212.29541	84789.5753	85054.13026	84984.57
181	202402	2024	2	50472.80129	50907.329	51141.39451	85730.82635	85212.29541	84789.5753	85054.13
182	202403	2024	3	50427.41783	50472.801	50907.32862	86114.95863	85730.82635	85212.29541	84789.58
183	202404	2024	4	50305.37268	50427.418	50472.80129	86784.95981	86114.95863	85730.82635	85212.3
184	202501	2025	1	50021.21006	50305.373	50427.41783	87697.64929	86784.95981	86114.95863	85730.83
185	202502	2025	2	50265.13291	50021.21	50305.37268	88141.17853	87697.64929	86784.95981	86114.96
186	202503	2025	3	50676.36134	50265.133	50021.21006	88590.12309	88141.17853	87697.64929	86784.96
187	202504	2025	4	50903.19373	50676.361	50265.13291	89012.39104	88590.12309	88141.17853	87697.65
188	202601	2026	1	50987.39411	50903.194	50676.36134	89533.55412	89012.39104	88590.12309	88141.18
189	202602	2026	2	51028.01945	50987.394	50903.19373	89425.76001	89533.55412	89012.39104	88590.12
190	202603	2026	3	50994.9299	51028.019	50987.39411	89403.1437	89425.76001	89533.55412	89012.39
191	202604	2026	4	50739.0818	50994.93	51028.01945	88955.33399	89403.1437	89425.76001	89533.55
192	202701	2027	1	50560.71944	50739.082	50994.9299	89218.83948	88955.33399	89403.1437	89425.76
193	202702	2027	2	50154.55894	50560.719	50739.0818	88891.88158	89218.83948	88955.33399	89403.14
194	202703	2027	3	50318.61399	50154.559	50560.71944	88206.76037	88891.88158	89218.83948	88955.33
195	202704	2027	4	50045.29949	50318.614	50154.55894	87241.01498	88206.76037	88891.88158	89218.84
196	202801	2028	1	49489.05913	50045.299	50318.61399	87377.1882	87241.01498	88206.76037	88891.88
197	202802	2028	2	48899.77431	49489.059	50045.29949	87320.92328	87377.1882	87241.01498	88206.76
198	202803	2028	3	48454.2958	48899.774	49489.05913	87121.95955	87320.92328	87377.1882	87241.01
199	202804	2028	4	48031.41157	48454.296	48899.77431	86764.6685	87121.95955	87320.92328	87377.19
200	202901	2029	1	47578.79069	48031.412	48454.2958	87377.54117	86764.6685	87121.95955	87320.92
201	202902	2029	2	47203.63119	47578.791	48031.41157	87618.53244	87377.54117	86764.6685	87121.96
202	202903	2029	3	47371.14944	47203.631	47578.79069	87687.9226	87618.53244	87377.54117	86764.67
203	202904	2029	4	47466.19077	47371.149	47203.63119	87647.35833	87687.9226	87618.53244	87377.54

OBS	DTE	YEAR	QUARTER	HSSFL2	HSSFL3	HSSFL4	HSTOT	HSTOTL1	HSTOTL2	HSTOTL3
204	203001	2030	1	47528.33869	47466.191	47371.14944	88291.93385	87647.35833	87687.9226	87618.53
205	203002	2030	2	47580.43072	47528.339	47466.19077	88388.67723	88291.93385	87647.35833	87687.92
206	203003	2030	3	47499.38405	47580.431	47528.33869	88520.81908	88388.67723	88291.93385	87647.36
207	203004	2030	4	47399.9578	47499.384	47580.43072	88641.45009	88520.81908	88388.67723	88291.93
208	203101	2031	1	47639.92527	47399.958	47499.38405	88972.05766	88641.45009	88520.81908	88388.68
209	203102	2031	2	47718.65421	47639.925	47399.9578	87738.92196	88972.05766	88641.45009	88520.82
210	203103	2031	3	47661.83191	47718.654	47639.92527	87035.19596	87738.92196	88972.05766	88641.45
211	203104	2031	4	46880.62142	47661.832	47718.65421	86747.39228	87035.19596	87738.92196	88972.06
212	203201	2032	1	46327.72724	46880.621	47661.83191	86862.41055	86747.39228	87035.19596	87738.92
213	203202	2032	2	45968.8905	46327.727	46880.62142	85658.11607	86862.41055	86747.39228	87035.2
214	203203	2032	3	45689.43741	45968.891	46327.72724	84933.59396	85658.11607	86862.41055	86747.39
215	203204	2032	4	44987.26343	45689.437	45968.8905	84880.37056	84933.59396	85658.11607	86862.41
216	203301	2033	1	44459.15804	44987.263	45689.43741	85547.50146	84880.37056	84933.59396	85658.12
217	203302	2033	2	44355.83323	44459.158	44987.26343	85226.77004	85547.50146	84880.37056	84933.59
218	203303	2033	3	44602.23165	44355.833	44459.15804	85141.56549	85226.77004	85547.50146	84880.37
219	203304	2033	4	44638.78063	44602.232	44355.83323	85457.14027	85141.56549	85226.77004	85547.5
220	203401	2034	1	44702.08498	44638.781	44602.23165	86171.06131	85457.14027	85141.56549	85226.77
221	203402	2034	2	44938.58947	44702.085	44638.78063	85559.4233	86171.06131	85457.14027	85141.57
222	203403	2034	3	45192.18789	44938.589	44702.08498	85749.60401	85559.4233	86171.06131	85457.14
223	203404	2034	4	45025.25372	45192.188	44938.58947	86069.20393	85749.60401	85559.4233	86171.06
224	203501	2035	1	44982.59684	45025.254	45192.18789	86875.52273	86069.20393	85749.60401	85559.42
225	203502	2035	2	45311.01616	44982.597	45025.25372	86569.01293	86875.52273	86069.20393	85749.6
226	203503	2035	3	45760.13902	45311.016	44982.59684	86801.10998	86569.01293	86875.52273	86069.2
227	203504	2035	4	45901.71257	45760.139	45311.01616	86920.02266	86801.10998	86569.01293	86875.52
228	203601	2036	1	45997.27254	45901.713	45760.13902	87320.69336	86920.02266	86801.10998	86569.01
229	203602	2036	2	46162.47834	45997.273	45901.71257	86575.03019	87320.69336	86920.02266	86801.11
230	203603	2036	3	46174.93893	46162.478	45997.27254	86532.41181	86575.03019	87320.69336	86920.02
231	203604	2036	4	45864.00793	46174.939	46162.47834	86541.11495	86532.41181	86575.03019	87320.69
232	203701	2037	1	45613.88708	45864.008	46174.93893	87047.64156	86541.11495	86532.41181	86575.03
233	203702	2037	2	45623.99982	45613.887	45864.00793	86995.15948	87047.64156	86541.11495	86532.41
234	203703	2037	3	45830.48526	45624	45613.88708	87271.79894	86995.15948	87047.64156	86541.11
235	203704	2037	4	45926.58296	45830.485	45623.99982	87352.62026	87271.79894	86995.15948	87047.64
236	203801	2038	1	46106.93194	45926.583	45830.48526	87780.0191	87352.62026	87271.79894	86995.16
237	203802	2038	2	46311.14282	46106.932	45926.58296	87588.22632	87780.0191	87352.62026	87271.8
238	203803	2038	3	46581.56514	46311.143	46106.93194	87451.71021	87588.22632	87780.0191	87352.62
239	203804	2038	4	46526.20489	46581.565	46311.14282	87287.17909	87451.71021	87588.22632	87780.02
240	203901	2039	1	46412.05275	46526.205	46581.56514	87513.13561	87287.17909	87451.71021	87588.23
241	203902	2039	2	46359.09843	46412.053	46526.20489	87105.76635	87513.13561	87287.17909	87451.71
242	203903	2039	3	46415.2983	46359.098	46412.05275	86923.48551	87105.76635	87513.13561	87287.18

OBS	DTE	YEAR	QUARTER	HSSFL2	HSSFL3	HSSFL4	HSTOT	HSTOTL1	HSTOTL2	HSTOTL3
243	203904	2039	4	46138.49262	46415.298	46359.09843	86858.02616	86923.48551	87105.76635	87513.14
244	204001	2040	1	45966.5962	46138.493	46415.2983	87525.01494	86858.02616	86923.48551	87105.77
245	204002	2040	2	46087.03909	45966.596	46138.49262	87670.76512	87525.01494	86858.02616	86923.49
246	204003	2040	3	46405.35574	46087.039	45966.5962	87127.46072	87670.76512	87525.01494	86858.03
247	204004	2040	4	46566.24978	46405.356	46087.03909	88208.97288	87127.46072	87670.76512	87525.01
248	204101	2041	1	46696.86433	46566.25	46405.35574	88644.23112	88208.97288	87127.46072	87670.77
249	204102	2041	2	46890.22753	46696.864	46566.24978	88695.04282	88644.23112	88208.97288	87127.46
250	204103	2041	3	47100.47399	46890.228	46696.86433	88755.45996	88695.04282	88644.23112	88208.97
251	204104	2041	4	47053.86468	47100.474	46890.22753	88799.65931	88755.45996	88695.04282	88644.23

OBS	DTE	YEAR	QUARTER	HSTOTL4	SEA1	SEA2	SEA3	SEA4	Time	EMPCOM
1	197902	1979	2		0	1	0	0	2	4116.395
2	197903	1979	3		0	0	1	0	3	4119.434
3	197904	1979	4		0	0	0	1	4	4269.125
4	198001	1980	1		1	0	0	0	5	4215.991
5	198002	1980	2	113326.2667	0	1	0	0	6	4268.271
6	198003	1980	3	106371.2003	0	0	1	0	7	4217.146
7	198004	1980	4	98659.24513	0	0	0	1	8	4363.942
8	198101	1981	1	79435.86732	1	0	0	0	9	4324.634
9	198102	1981	2	57777.92641	0	1	0	0	10	4366.732
10	198103	1981	3	69064.86389	0	0	1	0	11	4301.742
11	198104	1981	4	77693.17387	0	0	0	1	12	4392.519
12	198201	1982	1	64524.39663	1	0	0	0	13	4307.767
13	198202	1982	2	66142.00608	0	1	0	0	14	4324.594
14	198203	1982	3	41860.4411	0	0	1	0	15	4249.503
15	198204	1982	4	38100.82161	0	0	0	1	16	4348.378
16	198301	1983	1	33654.27635	1	0	0	0	17	4313.63
17	198302	1983	2	37238.55243	0	1	0	0	18	4366.634
18	198303	1983	3	40007.34935	0	0	1	0	19	4306.913
19	198304	1983	4	45576.22398	0	0	0	1	20	4454.421
20	198401	1984	1	65336.1753	1	0	0	0	21	4442.309
21	198402	1984	2	83919.65811	0	1	0	0	22	4522.879
22	198403	1984	3	91985.50638	0	0	1	0	23	4558.33
23	198404	1984	4	99686.25105	0	0	0	1	24	4713.778
24	198501	1985	1	133630.5523	1	0	0	0	25	4703.749
25	198502	1985	2	113475.3711	0	1	0	0	26	4792.799
26	198503	1985	3	106085.8851	0	0	1	0	27	4797.379

OBS	DTE	YEAR	QUARTER	HSTOTL4	SEA1	SEA2	SEA3	SEA4	Time	EMPCOM
27	198504	1985	4	110022.9945	0	0	0	1	28	4951.894
28	198601	1986	1	136819.9697	1	0	0	0	29	4909.33
29	198602	1986	2	128659.8637	0	1	0	0	30	4990.137
30	198603	1986	3	132906.04	0	0	1	0	31	4988.864
31	198604	1986	4	152780.6011	0	0	0	1	32	5170.768
32	198701	1987	1	160778.0352	1	0	0	0	33	5114.656
33	198702	1987	2	166989.4131	0	1	0	0	34	5227.473
34	198703	1987	3	148558.6223	0	0	1	0	35	5176.53
35	198704	1987	4	188612.7458	0	0	0	1	36	5371.563
36	198801	1988	1	182077.4348	1	0	0	0	37	5349.252
37	198802	1988	2	143170.9957	0	1	0	0	38	5450.652
38	198803	1988	3	142016.8496	0	0	1	0	39	5434.662
39	198804	1988	4	130554.5774	0	0	0	1	40	5615.113
40	198901	1989	1	145271.8931	1	0	0	0	41	5562.782
41	198902	1989	2	133118.1668	0	1	0	0	42	5631.339
42	198903	1989	3	139041.9898	0	0	1	0	43	5580.227
43	198904	1989	4	152392.5672	0	0	0	1	44	5782.407
44	199001	1990	1	139163.213	1	0	0	0	45	5727.485
45	199002	1990	2	135812.3208	0	1	0	0	46	5772.517
46	199003	1990	3	127900.7812	0	0	1	0	47	5718.49
47	199004	1990	4	129173.2991	0	0	0	1	48	5800.827
48	199101	1991	1	125439.9466	1	0	0	0	49	5666.644
49	199102	1991	2	91702.62897	0	1	0	0	50	5685.108
50	199103	1991	3	81189.98676	0	0	1	0	51	5628.58
51	199104	1991	4	60521.10435	0	0	0	1	52	5691.006
52	199201	1992	1	46400.62811	1	0	0	0	53	5523.657
53	199202	1992	2	59269.19691	0	1	0	0	54	5559.378
54	199203	1992	3	57010.95573	0	0	1	0	55	5504.859
55	199204	1992	4	56137.89632	0	0	0	1	56	5582.292
56	199301	1993	1	54059.50865	1	0	0	0	57	5480.331
57	199302	1993	2	53135.67107	0	1	0	0	58	5503.343
58	199303	1993	3	49813.79689	0	0	1	0	59	5477.813
59	199304	1993	4	51095.18886	0	0	0	1	60	5544.735
60	199401	1994	1	45495.5885	1	0	0	0	61	5493.064
61	199402	1994	2	48095.16782	0	1	0	0	62	5555.351
62	199403	1994	3	40121.53983	0	0	1	0	63	5547.6
63	199404	1994	4	40883.44975	0	0	0	1	64	5652.884
64	199501	1995	1	49737.06764	1	0	0	0	65	5605.532
65	199502	1995	2	48190.617	0	1	0	0	66	5675.712

OBS	DTE	YEAR	QUARTER	HSTOTL4	SEA1	SEA2	SEA3	SEA4	Time	EMPCOM
66	199503	1995	3	51920.46692	0	0	1	0	67	5650.704
67	199504	1995	4	49100.08635	0	0	0	1	68	5752.937
68	199601	1996	1	43622.64438	1	0	0	0	69	5682.241
69	199602	1996	2	40152.55747	0	1	0	0	70	5760.603
70	199603	1996	3	43277.03935	0	0	1	0	71	5733.921
71	199604	1996	4	42242.9968	0	0	0	1	72	5851.557
72	199701	1997	1	48097.72489	1	0	0	0	73	5818.225
73	199702	1997	2	47865.00325	0	1	0	0	74	5924.755
74	199703	1997	3	42859.11847	0	0	1	0	75	5900.83
75	199704	1997	4	41589.13764	0	0	0	1	76	6030.964
76	199801	1998	1	49746.79859	1	0	0	0	77	5996.639
77	199802	1998	2	50996.00547	0	1	0	0	78	6101.594
78	199803	1998	3	45977.87499	0	0	1	0	79	6105.16
79	199804	1998	4	54672.68773	0	0	0	1	80	6248.901
80	199901	1999	1	51242.2625	1	0	0	0	81	6197.487
81	199902	1999	2	54194.25036	0	1	0	0	82	6311.068
82	199903	1999	3	57725.65413	0	0	1	0	83	6322.853
83	199904	1999	4	54089.05382	0	0	0	1	84	6476.206
84	200001	2000	1	59850.67927	1	0	0	0	85	6420.347
85	200002	2000	2	56470.46325	0	1	0	0	86	6532.125
86	200003	2000	3	63134.67956	0	0	1	0	87	6510.205
87	200004	2000	4	60798.601	0	0	0	1	88	6646.319
88	200101	2001	1	66039.80531	1	0	0	0	89	6628.381
89	200102	2001	2	54271.56482	0	1	0	0	90	6686.351
90	200103	2001	3	64121.75247	0	0	1	0	91	6624.541
91	200104	2001	4	62448.85617	0	0	0	1	92	6727.294
92	200201	2002	1	69754.58881	1	0	0	0	93	6653.835
93	200202	2002	2	69618.72717	0	1	0	0	94	6747.694
94	200203	2002	3	63919.67893	0	0	1	0	95	6692.541
95	200204	2002	4	66325.75818	0	0	0	1	96	6825.718
96	200301	2003	1	74946.59925	1	0	0	0	97	6732.657
97	200302	2003	2	69831.85149	0	1	0	0	98	6801.336
98	200303	2003	3	75712.25549	0	0	1	0	99	6753.322
99	200304	2003	4	88566.46184	0	0	0	1	100	6888.657
100	200401	2004	1	92428.42808	1	0	0	0	101	6831.744
101	200402	2004	2	99307.26886	0	1	0	0	102	6930.925
102	200403	2004	3	81293.05068	0	0	1	0	103	6888.619
103	200404	2004	4	100652.2129	0	0	0	1	104	7042.854
104	200501	2005	1	103215.8214	1	0	0	0	105	6978.604

OBS	DTE	YEAR	QUARTER	HSTOTL4	SEA1	SEA2	SEA3	SEA4	Time	EMPCOM
105	200502	2005	2	103391.5294	0	1	0	0	106	7090.004
106	200503	2005	3	105549.1109	0	0	1	0	107	7068.267
107	200504	2005	4	102425.8299	0	0	0	1	108	7234.034
108	200601	2006	1	107350.0094	1	0	0	0	109	7192.718
109	200602	2006	2	105362.3047	0	1	0	0	110	7286.355
110	200603	2006	3	116342.9343	0	0	1	0	111	7246.789
111	200604	2006	4	97701.03724	0	0	0	1	112	7373.029
112	200701	2007	1	109924.7964	1	0	0	0	113	7296.096
113	200702	2007	2	98914.02334	0	1	0	0	114	7351.445
114	200703	2007	3	81118.02306	0	0	1	0	115	7298.784
115	200704	2007	4	75781.18502	0	0	0	1	116	7408.939
116	200801	2008	1	70940.48313	1	0	0	0	117	7270.003
117	200802	2008	2	66378.55065	0	1	0	0	118	7305.217
118	200803	2008	3	53894.90945	0	0	1	0	119	7168.83
119	200804	2008	4	43667.33116	0	0	0	1	120	7188.948
120	200901	2009	1	41697.1012	1	0	0	0	121	6937.619
121	200902	2009	2	39667.66109	0	1	0	0	122	6872.934
122	200903	2009	3	26623.88618	0	0	1	0	123	6684.042
123	200904	2009	4	24015.00576	0	0	0	1	124	6790.723
124	201001	2010	1	20354.81486	1	0	0	0	125	6682.965
125	201002	2010	2	22446.72508	0	1	0	0	126	6787.902
126	201003	2010	3	20647.51511	0	0	1	0	127	6673.683
127	201004	2010	4	18739.62822	0	0	0	1	128	6829.616
128	201101	2011	1	22508.74047	1	0	0	0	129	6754.854
129	201102	2011	2	18208.47249	0	1	0	0	130	6808.929
130	201103	2011	3	24670.33956	0	0	1	0	131	6751.29
131	201104	2011	4	22349.97099	0	0	0	1	132	6898.289
132	201201	2012	1	19604.35646	1	0	0	0	133	6847.371
133	201202	2012	2	29166.60265	0	1	0	0	134	6951.069
134	201203	2012	3	24446.26247	0	0	1	0	135	6905.253
135	201204	2012	4	23587.07774	0	0	0	1	136	7071.706
136	201301	2013	1	24883.2963	1	0	0	0	137	7015.528
137	201302	2013	2	31552.88559	0	1	0	0	138	7072.25
138	201303	2013	3	28528.05211	0	0	1	0	139	7019.569
139	201304	2013	4	31946.02367	0	0	0	1	140	7192.88
140	201401	2014	1	38058.41103	1	0	0	0	141	7103.929
141	201402	2014	2	34221.65769	0	1	0	0	142	7177.7
142	201403	2014	3	37559.45355	0	0	1	0	143	7143.338
143	201404	2014	4	43926.16251	0	0	0	1	144	7311.328

OBS	DTE	YEAR	QUARTER	HSTOTL4	SEA1	SEA2	SEA3	SEA4	Time	EMPCOM
144	201501	2015	1	43462.60459	1	0	0	0	145	7235.667
145	201502	2015	2	48099.74848	0	1	0	0	146	7329.924
146	201503	2015	3	51902.61533	0	0	1	0	147	7309.812
147	201504	2015	4	57505.55654	0	0	0	1	148	7481.669
148	201601	2016	1	62352.23184	1	0	0	0	149	7402.021
149	201602	2016	2	68217.39594	0	1	0	0	150	7500.153
150	201603	2016	3	74347.33183	0	0	1	0	151	7479.22
151	201604	2016	4	79520.37744	0	0	0	1	152	7649.519
152	201701	2017	1	82900.24087	1	0	0	0	153	7563.63
153	201702	2017	2	85445.86566	0	1	0	0	154	7652.836
154	201703	2017	3	87584.09648	0	0	1	0	155	7617.423
155	201704	2017	4	88718.2503	0	0	0	1	156	7774.228
156	201801	2018	1	90586.3388	1	0	0	0	157	7673.45
157	201802	2018	2	90052.34458	0	1	0	0	158	7751.426
158	201803	2018	3	89443.68406	0	0	1	0	159	7704.958
159	201804	2018	4	89634.47946	0	0	0	1	160	7851.76
160	201901	2019	1	90048.69809	1	0	0	0	161	7744.505
161	201902	2019	2	89769.72002	0	1	0	0	162	7820.241
162	201903	2019	3	90469.81402	0	0	1	0	163	7770.654
163	201904	2019	4	91644.66174	0	0	0	1	164	7915.292
164	202001	2020	1	92025.22613	1	0	0	0	165	7805.725
165	202002	2020	2	91670.55699	0	1	0	0	166	7895.369
166	202003	2020	3	91998.50542	0	0	1	0	167	7828.527
167	202004	2020	4	92054.92874	0	0	0	1	168	7964.391
168	202101	2021	1	91225.28122	1	0	0	0	169	7849.501
169	202102	2021	2	90421.28074	0	1	0	0	170	7919.054
170	202103	2021	3	89919.2979	0	0	1	0	171	7861.652
171	202104	2021	4	89204.89787	0	0	0	1	172	8007.145
172	202201	2022	1	88032.66003	1	0	0	0	173	7896.256
173	202202	2022	2	87236.62373	0	1	0	0	174	7968.204
174	202203	2022	3	86855.02802	0	0	1	0	175	7910.241
175	202204	2022	4	86207.4507	0	0	0	1	176	8057.939
176	202301	2023	1	85877.53244	1	0	0	0	177	7947.171
177	202302	2023	2	85445.33929	0	1	0	0	178	8018.784
178	202303	2023	3	85329.30784	0	0	1	0	179	7962.102
179	202304	2023	4	85104.80176	0	0	0	1	180	8112.632
180	202401	2024	1	85318.53981	1	0	0	0	181	8002.918
181	202402	2024	2	84984.57309	0	1	0	0	182	8076.204
182	202403	2024	3	85054.13026	0	0	1	0	183	8018.839

OBS	DTE	YEAR	QUARTER	HSTOTL4	SEA1	SEA2	SEA3	SEA4	Time	EMPCOM
183	202404	2024	4	84789.5753	0	0	0	1	184	8171.955
184	202501	2025	1	85212.29541	1	0	0	0	185	8062.025
185	202502	2025	2	85730.82635	0	1	0	0	186	8138.152
186	202503	2025	3	86114.95863	0	0	1	0	187	8082.292
187	202504	2025	4	86784.95981	0	0	0	1	188	8238.023
188	202601	2026	1	87697.64929	1	0	0	0	189	8127.529
189	202602	2026	2	88141.17853	0	1	0	0	190	8204.715
190	202603	2026	3	88590.12309	0	0	1	0	191	8149.47
191	202604	2026	4	89012.39104	0	0	0	1	192	8307.158
192	202701	2027	1	89533.55412	1	0	0	0	193	8197.841
193	202702	2027	2	89425.76001	0	1	0	0	194	8276.694
194	202703	2027	3	89403.1437	0	0	1	0	195	8221.153
195	202704	2027	4	88955.33399	0	0	0	1	196	8379.779
196	202801	2028	1	89218.83948	1	0	0	0	197	8268.455
197	202802	2028	2	88891.88158	0	1	0	0	198	8348.67
198	202803	2028	3	88206.76037	0	0	1	0	199	8292.403
199	202804	2028	4	87241.01498	0	0	0	1	200	8452.074
200	202901	2029	1	87377.1882	1	0	0	0	201	8339.751
201	202902	2029	2	87320.92328	0	1	0	0	202	8419.854
202	202903	2029	3	87121.95955	0	0	1	0	203	8362.054
203	202904	2029	4	86764.6685	0	0	0	1	204	8524.192
204	203001	2030	1	87377.54117	1	0	0	0	205	8412.13
205	203002	2030	2	87618.53244	0	1	0	0	206	8506.634
206	203003	2030	3	87687.9226	0	0	1	0	207	8440.39
207	203004	2030	4	87647.35833	0	0	0	1	208	8594.891
208	203101	2031	1	88291.93385	1	0	0	0	209	8477.334
209	203102	2031	2	88388.67723	0	1	0	0	210	8556.108
210	203103	2031	3	88520.81908	0	0	1	0	211	8497.683
211	203104	2031	4	88641.45009	0	0	0	1	212	8657.236
212	203201	2032	1	88972.05766	1	0	0	0	213	8538.342
213	203202	2032	2	87738.92196	0	1	0	0	214	8616.487
214	203203	2032	3	87035.19596	0	0	1	0	215	8557.446
215	203204	2032	4	86747.39228	0	0	0	1	216	8718.238
216	203301	2033	1	86862.41055	1	0	0	0	217	8598.441
217	203302	2033	2	85658.11607	0	1	0	0	218	8677.552
218	203303	2033	3	84933.59396	0	0	1	0	219	8619.537
219	203304	2033	4	84880.37056	0	0	0	1	220	8782.076
220	203401	2034	1	85547.50146	1	0	0	0	221	8662.414
221	203402	2034	2	85226.77004	0	1	0	0	222	8742.735

OBS	DTE	YEAR	QUARTER	HSTOTL4	SEA1	SEA2	SEA3	SEA4	Time	EMPCOM
222	203403	2034	3	85141.56549	0	0	1	0	223	8684.847
223	203404	2034	4	85457.14027	0	0	0	1	224	8848.12
224	203501	2035	1	86171.06131	1	0	0	0	225	8727.056
225	203502	2035	2	85559.4233	0	1	0	0	226	8808.297
226	203503	2035	3	85749.60401	0	0	1	0	227	8750.225
227	203504	2035	4	86069.20393	0	0	0	1	228	8915.24
228	203601	2036	1	86875.52273	1	0	0	0	229	8793.837
229	203602	2036	2	86569.01293	0	1	0	0	230	8877.152
230	203603	2036	3	86801.10998	0	0	1	0	231	8820.949
231	203604	2036	4	86920.02266	0	0	0	1	232	8987.948
232	203701	2037	1	87320.69336	1	0	0	0	233	8865.256
233	203702	2037	2	86575.03019	0	1	0	0	234	8949.483
234	203703	2037	3	86532.41181	0	0	1	0	235	8893.633
235	203704	2037	4	86541.11495	0	0	0	1	236	9061.737
236	203801	2038	1	87047.64156	1	0	0	0	237	8936.608
237	203802	2038	2	86995.15948	0	1	0	0	238	9021.226
238	203803	2038	3	87271.79894	0	0	1	0	239	8965.344
239	203804	2038	4	87352.62026	0	0	0	1	240	9133.9
240	203901	2039	1	87780.0191	1	0	0	0	241	9008.357
241	203902	2039	2	87588.22632	0	1	0	0	242	9093.664
242	203903	2039	3	87451.71021	0	0	1	0	243	9035.456
243	203904	2039	4	87287.17909	0	0	0	1	244	9206.953
244	204001	2040	1	87513.13561	1	0	0	0	245	9080.573
245	204002	2040	2	87105.76635	0	1	0	0	246	9180.537
246	204003	2040	3	86923.48551	0	0	1	0	247	9116.019
247	204004	2040	4	86858.02616	0	0	0	1	248	9283.651
248	204101	2041	1	87525.01494	1	0	0	0	249	9155.071
249	204102	2041	2	87670.76512	0	1	0	0	250	9241.642
250	204103	2041	3	87127.46072	0	0	1	0	251	9185.235
251	204104	2041	4	88208.97288	0	0	0	1	252	9359.057

OBS	DTE	YEAR	QUARTER	EMPIND	ACTIND	LGCONCOM	LG1EMCOM	LNCONIND	LN0EMIND
1	197902	1979	2	1265.1996	29,173	12.1212	.	10.2811	7.10808
2	197903	1979	3	1273.6012	28,995	12.1262	8.32426	10.275	7.11208
3	197904	1979	4	1283.0665	29,321	12.1342	8.32502	10.2862	7.11526

OBS	DTE	YEAR	QUARTER	EMPIND	ACTIND	LGCONCOM	LG1EMCOM	LNCONIND	LN0EMIND
4	198001	1980	1	1256.5792	29,945	12.1439	8.36061	10.3073	7.09531
5	198002	1980	2	1255.6581	30,014	12.151	8.34787	10.3096	7.09049
6	198003	1980	3	1241.8223	29,643	12.154	8.36035	10.2971	7.07623
7	198004	1980	4	1259.5617	29,947	12.1583	8.34816	10.3072	7.08791
8	198101	1981	1	1243.6446	30,504	12.164	8.38229	10.3256	7.07876
9	198102	1981	2	1274.3618	30,256	12.1696	8.37314	10.3174	7.10036
10	198103	1981	3	1279.9714	29,902	12.1712	8.38304	10.3057	7.10242
11	198104	1981	4	1265.6209	30,033	12.1713	8.36793	10.3101	7.08958
12	198201	1982	1	1215.0474	30,466	12.1814	8.38877	10.3244	7.05393
13	198202	1982	2	1210.546	30,302	12.1864	8.3692	10.319	7.04943
14	198203	1982	3	1195.7993	29,749	12.1868	8.37323	10.3007	7.03931
15	198204	1982	4	1175.8957	29,863	12.1891	8.35561	10.3045	7.02108
16	198301	1983	1	1169.3971	30,084	12.1948	8.37855	10.3119	7.01616
17	198302	1983	2	1198.5917	29,607	12.1989	8.37036	10.2959	7.03852
18	198303	1983	3	1213.3708	29,053	12.2009	8.38275	10.2769	7.04804
19	198304	1983	4	1224.871	29,199	12.2021	8.36876	10.2819	7.05324
20	198401	1984	1	1219.2247	29,619	12.2039	8.40252	10.2962	7.05307
21	198402	1984	2	1237.7853	29,356	12.2043	8.39949	10.2873	7.06484
22	198403	1984	3	1245.9485	28,795	12.2108	8.41748	10.268	7.07268
23	198404	1984	4	1255.7307	29,037	12.224	8.42512	10.2764	7.07809
24	198501	1985	1	1234.0644	29,678	12.2362	8.45848	10.2982	7.06193
25	198502	1985	2	1255.0262	29,218	12.2413	8.45619	10.2825	7.07775
26	198503	1985	3	1266.6146	28,543	12.2485	8.47506	10.2593	7.08707
27	198504	1985	4	1275.4214	28,822	12.2451	8.47587	10.269	7.09232
28	198601	1986	1	1261.3688	29,332	12.2448	8.50757	10.2866	7.08506
29	198602	1986	2	1274.4737	28,649	12.2487	8.49889	10.2632	7.09854
30	198603	1986	3	1282.5394	27,912	12.2484	8.51533	10.2372	7.10726
31	198604	1986	4	1292.788	27,823	12.246	8.51503	10.234	7.1142
32	198701	1987	1	1273.4309	28,347	12.2515	8.5508	10.2527	7.10242
33	198702	1987	2	1290.5846	27,850	12.2555	8.53987	10.2351	7.11347
34	198703	1987	3	1299.7469	27,136	12.2551	8.56175	10.2091	7.11972
35	198704	1987	4	1317.1461	27,028	12.2516	8.55179	10.205	7.1325
36	198801	1988	1	1313.8706	28,016	12.2602	8.58873	10.2409	7.13178
37	198802	1988	2	1331.3121	27,463	12.2638	8.58448	10.2211	7.14204
38	198803	1988	3	1329.4281	26,836	12.2631	8.60332	10.1981	7.14006
39	198804	1988	4	1341.8426	26,831	12.2608	8.60025	10.1978	7.14842
40	198901	1989	1	1322.4231	27,845	12.2692	8.63293	10.2347	7.13855
41	198902	1989	2	1332.3906	27,450	12.2741	8.6235	10.2206	7.14606
42	198903	1989	3	1323.3799	26,723	12.2731	8.63588	10.2068	7.13823

OBS	DTE	YEAR	QUARTER	EMPIND	ACTIND	LGCONCOM	LG1EMCOM	LNCONIND	LN0EMIND
43	198904	1989	4	1327.0474	26,736	12.2692	8.62659	10.2239	7.13918
44	199001	1990	1	1298.1846	27,459	12.2702	8.6623	10.2613	7.11947
45	199002	1990	2	1300.4107	27,049	12.2687	8.653	10.2731	7.12166
46	199003	1990	3	1285.039	26,424	12.265	8.66095	10.2752	7.11029
47	199004	1990	4	1265.5981	26,289	12.2614	8.65146	10.2775	7.09598
48	199101	1991	1	1219.3528	26,806	12.268	8.66585	10.2874	7.06193
49	199102	1991	2	1213.3884	26,244	12.2666	8.64257	10.2862	7.05738
50	199103	1991	3	1195.5012	25,597	12.2645	8.64571	10.278	7.04586
51	199104	1991	4	1181.6977	25,475	12.2635	8.63574	10.2694	7.03351
52	199201	1992	1	1136.1564	25,572	12.2683	8.64661	10.2617	7.00097
53	199202	1992	2	1130.6915	24,935	12.2668	8.61693	10.2584	6.99696
54	199203	1992	3	1115.2958	24,407	12.2604	8.62325	10.2503	6.9861
55	199204	1992	4	1089.1833	24,258	12.2546	8.61328	10.2382	6.96404
56	199301	1993	1	1062.5582	24,799	12.2642	8.62728	10.2394	6.93945
57	199302	1993	2	1054.6413	24,168	12.2645	8.60886	10.2328	6.93391
58	199303	1993	3	1038.5784	23,757	12.2629	8.61305	10.2333	6.9255
59	199304	1993	4	1026.9173	23,765	12.2637	8.60857	10.2345	6.91513
60	199401	1994	1	1012.3046	24,061	12.2734	8.6208	10.2366	6.89791
61	199402	1994	2	1025.1076	23,663	12.2778	8.6113	10.2406	6.91085
62	199403	1994	3	1025.9207	23,364	12.2786	8.62263	10.2436	6.91523
63	199404	1994	4	1024.6659	23,379	12.2824	8.62128	10.2447	6.91642
64	199501	1995	1	1021.6011	23,741	12.2907	8.64003	10.2485	6.90935
65	199502	1995	2	1029.7542	23,440	12.2915	8.6315	10.2523	6.91771
66	199503	1995	3	1034.3624	23,066	12.2913	8.64395	10.25	6.92176
67	199504	1995	4	1031.2962	22,923	12.2923	8.63953	10.2473	6.91899
68	199601	1996	1	1035.6926	23,175	12.2952	8.65746	10.2449	6.92353
69	199602	1996	2	1051.5638	22,956	12.295	8.64509	10.2463	6.93945
70	199603	1996	3	1055.4124	22,686	12.2961	8.6588	10.2491	6.94322
71	199604	1996	4	1060.7759	22,776	12.2988	8.65415	10.2501	6.94851
72	199701	1997	1	1059.2085	23,014	12.3036	8.67447	10.2544	6.94707
73	199702	1997	2	1078.5455	22,608	12.3053	8.66875	10.2561	6.96555
74	199703	1997	3	1089.77	22,353	12.3065	8.6869	10.2583	6.97597
75	199704	1997	4	1087.1027	22,358	12.3069	8.68284	10.2517	6.97401
76	199801	1998	1	1092.3943	22,975	12.3137	8.70467	10.2696	6.97924
77	199802	1998	2	1105.7723	22,803	12.3154	8.69895	10.2729	6.99228
78	199803	1998	3	1101.5732	22,581	12.3174	8.71631	10.274	6.9886
79	199804	1998	4	1094.4656	22,653	12.3195	8.7169	10.2749	6.98277
80	199901	1999	1	1078.1798	22,866	12.3246	8.74016	10.2729	6.96829
81	199902	1999	2	1089.3991	22,599	12.3274	8.7319	10.2692	6.97887

OBS	DTE	YEAR	QUARTER	EMPIND	ACTIND	LGCONCOM	LG1EMCOM	LNCONIND	LN0EMIND
82	199903	1999	3	1086.3799	22,339	12.3296	8.75007	10.2693	6.97597
83	199904	1999	4	1084.294	22,289	12.3325	8.75193	10.2675	6.97439
84	200001	2000	1	1081.9195	22,394	12.3367	8.77589	10.2662	6.96829
85	200002	2000	2	1091.0416	22,115	12.338	8.76784	10.2655	6.97625
86	200003	2000	3	1094.1283	21,844	12.3384	8.78522	10.2649	6.97859
87	200004	2000	4	1082.1473	21,932	12.341	8.78179	10.2655	6.96782
88	200101	2001	1	1069.9858	22,199	12.3451	8.80234	10.2658	6.95759
89	200102	2001	2	1057.882	21,927	12.3472	8.79944	10.2631	6.94592
90	200103	2001	3	1036.0588	21,679	12.3484	8.80814	10.262	6.92451
91	200104	2001	4	1004.2396	21,630	12.3508	8.79886	10.2612	6.89305
92	200201	2002	1	979.5314	21,742	12.3551	8.81426	10.257	6.8686
93	200202	2002	2	982.83885	21,476	12.3574	8.80327	10.2521	6.87244
94	200203	2002	3	971.09195	21,237	12.359	8.81727	10.2494	6.86003
95	200204	2002	4	957.64865	21,127	12.3613	8.80906	10.2471	6.84588
96	200301	2003	1	941.00971	21,184	12.3638	8.82874	10.2463	6.82806
97	200302	2003	2	935.96374	20,867	12.3649	8.81503	10.2456	6.82263
98	200303	2003	3	928.81162	20,673	12.3659	8.82518	10.2469	6.81465
99	200304	2003	4	920.97649	20,670	12.3677	8.8181	10.2488	6.80594
100	200401	2004	1	917.28947	20,910	12.3713	8.83793	10.2521	6.80184
101	200402	2004	2	925.27529	20,734	12.3722	8.82964	10.2492	6.81036
102	200403	2004	3	925.71414	20,584	12.3732	8.84408	10.2501	6.81091
103	200404	2004	4	915.3797	20,709	12.3749	8.83796	10.2523	6.79917
104	200501	2005	1	907.42951	21,017	12.3771	8.86007	10.2564	6.79021
105	200502	2005	2	911.06293	20,558	12.379	8.8509	10.2473	6.79425
106	200503	2005	3	913.19918	20,387	12.38	8.86671	10.2473	6.79593
107	200504	2005	4	906.46568	20,396	12.3811	8.86366	10.2482	6.78807
108	200601	2006	1	904.94886	20,672	12.3833	8.88685	10.2535	6.78581
109	200602	2006	2	909.44518	20,354	12.3858	8.88113	10.2465	6.79032
110	200603	2006	3	908.77736	20,103	12.3871	8.89404	10.244	6.78886
111	200604	2006	4	898.10482	20,100	12.3884	8.88863	10.2453	6.77662
112	200701	2007	1	889.1038	20,455	12.3908	8.90589	10.2496	6.76884
113	200702	2007	2	888.65534	20,346	12.3916	8.89508	10.2529	6.76838
114	200703	2007	3	888.81633	20,123	12.3924	8.90262	10.2521	6.76803
115	200704	2007	4	872.22771	20,106	12.3946	8.89538	10.2521	6.74876
116	200801	2008	1	859.23033	20,397	12.397	8.91036	10.2557	6.73328
117	200802	2008	2	858.88271	20,213	12.3974	8.89139	10.2576	6.73281
118	200803	2008	3	854.87002	20,028	12.3981	8.89618	10.2583	6.72707
119	200804	2008	4	829.48575	19,923	12.3994	8.87716	10.2593	6.69568
120	200901	2009	1	786.54769	20,008	12.4018	8.87974	10.2606	6.64262

OBS	DTE	YEAR	QUARTER	EMPIND	ACTIND	LGCONCOM	LG1EMCOM	LNCONIND	LN0EMIND
121	200902	2009	2	763.53306	19,759	12.4028	8.84386	10.261	6.61312
122	200903	2009	3	746.75779	19,590	12.4025	8.83431	10.2609	6.59154
123	200904	2009	4	733.61021	19,440	12.4032	8.80603	10.2606	6.5734
124	201001	2010	1	724.035	19,565	12.4041	8.82188	10.2617	6.56018
125	201002	2010	2	731.13138	19,404	12.4045	8.80566	10.2633	6.57088
126	201003	2010	3	736.45014	19,219	12.4047	8.82117	10.2628	6.57703
127	201004	2010	4	731.71771	19,195	12.4053	8.80293	10.2625	6.5692
128	201101	2011	1	722.97919	19,358	12.4067	8.82206	10.2625	6.56357
129	201102	2011	2	729.73755	19,173	12.4065	8.81217	10.2616	6.5699
130	201103	2011	3	736.17661	19,003	12.4064	8.81998	10.2619	6.57633
131	201104	2011	4	730.77798	19,010	12.4071	8.81	10.2613	6.56752
132	201201	2012	1	728.32929	19,208	#N/A	8.83216	#N/A	6.56498
133	201202	2012	2	737.16423	19,059	#N/A	8.82284	#N/A	6.57298
134	201203	2012	3	742.24664	18,877	#N/A	8.83412	#N/A	6.58258
135	201204	2012	4	735.39439	18,811	#N/A	8.82382	#N/A	6.58948
136	201301	2013	1	729.23836	19,023	#N/A	8.84383	#N/A	6.58465
137	201302	2013	2	731.68308	18,922	#N/A	8.83537	#N/A	6.59373
138	201303	2013	3	738.06396	18,805	#N/A	8.8475	#N/A	6.60245
139	201304	2013	4	730.98625	18,813	#N/A	8.83986	#N/A	6.60584
140	201401	2014	1	735.69395	#N/A	#N/A	8.86039	#N/A	6.59728
141	201402	2014	2	745.21182	#N/A	#N/A	8.85318	#N/A	6.60313
142	201403	2014	3	755.82625	#N/A	#N/A	8.86692	#N/A	6.61352
143	201404	2014	4	748.81029	#N/A	#N/A	8.86029	#N/A	6.61754
144	201501	2015	1	751.61627	#N/A	#N/A	8.88179	#N/A	6.61056
145	201502	2015	2	755.16158	#N/A	#N/A	8.87484	#N/A	6.6158
146	201503	2015	3	760.61374	#N/A	#N/A	8.88861	#N/A	6.6242
147	201504	2015	4	755.39097	#N/A	#N/A	8.88174	#N/A	6.62632
148	201601	2016	1	757.91784	#N/A	#N/A	8.90197	#N/A	6.61754
149	201602	2016	2	760.93521	#N/A	#N/A	8.89418	#N/A	6.62021
150	201603	2016	3	765.64854	#N/A	#N/A	8.90769	#N/A	6.62844
151	201604	2016	4	758.79604	#N/A	#N/A	8.90047	#N/A	6.62976
152	201701	2017	1	760.55242	#N/A	#N/A	8.91936	#N/A	6.62087
153	201702	2017	2	763.66055	#N/A	#N/A	8.91002	#N/A	6.62207
154	201703	2017	3	767.8247	#N/A	#N/A	8.92204	#N/A	6.62817
155	201704	2017	4	760.82132	#N/A	#N/A	8.91347	#N/A	6.62831
156	201801	2018	1	762.4362	#N/A	#N/A	8.93101	#N/A	6.61794
157	201802	2018	2	766.31902	#N/A	#N/A	8.921	#N/A	6.61981
158	201803	2018	3	771.10129	#N/A	#N/A	8.93234	#N/A	6.62659
159	201804	2018	4	764.99182	#N/A	#N/A	8.9233	#N/A	6.62804

OBS	DTE	YEAR	QUARTER	EMPIND	ACTIND	LGCONCOM	LG1EMCOM	LNCONIND	LN0EMIND
160	201901	2019	1	765.55988	#N/A	#N/A	8.9402	#N/A	6.61754
161	201902	2019	2	767.82872	#N/A	#N/A	8.92971	#N/A	6.61834
162	201903	2019	3	771.05144	#N/A	#N/A	8.94079	#N/A	6.62367
163	201904	2019	4	763.41666	#N/A	#N/A	8.93175	#N/A	6.62367
164	202001	2020	1	763.94364	#N/A	#N/A	8.94877	#N/A	6.61338
165	202002	2020	2	765.76509	#N/A	#N/A	8.93868	#N/A	6.61419
166	202003	2020	3	768.54978	#N/A	#N/A	8.95229	#N/A	6.61994
167	202004	2020	4	760.37893	#N/A	#N/A	8.94215	#N/A	6.62021
168	202101	2021	1	760.27208	#N/A	#N/A	8.95826	#N/A	6.61097
169	202102	2021	2	761.70045	#N/A	#N/A	8.94772	#N/A	6.61231
170	202103	2021	3	764.71594	#N/A	#N/A	8.95877	#N/A	6.61914
171	202104	2021	4	756.52824	#N/A	#N/A	8.94977	#N/A	6.62087
172	202201	2022	1	756.10529	#N/A	#N/A	8.96636	#N/A	6.6111
173	202202	2022	2	756.96755	#N/A	#N/A	8.95577	#N/A	6.61123
174	202203	2022	3	759.84208	#N/A	#N/A	8.96661	#N/A	6.6166
175	202204	2022	4	751.93865	#N/A	#N/A	8.95732	#N/A	6.61673
176	202301	2023	1	751.90222	#N/A	#N/A	8.9741	#N/A	6.60611
177	202302	2023	2	753.03893	#N/A	#N/A	8.96376	#N/A	6.60489
178	202303	2023	3	756.15882	#N/A	#N/A	8.97499	#N/A	6.60948
179	202304	2023	4	748.359	#N/A	#N/A	8.96646	#N/A	6.60868
180	202401	2024	1	748.62804	#N/A	#N/A	8.98387	#N/A	6.59837
181	202402	2024	2	749.85631	#N/A	#N/A	8.97367	#N/A	6.59755
182	202403	2024	3	752.98404	#N/A	#N/A	8.98496	#N/A	6.60191
183	202404	2024	4	745.20564	#N/A	#N/A	8.97651	#N/A	6.60055
184	202501	2025	1	744.61528	#N/A	#N/A	8.9939	#N/A	6.58934
185	202502	2025	2	744.94573	#N/A	#N/A	8.98378	#N/A	6.5881
186	202503	2025	3	747.10569	#N/A	#N/A	8.99524	#N/A	6.59181
187	202504	2025	4	738.70829	#N/A	#N/A	8.98705	#N/A	6.58961
188	202601	2026	1	738.12192	#N/A	#N/A	9.00445	#N/A	6.578
189	202602	2026	2	738.491	#N/A	#N/A	8.99442	#N/A	6.57591
190	202603	2026	3	740.69288	#N/A	#N/A	9.00623	#N/A	6.57967
191	202604	2026	4	732.46988	#N/A	#N/A	8.99824	#N/A	6.57758
192	202701	2027	1	731.60213	#N/A	#N/A	9.01576	#N/A	6.56597
193	202702	2027	2	731.59247	#N/A	#N/A	9.00587	#N/A	6.564
194	202703	2027	3	733.57956	#N/A	#N/A	9.01751	#N/A	6.5678
195	202704	2027	4	725.32781	#N/A	#N/A	9.00944	#N/A	6.56569
196	202801	2028	1	724.77986	#N/A	#N/A	9.02667	#N/A	6.55393
197	202802	2028	2	724.70889	#N/A	#N/A	9.01634	#N/A	6.55194
198	202803	2028	3	726.54975	#N/A	#N/A	9.02786	#N/A	6.55564

OBS	DTE	YEAR	QUARTER	EMPIND	ACTIND	LGCONCOM	LG1EMCOM	LNCONIND	LN0EMIND
199	202804	2028	4	718.14549	#N/A	#N/A	9.01965	#N/A	6.55336
200	202901	2029	1	717.63233	#N/A	#N/A	9.03677	#N/A	6.54161
201	202902	2029	2	717.76305	#N/A	#N/A	9.02641	#N/A	6.53973
202	202903	2029	3	719.86741	#N/A	#N/A	9.03788	#N/A	6.54377
203	202904	2029	4	711.91766	#N/A	#N/A	9.02981	#N/A	6.54204
204	203001	2030	1	711.53652	#N/A	#N/A	9.04673	#N/A	6.53044
205	203002	2030	2	711.31932	#N/A	#N/A	9.03627	#N/A	6.5281
206	203003	2030	3	713.87876	#N/A	#N/A	9.04888	#N/A	6.53306
207	203004	2030	4	706.19994	#N/A	#N/A	9.03942	#N/A	6.5319
208	203101	2031	1	705.99785	#N/A	#N/A	9.05529	#N/A	6.52092
209	203102	2031	2	706.5426	#N/A	#N/A	9.04458	#N/A	6.52003
210	203103	2031	3	708.94225	#N/A	#N/A	9.05573	#N/A	6.52547
211	203104	2031	4	701.18725	#N/A	#N/A	9.04727	#N/A	6.52459
212	203201	2032	1	701.12704	#N/A	#N/A	9.06356	#N/A	6.51397
213	203202	2032	2	701.37019	#N/A	#N/A	9.05248	#N/A	6.51323
214	203203	2032	3	703.72461	#N/A	#N/A	9.06321	#N/A	6.5187
215	203204	2032	4	696.03166	#N/A	#N/A	9.05467	#N/A	6.51767
216	203301	2033	1	696.07713	#N/A	#N/A	9.07086	#N/A	6.50668
217	203302	2033	2	696.48081	#N/A	#N/A	9.05975	#N/A	6.50593
218	203303	2033	3	699.09303	#N/A	#N/A	9.07048	#N/A	6.5113
219	203304	2033	4	691.79998	#N/A	#N/A	9.06204	#N/A	6.51041
220	203401	2034	1	692.23324	#N/A	#N/A	9.07808	#N/A	6.49964
221	203402	2034	2	692.94529	#N/A	#N/A	9.06691	#N/A	6.49888
222	203403	2034	3	695.71186	#N/A	#N/A	9.07761	#N/A	6.50429
223	203404	2034	4	688.44334	#N/A	#N/A	9.0694	#N/A	6.50354
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225	203502	2035	2	689.63769	#N/A	#N/A	9.07449	#N/A	6.49209
226	203503	2035	3	692.56426	#N/A	#N/A	9.08521	#N/A	6.49783
227	203504	2035	4	685.42811	#N/A	#N/A	9.07693	#N/A	6.49708
228	203601	2036	1	685.91706	#N/A	#N/A	9.09312	#N/A	6.48647
229	203602	2036	2	686.67719	#N/A	#N/A	9.08186	#N/A	6.48601
230	203603	2036	3	689.53261	#N/A	#N/A	9.09274	#N/A	6.49179
231	203604	2036	4	682.38698	#N/A	#N/A	9.08455	#N/A	6.49133
232	203701	2037	1	682.9128	#N/A	#N/A	9.10074	#N/A	6.48142
233	203702	2037	2	683.58766	#N/A	#N/A	9.08946	#N/A	6.48127
234	203703	2037	3	686.37735	#N/A	#N/A	9.1002	#N/A	6.48692
235	203704	2037	4	679.27964	#N/A	#N/A	9.09195	#N/A	6.48647
236	203801	2038	1	679.9529	#N/A	#N/A	9.10814	#N/A	6.47666
237	203802	2038	2	680.74479	#N/A	#N/A	9.09678	#N/A	6.47636

OBS	DTE	YEAR	QUARTER	EMPIND	ACTIND	LGCONCOM	LG1EMCOM	LNCONIND	LN0EMIND
238	203803	2038	3	683.66961	#N/A	#N/A	9.10764	#N/A	6.48219
239	203804	2038	4	676.62749	#N/A	#N/A	9.09933	#N/A	6.48188
240	203901	2039	1	677.31117	#N/A	#N/A	9.11549	#N/A	6.47188
241	203902	2039	2	678.02828	#N/A	#N/A	9.1042	#N/A	6.47157
242	203903	2039	3	680.86391	#N/A	#N/A	9.11514	#N/A	6.47743
243	203904	2039	4	673.69849	#N/A	#N/A	9.10698	#N/A	6.47713
244	204001	2040	1	674.36699	#N/A	#N/A	9.12326	#N/A	6.46723
245	204002	2040	2	674.62949	#N/A	#N/A	9.11197	#N/A	6.46677
246	204003	2040	3	677.67441	#N/A	#N/A	9.12437	#N/A	6.47312
247	204004	2040	4	670.68445	#N/A	#N/A	9.11494	#N/A	6.47327
248	204101	2041	1	671.56153	#N/A	#N/A	9.13041	#N/A	6.46381
249	204102	2041	2	672.30429	#N/A	#N/A	9.11893	#N/A	6.46397
250	204103	2041	3	675.29696	#N/A	#N/A	9.13006	#N/A	6.47033
251	204104	2041	4	668.34699	#N/A	#N/A	9.12208	#N/A	6.47049

Triennial Cost Allocation Proceeding

EUFORECASTER

I. Introduction

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

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

End Use Forecaster: An Overview

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

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

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

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

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

Table 1. Alternative Market Segmentation Designs – Utility Industry Example

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

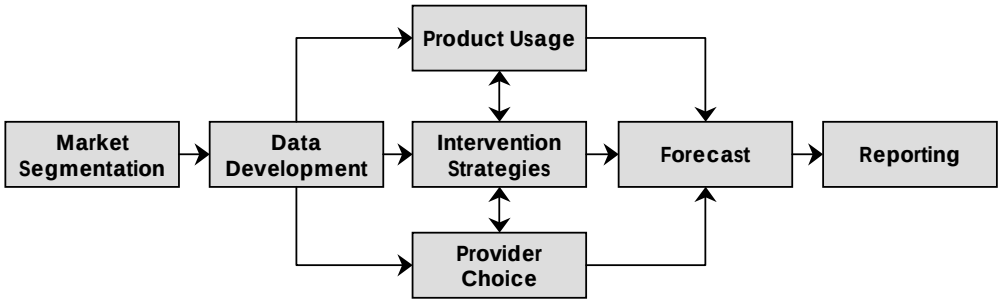
End Use Forecaster has other dimensions that capture factors affecting product demands. Perhaps the most important of these is End Use Forecaster's "vintaging" capability. Vintaging refers to product or service turnover that is a function of either physical lives or contract period. Accurate assessments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

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

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

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

Figure 1. End Use Forecaster Modules and Structure



Interface Design

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

Figure 2. Welcome Screen

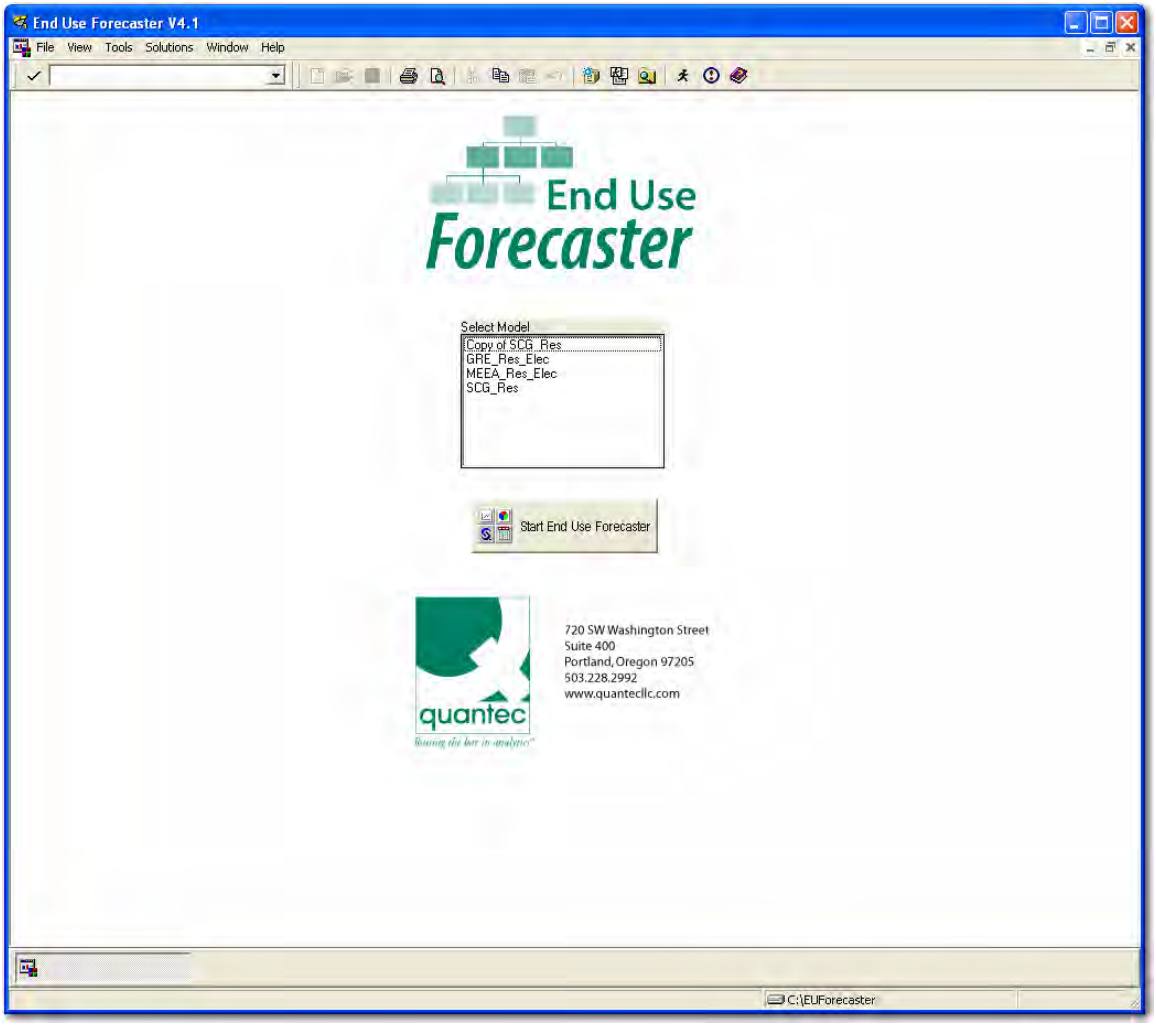
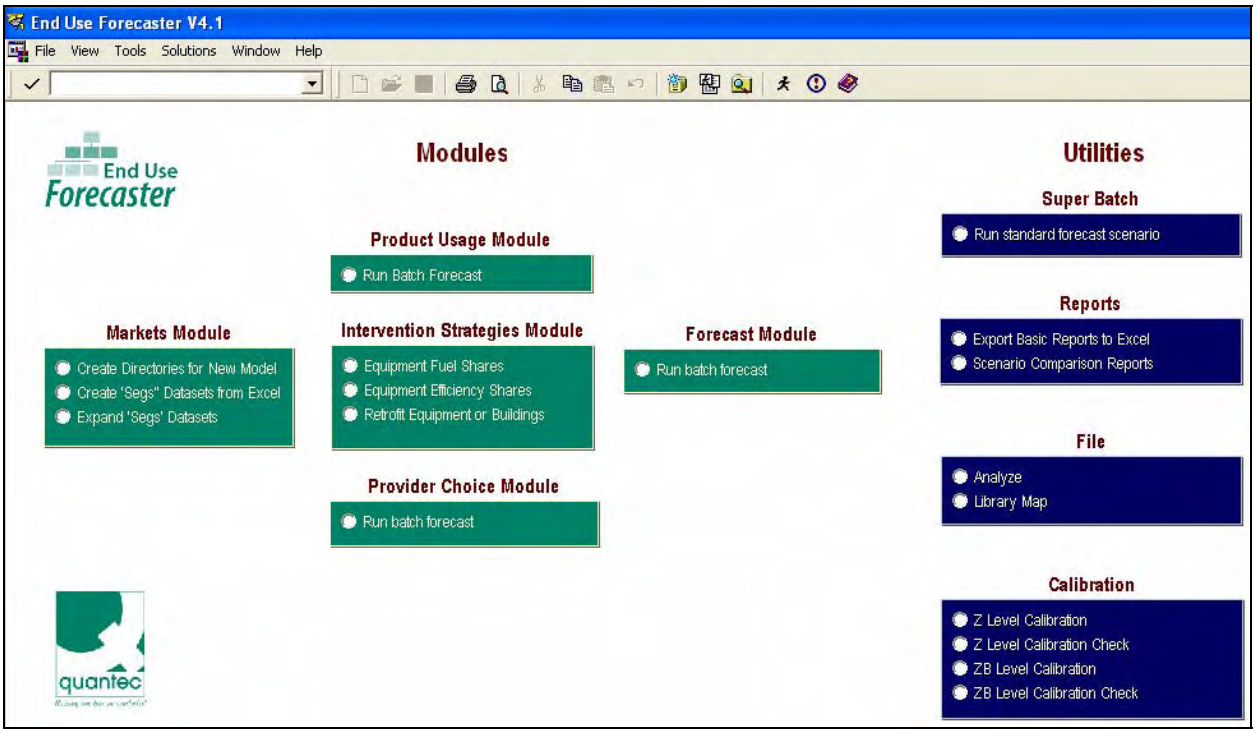


Figure 3. Main Dashboard



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

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

Data Exchange

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

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

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

Market Segmentation

Market Segments

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

Strategic Information Needs

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

Data Development and Entry

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

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

Data Entry Formats

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

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

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

Product Usage Module: Modeling Equipment Consumption

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

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

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

Provider Choice Module: Modeling Customer Service and Purchase Decisions

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

Modes of Choice Modeling

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

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

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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

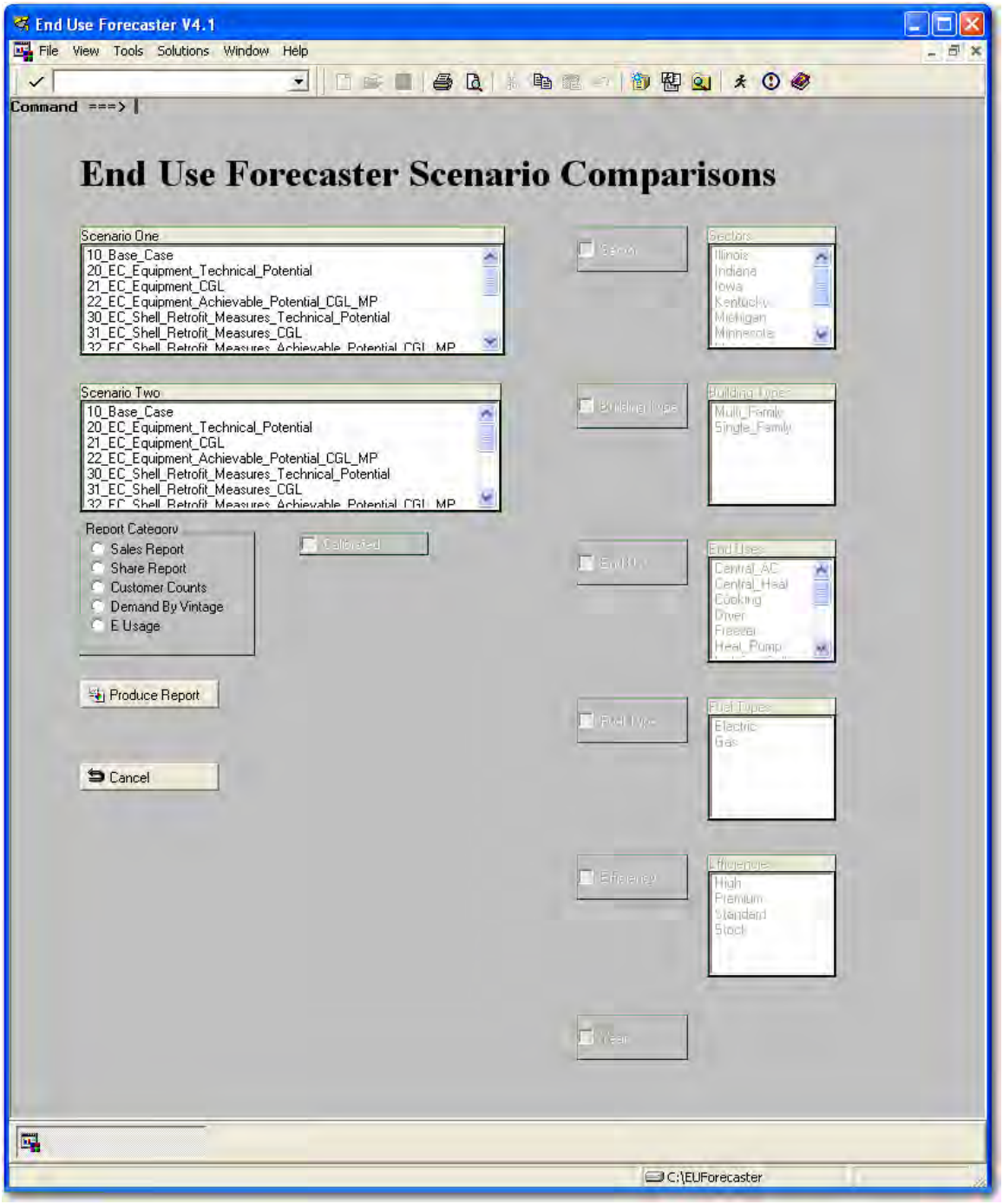
The Forecast Module incorporates all the information compiled from the other modules – Usage, Choice, and Intervention Strategies – related to the overall economic growth of the market segment and equipment lifetime (decay) functions to create the final forecast for a given scenario.

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

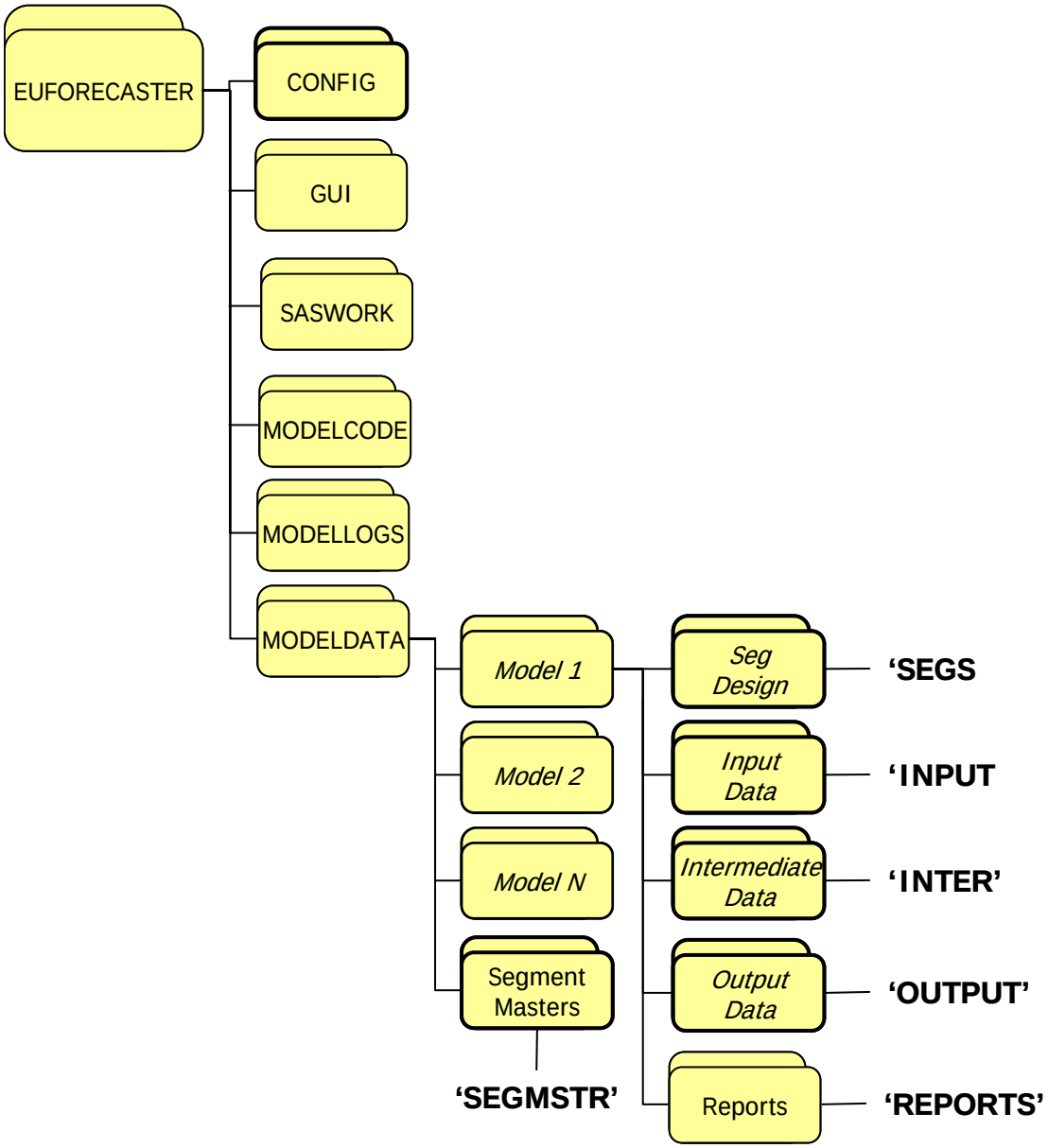
cases, where the documentation does not refer to a specific scenario, datasets are referred to with an **"_xx**" suffix, such as **saturations_xx**.

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

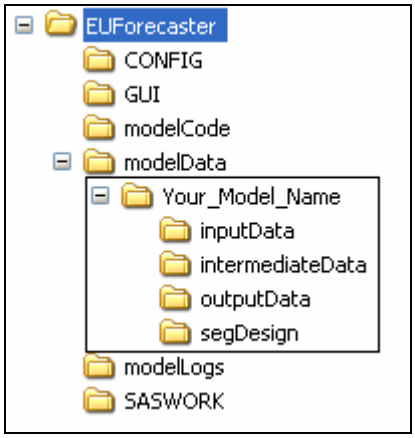
The execution of the first task – creation of a customized market segmentation design – is based on four steps, listed briefly below and then described in greater detail.

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.

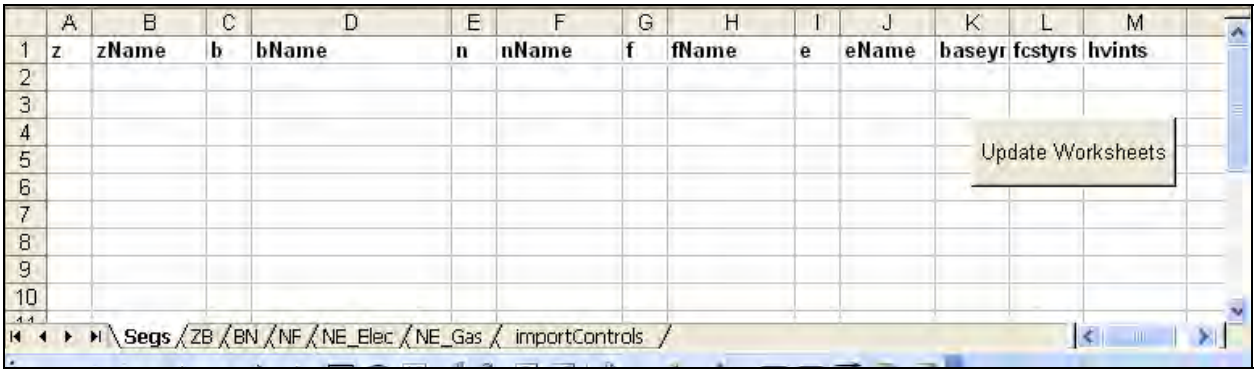
Table 3 summarizes the intended use of each of these dimensions. Note that while the model must include all five dimension, you are not required to use all of them. For example, suppose you want a design with alternative providers at Dimension 4 and do not wish to complicate the model with product/service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

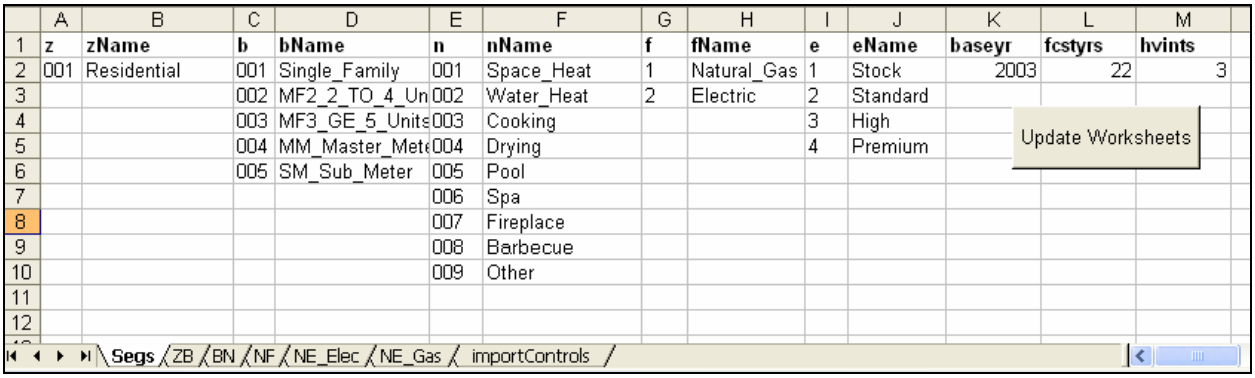
Figure 7. Empty "Segs" Tab in Seg_Design_Template.xls



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



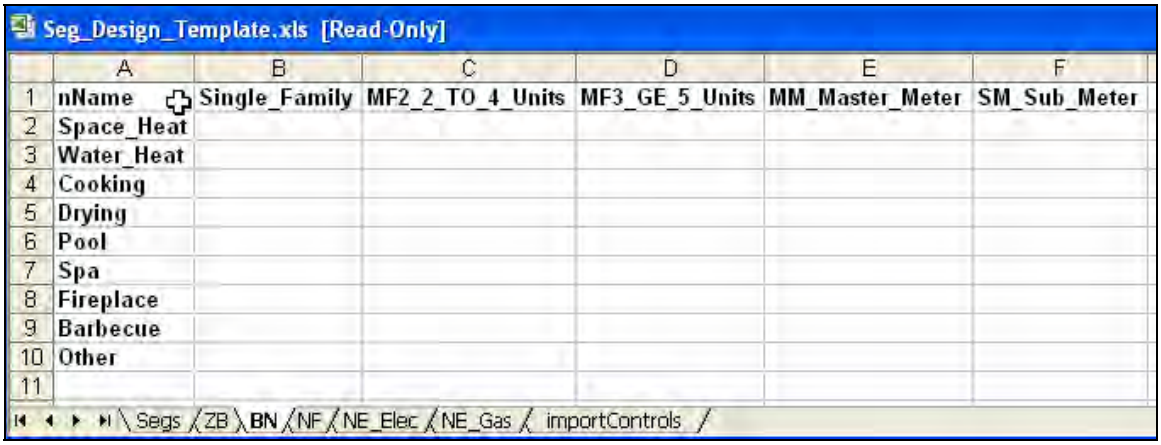
	A	B	C	D	E	F	G	H	I	J	K	L	M
1	z	zName	b	bName	n	nName	f	fName	e	eName	baseyr	fcstyrs	hvints
2	001	Residential	001	Single_Family	001	Space_Heat	1	Natural_Gas	1	Stock	2003	22	3
3			002	MF2_2_TO_4_Un	002	Water_Heat	2	Electric	2	Standard			
4			003	MF3_GE_5_Units	003	Cooking			3	High			
5			004	MM_Master_Met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

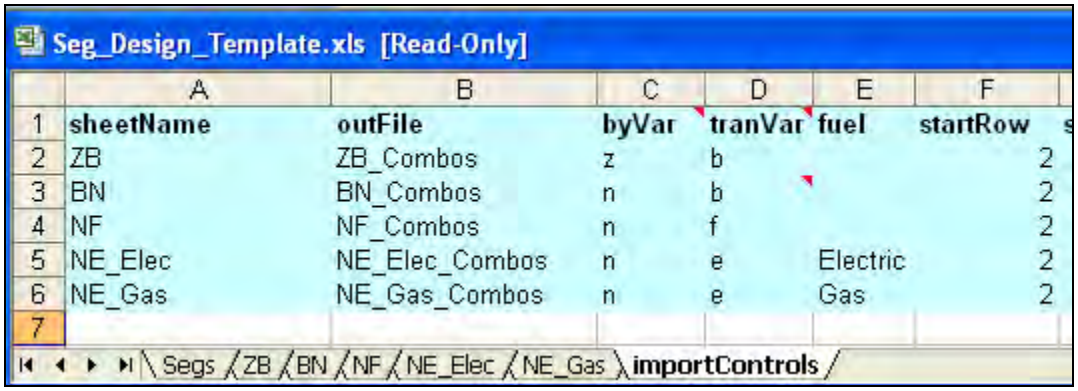
Segs / ZB / BN / NF / NE_Elec / NE_Gas / imp

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



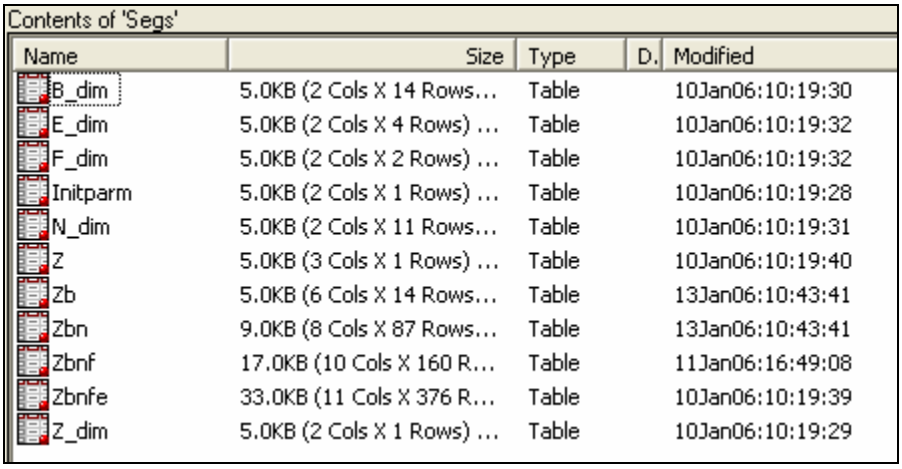
	A	B	C	D	E	F
1	**sheetName**	**outFile**	**byVar**	**tranVar**	**fuel**	**startRow**
2	ZB	ZB_Combos	z	b		2
3	BN	BN_Combos	n	b		2
4	NF	NF_Combos	n	f		2
5	NE_Elec	NE_Elec_Combos	n	e	Electric	2
6	NE_Gas	NE_Gas_Combos	n	e	Gas	2
7						

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.

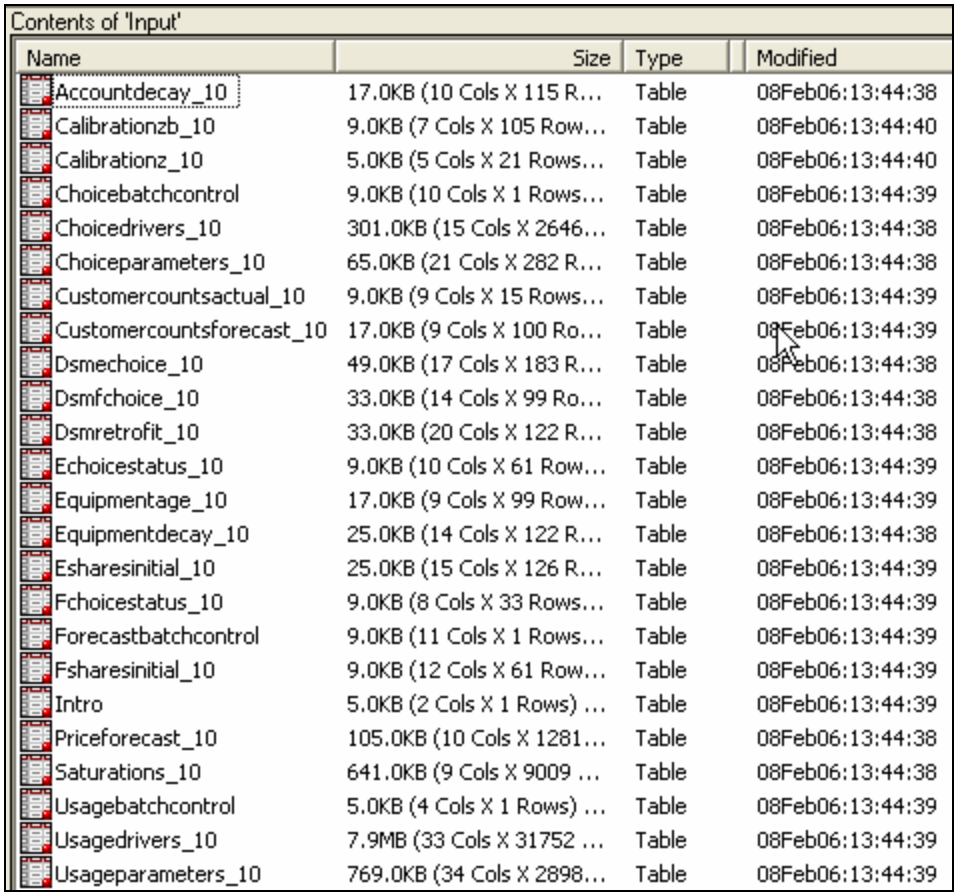
Figure 12. Contents of Segs Library



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

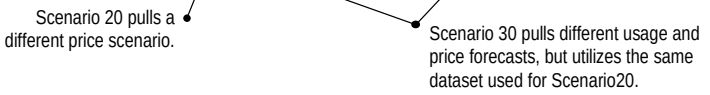
End Use Forecaster automatically creates the base case scenario, denoted by "_10," for each of these datasets. Additional scenarios can be designated in each batch dataset by:

- 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



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"

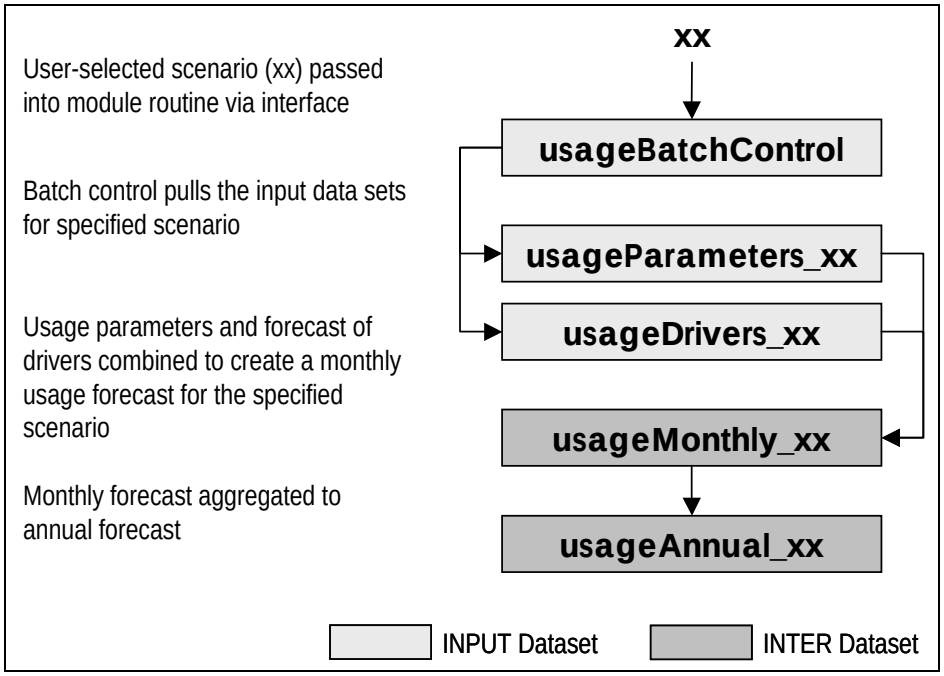


Table 5. Product Usage Module Data Library

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

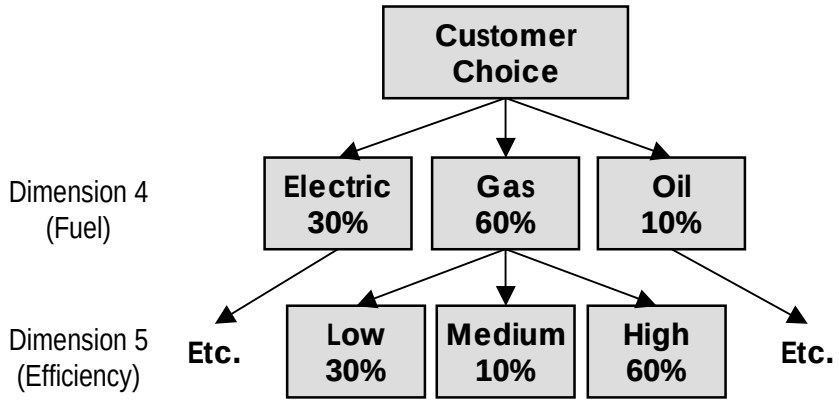
V. Provider Choice Module

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

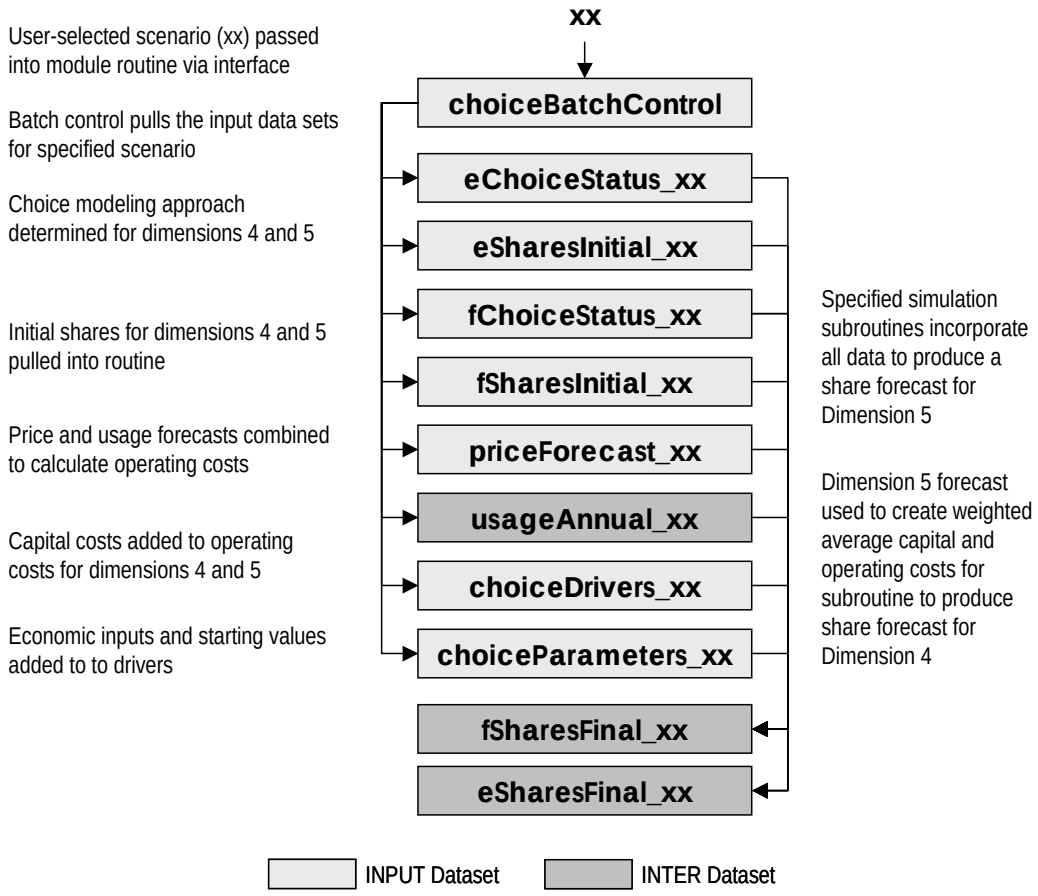
Figure 17 shows the data and analysis flow through the Provider Choice Module.

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**).

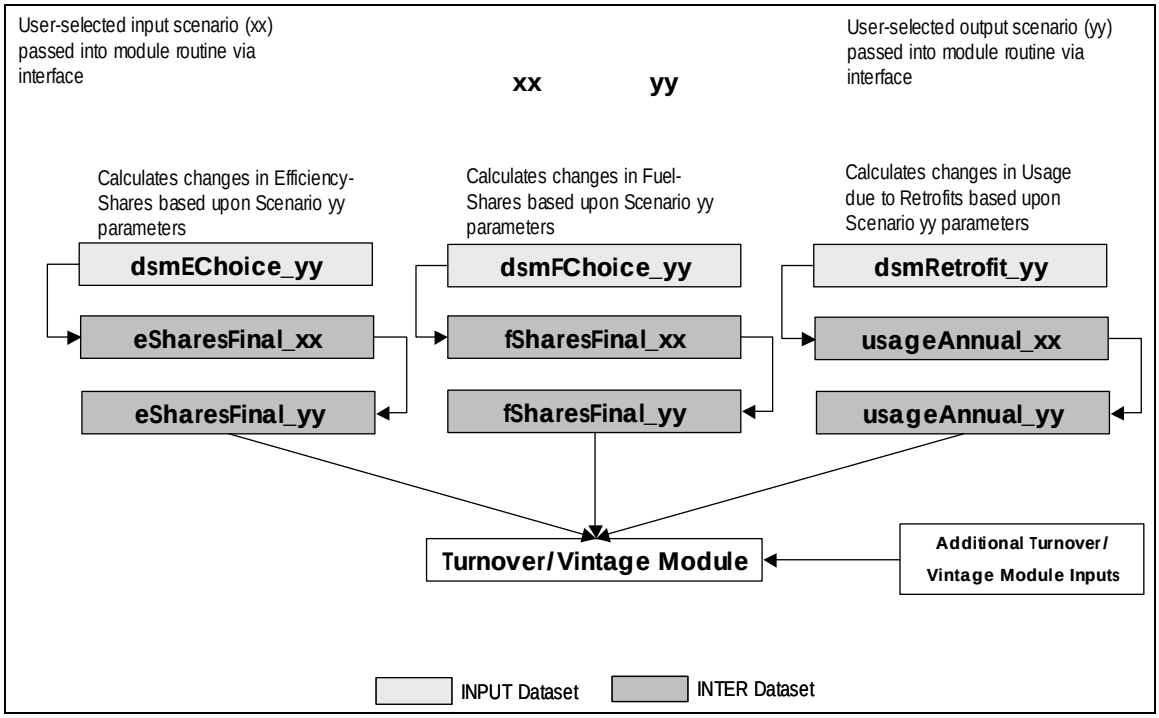
The Market Segmentation module creates base case files ("_10" files) where there is no intervention for each of these program categories. These files serve as templates that allow the user to create different scenarios of interest. To create strategies, you must copy these files to another scenario number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

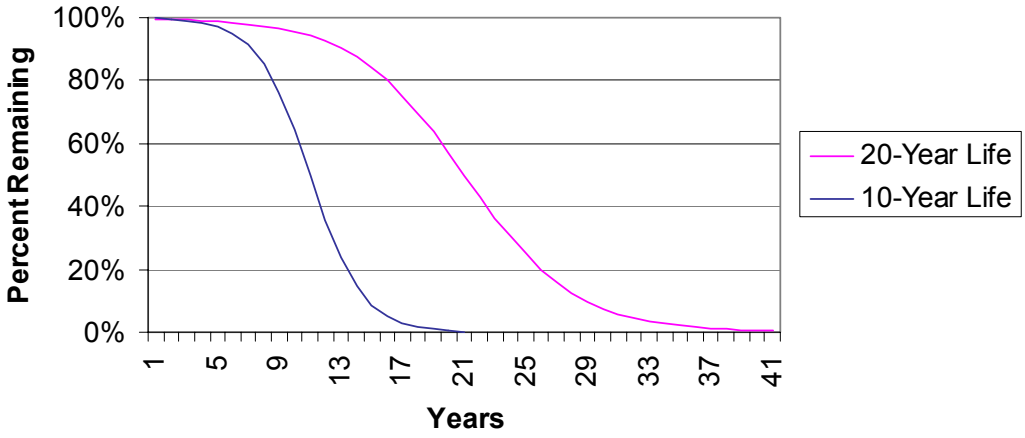
[3] These are discrete analogs to the continuous time distributions.

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:

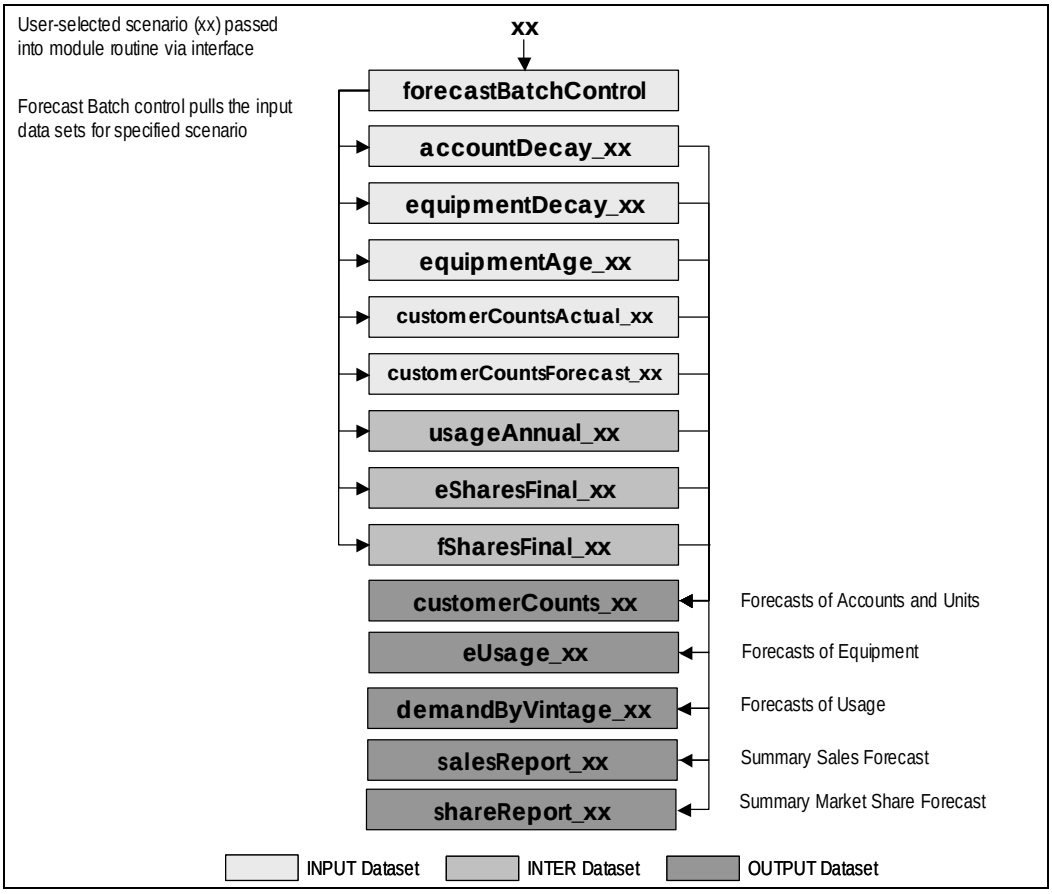
1. Merges all input data across Dimensions 1-3, including:
   - Existing accounts, plus a distribution of accounts across historical building vintages
   - New construction forecast, plus capture rates for new and conversion buildings
   - Dimension 3 saturation, equal to the number of Dimension 2 customers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

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 1,351 for an Average Year. The gas demand forecasts under Cold, Hot and Base temperature were then constructed based on Cold Year (Hdd = 1,644), Hot Year (Hdd=1,058) 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 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 2014 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 2014 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 1,351 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 2015 and is based on Global Insight's latest US Economic Forecast. The historical 2014 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 remaining deployment phase of 2015-2016, a share 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

2017 TCAP Phase II: Core Commercial
Source Data

Segment	2014 Therm Sales	2014 Meter Count	2014 Meter Count, Existing/Old customers	2014 Meter Count New Customers	Avg Use Per Meter Existing Customers	Avg Use Per Meter New Customers	Price Elasticity
Office	64071295	40860	40641	219	**1408**	2313	-0.135376
Restaurant	268467576	37773	37356	417	**6397**	7034	-0.091877
Retail	55742283	24596	24449	148	**2041**	2135	-0.265060
Laundry	62897479	4213	4199	14	**13414**	25014	-0.122795
Warehouse	18447383	7424	7396	28	**2229**	4811	-0.043035
School	30952337	6639	6634	5	**4201**	4966	-0.000001
College	23966261	2767	2747	20	**7827**	4580	-0.037179
Health	60361193	7141	7124	17	**7538**	40933	-0.096826
Lodging	60885992	4788	4771	17	**11442**	16253	-0.105697
Misc	70363171	34131	33806	325	**1843**	3341	-0.000001
Government	23525556	3622	3608	14	**5861**	3784	-0.095709
TCU	25862108	6508	6477	31	**3579**	3957	-0.129301
Construction	10951600	5420	5380	41	**1525**	41011	-0.161076
Agriculture	37772265	1439	1425	14	**23638**	24963	-0.315282

2017 TCAP Phase II: Core Commercial Employment Data

YEAR	Office	Restaurant	Retail	Laundry	Warehouse	School	College
2014	1.178675	0.67656947	0.9753179	0.0905688	0.455675	0.615177	0.205059
2015	1.2212753	0.68763044	0.99129301	0.0910189	0.46526241	0.6148998	0.2049666
2016	1.2745228	0.69468383	1.00146606	0.0910094	0.47623051	0.6161241	0.2053747
2017	1.3070049	0.6948225	1.00166599	0.090545	0.48608523	0.6254945	0.2084982
2018	1.3194601	0.69274057	0.99866582	0.0901102	0.49337994	0.6358708	0.2119569
2019	1.3425908	0.69175523	0.99724346	0.0898465	0.50025575	0.6468445	0.2156148
2020	1.3813418	0.69098057	0.99612313	0.0896581	0.5063115	0.6574574	0.2191525

YEAR	Health	Lodging	Misc	Government	TCU	Construction	Agriculture
2014	1.09993205	0.1336999	0.21786746	0.498750008	0.52986667	0.346532838	0.2329333
2015	1.13556322	0.1371808	0.218948763	0.498463628	0.54597273	0.369369334	0.2402221
2016	1.17012692	0.1385994	0.218924735	0.49946211	0.55841075	0.393105668	0.2452433
2017	1.19602968	0.1406498	0.217807289	0.507078594	0.56454748	0.422376391	0.2475611
2018	1.21403642	0.1427343	0.216761743	0.515489389	0.57088243	0.449695304	0.2482937
2019	1.22998736	0.1439877	0.216127428	0.524386785	0.57628971	0.469700773	0.2489001
2020	1.24184029	0.14478	0.21567444	0.53298923	0.58306109	0.489584423	0.2499783

2017 TCAP: Core Commercial Use Per Meter (new)

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other	Total Building
Office	5400	17920	708	3655	3	1461	270	3	3	3	32	29446
Restaurant	2225	7385	292	1506	1	602	111	1	1	1	13	12135
Retail	1871	6209	245	1266	1	506	93	1	1	1	11	10202
Laundry	4735	15713	620	3205	3	1281	237	3	3	3	28	25819
Warehouse	13683	45407	1793	9261	7	3702	683	7	7	7	81	74610
School	846	2808	111	573	0	229	42	0	0	0	5	4613
College	3830	12711	502	2592	2	1036	191	2	2	2	23	20886
Health	0	1	0	0	0	0	0	0	0	0	0	1
Lodging	11847	39315	1552	8018	6	3205	592	6	6	6	70	64599
Misc	631	2094	83	427	0	171	32	0	0	0	4	3440
Government	11138	36961	1459	7538	6	3013	556	6	6	6	66	60732
TCU	64	213	8	43	0	17	3	0	0	0	0	349
Construction	0	1	0	0	0	0	0	0	0	0	0	1
Agriculture	0	1	0	0	0	0	0	0	0	0	0	1

2017 TCAP: Core Commercial Use Per Meter (Average)

Sector	Space Heater	Water Heater	Cooktop	Griddle	Fryer	Other Cooking Equipment	Kitchen Equipment	AC	Dryer	Engine	Other	Total Building
Office	552	229	28	9	7	29	6	9	27	8	550	1455
Restaurant	460	890	1485	611	1173	1298	316	18	8	0	292	6551
Retail	485	295	107	18	119	206	127	28	54	4	672	2116
Laundry	42	666	5	1	1	8	0	1	6694	0	6233	13652
Warehouse	425	123	18	5	42	49	62	48	141	42	1366	2321
School	2450	826	140	10	31	257	26	31	5	33	717	4526
College	3469	1714	167	49	86	206	48	217	53	74	2359	8441
Health	2467	1546	248	48	67	191	108	45	339	25	2608	7692
Lodging	1680	3432	474	116	148	577	284	28	894	1	3879	11512
Misc	706	431	87	17	29	72	23	73	28	5	476	1947
Government	2573	1496	131	65	38	108	59	69	35	380	1008	5961
TCU	780	280	25	6	12	22	15	38	2	1224	1294	3697
Construction	531	166	13	0	2	7	5	16	99	0	783	1623
Agriculture	3433	832	141	24	294	653	594	8	866	5677	11463	23985

2017 TCAP: Core Commercial Average and Marginal Gas Prices By Business Type-
Core Commercial $/Therm

Year	Com Price Deflator	C Agriculture Average Price	C Agriculture Marginal Price	C College Average Price	C College Marginal Price	C Construction Average Price	C Construction Marginal Price	C Government Average Price	C Government Marginal Price	C Health Average Price	C Health Marginal Price	C Laundry Average Price	C Laundry Marginal Price	C Lodging Average Price	C Lodging Marginal Price
2014	100.00	0.9419	0.8003	0.8969	0.8144	0.9229	0.8056	0.8339	0.7766	0.8370	0.7351	0.8872	0.7759	0.7812	0.7100
2015	99.45	0.8321	0.6892	0.7876	0.7036	0.8133	0.6946	0.7234	0.6649	0.7254	0.6223	0.7774	0.6642	0.6692	0.5966
2016	101.77	0.8617	0.7189	0.8172	0.7333	0.8429	0.7243	0.7530	0.6946	0.7551	0.6521	0.8070	0.6939	0.6989	0.6264
2017	104.48	0.8885	0.7478	0.8433	0.7616	0.8694	0.7530	0.7811	0.7244	0.7848	0.6835	0.8340	0.7237	0.7292	0.6589
2018	107.21	0.9176	0.7752	0.8729	0.7895	0.8988	0.7806	0.8092	0.7511	0.8116	0.7089	0.8630	0.7504	0.7555	0.6834
2019	109.85	0.9693	0.8254	0.9252	0.8400	0.9506	0.8308	0.8599	0.8005	0.8611	0.7570	0.9146	0.7998	0.8045	0.7308
2020	112.55	1.0794	0.9338	1.0358	0.9490	1.0610	0.9395	0.9690	0.9082	0.9689	0.8634	1.0246	0.9075	0.9119	0.8364

Year	Com Price Deflator	C Misc Average Price	C Misc Marginal Price	C Office Average Price	C Office Marginal Price	C Restaurant Average Price	C Restaurant Marginal Price	C Retail Average Price	C Retail Marginal Price	C School Average Price	C School Marginal Price	C TCU Average Price	C TCU Marginal Price	C Warehouse Average Price	C Warehouse Marginal Price
2014	100.00	0.8002	0.7349	0.8203	0.7462	0.9344	0.8010	0.8200	0.7367	0.8081	0.7249	0.8601	0.7404	0.7255	0.6782
2015	99.45	0.6886	0.6222	0.7093	0.6338	0.8247	0.6899	0.7087	0.6240	0.6963	0.6119	0.7485	0.6277	0.6123	0.5640
2016	101.77	0.7183	0.6519	0.7390	0.6635	0.8543	0.7196	0.7384	0.6537	0.7260	0.6416	0.7782	0.6575	0.6420	0.5938
2017	104.48	0.7480	0.6834	0.7677	0.6945	0.8811	0.7485	0.7675	0.6851	0.7560	0.6735	0.8078	0.6887	0.6742	0.6276
2018	107.21	0.7748	0.7088	0.7953	0.7202	0.9102	0.7759	0.7948	0.7105	0.7825	0.6986	0.8347	0.7143	0.6990	0.6511
2019	109.85	0.8243	0.7569	0.8455	0.7687	0.9619	0.8261	0.8447	0.7587	0.8318	0.7464	0.8842	0.7626	0.7466	0.6975
2020	112.55	0.9322	0.8633	0.9541	0.8755	1.0720	0.9346	0.9529	0.8652	0.9393	0.8525	0.9921	0.8691	0.8526	0.8021

2017 TCAP Phase II: Average and Marginal Electric Price Inputs for Core Commercial (Cents/KwH)

Year	C Agriculture Average Price	C Agriculture Marginal Price	C College Average Price	C College Marginal Price	C Construction Average Price	C Construction Marginal Price	C Government Average Price	C Government Marginal Price	C Health Average Price	C Health Marginal Price	C Laundry Average Price	C Laundry Marginal Price	C Lodging Average Price	C Lodging Marginal Price
2014	18.73	17.86	17.84	18.17	18.36	17.97	16.59	17.33	16.65	16.40	17.65	17.31	15.54	15.84
2015	19.16	18.17	18.13	18.55	18.72	18.31	16.65	17.53	16.70	16.41	17.90	17.51	15.41	15.73
2016	19.92	18.92	18.89	19.30	19.48	19.06	17.40	18.28	17.45	17.16	18.65	18.26	16.15	16.48
2017	20.51	19.50	19.47	19.87	20.07	19.64	18.03	18.89	18.12	17.83	19.25	18.88	16.84	17.18
2018	21.34	20.32	20.30	20.70	20.90	20.46	18.82	19.69	18.87	18.58	20.07	19.67	17.57	17.92
2019	22.06	21.07	21.06	21.44	21.64	21.21	19.57	20.43	19.60	19.32	20.82	20.41	18.31	18.65
2020	22.72	21.79	21.80	22.14	22.33	21.92	20.40	21.19	20.39	20.15	21.56	21.17	19.19	19.52

Year	C Misc Average Price	C Misc Marginal Price	C Office Average Price	C Office Marginal Price	C Restaurant Average Price	C Restaurant Marginal Price	C Retail Average Price	C Retail Marginal Price	C School Average Price	C School Marginal Price	C TCU Average Price	C TCU Marginal Price	C Warehouse Average Price	C Warehouse Marginal Price
2014	15.92	16.40	16.32	16.65	18.59	17.87	16.31	16.44	16.07	16.18	17.11	16.52	14.43	15.13
2015	15.85	16.40	16.33	16.71	18.98	18.19	16.31	16.45	16.03	16.13	17.23	16.55	14.09	14.87
2016	16.60	17.16	17.08	17.46	19.74	18.94	17.07	17.20	16.78	16.89	17.99	17.30	14.84	15.63
2017	17.27	17.83	17.72	18.12	20.34	19.52	17.72	17.87	17.45	17.57	18.65	17.96	15.56	16.37
2018	18.02	18.58	18.49	18.88	21.17	20.34	18.48	18.63	18.20	18.31	19.41	18.73	16.26	17.07
2019	18.76	19.32	19.25	19.62	21.89	21.09	19.23	19.37	18.93	19.05	20.13	19.46	17.00	17.80
2020	19.62	20.14	20.08	20.43	22.56	21.81	20.06	20.19	19.77	19.89	20.88	20.28	17.94	18.72

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
Triennial Cost Allocation Proceeding
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

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

b	n	f	e	bname	ename	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	ename	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

2017 TCAP Phase II: Core Commercial Model Out of Model Adjustments Detail
AVERAGE YEAR

	EUF Model mdth	AMI Mdth	EE Saving mdth	SCG COMM MDTH	SGIP	Migration	Vernon	Core Comm Forecast
2013	84305.398	84305.4		84305.4	104.5525	0	0	84305.398
2014	81426.65	81426.65	0	81426.65	139.4034	0	0	81566.05337
2015	83469.75522	82899.66	478.9493	82420.71	0.147973	18.88262	32.0391	82223.81633
2016	83889.80484	83107.11	957.8987	82149.21	0.261798	18.88262	64.0782	81920.39789
2017	83949.85987	83110.36	1436.848	81673.51	0.375623	18.88262	96.1173	81412.77158
2018	83880.12899	83041.33	1915.797	81125.53	0.489448	18.88262	128.1564	80832.86339
2019	83641.79908	82805.38	2394.747	80410.63	0.603273	18.88262	160.1955	80086.04218
2020	82874.94726	82046.2	2873.696	79172.5	0.717098	18.88262	192.2346	78815.98426

2017 TCAP: CORE COMMERCIAL
AVERAGE YEAR

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
	0.11225	0.10386	0.09132	0.08014	0.07627	0.06957	0.06274	0.06125	0.06576	0.06729	0.09510	0.11444	1.00
YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2014	9140.06	8456.99	7436.05	6525.87	6210.52	5665.20	5108.96	4987.40	5354.36	5479.13	7743.64	9318.48	81566.05
2015	9229.54	8539.79	7508.85	6589.76	6271.32	5720.66	5158.98	5036.23	5406.77	5532.77	7819.44	9409.70	82223.82
2016	9195.48	8508.29	7481.14	6565.44	6248.18	5699.55	5139.94	5017.65	5386.82	5512.35	7790.59	9374.98	81920.40
2017	9138.50	8455.57	7434.79	6524.75	6209.46	5664.24	5108.08	4986.55	5353.44	5478.20	7742.31	9316.88	81412.77
2018	9073.40	8395.35	7381.83	6478.28	6165.23	5623.89	5071.69	4951.04	5315.31	5439.18	7687.16	9250.51	80832.86
2019	8989.57	8317.79	7313.63	6418.42	6108.27	5571.93	5024.83	4905.29	5266.20	5388.92	7616.13	9165.05	80086.04
2020	8847.01	8185.89	7197.65	6316.63	6011.40	5483.57	4945.14	4827.50	5182.68	5303.46	7495.35	9019.70	78815.98

2017 TCAP: CORE COMMERCIAL
COLD YEAR

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
	0.11225	0.10386	0.09132	0.08014	0.07627	0.06957	0.06274	0.06125	0.06576	0.06729	0.09510	0.11444	1.00
YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2014	10040.69	9209.84	7967.30	6859.64	6474.94	5813.22	5137.91	4987.40	5436.38	5585.44	8341.69	10258.27	86252.13
2015	10141.16	9301.83	8046.59	6927.60	6538.97	5870.49	5188.27	5036.23	5489.80	5640.38	8424.79	10360.96	86967.10
2016	10104.10	9267.82	8017.11	6902.17	6514.95	5848.89	5169.13	5017.65	5469.57	5619.61	8393.94	10323.11	86648.05
2017	10041.86	9210.70	7967.65	6859.54	6474.69	5812.71	5137.11	4986.55	5435.71	5584.84	8342.17	10259.52	86113.05
2018	9970.70	9145.41	7911.12	6810.81	6428.68	5771.37	5100.53	4951.04	5397.03	5545.10	8283.00	10186.83	85501.61
2019	9878.97	9061.24	7838.25	6748.03	6369.39	5718.11	5053.41	4905.29	5347.20	5493.92	8206.72	10093.11	84713.64
2020	9722.71	8917.89	7714.19	6641.17	6268.50	5627.50	4973.28	4827.50	5262.43	5406.84	8076.85	9933.47	83372.33

2017 TCAP: CORE COMMERCIAL
HOT YEAR

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
	0.11225	0.10386	0.09132	0.08014	0.07627	0.06957	0.06274	0.06125	0.06576	0.06729	0.09510	0.11444	1.00
YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2014	8239.43	7704.14	6904.80	6192.10	5946.10	5517.17	5080.02	4987.40	5272.33	5372.81	7145.59	8380.18	76881.47
2015	8317.91	7777.75	6971.11	6251.91	6003.67	5570.83	5129.68	5036.23	5323.75	5425.15	7214.09	8459.95	77482.04
2016	8286.86	7748.76	6945.18	6228.70	5981.41	5550.22	5110.74	5017.65	5304.07	5405.09	7187.23	8428.35	77194.24
2017	8235.14	7700.44	6901.93	6189.97	5944.24	5515.76	5079.05	4986.55	5271.17	5371.56	7142.45	8375.74	76713.98
2018	8176.10	7645.28	6852.54	6145.74	5901.79	5476.41	5042.86	4951.04	5233.58	5333.25	7091.32	8315.68	76165.60
2019	8100.18	7574.33	6789.01	6088.81	5847.15	5425.76	4996.25	4905.29	5185.19	5283.93	7025.55	8238.45	75459.91
2020	7971.31	7453.88	6681.10	5992.10	5754.30	5339.64	4917.00	4827.50	5102.93	5200.09	6913.86	8107.37	74261.08

2017 TCAP: CORE COMMERCIAL
BASE YEAR

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
	0.11225	0.10386	0.09132	0.08014	0.07627	0.06957	0.06274	0.06125	0.06576	0.06729	0.09510	0.11444	1.00
YEAR	MDTH1	MDTH2	MDTH3	MDTH4	MDTH5	MDTH6	MDTH7	MDTH8	MDTH9	MDTH10	MDTH11	MDTH12	TOTAL
2014	4987.40	4987.40	4987.40	4987.40	4987.40	4987.40	4987.40	4987.40	4987.40	4987.40	4987.40	4987.40	59988.26
2015	5026.19	5027.85	5030.31	5032.51	5033.27	5034.59	5035.93	5036.23	5035.34	5035.04	5029.56	5025.76	60382.60
2016	5005.98	5007.91	5010.77	5013.32	5014.21	5015.74	5017.30	5017.65	5016.61	5016.27	5009.90	5005.47	60151.13
2017	4973.26	4975.46	4978.72	4981.63	4982.64	4984.39	4986.15	4986.55	4985.38	4984.98	4977.72	4972.68	59769.56
2018	4936.11	4938.59	4942.24	4945.50	4946.64	4948.60	4950.58	4951.04	4949.71	4949.27	4941.12	4935.46	59334.87
2019	4888.74	4891.49	4895.54	4899.16	4900.42	4902.60	4904.79	4905.29	4903.82	4903.34	4894.30	4888.01	58777.49
2020	4809.32	4812.35	4816.79	4820.76	4822.15	4824.54	4826.95	4827.50	4825.89	4825.35	4815.42	4808.52	57835.54

TCAP 2017: PHASE II
GAS AC LOAD FORECAST

Mdth

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1998	8.08	13.62	9.17	2.71	19.42	4.76	15.92	23.80	25.79	18.04	16.84	11.70	169.86
1999	18.53	10.55	7.91	3.10	19.89	2.87	15.98	21.32	21.63	19.37	26.71	22.52	190.37
2000	11.41	20.51	2.60	13.87	15.21	18.55	22.41	23.06	26.21	22.33	15.96	11.32	203.44
2001	11.62	9.43	8.40	12.38	12.03	17.56	19.95	19.97	20.99	17.96	15.14	10.96	176.40
2002	7.63	10.06	10.65	11.26	11.88	14.57	16.46	19.74	20.67	18.20	13.51	11.44	166.07
2003	8.49	11.96	7.95	10.45	10.52	14.29	15.57	25.58	24.08	20.34	17.82	10.11	177.14
2004	8.15	8.22	6.65	11.70	13.30	16.99	17.61	22.20	21.97	21.96	13.99	9.71	172.46
2005	8.19	16.14	1.29	7.16	10.57	13.39	15.96	21.03	21.59	14.54	11.73	8.75	150.34
2006	6.98	6.65	6.25	5.64	7.15	11.00	14.91	20.38	15.83	13.78	9.45	8.78	126.81
2007	6.23	6.18	4.94	8.46	7.46	9.78	11.57	15.59	16.43	11.56	8.80	5.73	112.72
2008	4.01	4.54	5.41	6.38	7.37	7.20	10.54	13.11	12.40	9.87	8.56	6.20	95.59
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	4.91	11.10	0.00	6.54	7.06	7.12	9.87	12.84	12.55	11.34	8.69	4.89	96.92
2012	3.76	3.33	3.83	4.60	6.16	7.16	8.28	12.14	12.07	8.29	4.59	3.18	77.38
2013	3.01	2.64	4.36	5.41	7.86	8.28	10.58	9.99	9.92	5.99	4.77	3.28	76.08
2014	3.28	4.25	3.77	5.65	5.88	9.06	9.39	11.42	11.71	12.10	9.30	5.39	91.20
2015	3.17	3.23	3.77	4.94	6.28	7.73	8.91	10.58	10.63	8.32	5.89	3.74	77.19
2016	3.17	3.23	3.77	4.94	6.28	7.73	8.91	10.58	10.63	8.32	5.89	3.74	77.19
2017	3.17	3.23	3.77	4.94	6.28	7.73	8.91	10.58	10.63	8.32	5.89	3.74	77.19
2018	3.17	3.23	3.77	4.94	6.28	7.73	8.91	10.58	10.63	8.32	5.89	3.74	77.19
2019	3.17	3.23	3.77	4.94	6.28	7.73	8.91	10.58	10.63	8.32	5.89	3.74	77.19
2020	1.76	1.79	2.10	2.75	3.49	4.29	4.95	5.88	5.91	4.62	3.27	2.08	42.88

TCAP 2017: PHASE II
GAS ENGINE LOAD FORECAST

Mdth

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1998	55.01	48.37	39.86	60.66	95.29	151.19	219.38	288.02	219.56	170.69	110.86	71.14	1530.04
1999	62.70	64.68	86.59	114.95	166.14	212.22	264.05	332.12	270.66	197.07	154.79	85.22	2011.17
2000	87.98	105.52	80.25	139.99	209.78	277.18	339.81	311.17	347.65	211.96	125.87	91.38	2328.53
2001	74.54	73.61	85.43	147.25	202.59	321.37	356.23	404.30	344.98	233.07	145.17	96.90	2485.44
2002	48.24	65.90	160.56	205.41	231.37	320.32	377.25	358.32	305.94	219.52	154.04	68.09	2514.95
2003	38.26	78.18	140.61	168.18	178.72	278.26	314.91	314.40	312.12	217.38	145.98	92.49	2279.47
2004	49.90	79.03	137.34	207.34	282.92	348.82	363.25	384.28	330.98	220.46	96.27	107.43	2608.02
2005	8.90	37.84	76.39	103.94	157.76	200.46	222.19	298.76	246.61	160.30	98.44	80.05	1691.64
2006	44.13	65.28	91.07	72.57	120.46	177.54	239.82	246.97	238.27	144.03	93.96	95.86	1629.96
2007	55.93	92.04	119.27	173.36	227.59	276.14	338.55	330.98	288.52	170.76	145.42	98.82	2317.39
2008	46.03	58.29	112.92	203.29	242.15	306.32	316.84	318.82	299.20	202.00	141.71	71.46	2319.02
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	39.90	49.31	68.50	100.43	138.51	156.32	203.14	197.32	187.05	138.32	93.74	64.13	1436.68
2012	263.21	229.26	176.97	83.04	123.16	127.38	112.39	180.30	116.22	261.51	99.02	270.07	2042.54
2013	69.96	65.42	94.90	117.01	168.91	217.96	266.05	289.93	254.51	155.22	110.24	89.18	1899.29
2014	118.54	172.54	146.47	118.80	270.67	340.82	340.42	321.69	271.00	223.90	167.22	92.80	2584.86
2015	128.51	146.83	129.87	98.65	178.58	218.62	220.24	231.86	192.08	197.22	126.97	139.51	2008.94
2016	129.79	148.30	131.17	99.64	180.37	220.80	222.44	234.18	194.00	199.20	128.24	140.90	2029.03
2017	131.09	149.78	132.48	100.64	182.17	223.01	224.66	236.52	195.94	201.19	129.52	142.31	2049.32
2018	132.40	151.28	133.81	101.64	184.00	225.24	226.91	238.89	197.90	203.20	130.81	143.74	2069.82
2019	133.72	152.79	135.14	102.66	185.84	227.49	229.18	241.28	199.88	205.23	132.12	145.17	2090.52
2020	133.72	152.79	135.14	102.66	185.84	227.49	229.18	241.28	199.88	205.23	132.12	145.17	2090.52

G10 INDUSTRIAL DATA TABLES

G10 Industrial DATA TABLES

Southern California Gas Company
2016 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
2016 TCAP - Industrial G10
Electric Price Forecasat (Cent/KWH)

Year	Chemical Average Price	Chemical Marginal Price	Fab Metal Average Price	Fab Metal Marginal Price	Food Average Price	Food Marginal Price	Mining Average Price	Mining Marginal Price	Petroleum Average Price	Petroleum Marginal Price
2014	13.50	10.51	12.82	10.29	12.82	10.25	12.61	10.13	12.94	10.30
2015	13.66	10.60	12.83	10.33	12.83	10.28	12.57	10.13	12.97	10.34
2016	14.24	11.07	13.42	10.79	13.42	10.74	13.16	10.59	13.56	10.81
2017	14.72	11.45	13.94	11.19	13.94	11.15	13.69	11.01	14.07	11.21
2018	15.34	11.93	14.53	11.67	14.53	11.62	14.27	11.47	14.67	11.68
2019	15.92	12.39	15.11	12.12	15.11	12.07	14.85	11.93	15.25	12.14
2020	16.51	12.86	15.75	12.62	15.75	12.57	15.51	12.44	15.89	12.63

Year	Prim Metal Average Price	Prim Metal Marginal Price	Stone Average Price	Stone Marginal Price	Textile Average Price	Textile Marginal Price	Transport Average Price	Transport Marginal Price	Wood Paper Average Price	Wood Paper Marginal Price	Misc Average Price	Misc Marginal Price
2014	12.11	9.93	13.61	10.56	13.02	10.21	13.56	10.51	13.50	10.57	14.23	10.89
2015	11.97	9.89	13.79	10.67	13.07	10.24	13.73	10.60	13.65	10.68	14.53	11.07
2016	12.56	10.36	14.38	11.13	13.66	10.70	14.31	11.06	14.24	11.14	15.11	11.53
2017	13.12	10.78	14.85	11.51	14.16	11.11	14.79	11.45	14.72	11.52	15.56	11.89
2018	13.68	11.24	15.48	12.00	14.76	11.58	15.41	11.93	15.34	12.01	16.20	12.39
2019	14.26	11.70	16.05	12.45	15.34	12.03	15.99	12.39	15.91	12.46	16.77	12.85
2020	14.96	12.22	16.64	12.92	15.97	12.53	16.58	12.86	16.50	12.93	17.31	13.29

Southern California Gas Company
2018 TCAP - Industrial G10
Gas Price Forecasat ($/Therm)

Year	Price Deflator	Chemical Average Price	Chemical Marginal Price	Fab Metal Average Price	Fab Metal Marginal Price	Food Average Price	Food Marginal Price	Mining Average Price	Mining Marginal Price	Petroleum Average Price	Petroleum Marginal Price
2014	100.00	0.7535	0.6892	0.7156	0.6746	0.7156	0.6719	0.7035	0.6640	0.7221	0.6755
2015	99.45	0.6409	0.5753	0.6022	0.5604	0.6022	0.5575	0.5898	0.5495	0.6088	0.5612
2016	101.77	0.6706	0.6050	0.6319	0.5902	0.6319	0.5873	0.6196	0.5793	0.6386	0.5910
2017	104.48	0.7019	0.6383	0.6644	0.6240	0.6644	0.6213	0.6526	0.6136	0.6708	0.6249
2018	107.21	0.7274	0.6623	0.6890	0.6475	0.6890	0.6447	0.6767	0.6367	0.6956	0.6484
2019	109.85	0.7757	0.7090	0.7363	0.6937	0.7363	0.6909	0.7236	0.6826	0.7431	0.6946
2020	112.55	0.8822	0.8139	0.8419	0.7983	0.8419	0.7953	0.8288	0.7868	0.8489	0.7992

Year	Prim Metal Average Price	Prim Metal Marginal Price	Stone Average Price	Stone Marginal Price	Textile Average Price	Textile Marginal Price	Transport Average Price	Transport Marginal Price	Wood Paper Average Price	Wood Paper Marginal Price	Misc Average Price	Misc Marginal Price
2014	0.6760	0.6514	0.7597	0.6926	0.7264	0.6698	0.7567	0.6890	0.7534	0.6932	0.7939	0.7141
2015	0.5617	0.5366	0.6473	0.5788	0.6133	0.5554	0.6442	0.5751	0.6407	0.5794	0.6819	0.6009
2016	0.5915	0.5664	0.6770	0.6086	0.6430	0.5852	0.6740	0.6048	0.6704	0.6092	0.7117	0.6306
2017	0.6254	0.6012	0.7080	0.6417	0.6750	0.6193	0.7051	0.6382	0.7019	0.6423	0.7418	0.6629
2018	0.6488	0.6239	0.7338	0.6658	0.7000	0.6426	0.7307	0.6621	0.7273	0.6664	0.7682	0.6876
2019	0.6951	0.6694	0.7822	0.7126	0.7477	0.6887	0.7791	0.7088	0.7754	0.7132	0.8174	0.7351
2020	0.7996	0.7732	0.8890	0.8177	0.8537	0.7930	0.8858	0.8137	0.8818	0.8183	0.9248	0.8409

Southern California Gas Company
2016 TCAP - Industrial G10
Historical Throughput and Customer Counts

Business Type	therms_ 2014	meters_ 2014	meters_ 2014_ ExCust	meters_ 2014_ NewCust	avgUse_ 2014_ ExCust	avgUse_ 2014_ NewCust	Price Elasticity	Employment Elasticity
Mining	2271103	218.0	215	3	10546	1219	0.000000	0.321451
Food	75029760	2794.0	2,743	51	26794	30066	-0.190795	1.242506
Textile	13142733	531.0	527	4	24916	3008	0.000000	0.033325
Wood_Paper	9571716	478.0	476	2	20103	1352	0.000000	0.508272
Chemical	22776663	999.0	998	1	22786	36245	-0.080517	0.650067
Petroleum	11145984	134.0	134	0	83179	0	-0.180563	0.084537
Stone	5056397	451.0	449	2	11257	1007	0.000000	0.416909
Prim_Metal	11339720	356.0	355	1	31699	86697	0.000000	0.956685
Fab_Metal	25269237	2187.0	2,185	2	11563	1970	-0.137441	1.023881
Transport	13547388	1789.0	1,788	1	7576	2001	0.000000	0.402505
Misc	37931390	7197.0	7,177	20	5276	3429	-0.108307	0.879307
Total	227082091.00	17134						

Southern California Gas Company
2016 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
2016 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
2016 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
2016 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
2016 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
2016 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
2016 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
2016 TCAP - Industrial G10
Employment Forecast (in thousands)

YEAR	Mining	Food	Textile	Wood_Paper	Chemical	Petroleum	Stone	Primary_Metal	Fabricated_Metal	Transportation	Miscellaneous	Total
2014	22.8675	104.6408	11.3017	28.7175	45.8542	8.5217	17.1933	11.9342	87.6558	74.1133	312.2175	725.0175
2015	21.7900	104.2242	10.9892	29.2942	45.7283	8.4508	17.8175	11.8075	89.6650	75.1183	315.1533	730.0367
2016	21.3492	105.3717	10.6825	30.6167	46.2575	8.5208	18.0608	12.0717	93.7600	75.1892	317.4775	739.3592
2017	22.4642	106.5167	10.3367	31.5883	46.8567	8.4367	18.3708	12.4150	95.7375	73.7850	318.4000	744.9133
2018	23.2042	107.6517	10.0083	32.0242	47.4192	8.2758	18.6467	12.6075	95.6625	72.0033	318.1100	745.6150
2019	23.6908	108.0300	9.6733	32.4483	47.6500	8.1050	18.7267	12.6167	95.6483	69.7708	316.9525	743.3133
2020	23.8858	108.6342	9.3258	33.0208	47.5008	7.9558	18.6075	12.5183	95.7292	67.2558	315.3008	739.7350
2021	24.0692	109.2792	8.9567	33.1050	47.0942	7.7858	18.4333	12.4058	95.9692	64.8233	314.0075	735.9217

Southern California Gas Company
2016 TCAP - Industrial G10
Core Industrial Demand Forecast **(Mdth)**
Average Temperature

	Model Output						
Avg	G10-Ind	EE/DSM	AB970	City of Vernon	AMI	C2NC Migration	Final
2014	22,708.2	0.0	0.0	0.00	0.00	0.00	22,708
2015	23,099.9	316.6	0.1	62.00	4.04	293.25	22,424
2016	23,277.6	633.2	0.1	124.00	11.83	293.25	22,215
2017	23,382.5	949.8	0.1	186.01	18.67	293.25	21,935
2018	23,436.0	1,266.4	0.2	248.01	19.53	293.25	21,609
2019	23,308.3	1,583.0	0.2	310.01	19.42	293.25	21,103
2020	22,987.0	1,899.6	0.3	372.01	19.16	293.25	20,403

Southern California Gas Company
2016 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
2014	23,036.5	0.0	0.00	0.00	0.00	0.00	23,037
2015	23,433.9	321.2	0.05	62.00	4.08	293.25	22,753
2016	23,614.2	642.4	0.09	124.00	11.98	293.25	22,543
2017	23,720.6	963.6	0.13	186.01	18.93	293.25	22,259
2018	23,774.9	1,284.7	0.18	248.01	19.81	293.25	21,929
2019	23,645.3	1,605.9	0.22	310.01	19.70	293.25	21,417
2020	23,319.4	1,927.1	0.26	372.01	19.43	293.25	20,708

Southern California Gas Company
2016 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
2014	22,379.9	0.0	0.00	0.00	0.00	0.00	22,380
2015	22,766.0	312.0	0.05	62.00	4.01	293.25	22,095
2016	22,941.1	624.1	0.09	124.00	11.69	293.25	21,888
2017	23,044.4	936.1	0.13	186.01	18.42	293.25	21,611
2018	23,097.2	1,248.1	0.18	248.01	19.25	293.25	21,289
2019	22,971.3	1,560.1	0.22	310.01	19.14	293.25	20,789
2020	22,654.6	1,872.2	0.26	372.01	18.88	293.25	20,099

Southern California Gas Company
2016 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
2014	21,194.3	0.0	0.00	0.00	0.00	0.00	21,194
2015	21,559.9	295.5	0.05	62.00	3.89	293.25	20,905
2016	21,725.8	591.0	0.09	124.00	11.16	293.25	20,706
2017	21,823.7	886.5	0.13	186.01	17.48	293.25	20,441
2018	21,873.6	1,182.0	0.18	248.01	18.23	293.25	20,132
2019	21,754.4	1,477.5	0.22	310.01	18.13	293.25	19,656
2020	21,454.5	1,773.0	0.26	372.01	17.88	293.25	18,999

Triennial Cost Allocation Proceeding

NATURAL GAS VEHICLES

2016 TCAP-Phase II SoCalGas and SDG&E

All categories of demand are based on the following combined utilities growth rate methodology:
Throughput forecast begins with a growth increase rate of 5.77% and continue at that rate through 2020.
The 5.77% growth rate was determined by applying a growth rate formula to the combined utilities actual throughput from 2009 through 2014.
SoCalGas 2014 throughput is actual provided by the Customer Insights and Analytics group. SDG&E actual is provided by the Electric Forecasting and Analysis group.
SoCalGas overall throughput growth is expected to increase from 12,539 Mdtherms in 2014 to 17,556 Mdtherms at the end of 2020, a rate of 8.3 million therms per year.
SD&E overall throughput growth is expected to increase from 1,477 Mdtherms in 2014 to 2,068 Mdtherms at the end of 2020, a rate of 0.98 million therms per year.

Compressed:
SoCalGas.
2014 throughput increases from 232 Mdtherms to 324 Mdtherms in 2020.

SDG&E.
2014 throughput increases from 65 Mdtherms to 91 Mdtherms in 2020.

Uncompressed:
SoCalGas.
2014 throughput increases from 9,681 Mdtherms to 13,555 Mdtherms in 2020.

SDG&E.
2014 throughput increases from 472 Mdtherms to 662 Mdtherms in 2020.

Aggregated Transportation:
SoCalGas.
2014 throughput increases from 2,626 Mdtherms to 3,677 Mdtherms in 2020.

SDG&E.
2014 throughput increases from 937 Mdtherms to1,315 Mdtherms in 2020.

Station Growth:
Uncompressed growth rate is 3.5% based on the combined utilities growth rate, 2010 through 2014.
Compressed growth is based on management's decision.
SoCalGas uncompressed NGV stations are expected to grow from a 2014 level of 278 to approximately 342 in 2020, at an annual growth rate of 3.5%.
SoCalGas compressed NGV stations are expected to grow from 20 in 2014 to approximately 44 in 2020, and average of 4 new stations per year (combination of 2-3 public access, and fleet only stations).
SDG&E uncompressed NGV stations are expected to grow from a 2014 level of 27 to approximately 41 in 2020, at an annual growth rate of 3.5%.
SDG&E compressed NGV stations are expected to grow from 6 in 2014 to about 8 in 2020.

1. SoCalGas NGV 2016 TCAP

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

3. Data

Table 1 - Utilities Comb. Volume Forecast Growth Rate

Years	Total Volume	Total Yearly Volume Change	Yearly growth	Average growth 2009 through 2014	Volumes (MM therms) SDG&E	Volumes (therms) SoCalGas
	MMTherms	MMTherms	%	%		
End 2014	140.16	9.55	7.31	5.79	14.767072	125,388,584
End 2013	130.60	8.29	6.78		13.640335	116,962,047
End 2012	122.31	8.30	7.28		12.518685	109,794,927
End 2011	114.02	4.65	4.25		11.002706	103,014,171
End 2010	109.37	3.51	3.32		10.315628	1,000,000
End 2009	105.86	n/a	n/a		10.716593	
Compounded Annual growth rate = 5.77%				0.0577		

SoCalGas Monthly Forecast Volumes

Year	January	February	March	April	May	June	July	August
						Compressed Volumes (M Decatherms)		
2014 (therms)	201,167	178,985	207,395	196,154	188,612	174,224	182,115	189,756
2014	20.12	17.90	20.74	19.62	18.86	17.42	18.21	18.98
2015	21.28	18.93	21.94	20.75	19.95	18.43	19.26	20.07
2016	22.51	20.02	23.20	21.94	21.10	19.49	20.37	21.23
2017	23.80	21.18	24.54	23.21	22.32	20.62	21.55	22.45
2018	25.18	22.40	25.96	24.55	23.61	21.81	22.79	23.75
2019	26.63	23.69	27.45	25.97	24.97	23.06	24.11	25.12
2020	28.17	25.06	29.04	27.46	26.41	24.39	25.50	26.57

					Uncompressed Volumes (M Decatherms)			
2014 (therms)	7,725,254	7,144,055	8,060,710	8,081,905	8,454,883	8,132,292	8,404,052	8,397,886
2014	773	714	806	808	845	813	840	840
2015	817	756	853	855	894	860	889	888
2016	864	799	902	904	946	910	940	939
2017	914	845	954	956	1,000	962	994	994
2018	967	894	1,009	1,011	1,058	1,018	1,052	1,051
2019	1,023	946	1,067	1,070	1,119	1,077	1,113	1,112
2020	1,082	1,000	1,129	1,132	1,184	1,139	1,177	1,176
					Aggregated Transportation Volumes (M Decatherms)			
2014 (therms)	1,953,399	1,948,246	2,229,356	2,166,079	2,215,439	2,082,750	2,017,704	2,106,286
2014	195	195	223	217	222	208	202	211
2015	207	206	236	229	234	220	213	223
2016	219	218	249	242	248	233	226	236
2017	231	231	264	256	262	246	239	249
2018	244	244	279	271	277	261	253	264
2019	259	258	295	287	293	276	267	279
2020	274	273	312	303	310	292	283	295

4. Data(SoCalGas throughput) provided by Jungchi Wang on March 18, 2015

September	October	November	December	Annual
206,316	210,541	191,682	190,472	2,317,419
20.63	21.05	19.17	19.05	232
21.82	22.27	20.27	20.15	245
23.08	23.55	21.44	21.31	259
24.41	24.91	22.68	22.54	274
25.82	26.35	23.99	23.84	290
27.31	27.87	25.37	25.21	307
28.89	29.48	26.84	26.67	324

8,661,700	8,435,240	7,554,110	7756880	96,808,967
866	844	755	776	9,681
916	892	799	820	10,239
969	944	845	868	10,830
1,025	998	894	918	11,455
1,084	1,056	945	971	12,116
1,147	1,117	1,000	1,027	12,815
1,213	1,181	1,058	1,086	13,555

2,232,663	2,556,334	2,339,621	2,414,321	26,262,198
223	256	234	241	2,626
236	270	247	255	2,778
250	286	262	270	2,938
264	302	277	286	3,108
279	320	293	302	3,287
296	338	310	320	3,477
313	358	328	338	3,677

Public Access Compressed Load Detail			
Year	Stations with Public Access and Time Fill	Stations with Public Access Only	**Combined Public**
	therms	therms	**therms**
2014	1,443,216	231,771	**1,674,987**
2015	1,526,490	245,144	**1,771,634**
2016	1,614,568	259,289	**1,873,857**
2017	1,707,729	274,250	**1,981,979**
2018	1,806,265	290,074	**2,096,339**
2019	1,910,486	306,811	**2,217,297**
2016-2019 Average	1,808,160	290,379	2,098,538

SoCalGas Compressed Volume Detail			
Year	Public Access Compress	Utility Timefill	Total
	therms	therms	therms
2014	1,674,987	642,432	2,317,419
2015	1,771,634	679,500	2,451,134
2016	1,873,857	718,707	2,592,565
2017	1,981,979	760,177	2,742,155
2018	2,096,339	804,039	2,900,378
2019	2,217,297	850,432	3,067,730
2017-2019 Average	2,098,538	804,883	2,903,421

Combined Utilities NGV Station Growth					Utilities	
Year	Total No. of Stations	Yearly change	Yearly % change	Compounded growth rate	SDG&E	SoCalGas
2014	331	12	3.8%	3.5%	33	298
2013	319	13	4.2%		31	288
2012	306	9	3.0%		30	276
2011	297	8	2.8%		29	268
2010	289	n/a	n/a		28	261

3.5 percent growth rate 2016 - 2020

Year	SoCalGas Station Growth (Uncompressed)		SDG&E Station Growth (Uncompressed)		SoCalGas Compressed Station Growth	SDG&E Compressed Station Growth	Total SoCalGas stations	Total SDG&E stations
	Station count	Yearly change	Station count	Yearly change				
2015	288	10	28	1	2	0	310	34
2016	298	10	29	1	6	0	326	35
2017	308	10	30	1	4	1	351	37
2018	319	11	31	1	4	0	355	38
2019	330	11	32	1	4	1	370	40
2020	342	12	33	1	4	0	386	41

ENERGY EFFICIENCY

A Sempra Energy utility™

	Reported 2014	Forecast 2015	Forecast 2016	Forecast 2017	Forecast 2018	Forecast 2019	Forecast 2020
SoCalGas EE Program TOTAL (Recorded)	**28,856,008**						
PUC Goal	23,190,000	25,300,000	25,300,000	25,300,000	25,300,000	25,300,000	25,300,000
Difference	**5,666,008**						
	124%						

SoCalGas	**2014 therms**	**2015 therms**
Core Residential	7,371,223	7,551,112
Core Commercial	4,093,890	4,789,493
Core Industrial	2,457,183	3,166,066
NonCore Commercial	2,168,951	1,578,427
NonCore Industrial retail	6,592,493	5,799,216
NonCore Industrial refinery	6,172,268	7,603,545
Total	**28,856,008**	**30,487,860**

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

ANNUAL NET SAVINGS	**2014 Mdth**	**2015 Mdth**	**2016 Mdth**	**2017 Mdth**	**2018 Mdth**	**2019 Mdth**	**2020 Mdth**
Core Residential	592	755	755	755	755	755	755
Core Commercial	329	479	479	479	479	479	479
Core Industrial	197	317	317	317	317	317	317
NonCore Commercial	174	158	158	158	158	158	158
NonCore Industrial retail	530	580	580	580	580	580	580
NonCore Industrial refinery	496	760	760	760	760	760	760
Total	**2,319**	**3,049**	**3,049**	**3,049**	**3,049**	**3,049**	**3,049**

Cumulative Savings Mdth	**2014 Mdth**	**2015 Mdth**	**2016 Mdth**	**2017 Mdth**	**2018 Mdth**	**2019 Mdth**	**2020 Mdth**
Core Residential		755	1,510	2,265	3,020	3,776	4,531
Core Commercial		479	958	1,437	1,916	2,395	2,874
Core Industrial		317	633	950	1,266	1,583	1,900
NonCore Commercial		158	316	474	631	789	947
NonCore Industrial regular		580	1,160	1,740	2,320	2,900	3,480
NonCore Industrial refinery		760	1,521	2,281	3,041	3,802	4,562
Total Load Impacts		**3,049**	**6,098**	**9,146**	**12,195**	**15,244**	**18,293**
		1	2	3	4	5	6

NOTES:
Years for 2010, 2011, 2012 2013, 2014(almost final) are recorded.
Median Life Cycle of 15 years is assumed.

Triennial Cost Allocation Proceeding

EXCHANGE DEMAND FORECAST

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.

Interutility Exchange -
Volumes in Dth

			ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	ACTUAL	Annual Total	RATE PER DTH	$ VALUE	
	SoCal del to PG&E Customers		Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12				Total
	Zone 1															$0.10		
		Topock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		Value Zone 1	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**										
	zone 2															$0.10		
		Pisgah	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
		Value Zone 2	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**										
	EOR		0.0000	0.0000	0.0019	0.0155	0.1413	0.2348	0.1895	0.3374	0.0797	0.0000	0.0000	0.0000		$0.10		
		Arco (Texaco Exploration 6'99)	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
		Rio Bravo	0	0	25	208	1,894	3,148	2,540	4,523	1,069	0	0	0	13407.00			13,407
		Chevron	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
		Dexzel	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
		Oxy USA	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Total EOR		**0**	**0**	**25**	**208**	**1,894**	**3,148**	**2,540**	**4,523**	**1,069**	**0**	**0**	**0**	13407.00			**13,407**
	Value EOR		**$0.00**	**$0.00**	**$2.50**	**$20.80**	**$189.40**	**$314.80**	**$254.00**	**$452.30**	**$106.90**	**$0.00**	**$0.00**	**$0.00**				
	Zone 3															$0.10		
		Bakersfield(stock & allen)	16,092	6,259	5,494	3,389	1,722	1,799	1,347	1,692	1,692	2,548	4,802	4,802	51638.00			51,638
		Fellows	445	321	265	204	17	3	2	4	13	47	0	285	1606.00			1,606
		Maricopa	4,356	2,885	2,405	981	980	773	665	814	789	1,365	0	3,329	19342.00			19,342
		Taft (lincoln&ash)	43,159	35,180	34,562	19,328	13,081	12,097	11,130	12,155	10,614	13,963	26,153	44,849	276271.00			276,271
		Kern River Intertie/Bakersfield (L202) & Bakersfield (L7309)	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
		Oxy USA #11	4,339	4,736	3,684	1,828	1,764	1,749	1,870	1,784	1,729	1,882	2,408	2,894	30667.00			30,667
		Sullivan Road	10	8	6	4	3	3	2	2	3	4	7	18	70.00			70
	Total Non-EOR Zone 3		**68,401**	**49,389**	**46,416**	**25,734**	**17,567**	**16,424**	**15,016**	**16,451**	**14,840**	**19,809**	**33,370**	**56,177**	379594.00			**379,594**
	Total Zone 3		**68,401**	**49,389**	**46,441**	**25,942**	**19,461**	**19,572**	**17,556**	**20,974**	**15,909**	**19,809**	**33,370**	**56,177**	393001.00			**393,001**
	Value Zone 3		**$6,840.10**	**$4,938.90**	**$4,641.60**	**$2,573.40**	**$1,756.70**	**$1,642.40**	**$1,501.60**	**$1,645.10**	**$1,484.00**	**$1,980.90**	**$3,337.00**	**$5,617.70**				
	Zone 4															$0.10		
		Adelaida	0	0	0	0	0	0	0	0	0	0	0	0	0.00	$0.02		0
		Creston	74	63	53	33	20	17	13	359	14	28	52	107	833.00			833
		Selma area	715	625	497	465	350	343	329	359	348	373	676	873	5953.00			5,953
		Shandon	2,288	1,813	1,841	969	583	546	485	504	467	711	1,389	2,152	13748.00			13,748
		Unocal Shandon	2,153	1,766	955	151	1,810	2,229	2,167	1,949	1,416	1,887	2,106	2,390	20979.00			20,979
	Total Zone 4		**5,230**	**4,267**	**3,346**	**1,618**	**2,763**	**3,135**	**2,994**	**3,171**	**2,245**	**2,999**	**4,223**	**5,522**	41513.00			**41,513**
		Value Zone 4	**$523.00**	**$426.70**	**$334.60**	**$161.80**	**$276.30**	**$313.50**	**$299.40**	**$317.10**	**$224.50**	**$299.90**	**$422.30**	**$552.20**	4151.30			
	Total Socal Delivery VALUE ($)		**$7,363.10**	**$5,365.60**	**$4,978.70**	**$2,756.00**	**$2,222.40**	**$2,270.70**	**$2,055.00**	**$2,414.50**	**$1,815.40**	**$2,280.80**	**$3,759.30**	**$6,169.90**				
Total	**TOTAL SOCAL DELIVERY (Velume in DTH)**		**73,631**	**53,656**	**49,787**	**27,560**	**22,224**	**22,707**	**20,550**	**24,145**	**18,154**	**22,808**	**37,593**	**61,699**	434514.00	**$434.51**		**434,514**
			0.1695	**0.1235**	**0.1146**	**0.0634**	**0.0511**	**0.0523**	**0.0473**	**0.0556**	**0.0418**	**0.0525**	**0.0865**	**0.1420**				

			Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12				Total
	PG&E del to SoCal Customers																	
	Zone 1															$0.10		
		Topock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		Needles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		Sum Zone 1					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
		Value Zone 1	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00							0.00			
	Zone 2															$0.10		
		Needles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
		Value Zone 2	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00				
	EOR Redelivery														0.00	$0.10		233
			0	0	25	208	0	0	0	0	0	0	0	0	233.00			0
		Value EOR	$0.00	$0.00	$2.50	$20.80	$0.00	$0.00										
	Zone 3															$0.10		
		Baksfld(STOCK)	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
		Monolith	33,179	51,897	32,041	124,148	99,772	64,652	30,825	4,916	5,722	8,731	965	2,132	458980.00			458,980
		Kettleman	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
		Buttonwillow	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
		Bakersfld(palm & west)	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
		Taft(lincoln&date)	82	54	65	31	2	2	1	2	2	3	20	20	284.00			284
	Subtotal non-EOR Zone 3		**33,261**	**51,951**	**32,106**	**124,179**	**99,774**	**64,654**	**30,826**	**4,918**	**5,724**	**8,734**	**985**	**2,152**	459264.00			**459,264**
	Total Zone 3		**33,261**	**51,951**	**32,131**	**124,387**	**99,774**	**64,654**	**30,826**	**4,918**	**5,724**	**8,734**	**985**	**2,152**	459497.00			**459,497**
		Value Zone 3	$3,326.10	$5,195.10	$3,210.60	$12,417.90	$9,977.40	$6,465.40	$3,082.60	$491.80	$572.40	$873.40	$98.50	$215.20				
	Zone 4															$0.10		
		Atascadero	0	0	0	0	0	0	0	0	1,998	23,725	0	0	25723.00			25,723
		Burrell Station Intertie	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
		Templeton	438	429	421	209	79	521	590	643	711	634	501	351	5527.00			5,527
		San Joaquin-Manning	7,585	6,399	12,867	2,962	5,968	15,857	18,765	3,003	40,413	25,796	16,810	3,961	160386.00			160,386
		San Joaquin-Floral& sj	8,286	17,064	7,012	10,685	3,129	6,591	2,468	86,371	4,147	1,960	14,000	11,974	173687.00			173,687
		Raisin City-tap 111	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
		Raisin City-tap 138	297	252	274	195	134	119	126	60	222	362	711	1,085	3837.00			3,837
		Morrow bay	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
		2	3	2	2	2	1	1	1	1	1	2	7	6	29.00			29
	Total Zone 4		**16,609**	**24,146**	**20,576**	**14,053**	**9,311**	**23,089**	**21,950**	**90,078**	**47,492**	**52,479**	**32,029**	**17,377**	369189.00			**369,189**
		Value Zone 4	**$1,660.90**	**$2,414.60**	**$2,057.60**	**$1,405.30**	**$931.10**	**$2,308.90**	**$2,195.00**	**$9,007.80**	**$4,749.20**	**$5,247.90**	**$3,202.90**	**$1,737.70**				
	COST OF OWNERSHIP		**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**				
	Value of PGE Delivery		**$5,333.85**	**$7,956.55**	**$5,617.55**	**$14,190.85**	**$11,255.35**	**$9,121.15**	**$5,624.45**	**$9,846.45**	**$5,668.45**	**$6,468.15**	**$3,648.25**	**$2,299.75**				
Total	**TOTAL PG&E Delivery**		**49,870**	**76,097**	**52,707**	**138,440**	**109,085**	**87,743**	**52,776**	**94,996**	**53,216**	**61,213**	**33,014**	**19,529**	828686.00	**$828.69**		**828,686**
				-1.9444	-0.8699	36.9726	-0.2166	-0.2513	-0.5045	1.1986	-0.5051	0.0953	-1.1192	8.2094				
Differenc	**(Receipts) from PGE minus Deliveries to PGE**		**23,761**	**-22,441**	**-2,920**	**-110,880**	**-86,861**	**-65,036**	**-32,226**	**-70,851**	**-35,062**	**-38,405**	**4,579**	**42,170**	**-394,172**			**-394,172**
	SoCal Owes PG&E -PGE owes Socal		**-23,761**	**22,441**	**2,920**	**110,880**	**86,861**	**65,036**	**32,226**	**70,851**	**35,062**	**38,405**	**-4,579**	**-42,170**	394,172			

Interutility Exchange -
Volumes in Dth

completed

		ACTUAL Jan-13	ACTUAL Feb-13	ACTUAL Mar-13	ACTUAL Apr-13	ACTUAL May-13	ACTUAL Jun-13	ACTUAL Jul-13	ACTUAL Aug-13	ACTUAL Sep-13	ACTUAL Oct-13	ACTUAL Nov-13	ACTUAL Dec-13	Annual Total	RATE PER DTH	$ VALUE	
	SoCal del to PG&E Customers																Total
	Zone 1														$0.10		
	Topock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	Value Zone 1	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**										
	zone 2														$0.10		
	Pisgah	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
	Value Zone 2	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**										
	EOR	0.0000	0.0000	0.0000	0.0000	0.0000	0.5164	0.2494	0.1186	0.1156	0.0000	0.0000	0.0000		$0.10		
	Arco (Texaco Exploration 6'99)	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Rio Bravo	0	0	0	0	0	3,382	1,633	777	757	0	0	0	6549.00			6,549
	Chevron	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Dexzel	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Oxy USA	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Total EOR	**0**	**0**	**0**	**0**	**0**	**3,382**	**1,633**	**777**	**757**	**0**	**0**	**0**	6549.00			**6,549**
	Value EOR	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$338.20**	**$163.30**	**$77.70**	**$75.70**	**$0.00**	**$0.00**	**$0.00**				
	Zone 3														$0.10		
	Bakersfield(stock & allen)	11,115	5,434	2,428	0	0	0	0	0	0	0	0	0	18977.00			18,977
	Fellows	339	257	70	22	7	74	65	69	0	118	120	243	1384.00			1,384
	Maricopa	3,686	340	1,277	2	481	766	745	833	1,106	3	0	2,864	12103.00			12,103
	Taft (lincoln&ash)	54,392	93,260	-31,156	17,456	15,269	11,634	10,411	11,501	12,289	15,897	27,641	51,443	290037.00			290,037
	Kern River Intertie/Bakersfield (L202) & Bakersfield (L7309)	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Oxy USA #11	2,401	1,990	2,089	2,007	2,165	2,177	2,137	1,799	2,245	2,167	231	1,870	23278.00			23,278
	Sullivan Road	13	9	4	3	3	3	3	3	4	5	14	15	79.00			79
	Total Non-EOR Zone 3	**71,946**	**101,290**	**-25,288**	**19,490**	**17,925**	**14,654**	**13,361**	**14,205**	**15,644**	**18,190**	**28,006**	**56,435**	345858.00			**345,858**
	Total Zone 3	**71,946**	**101,290**	**-25,288**	**19,490**	**17,925**	**18,036**	**14,994**	**14,982**	**16,401**	**18,190**	**28,006**	**56,435**	352407.00			**352,407**
	Value Zone 3	**$7,194.60**	**$10,129.00**	**-$2,528.80**	**$1,949.00**	**$1,792.50**	**$1,465.40**	**$1,336.10**	**$1,420.50**	**$1,564.40**	**$1,819.00**	**$2,800.60**	**$5,643.50**				
	Zone 4														$0.10		
	Adelaida	0	0	0	0	0	0	0	0	0	0	0	0	0.00	$0.02		0
	Creston	80	62	40	20	15	11	10	10	14	22	38	44	366.00			366
	Selma area	918	739	491	443	377	357	356	355	373	441	569	781	6200.00			6,200
	Shandon	2,610	4,687	-1,438	795	634	491	422	472	512	775	1,366	2,439	13765.00			13,765
	Unocal Shandon	2,701	0	0	4,884	3,406	16	0	0	0	0	0	2,687	13694.00			13,694
	Total Zone 4	**6,309**	**5,488**	**-907**	**6,142**	**4,432**	**875**	**788**	**837**	**899**	**1,238**	**1,973**	**5,951**	34025.00			**34,025**
	Value Zone 4	**$630.90**	**$548.80**	**-$90.70**	**$614.20**	**$443.20**	**$87.50**	**$78.80**	**$83.70**	**$89.90**	**$123.80**	**$197.30**	**$595.10**	3402.50			
	Total Socal Delivery VALUE ($)	**$7,825.50**	**$10,677.80**	**-$2,619.50**	**$2,563.20**	**$2,235.70**	**$1,891.10**	**$1,578.20**	**$1,581.90**	**$1,730.00**	**$1,942.80**	**$2,997.90**	**$6,238.60**				
Total	**TOTAL SOCAL DELIVERY (Velume in DTH)**	**78,255**	**106,778**	**-26,195**	**25,632**	**22,357**	**18,911**	**15,782**	**15,819**	**17,300**	**19,428**	**29,979**	**62,386**	386432.00	**$386.43**		**386,432**
		0.2025	**0.2763**	**-0.0678**	**0.0663**	**0.0579**	**0.0489**	**0.0408**	**0.0409**	**0.0448**	**0.0503**	**0.0776**	**0.1614**				

		Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13				
	PG&E del to SoCal Customers																Total
	Zone 1														$0.10		
	Topock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	Needles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	Sum Zone 1					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
	Value Zone 1	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00							0.00			
	Zone 2														$0.10		
	Needles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
	Value Zone 2	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00				
	EOR Redelivery													0.00	$0.10		0
		0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Value EOR	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00										
	Zone 3														$0.10		
	Baksfld(STOCK)	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Monolith	337	939	3,769	141	46	290	189	133	49	485	554	2,132	9064.00			9,064
	Kettleman	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Buttonwillow	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Bakersfld(palm & west)	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Taft(lincoln&date)	96	30	7	3	2	2	2	2	2	6	6	56	214.00			214
	Subtotal non-EOR Zone 3	**433**	**969**	**3,776**	**144**	**48**	**292**	**191**	**135**	**51**	**491**	**560**	**2,188**	9278.00			**9,278**
	Total Zone 3	**433**	**969**	**3,776**	**144**	**48**	**292**	**191**	**135**	**51**	**491**	**560**	**2,188**	9278.00			**9,278**
	Value Zone 3	$43.30	$96.90	$377.60	$14.40	$4.80	$29.20										
	Zone 4														$0.10		
	Atascadero	0	0	0	0	0	0	0	0	0	0	0	1,133	1133.00			1,133
	Burrell Station Intertie	0	0	0	0	0	0	0	0	0	0	1	0	1.00			1
	Templeton	418	601	471	547	695	542	517	620	514	295	441	548	6209.00			6,209
	San Joaquin-Manning	21,216	10,026	27,987	21,924	19,312	38,848	104,805	101,404	66,681	4,241	2,324	30,042	448810.00			448,810
	San Joaquin-Floral& sj	20,153	9,365	7,304	5,215	7,368	6,302	4,728	1,925	4,872	6,689	15,879	17,108	106908.00			106,908
	Raisin City-tap 111	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Raisin City-tap 138	1,209	1,007	585	504	274	347	310	315	342	370	762	1,300	7325.00			7,325
	Morrow bay	0	0	0	0	0	0	0	0	0	0	0	0	0.00			0
	Other Creston	6	3	1	1	1	1	1	1	1	1	2	6	25.00			25
	Total Zone 4	**43,002**	**21,002**	**36,348**	**28,191**	**27,650**	**46,040**	**110,361**	**104,265**	**72,410**	**11,596**	**19,409**	**50,137**	570411.00			**570,411**
	Value Zone 4	**$4,300.20**	**$2,100.20**	**$3,634.80**	**$2,819.10**	**$2,765.00**	**$4,604.00**	**$11,036.10**	**$10,426.50**	**$7,241.00**	**$1,159.60**	**$1,940.90**	**$5,013.70**				
	COST OF OWNERSHIP	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**	**$346.85**				
	Value of PGE Delivery	**$4,690.35**	**$2,543.95**	**$4,359.25**	**$3,180.35**	**$3,116.65**	**$4,980.05**	**$11,382.95**	**$10,773.35**	**$7,587.85**	**$1,506.45**	**$2,287.75**	**$5,360.55**				
Total	**TOTAL PG&E Delivery**	**43,435**	**21,971**	**40,124**	**28,335**	**27,698**	**46,332**	**110,552**	**104,400**	**72,461**	**12,087**	**19,969**	**52,325**	579689.00	**$579.69**		**579,689**
			1.4356	-1.7820	-0.9592	0.9760	4.1341	2.4561	-0.0653	-0.3773	-1.1331	0.3636	0.0051				
Differenc	**(Receipts) from PGE minus Deliveries to PGE**	**34,820**	**84,807**	**-66,319**	**-2,703**	**-5,341**	**-27,421**	**-94,770**	**-88,581**	**-55,161**	**7,341**	**10,010**	**10,061**	**-193,257**			**-193,257**
	SoCal Owes PG&E -PGE owes Socal	**-34,820**	**-84,807**	**66,319**	**2,703**	**5,341**	**27,421**	**94,770**	**88,581**	**55,161**	**-7,341**	**-10,010**	**-10,061**	193,257			

Interutility Exchange -
Volumes in Dth

completed

RATE PER DTH **$**

	ACTUAL Jan-14	ACTUAL Feb-14	ACTUAL Mar-14	ACTUAL Apr-14	ACTUAL May-14	ACTUAL Jun-14	ACTUAL Jul-14	ACTUAL Aug-14	ACTUAL Sep-14	ACTUAL Oct-14	ACTUAL Nov-14	ACTUAL Dec-14	Annual Total	VALUE	Total
SoCal del to PG&E Customers															
Zone 1														$0.10	
Topock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Value Zone 1	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**									
zone 2														$0.10	
Pisgah	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Value Zone 2	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**									
EOR	0.0000	0.0000	0.0000	0.0000	0.2421	0.5363	0.0000	0.0000	0.1353	0.0856	0.0007	0.0000		$0.10	
Arco (Texaco Exploration 6'99)	0	0	0	0	0	0	0	0	0	0		0	0.00		0
Rio Bravo	0	0	0	0	1,015	2,248	0	0	567	359	3	0	4192.00		4,192
Chevron	0	0	0	0	0	0	0	0	0	0			0.00		0
Dexzel	0	0	0	0	0	0	0	0	0	0			0.00		0
Oxy USA	0	0	0	0	0	0	0	0	0	0			0.00		0
Total EOR	**0**	**0**	**0**	**0**	**1,015**	**2,248**	**0**	**0**	**567**	**359**	**3**	**0**	4192.00		**4,192**
Value EOR	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$101.50**	**$224.80**	**$0.00**	**$0.00**	**$56.70**	**$35.90**	**$0.30**	**$0.00**			
Zone 3														$0.10	
Bakersfield(stock & allen)	0	0	0	0	0	0	0	0	0	0	0	0	0.00		0
Fellows	327	450	191	197	61	74	72	65	78	71	112	216	1914.00		1,914
Maricopa	4,116	3,136	1,838	0	573	1,008	1,023	1,027	1,237	1,202	1,541	0	16701.00		16,701
Taft (lincoln&ash)	39,792	25,945	22,558	17,770	14,342	14,251	9,133	11,759	11,174	13,490	21,859	35,730	237803.00		237,803
Kern River Intertie/Bakersfield (L202) & Bakersfield (L7309)	0	0	0	0	0	0	0	0	0	0	0	0	0.00		0
Oxy USA #11	1,606	1,359	1,477	1,489	1,543	1,446	1,382	1,532	1,205	1,317	1,640	1,672	17668.00		17,668
Sullivan Road	10	6	4	4	4	4	5	4	4	4	5	14	68.00		68
Total Non-EOR Zone 3	**45,851**	**30,896**	**26,068**	**19,460**	**16,523**	**16,783**	**11,615**	**14,387**	**13,698**	**16,084**	**25,157**	**37,632**	274154.00		**274,154**
Total Zone 3	**45,851**	**30,896**	**26,068**	**19,460**	**17,538**	**19,031**	**11,615**	**14,387**	**14,265**	**16,443**	**25,160**	**37,632**	278346.00		**278,346**
Value Zone 3	**$4,585.10**	**$3,089.60**	**$2,606.80**	**$1,946.00**	**$1,652.30**	**$1,678.30**	**$1,161.50**	**$1,438.70**	**$1,369.80**	**$1,608.40**	**$2,515.70**	**$3,763.20**			
Zone 4														$0.10	
Adelaida	0	0	0	0	0	0	0	0	0	0	0	0	0.00	$0.02	0
Creston	36	33	26	19	13	11	9	12	9	16	29	50	263.00		263
Selma area	725	560	450	451	389	366	343	359	384	446	566	736	5775.00		5,775
Shandon	1,957	1,187	1,140	819	599	494	464	470	439	600	1,170	1,737	11076.00		11,076
Unocal Shandon	1,745	1,912	2,030	1,491	614	98	0	0	1	0	268	2,867	11026.00		11,026
Total Zone 4	**4,463**	**3,692**	**3,646**	**2,780**	**1,615**	**969**	**816**	**841**	**833**	**1,062**	**2,033**	**5,390**	28140.00		**28,140**
Value Zone 4	**$446.30**	**$369.20**	**$364.60**	**$278.00**	**$161.50**	**$96.90**							1716.50		
Total Socal Delivery VALUE ($)	**$5,031.40**	**$3,458.80**	**$2,971.40**	**$2,224.00**	**$1,915.30**	**$2,000.00**	**$1,161.50**	**$1,438.70**	**$1,426.50**	**$1,644.30**	**$2,516.00**	**$3,763.20**			
Total **TOTAL SOCAL DELIVERY (Velume in DTH)**	**50,314**	**34,588**	**29,714**	**22,240**	**19,153**	**20,000**	**12,431**	**15,228**	**15,098**	**17,505**	**27,193**	**43,022**	306486.00	**$306.49**	**306,486**
	0.1642	**0.1129**	**0.0970**	**0.0726**	**0.0625**	**0.0653**	**0.0406**	**0.0497**	**0.0493**	**0.0571**	**0.0887**	**0.1404**			

	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14			Total
PG&E del to SoCal Customers															
Zone 1														$0.10	
Topock	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Needles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Sum Zone 1					0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Value Zone 1	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00							0.00		
Zone 2														$0.10	
Needles	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Value Zone 2	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00									
EOR Redelivery													0.00	$0.10	0
	0	0	0	0	0	0	0	0	0	0	0	0	0.00		0
Value EOR	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00									
Zone 3														$0.10	
Baksfld(STOCK)	0	0	0	0	0	0	0	0	0	0	0	0	0.00		0
Monolith	324	709	379	190	89	65	949	714	2,046	997	837	1,040	8339.00		8,339
Kettleman	0	0	0	0	0	0	0	0	0	0	0	0	0.00		0
Buttonwillow	0	0	0	0	0	0	0	0	0	0	0	0	0.00		0
Bakersfld(palm & west)	0	0	0	0	0	0	0	0	0	0	0	0	0.00		0
Taft(lincoln&date)	50	51	20	8	8	2	1	1	2	2	4	16	165.00		165
Subtotal non-EOR Zone 3	**374**	**760**	**399**	**198**	**97**	**67**	**950**	**715**	**2,048**	**999**	**841**	**1,056**	8504.00		**8,504**
Total Zone 3	**374**	**760**	**399**	**198**	**97**	**67**	**950**	**715**	**2,048**	**999**	**841**	**1,056**	8504.00		**8,504**
Value Zone 3	$37.40	$76.00	$39.90	$19.80	$9.70	$6.70									
Zone 4														$0.10	
Atascadero	0	0	0	0	0	0	0	0	0	0	0	811	811.00		811
0	0	0	0	0	0	0	0	0	0	0	0	0	0.00		0
Templeton	643	419	413	538	591	661	593	451	473	107	51	202	5142.00		5,142
11738	14,003	17,704	14,385	20,086	15,206	23,710	68,204	26,871	42,767	45,988	12,950	1,056	302930.00		302,930
San Joaquin-Floral& sj	9,004	11,757	8,038	7,466	2,435	2,482	546	1,023	1,300	4,518	2,131	5,960	56660.00		56,660
Raisin City-tap 111	0	0	0	0	0	0	0	0	0	0	0	0	0.00		0
Raisin City-tap 138	304	1,267	548	490	400	454	320	258	317	355	602	611	5926.00		5,926
Morrow bay	0	0	0	0	0	0	0	0	258,261	160,292	0	0	418553.00		418,553
Other Creston	4	4	4	1	2	0	1	1	1	1	4	6	29.00		29
Total Zone 4	**23,958**	**31,151**	**23,388**	**28,581**	**18,634**	**27,307**	**69,664**	**28,604**	**303,119**	**211,261**	**15,738**	**8,646**	790051.00		**790,051**
Value Zone 4	**$2,395.80**	**$3,115.10**	**$2,338.80**	**$2,858.10**	**$1,863.40**	**$2,730.70**	**$6,966.40**	**$2,860.40**	**$30,311.90**	**$21,126.10**	**$1,573.80**	**$864.60**			
COST OF OWNERSHIP	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**			
Value of PGE Delivery	**$2,433.20**	**$3,191.10**	**$2,378.70**	**$2,877.90**	**$1,873.10**	**$2,737.40**	**$6,966.40**	**$2,860.40**	**$30,311.90**	**$21,126.10**	**$1,573.80**	**$864.60**	79,195		
Total **TOTAL PG&E Delivery**	**24,332**	**31,911**	**23,787**	**28,779**	**18,731**	**27,374**	**70,614**	**29,319**	**305,167**	**212,260**	**16,579**	**9,702**	798555.00	**$798.56**	**798,555**
		-0.8970	1.2140	-2.1033	-1.0645	-18.4739	6.8903	-0.7578	19.5854	-0.3286	-1.0545	2.1393			
Differenc **(Receipts) from PGE minus Deliveries to PGE**	**25,982**	**2,677**	**5,927**	**-6,539**	**422**	**-7,374**	**-58,183**	**-14,091**	**-290,069**	**-194,755**	**10,614**	**33,320**	**-492,069**		**-492,069**
SoCal Owes PG&E -PGE owes Socal	**-25,982**	**-2,677**	**-5,927**	**6,539**	**-422**	**7,374**	**58,183**	**14,091**	**290,069**	**194,755**	**-10,614**	**-33,320**	492,069		

Triennial Cost Allocation Proceeding

SUPPORTING DATA

The Gas Company

A Sempra Energy utility™

TCAP 2015 Gas Price Forecast by Basin

Current $/MMbtu

SoCal Border — **Updated February 17, 2015**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	$ (0.24)	$ (0.22)	$ (0.12)	$ (0.28)	$ (0.03)	$ (0.17)	$ 0.03	$ (0.12)	$ (0.24)	$ (0.22)	$ (0.14)	$ (0.18)
2013	$ (0.18)	$ (0.22)	$ (0.05)	$ 0.05	$ 0.01	$ 0.02	$ (0.13)	$ (0.13)	$ (0.12)	$ (0.09)	$ (0.07)	$ (0.39)
2014	$ (0.04)	$ (0.69)	$ (0.21)	$ (0.05)	$ 0.09	$ (0.15)	$ (0.30)	$ (0.29)	$ (0.19)	$ (0.04)	$ (0.09)	$ (0.09)
2 yr avg differential (source: NGI)	$ (0.11)	$ (0.46)	$ (0.13)	$ 0.00	$ 0.05	$ (0.07)	$ (0.22)	$ (0.21)	$ (0.16)	$ (0.06)	$ (0.08)	$ (0.24)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	**4.35**	**4.17**	**3.91**	**4.23**	**4.24**	**4.55**	**4.42**	**4.17**	**4.14**	**3.53**	**3.5**	**3.48**
2012	$ 2.92	$ 2.74	$ 2.30	$ 2.22	$ 2.46	$ 2.59	$ 2.91	$ 2.96	$ 3.07	$ 3.53	$ 3.66	$ 3.52
2013	$ 3.53	$ 3.52	$ 3.86	$ 4.11	$ 4.03	$ 3.82	$ 3.76	$ 3.55	$ 3.73	$ 3.75	$ 3.69	$ 4.62
2014	$ 4.64	$ 6.57	$ 4.98	$ 4.66	$ 4.46	$ 4.72	$ 4.34	$ 4.16	$ 4.09	$ 3.82	$ 4.16	$ 3.49
2015	$ 2.96	$ 2.99	$ 2.78	$ 2.77	$ 2.79	$ 2.83	$ 2.98	$ 3.01	$ 2.99	$ 2.95	$ 3.12	$ 3.36
2016	$ 3.44	$ 3.43	$ 3.38	$ 3.21	$ 3.21	$ 3.26	$ 3.46	$ 3.47	$ 3.34	$ 3.32	$ 3.48	$ 3.66
2017	$ 3.86	$ 4.19	$ 3.82	$ 3.49	$ 3.44	$ 3.59	$ 3.78	$ 3.79	$ 3.72	$ 3.65	$ 3.74	$ 4.07
2018	$ 4.07	$ 4.40	$ 4.01	$ 3.61	$ 3.56	$ 3.70	$ 3.89	$ 3.90	$ 3.83	$ 3.76	$ 3.86	$ 4.19
2019	$ 4.25	$ 4.66	$ 4.28	$ 3.91	$ 3.90	$ 4.09	$ 4.27	$ 4.30	$ 4.27	$ 4.22	$ 4.40	$ 4.64
2020	$ 5.10	$ 5.77	$ 5.13	$ 4.75	$ 4.73	$ 4.93	$ 5.01	$ 5.01	$ 5.00	$ 4.93	$ 5.17	$ 5.26

San Juan Basin — **Updated February 17, 2015**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	$ 0.04	$ 0.02	$ 0.12	$ 0.09	$ 0.17	$ 0.12	$ 0.20	$ 0.09	$ 0.08	$ 0.04	$ 0.12	$ 0.05
2013	$ (0.02)	$ 0.03	$ 0.11	$ 0.22	$ 0.17	$ 0.19	$ 0.12	$ 0.10	$ 0.09	$ 0.12	$ 0.11	$ (0.27)
2014	$ 0.07	$ (0.62)	$ 0.05	$ 0.15	$ 0.18	$ 0.09	$ 0.03	$ 0.02	$ 0.06	$ 0.14	$ 0.07	$ 0.08
2 yr avg differential (source: NGI)	$ 0.02	$ (0.29)	$ 0.08	$ 0.18	$ 0.18	$ 0.14	$ 0.08	$ 0.06	$ 0.08	$ 0.13	$ 0.09	$ (0.09)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	$ 2.65	$ 2.50	$ 2.06	$ 1.85	$ 2.26	$ 2.31	$ 2.74	$ 2.75	$ 2.74	$ 3.28	$ 3.40	$ 3.30
2013	$ 3.37	$ 3.27	$ 3.69	$ 3.95	$ 3.86	$ 3.66	$ 3.50	$ 3.32	$ 3.51	$ 3.55	$ 3.52	$ 4.49
2014	$ 4.52	$ 6.49	$ 4.72	$ 4.46	$ 4.38	$ 4.48	$ 4.01	$ 3.85	$ 3.83	$ 3.64	$ 4.00	$ 3.32
2015	$ 2.87	$ 2.33	$ 2.77	$ 2.65	$ 2.68	$ 2.76	$ 2.88	$ 2.90	$ 2.87	$ 2.85	$ 3.00	$ 3.37
2016	$ 3.39	$ 3.70	$ 3.28	$ 3.04	$ 3.06	$ 3.13	$ 3.24	$ 3.26	$ 3.23	$ 3.20	$ 3.32	$ 3.68
2017	$ 3.72	$ 4.03	$ 3.61	$ 3.30	$ 3.31	$ 3.39	$ 3.49	$ 3.51	$ 3.48	$ 3.45	$ 3.57	$ 3.92
2018	$ 3.94	$ 4.23	$ 3.80	$ 3.43	$ 3.43	$ 3.50	$ 3.60	$ 3.62	$ 3.60	$ 3.57	$ 3.69	$ 4.05
2019	$ 4.11	$ 4.49	$ 4.07	$ 3.73	$ 3.78	$ 3.89	$ 3.97	$ 4.03	$ 4.04	$ 4.03	$ 4.23	$ 4.50
2020	$ 4.96	$ 5.61	$ 4.92	$ 4.57	$ 4.61	$ 4.73	$ 4.71	$ 4.74	$ 4.77	$ 4.74	$ 5.00	$ 5.11

AECO — **Updated February 17, 2015**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	$ 0.30	$ 0.47	$ 0.46	$ 0.38	$ 0.47	$ 0.57	$ 0.72	$ 0.74	$ 0.63	$ 0.41	$ 0.34	$ 0.34
2013	$ 0.45	$ 0.40	$ 0.52	$ 0.67	$ 0.62	$ 0.67	$ 0.93	$ 1.12	$ 1.62	$ 0.60	$ 0.39	$ 0.54
2014	$ 0.57	$ (0.87)	$ (0.29)	$ 0.09	$ 0.19	$ 0.09	$ 0.12	$ 0.10	$ 0.12	$ 0.28	$ 0.35	$ 0.32
2 yr avg differential (source: NGI)	$ 0.51	$ (0.24)	$ 0.11	$ 0.38	$ 0.40	$ 0.38	$ 0.52	$ 0.61	$ 0.87	$ 0.44	$ 0.37	$ 0.43

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	$ 2.38	$ 2.05	$ 1.72	$ 1.56	$ 1.96	$ 1.86	$ 2.22	$ 2.10	$ 2.20	$ 2.90	$ 3.18	$ 3.01
2013	$ 2.89	$ 2.90	$ 3.29	$ 3.49	$ 3.42	$ 3.18	$ 2.70	$ 2.29	$ 1.98	$ 3.07	$ 3.24	$ 3.69
2014	$ 4.03	$ 6.75	$ 5.06	$ 4.52	$ 4.37	$ 4.48	$ 3.92	$ 3.77	$ 3.78	$ 3.51	$ 3.72	$ 3.08
2015	$ 2.63	$ 2.49	$ 2.73	$ 2.45	$ 2.45	$ 2.52	$ 2.43	$ 2.35	$ 2.08	$ 2.54	$ 2.72	$ 2.84
2016	$ 2.90	$ 3.64	$ 3.25	$ 2.85	$ 2.83	$ 2.89	$ 2.79	$ 2.71	$ 2.44	$ 2.89	$ 3.04	$ 3.16

2017	$ 3.23	$ 3.74	$ 3.57	$ 3.11	$ 3.09	$ 3.15	$ 3.04	$ 2.96	$ 2.69	$ 3.15	$ 3.29	$ 3.40
2018	$ 3.45	$ 3.94	$ 3.77	$ 3.23	$ 3.20	$ 3.26	$ 3.15	$ 3.07	$ 2.81	$ 3.26	$ 3.41	$ 3.52
2019	$ 3.63	$ 4.20	$ 4.03	$ 3.53	$ 3.55	$ 3.65	$ 3.53	$ 3.47	$ 3.25	$ 3.72	$ 3.95	$ 3.97
2020	$ 4.48	$ 5.32	$ 4.88	$ 4.37	$ 4.38	$ 4.49	$ 4.27	$ 4.19	$ 3.97	$ 4.43	$ 4.73	$ 4.59

Permian Basin **Updated February 17, 2015**

2012	$ 0.06	$ 0.04	$ 0.12	$ 0.06	$ 0.11	$ 0.05	$ 0.13	$ 0.06	$ 0.08	$ 0.05	$ 0.15	$ 0.09
2013	$ 0.02	$ 0.05	$ 0.14	$ 0.18	$ 0.16	$ 0.18	$ 0.11	$ 0.10	$ 0.08	$ 0.14	$ 0.12	$ (0.14)
2014	$ 0.12	$ (0.63)	$ 0.12	$ 0.16	$ 0.18	$ 0.10	$ 0.09	$ 0.05	$ 0.08	$ 0.16	$ 0.11	$ 0.14
2 yr avg differential (source: NGI)	$ 0.07	$ (0.29)	$ 0.13	$ 0.17	$ 0.17	$ 0.14	$ 0.10	$ 0.07	$ 0.08	$ 0.15	$ 0.11	$ (0.00)

Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2012	$ 2.63	$ 2.48	$ 2.06	$ 1.88	$ 2.32	$ 2.38	$ 2.81	$ 2.79	$ 2.75	$ 3.27	$ 3.36	$ 3.26
2013	$ 3.32	$ 3.25	$ 3.66	$ 3.98	$ 3.88	$ 3.66	$ 3.51	$ 3.32	$ 3.52	$ 3.53	$ 3.50	$ 4.36
2014	$ 4.48	$ 6.50	$ 4.65	$ 4.46	$ 4.37	$ 4.47	$ 3.96	$ 3.81	$ 3.82	$ 3.63	$ 3.97	$ 3.26
2015	$ 2.86	$ 2.32	$ 2.72	$ 2.66	$ 2.68	$ 2.76	$ 2.85	$ 2.89	$ 2.87	$ 2.83	$ 2.97	$ 3.27
2016	$ 3.34	$ 3.69	$ 3.24	$ 3.06	$ 3.06	$ 3.13	$ 3.21	$ 3.25	$ 3.23	$ 3.18	$ 3.29	$ 3.59
2017	$ 3.67	$ 4.03	$ 3.56	$ 3.32	$ 3.32	$ 3.39	$ 3.46	$ 3.50	$ 3.48	$ 3.44	$ 3.55	$ 3.83
2018	$ 3.89	$ 4.23	$ 3.75	$ 3.44	$ 3.44	$ 3.50	$ 3.57	$ 3.61	$ 3.60	$ 3.55	$ 3.67	$ 3.95
2019	$ 4.07	$ 4.49	$ 4.02	$ 3.75	$ 3.78	$ 3.89	$ 3.95	$ 4.01	$ 4.04	$ 4.01	$ 4.21	$ 4.40
2020	$ 4.92	$ 5.60	$ 4.87	$ 4.58	$ 4.61	$ 4.73	$ 4.69	$ 4.72	$ 4.77	$ 4.72	$ 4.98	$ 5.02

Kern Delivered **Updated February 17, 2015**

2012	**$ 0.00**	**$ (0.00)**	**$ 0.13**	**$ 0.07**	**$ 0.19**	**$ 0.16**	**$ 0.22**	**$ 0.11**	**$ 0.09**	**$ (0.03)**	**$ 0.02**	**$ 0.00**
2013	**$ (0.04)**	**$ (0.02)**	**$ 0.09**	**$ 0.20**	**$ 0.18**	**$ 0.23**	**$ 0.17**	**$ 0.13**	**$ 0.14**	**$ 0.06**	**$ 0.10**	**$ (0.34)**
2014	**$ 0.06**	**$ (1.13)**	**$ (0.10)**	**$ 0.12**	**$ 0.17**	**$ 0.09**	**$ 0.06**	**$ 0.07**	**$ 0.11**	**$ 0.18**	**$ 0.04**	**$ 0.04**
2 yr avg differential (source: NGI)	**$ 0.01**	**$ (0.57)**	**$ (0.01)**	**$ 0.16**	**$ 0.17**	**$ 0.16**	**$ 0.12**	**$ 0.10**	**$ 0.12**	**$ 0.12**	**$ 0.07**	**$ (0.15)**

Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2012	$ 2.68	$ 2.53	$ 2.05	$ 1.88	$ 2.25	$ 2.27	$ 2.71	$ 2.74	$ 2.74	$ 3.34	$ 3.49	$ 3.34
2013	$ 3.38	$ 3.32	$ 3.72	$ 3.96	$ 3.86	$ 3.62	$ 3.45	$ 3.29	$ 3.47	$ 3.61	$ 3.53	$ 4.56
2014	$ 4.53	$ 7.00	$ 4.87	$ 4.49	$ 4.39	$ 4.48	$ 3.98	$ 3.80	$ 3.79	$ 3.61	$ 4.03	$ 3.35
2015	$ 2.84	$ 2.30	$ 2.86	$ 2.67	$ 2.68	$ 2.74	$ 2.84	$ 2.86	$ 2.83	$ 2.86	$ 3.02	$ 3.42
2016	$ 3.40	$ 3.98	$ 3.38	$ 3.07	$ 3.06	$ 3.11	$ 3.20	$ 3.22	$ 3.18	$ 3.21	$ 3.34	$ 3.73
2017	$ 3.73	$ 4.31	$ 3.70	$ 3.33	$ 3.32	$ 3.37	$ 3.45	$ 3.47	$ 3.44	$ 3.47	$ 3.59	$ 3.97
2018	$ 3.95	$ 4.51	$ 3.89	$ 3.45	$ 3.43	$ 3.48	$ 3.56	$ 3.59	$ 3.55	$ 3.58	$ 3.71	$ 4.10
2019	$ 4.12	$ 4.77	$ 4.16	$ 3.75	$ 3.78	$ 3.87	$ 3.94	$ 3.99	$ 3.99	$ 4.04	$ 4.25	$ 4.55
2020	$ 4.98	$ 5.89	$ 5.01	$ 4.59	$ 4.61	$ 4.71	$ 4.67	$ 4.70	$ 4.72	$ 4.75	$ 5.03	$ 5.16
2021	$ 5.96	$ 7.04	$ 5.74	$ 5.24	$ 5.19	$ 5.24	$ 5.10	$ 5.05	$ 5.02	$ 4.99	$ 5.28	$ 5.35

Updated February 17, 2015

$/MMBTU. 2012-February 2014 Historical Data from NGI. 2014 March to 2016 October data for SoCalGas Border shows the NYMEX Clearport futures. 2016-2025 SocalGa

WACOG	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2014	**$ 4.51**	**$ 6.61**	**$ 4.78**	**$ 4.49**	**$ 4.40**	**$ 4.50**	**$ 4.03**	**$ 3.86**	**$ 3.85**	**$ 3.65**	**$ 4.01**	**$ 3.32**
2015	**$ 2.86**	**$ 2.38**	**$ 2.78**	**$ 2.66**	**$ 2.68**	**$ 2.76**	**$ 2.86**	**$ 2.88**	**$ 2.84**	**$ 2.85**	**$ 3.00**	**$ 3.34**
2016	**$ 3.37**	**$ 3.73**	**$ 3.31**	**$ 3.06**	**$ 3.07**	**$ 3.14**	**$ 3.23**	**$ 3.25**	**$ 3.20**	**$ 3.20**	**$ 3.32**	**$ 3.65**

2017	**$ 3.71**	**$ 4.09**	**$ 3.64**	**$ 3.33**	**$ 3.32**	**$ 3.40**	**$ 3.49**	**$ 3.51**	**$ 3.46**	**$ 3.46**	**$ 3.58**	**$ 3.91**
2018	**$ 3.93**	**$ 4.30**	**$ 3.83**	**$ 3.45**	**$ 3.44**	**$ 3.51**	**$ 3.60**	**$ 3.62**	**$ 3.58**	**$ 3.58**	**$ 3.70**	**$ 4.03**
2019	**$ 4.10**	**$ 4.56**	**$ 4.10**	**$ 3.75**	**$ 3.79**	**$ 3.90**	**$ 3.97**	**$ 4.02**	**$ 4.02**	**$ 4.04**	**$ 4.24**	**$ 4.48**
2020	**$ 4.95**	**$ 5.67**	**$ 4.95**	**$ 4.59**	**$ 4.61**	**$ 4.74**	**$ 4.71**	**$ 4.73**	**$ 4.75**	**$ 4.74**	**$ 5.01**	**$ 5.10**
2021	**$ 5.94**	**$ 6.83**	**$ 5.68**	**$ 5.24**	**$ 5.19**	**$ 5.27**	**$ 5.14**	**$ 5.09**	**$ 5.04**	**$ 4.99**	**$ 5.26**	**$ 5.28**

Malin

Malin **Updated February 17, 2015**

2012	**$ (0.11)**	**$ (0.07)**	**$ 0.03**	**$ 0.02**	**$ 0.14**	**$ 0.15**	**$ 0.18**	**$ 0.08**	**$ 0.06**	**$ (0.08)**	**$ (0.03)**	**$ (0.08)**
2013	**$ (0.11)**	**$ (0.10)**	**$ 0.04**	**$ 0.16**	**$ 0.12**	**$ 0.17**	**$ 0.10**	**$ 0.06**	**$ 0.07**	**$ (0.04)**	**$ 0.03**	**$ (0.31)**
2014	**$ 0.06**	**$ (1.04)**	**$ (0.14)**	**$ 0.06**	**$ 0.11**	**$ 0.01**	**$ (0.02)**	**$ (0.00)**	**$ 0.02**	**$ 0.11**	**$ (0.00)**	**$ (0.01)**
2 yr avg differential (source: NGI)	**$ (0.03)**	**$ (0.57)**	**$ (0.05)**	**$ 0.11**	**$ 0.11**	**$ 0.09**	**$ 0.04**	**$ 0.03**	**$ 0.04**	**$ 0.03**	**$ 0.01**	**$ (0.16)**

Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2012	$ 2.80	$ 2.60	$ 2.15	$ 1.93	$ 2.29	$ 2.28	$ 2.75	$ 2.76	$ 2.77	$ 3.40	$ 3.55	$ 3.43
2013	$ 3.45	$ 3.40	$ 3.77	$ 4.00	$ 3.92	$ 3.68	$ 3.52	$ 3.36	$ 3.53	$ 3.71	$ 3.60	$ 4.54
2014	$ 4.54	$ 6.91	$ 4.91	$ 4.55	$ 4.45	$ 4.55	$ 4.06	$ 3.87	$ 3.88	$ 3.67	$ 4.08	$ 3.40
2015	$ 2.86	$ 2.36	$ 2.90	$ 2.72	$ 2.74	$ 2.81	$ 2.91	$ 2.94	$ 2.91	$ 2.94	$ 3.08	$ 3.43
2016	$ 3.44	$ 3.97	$ 3.42	$ 3.12	$ 3.12	$ 3.18	$ 3.27	$ 3.29	$ 3.26	$ 3.29	$ 3.39	$ 3.75
2017	$ 3.77	$ 4.31	$ 3.74	$ 3.38	$ 3.38	$ 3.44	$ 3.52	$ 3.55	$ 3.52	$ 3.55	$ 3.65	$ 3.99
2018	$ 3.99	$ 4.51	$ 3.93	$ 3.50	$ 3.49	$ 3.55	$ 3.63	$ 3.66	$ 3.63	$ 3.67	$ 3.77	$ 4.11
2019	$ 4.16	$ 4.77	$ 4.20	$ 3.80	$ 3.84	$ 3.94	$ 4.01	$ 4.06	$ 4.07	$ 4.12	$ 4.31	$ 4.56
2020	$ 5.01	$ 5.88	$ 5.05	$ 4.64	$ 4.67	$ 4.78	$ 4.75	$ 4.77	$ 4.80	$ 4.83	$ 5.08	$ 5.18

PGE Citigate **Updated February 17, 2015**

2012	**$ (0.43)**	**$ (0.39)**	**$ (0.34)**	**$ (0.44)**	**$ (0.31)**	**$ (0.34)**	**$ (0.08)**	**$ (0.18)**	**$ (0.47)**	**$ (0.64)**	**$ (0.32)**	**$ (0.41)**
2013	**$ (0.33)**	**$ (0.33)**	**$ (0.23)**	**$ (0.03)**	**$ (0.11)**	**$ (0.08)**	**$ (0.20)**	**$ (0.29)**	**$ (0.38)**	**$ (0.31)**	**$ (0.23)**	**$ (0.42)**
2014	**$ (0.09)**	**$ (0.95)**	**$ (0.46)**	**$ (0.48)**	**$ (0.48)**	**$ (0.55)**	**$ (0.66)**	**$ (0.63)**	**$ (0.53)**	**$ (0.50)**	**$ (0.42)**	**$ (0.42)**
2 yr avg differential (source: NGI)	**$ (0.21)**	**$ (0.64)**	**$ (0.35)**	**$ (0.25)**	**$ (0.30)**	**$ (0.31)**	**$ (0.43)**	**$ (0.46)**	**$ (0.46)**	**$ (0.41)**	**$ (0.33)**	**$ (0.42)**

Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2012	$ 3.11	$ 2.92	$ 2.52	$ 2.38	$ 2.74	$ 2.77	$ 3.01	$ 3.03	$ 3.30	$ 3.95	$ 3.83	$ 3.76
2013	$ 3.67	$ 3.63	$ 4.04	$ 4.19	$ 4.15	$ 3.92	$ 3.82	$ 3.71	$ 3.99	$ 3.98	$ 3.85	$ 4.65
2014	$ 4.69	$ 6.83	$ 5.23	$ 5.09	$ 5.04	$ 5.11	$ 4.70	$ 4.49	$ 4.43	$ 4.29	$ 4.50	$ 3.82
2015	$ 3.25	$ 2.87	$ 3.19	$ 3.08	$ 3.15	$ 3.21	$ 3.38	$ 3.42	$ 3.41	$ 3.38	$ 3.41	$ 3.69
2016	$ 3.62	$ 4.05	$ 3.71	$ 3.48	$ 3.53	$ 3.59	$ 3.74	$ 3.78	$ 3.77	$ 3.73	$ 3.73	$ 4.01
2017	$ 3.96	$ 4.38	$ 4.03	$ 3.74	$ 3.79	$ 3.84	$ 3.99	$ 4.03	$ 4.02	$ 3.99	$ 3.99	$ 4.25
2018	$ 4.17	$ 4.58	$ 4.23	$ 3.87	$ 3.91	$ 3.95	$ 4.10	$ 4.14	$ 4.14	$ 4.11	$ 4.11	$ 4.37
2019	$ 4.35	$ 4.84	$ 4.49	$ 4.17	$ 4.25	$ 4.34	$ 4.48	$ 4.55	$ 4.58	$ 4.56	$ 4.65	$ 4.82
2020	$ 5.20	$ 5.96	$ 5.34	$ 5.00	$ 5.08	$ 5.18	$ 5.22	$ 5.26	$ 5.30	$ 5.27	$ 5.42	$ 5.44
2021	$ 6.18	$ 7.11	$ 6.07	$ 5.65	$ 5.66	$ 5.71	$ 5.64	$ 5.61	$ 5.60	$ 5.52	$ 5.67	$ 5.62

Henry Hub **Updated February 17, 2015**

Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
2012	$ 2.68	$ 2.52	$ 2.18	$ 1.94	$ 2.43	$ 2.43	$ 2.93	$ 2.85	$ 2.83	$ 3.32	$ 3.52	$ 3.34
2013	$ 3.34	$ 3.30	$ 3.80	$ 4.16	$ 4.04	$ 3.84	$ 3.62	$ 3.42	$ 3.60	$ 3.67	$ 3.63	$ 4.22
2014	$ 4.60	$ 5.87	$ 4.77	$ 4.61	$ 4.56	$ 4.57	$ 4.04	$ 3.87	$ 3.90	$ 3.78	$ 4.07	$ 3.40

2015	$ 2.99	$ 2.68	2.84728125	2.82946875	2.85365625	2.89809375	2.95259375	2.96353125	2.9500625	2.97875	3.08665625	3.2725625
2016	3.41046875	3.40484375	3.3670625	3.22734375	3.23384375	3.271375	3.31221875	3.320625	3.3071875	3.329625	3.406	3.58834375
2017	3.7441875	3.73840625	3.68803125	3.48725	3.48984375	3.5258125	3.5625	3.5718125	3.56028125	3.58503125	3.6589375	3.82525
2018	3.96034375	3.94025	3.87996875	3.61090625	3.60853125	3.6384375	3.67234375	3.68425	3.6775625	3.70146875	3.7815	3.9514375
2019	4.135518441	4.200344983	4.147588417	3.913360759	3.954153795	4.029277507	4.051787331	4.085813257	4.117282581	4.158374894	4.320266358	4.400853404
2020	4.987981924	5.315112555	4.997880355	4.749010921	4.783315007	4.867485329	4.790114241	4.797130981	4.844022321	4.867186006	5.094871219	5.017689278
2021	5.972745674	6.469481712	5.727268063	5.396974715	5.363080155	5.398120023	5.213048392	5.15362285	5.140712104	5.111962825	5.347443605	5.201475038

Opal **Updated February 17, 2015**

2012	**$ 0.00**	**$ (0.01)**	**$ 0.12**	**$ 0.06**	**$ 0.18**	**$ 0.15**	**$ 0.21**	**$ 0.10**	**$ 0.08**	**$ (0.04)**	**$ 0.02**	**$ (0.00)**
2013	**$ (0.04)**	**$ (0.02)**	**$ 0.08**	**$ 0.20**	**$ 0.17**	**$ 0.22**	**$ 0.16**	**$ 0.13**	**$ 0.13**	**$ 0.06**	**$ 0.09**	**$ (0.32)**
2014	**$ 0.05**	**$ (1.14)**	**$ (0.13)**	**$ 0.12**	**$ 0.17**	**$ 0.08**	**$ 0.06**	**$ 0.06**	**$ 0.11**	**$ 0.17**	**$ 0.04**	**$ 0.04**
2 yr avg differential (source: NGI)	**$ 0.01**	**$ (0.58)**	**$ (0.02)**	**$ 0.16**	**$ 0.17**	**$ 0.15**	**$ 0.11**	**$ 0.10**	**$ 0.12**	**$ 0.11**	**$ 0.06**	**$ (0.14)**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	$ 2.68	$ 2.53	$ 2.06	$ 1.88	$ 2.26	$ 2.27	$ 2.72	$ 2.75	$ 2.74	$ 3.35	$ 3.50	$ 3.35
2013	$ 3.38	$ 3.32	$ 3.72	$ 3.96	$ 3.86	$ 3.62	$ 3.46	$ 3.29	$ 3.47	$ 3.61	$ 3.53	$ 4.54
2014	$ 4.54	$ 7.02	$ 4.90	$ 4.49	$ 4.39	$ 4.48	$ 3.98	$ 3.80	$ 3.79	$ 3.61	$ 4.04	$ 3.36
2015	$ 2.84	$ 2.30	$ 2.87	$ 2.67	$ 2.68	$ 2.75	$ 2.84	$ 2.87	$ 2.83	$ 2.86	$ 3.02	$ 3.41
2016	$ 3.40	$ 3.99	$ 3.39	$ 3.07	$ 3.06	$ 3.12	$ 3.20	$ 3.23	$ 3.19	$ 3.22	$ 3.34	$ 3.73
2017	$ 3.74	$ 4.32	$ 3.71	$ 3.33	$ 3.32	$ 3.37	$ 3.45	$ 3.48	$ 3.44	$ 3.47	$ 3.60	$ 3.96
2018	$ 3.95	$ 4.52	$ 3.90	$ 3.45	$ 3.44	$ 3.49	$ 3.56	$ 3.59	$ 3.56	$ 3.59	$ 3.72	$ 4.09
2019	$ 4.13	$ 4.78	$ 4.17	$ 3.75	$ 3.78	$ 3.88	$ 3.94	$ 3.99	$ 4.00	$ 4.04	$ 4.26	$ 4.54
2020	$ 4.98	$ 5.90	$ 5.02	$ 4.59	$ 4.61	$ 4.72	$ 4.68	$ 4.70	$ 4.72	$ 4.75	$ 5.03	$ 5.16

Sumas **Updated February 17, 2015**

2012	**$ (0.23)**	**$ (0.08)**	**$ 0.04**	**$ 0.09**	**$ 0.22**	**$ 0.27**	**$ 0.38**	**$ 0.23**	**$ 0.20**	**$ (0.08)**	**$ (0.13)**	**$ (0.14)**
2013	**$ (0.27)**	**$ (0.14)**	**$ (0.01)**	**$ 0.22**	**$ 0.19**	**$ 0.26**	**$ 0.26**	**$ 0.37**	**$ 0.39**	**$ (0.06)**	**$ (0.30)**	**$ (1.09)**
2014	**$ 0.07**	**$ (1.27)**	**$ (0.16)**	**$ 0.20**	**$ 0.25**	**$ 0.21**	**$ 0.13**	**$ 0.11**	**$ 0.14**	**$ 0.29**	**$ 0.10**	**$ 0.06**
2 yr avg differential (source: NGI)	$ (0.10)	$ (0.70)	$ (0.08)	$ 0.21	$ 0.22	$ 0.24	$ 0.19	$ 0.24	$ 0.26	$ 0.11	$ (0.10)	$ (0.52)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	$ 2.91	$ 2.60	$ 2.14	$ 1.85	$ 2.21	$ 2.16	$ 2.56	$ 2.61	$ 2.63	$ 3.39	$ 3.65	$ 3.48
2013	$ 3.62	$ 3.44	$ 3.81	$ 3.94	$ 3.85	$ 3.58	$ 3.37	$ 3.05	$ 3.22	$ 3.73	$ 3.93	$ 5.32
2014	$ 4.53	$ 7.14	$ 4.93	$ 4.42	$ 4.31	$ 4.35	$ 3.92	$ 3.76	$ 3.76	$ 3.50	$ 3.97	$ 3.34
2015	$ 2.76	$ 2.22	$ 3.01	$ 2.63	$ 2.60	$ 2.69	$ 2.83	$ 2.85	$ 2.81	$ 2.69	$ 2.99	$ 3.21
2016	$ 3.51	$ 4.11	$ 3.52	$ 3.03	$ 2.98	$ 3.06	$ 3.19	$ 3.21	$ 3.17	$ 3.04	$ 3.31	$ 3.53
2017	$ 3.84	$ 4.44	$ 3.85	$ 3.29	$ 3.24	$ 3.31	$ 3.44	$ 3.46	$ 3.42	$ 3.30	$ 3.56	$ 3.77
2018	$ 4.06	$ 4.64	$ 4.04	$ 3.42	$ 3.36	$ 3.43	$ 3.55	$ 3.57	$ 3.54	$ 3.41	$ 3.68	$ 3.89
2019	$ 4.24	$ 4.90	$ 4.31	$ 3.72	$ 3.70	$ 3.82	$ 3.93	$ 3.98	$ 3.98	$ 3.87	$ 4.22	$ 4.34
2020	$ 5.09	$ 6.02	$ 5.16	$ 4.55	$ 4.53	$ 4.66	$ 4.66	$ 4.69	$ 4.70	$ 4.58	$ 5.00	$ 4.96

Stanfield

Updated February 17, 2015

2012	**$ (0.11)**	**$ (0.04)**	**$ 0.06**	**$ 0.07**	**$ 0.20**	**$ 0.24**	**$ 0.34**	**$ 0.21**	**$ 0.13**	**$ (0.05)**	**$ (0.02)**	**$ (0.08)**
2013	**$ (0.12)**	**$ (0.08)**	**$ 0.07**	**$ 0.22**	**$ 0.21**	**$ 0.25**	**$ 0.21**	**$ 0.16**	**$ 0.21**	**$ 0.01**	**$ 0.03**	**$ (0.34)**
2014	**$ 0.09**	**$ (1.03)**	**$ (0.11)**	**$ 0.15**	**$ 0.22**	**$ 0.13**	**$ 0.07**	**$ 0.10**	**$ 0.12**	**$ 0.26**	**$ 0.07**	**$ 0.04**
2 yr avg differential (source: NGI)	$ (0.01)	$ (0.56)	$ (0.02)	$ 0.19	$ 0.21	$ 0.19	$ 0.14	$ 0.13	$ 0.16	$ 0.13	$ 0.05	$ (0.15)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	$ 2.79	$ 2.57	$ 2.12	$ 1.87	$ 2.23	$ 2.18	$ 2.59	$ 2.63	$ 2.70	$ 3.37	$ 3.54	$ 3.42
2013	$ 3.46	$ 3.38	$ 3.74	$ 3.94	$ 3.83	$ 3.59	$ 3.41	$ 3.25	$ 3.39	$ 3.66	$ 3.59	$ 4.56
2014	$ 4.51	$ 6.91	$ 4.88	$ 4.46	$ 4.34	$ 4.44	$ 3.97	$ 3.77	$ 3.78	$ 3.52	$ 4.00	$ 3.35
2015	$ 2.79	$ 2.24	$ 2.87	$ 2.64	$ 2.64	$ 2.71	$ 2.81	$ 2.83	$ 2.79	$ 2.84	$ 3.04	$ 3.42

2016	$ 3.42	$ 3.96	$ 3.39	$ 3.04	$ 3.02	$ 3.08	$ 3.17	$ 3.19	$ 3.14	$ 3.20	$ 3.36	$ 3.74
2017	$ 3.76	$ 4.29	$ 3.71	$ 3.30	$ 3.28	$ 3.34	$ 3.42	$ 3.44	$ 3.40	$ 3.45	$ 3.61	$ 3.97
2018	$ 3.97	$ 4.50	$ 3.90	$ 3.42	$ 3.40	$ 3.45	$ 3.53	$ 3.55	$ 3.51	$ 3.57	$ 3.73	$ 4.10
2019	$ 4.15	$ 4.76	$ 4.17	$ 3.73	$ 3.74	$ 3.84	$ 3.91	$ 3.95	$ 3.95	$ 4.02	$ 4.27	$ 4.55
2020	$ 5.00	$ 5.87	$ 5.02	$ 4.56	$ 4.57	$ 4.68	$ 4.65	$ 4.67	$ 4.68	$ 4.73	$ 5.04	$ 5.17

Socal Citygate

Updated February 17, 2015

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	$ 3.01	$ 2.85	$ 2.43	$ 2.33	$ 2.58	$ 2.70	$ 2.99	$ 3.06	$ 3.17	$ 3.66	$ 3.77	$ 3.67
2013	$ 3.63	$ 3.62	$ 4.00	$ 4.26	$ 4.21	$ 4.01	$ 3.88	$ 3.63	$ 3.84	$ 3.88	$ 3.83	$ 4.67
2014	$ 4.71	$ 6.34	$ 5.22	$ 4.85	$ 4.86	$ 4.94	$ 4.60	$ 4.39	$ 4.34	$ 4.01	$ 4.31	$ 3.64
2015	$ 3.09	$ 2.61	$ 2.94	$ 2.93	$ 2.95	$ 2.99	$ 3.14	$ 3.17	$ 3.15	$ 3.11	$ 3.28	$ 3.52
2016	$ 3.60	$ 3.59	$ 3.54	$ 3.37	$ 3.37	$ 3.42	$ 3.62	$ 3.63	$ 3.50	$ 3.48	$ 3.64	$ 3.82
2017	$ 4.02	$ 4.35	$ 3.98	$ 3.65	$ 3.60	$ 3.75	$ 3.94	$ 3.95	$ 3.88	$ 3.81	$ 3.90	$ 4.23
2018	$ 4.23	$ 4.56	$ 4.17	$ 3.77	$ 3.72	$ 3.86	$ 4.05	$ 4.06	$ 3.99	$ 3.92	$ 4.02	$ 4.35
2019	$ 4.41	$ 4.82	$ 4.44	$ 4.07	$ 4.06	$ 4.25	$ 4.43	$ 4.46	$ 4.43	$ 4.38	$ 4.56	$ 4.80
2020	$ 5.26	$ 5.93	$ 5.29	$ 4.91	$ 4.89	$ 5.09	$ 5.17	$ 5.17	$ 5.16	$ 5.09	$ 5.33	$ 5.42

Triennial Cost Allocation Proceeding

SERVICE AREA ECONOMIC FORECAST

Based on monthly data from eco1502m.xlsx, February 2015 forecast -- based on Global Insight's February 2015 Regional forecast
(Scott Wilder's workpapers for 2016 TCAP)

SOUTHERN CALIFORNIA GAS COMPANY SERVICE AREA ECONOMIC FORECAST

(forecast based on Global Insight's February 2015 Regional Forecasts)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
EMPLOYMENT (1000's)												
Total	7,963.9	7,858.4	7,913.5	8,117.0	8,348.4	8,514.7	8,690.2	8,861.4	8,986.5	9,068.5	9,156.3	9,264.4
Agriculture	208.0	216.7	221.5	227.8	234.0	232.9	240.2	245.2	247.6	248.3	248.9	250.0
Total Non-farm	7,755.9	7,641.7	7,692.0	7,889.2	8,114.4	8,281.7	8,450.0	8,616.2	8,739.0	8,820.2	8,907.4	9,014.4
Mining	18.4	18.7	20.7	22.6	22.5	22.9	21.8	21.3	22.5	23.2	23.7	23.9
Construction	318.9	285.6	287.5	301.8	325.8	346.5	369.4	393.1	422.4	449.7	469.7	489.6
Manufacturing	739.1	712.2	709.3	715.7	715.1	702.2	708.2	718.0	722.5	722.4	719.6	715.8
Transportation, Information, Utilities	499.9	492.4	492.3	500.4	515.3	529.9	546.0	558.4	564.5	570.9	576.3	583.1
Trade	1,328.1	1,320.7	1,340.6	1,373.2	1,407.3	1,431.0	1,456.6	1,477.7	1,487.8	1,492.0	1,497.5	1,502.4
Retail	911.0	906.3	920.3	939.9	957.5	975.3	991.3	1,001.5	1,001.7	998.7	997.2	996.1
Wholesale (including warehousing)	417.1	414.4	420.4	433.3	449.8	455.7	465.3	476.2	486.1	493.4	500.3	506.3
Restaurants	577.5	577.9	593.2	622.6	654.9	676.6	687.6	694.7	694.8	692.7	691.8	691.0
Finance, Insurance & Real Estate	423.5	412.2	411.2	417.6	423.6	420.5	425.6	428.2	422.7	416.1	414.2	414.4
Services	2,369.0	2,363.9	2,400.7	2,512.0	2,628.1	2,720.7	2,804.0	2,893.2	2,952.0	2,983.1	3,022.5	3,073.3
Accomodation	120.3	119.4	122.3	126.5	131.2	133.7	137.2	138.6	140.6	142.7	144.0	144.8
Personal & Laundry Services	80.1	79.7	80.8	84.6	88.2	90.6	91.0	91.0	90.5	90.1	89.8	89.7
Professional & Business Services	1,025.3	1,023.4	1,046.4	1,093.6	1,130.9	1,178.7	1,221.3	1,274.5	1,307.0	1,319.5	1,342.6	1,381.3
Health & Social Services	936.9	937.3	945.9	995.0	1,060.9	1,099.9	1,135.6	1,170.1	1,196.0	1,214.0	1,230.0	1,241.8
Misc. Services	206.5	204.1	205.3	212.2	217.0	217.9	218.9	218.9	217.8	216.8	216.1	215.7
Government & Education	1,481.5	1,458.2	1,436.4	1,423.4	1,421.8	1,431.5	1,430.8	1,431.6	1,449.8	1,470.1	1,492.1	1,520.9
OTHER												
Southern California Area Consumer Inflation*	-0.8%	1.2%	2.7%	2.0%	1.1%	1.3%	-0.5%	2.3%	2.7%	2.6%	2.5%	2.5%

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