EXH. CKC-5
DOCKETS UE-170033/UG-170034
2017 PSE GENERAL RATE CASE
WITNESS: DR. CHUN K. CHANG

BEFORE THE
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**Docket UE-170033** **Docket UG-170034**

SECOND EXHIBIT (NONCONFIDENTIAL) TO THE PREFILED REBUTTAL TESTIMONY OF

DR. CHUN K. CHANG

ON BEHALF OF PUGET SOUND ENERGY

AUGUST 9, 2017

Electric System Modeling Results

Dependent Variable: UPC
Method: Least Squares
Date: 02/12/16 Time: 14:07
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 17 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
JAN	50.04482	0.959077	52.18018	0.00E+00
FEB	52.28517	1.447831	36.11275	0
MAR	49.06692	0.764043	64.22012	0
APR	49.7785	0.633124	78.62367	0
MAY	50.06719	0.476874	104.9905	0
JUN	49.33959	0.434115	113.6555	0
JUL	48.74327	0.475223	102.5693	0.00E+00
AUG	48.65724	0.462099	105.296	0.00E+00
SEP	50.36678	0.416934	120.8028	0.00E+00
OCT	50.25625	0.625709	80.31894	0
NOV	49.66199	0.829412	59.87617	0.00E+00
DEC	54.30962	1.313243	41.35535	0
JAN*HDD65	0.797969	0.037291	21.39818	0.00E+00
FEB*HDD65	0.574906	0.076131	7.551535	0
FEB*HDD45	0.284234	0.108989	2.607916	9.20E-03
MAR*HDD65	0.642897	0.036634	17.54898	0
APR*HDD65	0.362573	0.035897	10.10029	0.00E+00
APR*HDD45	0.940059	0.305775	3.074351	2.10E-03
MAY*HDD65	0.121321	0.035014	3.464959	5.00E-04
OCT*HDD65	0.32525	0.049214	6.608904	0.00E+00
OCT*HDD45	0.910245	0.367954	2.4738	1.35E-02
NOV*HDD65	0.63385	0.047327	13.393	0.00E+00
NOV*HDD45	0.384407	0.084265	4.561903	0
DEC*HDD65	0.558944	0.068996	8.10111	0.00E+00
DEC*HDD45	0.388586	0.092876	4.183903	0
JUN*CDD60	0.266905	0.04296	6.212916	0.00E+00
JUL*CDD60	0.375932	0.030195	12.45032	0
AUG*CDD60	0.379031	0.033589	11.28434	0.00E+00
SEP*CDD60	0.168374	0.047477	3.546425	0.0004
WE	-3.90417	0.074408	-52.46992	0.00E+00
NYDY	-3.071094	0.585496	-5.245291	0.00E+00
XMASEV	-3.480217	0.639916	-5.438557	0.00E+00
XMASDY	-6.00448	0.733366	-8.187559	0
BOXDY	-3.488179	0.645138	-5.406874	0.00E+00
INDPDY	-2.977453	0.530244	-5.615253	0
MEMDY	-2.458436	0.529417	-4.643668	0
LABORDY	-2.745709	0.53666	-5.116289	0.00E+00
THNKSDY	-3.679177	0.606332	-6.067929	0
THNKSDYFA	-2.801993	0.635096	-4.411923	0.00E+00
D011912	-14.91872	1.2228	-12.20046	0.00E+00
D012012	-11.32502	1.206052	-9.390164	0.00E+00
D030814	6.473865	1.215636	5.325497	0.00E+00
D030914	-4.275816	1.20669	-3.543426	4.00E-04
AR(1)	0.762037	0.018115	42.06657	0.00E+00

R-squared	0.976259	Mean dependent var	5.62E+01
Adjusted R-squared	0.975538	S.D. dependent var	8.480457
S.E. of regression	1.326362	Akaike info criterion	3.43243
Sum squared resid	2491.077	Schwarz criterion	3.59174
Log likelihood	-2461.674	Hannan-Quinn criter.	3.491859
Durbin-Watson stat	2.061711		

Inverted AR Roots	0.76

Description of the Variables Included in the Electric System Model

JAN, FEB, …., NOV	Monthly Dummy Variables
CDD60	Cooling Degree Days at base temperature 60º F
HDD65	Heating Degree Days at base temperature 65º F
HDD45	Heating Degree Days at base temperature 45º F
WE	Weekend Dummy Variable
NYDY	New Year's Day Dummy Variable
XMASEV	Christmas Eve Dummy Variable
XMASDY	Christmas Day Dummy Variable
BOXDY	Day after Christmas Day Dummy Variable
INDPDY	Independence Day Dummy Variable
MEMDY	Memorial Day Dummy Variable
LABORDY	Labor Day Dummy Variable
THNKSDY	Thanksgiving Day Dummy Variable
THNKSDYFA	Friday after Thanksgiving Day Dummy Variable
TREND	Monthly Trend Variable (2012.01=1, 2012.02=2, etc.)
D(MM)(DD)(YY)	Daily Dummy Variable where (MM) is month, (DD) is date, and (YY) is year
AR(1)	The First-Order Autoregressive Term of Residuals

Electric Rate Schedule Modeling Results

Dependent Variable: UPC05
Method: Least Squares
Date: 02/24/16 Time: 16:51
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 13 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	36.3618	9.726433	3.738451	0.0002
SUN	33.44669	9.695032	3.449879	0.0006
JAN	2779.293	47.94336	57.97035	0
FEB	2652.297	46.90116	56.55077	0
MAR	2325.5	44.3491	52.43624	0
APR	1783.148	42.17136	42.2834	0
MAY	1408.085	36.97718	38.07985	0
JUN	1187.273	35.93986	33.035	0
JUL	1087.519	37.44258	29.04497	0
AUG	1068.705	37.57067	28.4452	0
SEP	1187.022	36.97494	32.10343	0
OCT	1513.105	40.19972	37.63967	0
NOV	2158.906	47.26021	45.68125	0
DEC	2721.803	49.7521	54.7073	0
HDD65	33.49334	1.763264	18.99508	0
HDD45	14.25358	3.329406	4.281117	0
CDD60	6.34614	2.093622	3.031178	0.0025
TREND	-4.122546	0.69732	-5.911983	0
AR(1)	0.597427	0.021528	27.75092	0

R-squared	0.979255	Mean dependent var	2160.097
Adjusted R-squared	0.978995	S.D. dependent var	985.849
S.E. of regression	142.8788	Akaike info criterion	12.7748
Sum squared resid	29417071	Schwarz criterion	12.84359
Log likelihood	-9306.603	Hannan-Quinn criter.	12.80046
Durbin-Watson stat	2.315238		

Inverted AR Roots	0.6

Dependent Variable: UPC07
Method: Least Squares
Date: 02/24/16 Time: 12:23
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 14 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	0.988781	0.108755	9.091789	0
SUN	1.573224	0.108753	14.466	0
HOL	2.159651	0.291991	7.396291	0
SEMHOL	1.206958	0.320628	3.764354	0.0002
JAN	29.37089	0.425631	69.00544	0
FEB	28.35257	0.417016	67.98916	0
MAR	26.11396	0.392099	66.60037	0
APR	23.19068	0.364751	63.57942	0
MAY	21.31079	0.30094	70.81401	0
JUN	21.54469	0.286187	75.28178	0
JUL	22.07272	0.303311	72.77269	0
AUG	21.94381	0.306223	71.6597	0
SEP	21.64667	0.291204	74.33515	0
OCT	23.6378	0.332102	71.17641	0
NOV	27.7615	0.412655	67.27534	0
DEC	31.32172	0.438625	71.40882	0
HDD65	0.452102	0.017591	25.70103	0
HDD45	0.326891	0.032372	10.09792	0
CDD60	0.371596	0.020849	17.82297	0
TREND	-0.028548	0.005127	-5.568564	0
AR(1)	0.42006	0.024029	17.48115	0

R-squared	0.961857	Mean dependent var	31.11712
Adjusted R-squared	0.961327	S.D. dependent var	7.624291
S.E. of regression	1.499345	Akaike info criterion	3.662213
Sum squared resid	3234.923	Schwarz criterion	3.738247
Log likelihood	-2652.415	Hannan-Quinn criter.	3.690577
Durbin-Watson stat	2.116963		

Inverted AR Roots	0.42

Dependent Variable: UPC08
Method: Least Squares
Date: 02/24/16 Time: 16:54
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
JAN	23.62052	0.64288	36.74174	0
FEB	23.336	0.630986	36.98338	0
MAR	21.79426	0.591748	36.83033	0
APR	19.41011	0.540152	35.93453	0
MAY	18.57928	0.418085	44.43903	0
JUN	19.18107	0.386877	49.57932	0
JUL	19.44967	0.419254	46.39114	0
AUG	19.82027	0.427875	46.3226	0
SEP	20.10935	0.387602	51.88148	0
OCT	19.68551	0.471704	41.73278	0
NOV	22.23354	0.616256	36.07839	0
DEC	24.21886	0.659434	36.72672	0
HDD65	0.208766	0.028996	7.199765	0
HDD45	0.196215	0.051681	3.796631	0.0002
CDD60	0.157158	0.034233	4.590834	0
TREND	-0.029014	0.006451	-4.497653	0
AR(1)	0.051228	0.02635	1.944113	0.0521

R-squared	0.606239	Mean dependent var	23.2816
Adjusted R-squared	0.601873	S.D. dependent var	4.836904
S.E. of regression	3.051957	Akaike info criterion	5.081019
Sum squared resid	13440.74	Schwarz criterion	5.14257
Log likelihood	-3692.144	Hannan-Quinn criter.	5.10398
Durbin-Watson stat	2.005337		

Inverted AR Roots	0.05

Dependent Variable: UPC10
Method: Least Squares
Date: 02/24/16 Time: 12:28
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	-51.53372	36.57329	-1.409053	0.159
SUN	-224.9084	36.46637	-6.167556	0
JAN	8482.758	245.6735	34.52859	0
FEB	8374.648	240.0143	34.89229	0
MAR	8001.178	229.9446	34.79611	0
APR	6197.612	225.1773	27.52326	0
MAY	7185.363	212.0623	33.88327	0
JUN	6957.863	210.9941	32.97657	0
JUL	6902.964	216.5575	31.87589	0
AUG	6947.009	217.176	31.98792	0
SEP	7227.859	219.9376	32.86322	0
OCT	7689.699	228.6029	33.6378	0
NOV	8237.528	249.892	32.96436	0
DEC	8629.169	256.6082	33.6278	0
HDD65	50.77416	7.117916	7.13329	0
HDD45	56.62076	13.76066	4.114682	0
CDD60	60.71718	8.441615	7.192602	0
TREND	-13.92403	4.709225	-2.956756	0.0032
AR(1)	0.762645	0.017157	44.44995	0

R-squared	0.858968	Mean dependent var	7983.155
Adjusted R-squared	0.857206	S.D. dependent var	1521.741
S.E. of regression	575.0371	Akaike info criterion	15.55967
Sum squared resid	4.76E+08	Schwarz criterion	15.62847
Log likelihood	-11339.56	Hannan-Quinn criter.	15.58534
Durbin-Watson stat	2.489908		

Inverted AR Roots	0.76

Dependent Variable: UPC11
Method: Least Squares
Date: 02/24/16 Time: 12:38
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 15 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	-24.96602	2.747781	-9.085885	0
SUN	-44.92523	2.752821	-16.31971	0
HOL	-30.28975	7.383307	-4.102464	0
SEMHOL	-1.742902	8.09709	-0.21525	0.8296
JAN	1293.746	11.71654	110.4204	0
FEB	1261.139	11.47246	109.9275	0
MAR	1194.938	10.79937	110.6489	0
APR	1123.875	10.12309	111.0208	0
MAY	1079.639	8.530699	126.5593	0
JUN	1097.165	8.182386	134.0887	0
JUL	1145.44	8.615561	132.9501	0
AUG	1145.819	8.674512	132.0903	0
SEP	1130.353	8.36254	135.1687	0
OCT	1181.817	9.357415	126.2974	0
NOV	1259.291	11.41491	110.3198	0
DEC	1306.06	12.0953	107.9808	0
HDD65	7.341288	0.466827	15.72593	0
HDD45	13.80282	0.867205	15.91645	0
CDD60	11.23635	0.554008	20.28192	0
TREND	-0.661002	0.150633	-4.388157	0
AR(1)	0.491627	0.023122	21.26261	0

R-squared	0.940676	Mean dependent var	1284.396
Adjusted R-squared	0.939851	S.D. dependent var	157.9826
S.E. of regression	38.74568	Akaike info criterion	10.16619
Sum squared resid	2160266	Schwarz criterion	10.24223
Log likelihood	-7400.322	Hannan-Quinn criter.	10.19456
Durbin-Watson stat	2.158807		

Inverted AR Roots	0.49

Dependent Variable: UPC12
Method: Least Squares
Date: 02/24/16 Time: 12:42
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 12 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	-150.2302	13.3055	-11.29083	0
SUN	-234.2734	13.34358	-17.55702	0
HOL	-159.9692	35.67347	-4.484263	0
SEMHOL	-15.24948	38.81256	-0.392901	0.6945
JAN	3597.732	76.55677	46.9943	0
FEB	3480.323	74.95639	46.43131	0
MAR	3348.87	70.63381	47.41171	0
APR	2995.836	67.97105	44.07518	0
MAY	3021.327	61.9773	48.74893	0
JUN	3074.944	61.08942	50.33513	0
JUL	3703.31	63.40875	58.40377	0
AUG	3370.943	61.63362	54.69326	0
SEP	3144.943	61.09387	51.47722	0
OCT	3131.751	63.24971	49.51408	0
NOV	3388.828	71.35528	47.49232	0
DEC	3564.752	74.55178	47.81579	0
HDD65	42.30915	2.553227	16.57086	0
HDD45	46.64036	4.924733	9.470638	0
CDD60	41.31019	3.034207	13.61482	0
AR(1)	0.742263	0.018653	39.79218	0

R-squared	0.918249	Mean dependent var	3906.587
Adjusted R-squared	0.91717	S.D. dependent var	715.5324
S.E. of regression	205.9317	Akaike info criterion	13.50657
Sum squared resid	61067302	Schwarz criterion	13.57898
Log likelihood	-9839.796	Hannan-Quinn criter.	13.53358
Durbin-Watson stat	2.206139		

Inverted AR Roots	0.74

Dependent Variable: UPC24
Method: Least Squares
Date: 02/24/16 Time: 15:23
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 10 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	-11.19965	0.222442	-50.34872	0
SUN	-15.83062	0.222312	-71.20896	0
HOL	-16.41478	0.602529	-27.24315	0
SEMHOL	-5.381585	0.663026	-8.116702	0
JAN	92.74378	0.802139	115.6206	0
FEB	91.78658	0.786942	116.637	0
MAR	88.05777	0.739515	119.0751	0
APR	84.85629	0.683247	124.1956	0
MAY	82.70597	0.553294	149.4792	0
JUN	83.85021	0.522222	160.5643	0
JUL	85.51959	0.556635	153.6368	0
AUG	86.07723	0.563727	152.693	0
SEP	84.44981	0.52912	159.6044	0
OCT	85.1248	0.614154	138.6051	0
NOV	90.01435	0.775449	116.0804	0
DEC	93.05738	0.826679	112.5677	0
HDD65	0.324502	0.034133	9.506926	0
HDD45	0.696869	0.062238	11.19691	0
CDD60	0.811979	0.040391	20.10306	0
TREND	-0.233684	0.009133	-25.58735	0
AR(1)	0.344282	0.025209	13.65727	0

R-squared	0.91896	Mean dependent var	83.72222
Adjusted R-squared	0.917833	S.D. dependent var	10.50277
S.E. of regression	3.010594	Akaike info criterion	5.056431
Sum squared resid	13042.63	Schwarz criterion	5.132465
Log likelihood	-3670.195	Hannan-Quinn criter.	5.084795
Durbin-Watson stat	2.124895		

Inverted AR Roots	0.34

Dependent Variable: UPC25
Method: Least Squares
Date: 02/24/16 Time: 15:32
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	-205.9786	4.152868	-49.59912	0
SUN	-260.4318	4.159767	-62.6073	0
HOL	-220.6109	11.10682	-19.86264	0
SEMHOL	-45.33514	12.08311	-3.751942	0.0002
JAN	1307.287	24.92308	52.45287	0
FEB	1174.002	24.24862	48.41521	0
MAR	1166.141	23.13661	50.40242	0
APR	1142.946	22.88635	49.94007	0
MAY	1141.19	22.39702	50.95278	0
JUN	1145.209	22.80579	50.21573	0
JUL	1151.868	23.53214	48.94873	0
AUG	1152.874	23.68471	48.67589	0
SEP	1161.285	23.70349	48.99216	0
OCT	1159.841	23.98172	48.36354	0
NOV	1184.927	25.56093	46.35697	0
DEC	1208.102	26.15779	46.18516	0
HDD55	2.318917	1.10202	2.104241	0.0355
HDD45	6.610036	1.788787	3.695261	0.0002
CDD60	8.287884	0.881835	9.398454	0
TREND	-1.804721	0.519617	-3.473174	0.0005
AR(1)	0.758412	0.017852	42.48341	0

R-squared	0.840785	Mean dependent var	1095.466
Adjusted R-squared	0.838572	S.D. dependent var	160.5686
S.E. of regression	64.51343	Akaike info criterion	11.1859
Sum squared resid	5989093	Schwarz criterion	11.26194
Log likelihood	-8144.709	Hannan-Quinn criter.	11.21427
Durbin-Watson stat	1.933825		

Inverted AR Roots	0.76

Dependent Variable: UPC26
Method: Least Squares
Date: 02/24/16 Time: 15:37
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 10 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	-1135.073	12.42349	-91.36504	0
SUN	-1400.686	12.34544	-113.4577	0
HOL	-1258.05	32.96718	-38.16068	0
SEMHOL	-500.4029	36.17705	-13.83205	0
JAN	6808.874	33.24269	204.8232	0
FEB	6699.657	32.35305	207.0796	0
MAR	6635.634	31.07524	213.5345	0
APR	6595.452	31.37328	210.2252	0
MAY	6618.236	31.3347	211.2111	0
JUN	6727.831	32.49795	207.0232	0
JUL	6811.569	35.26062	193.1778	0
AUG	6869.113	35.6969	192.4289	0
SEP	6834.153	33.29166	205.2812	0
OCT	6706.092	32.88162	203.9465	0
NOV	6730.367	34.48901	195.1453	0
DEC	6749.127	35.78525	188.6008	0
HDD45	15.19138	2.77425	5.475852	0
CDD60	46.89733	2.231966	21.01167	0
TREND	-5.242453	0.634197	-8.266286	0
AR(1)	0.472944	0.024472	19.32591	0

R-squared	0.938552	Mean dependent var	6325.473
Adjusted R-squared	0.937741	S.D. dependent var	681.1008
S.E. of regression	169.9463	Akaike info criterion	13.12245
Sum squared resid	41589715	Schwarz criterion	13.19486
Log likelihood	-9559.386	Hannan-Quinn criter.	13.14946
Durbin-Watson stat	2.07209		

Inverted AR Roots	0.47

Dependent Variable: UPC29
Method: Least Squares
Date: 03/08/16 Time: 14:59
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 5 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	-14.40129	6.004181	-2.398544	0.0166
SUN	-24.06262	5.988629	-4.018052	0.0001
JAN	39.39844	8.500467	4.634856	0
FEB	32.53224	8.854542	3.674074	0.0002
MAR	50.36856	8.488522	5.933725	0
APR	61.22902	8.59534	7.123513	0
MAY	99.9724	8.52255	11.73034	0
JUN	118.1494	9.124359	12.94879	0
JUL	171.1239	10.64424	16.07668	0
AUG	174.9071	10.90884	16.03352	0
SEP	100.069	8.988693	11.13277	0
OCT	60.28895	8.453599	7.13175	0
NOV	70.7334	8.616248	8.209304	0
DEC	51.1439	8.461839	6.044065	0
CDD60	3.708175	0.867275	4.275663	0
AR(1)	0.150161	0.026091	5.755306	0

R-squared	0.363041	Mean dependent var	88.0494
Adjusted R-squared	0.356425	S.D. dependent var	99.25239
S.E. of regression	79.62339	Akaike info criterion	11.60339
Sum squared resid	9154792	Schwarz criterion	11.66132
Log likelihood	-8454.476	Hannan-Quinn criter.	11.625
Durbin-Watson stat	2.020064		

Inverted AR Roots	0.15

Dependent Variable: UPC31
Method: Least Squares
Date: 02/24/16 Time: 16:23
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	-1578.303	18.32744	-86.11693	0
SUN	-1970.364	18.24563	-107.991	0
HOL	-1778.093	47.99372	-37.04845	0
SEMHOL	-1081.992	52.52745	-20.5986	0
JAN	7827.831	62.75171	124.7429	0
FEB	7771.586	61.16447	127.0605	0
MAR	7534.808	59.3051	127.0516	0
APR	7663.809	59.90879	127.9246	0
MAY	7367.687	59.93443	122.9291	0
JUN	7371.929	61.76387	119.3567	0
JUL	7434.878	65.51132	113.49	0
AUG	7466.385	66.10862	112.9412	0
SEP	7654.293	63.59394	120.362	0
OCT	7526.655	63.10994	119.2626	0
NOV	7497.736	65.79803	113.9508	0
DEC	7485.076	67.4644	110.9485	0
HDD45	21.16848	4.582104	4.619818	0
CDD60	32.29748	3.529692	9.150224	0
TREND	2.017388	1.25521	1.607211	0.1082
AR(1)	0.594706	0.022454	26.48577	0

R-squared	0.928941	Mean dependent var	7137.389
Adjusted R-squared	0.928004	S.D. dependent var	968.1842
S.E. of regression	259.7843	Akaike info criterion	13.97118
Sum squared resid	97182555	Schwarz criterion	14.0436
Log likelihood	-10178.96	Hannan-Quinn criter.	13.9982
Durbin-Watson stat	1.997978		

Inverted AR Roots	0.59

Dependent Variable: UPC4025
Method: Least Squares
Date: 02/24/16 Time: 16:29
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 8 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	-259.0082	3.790231	-68.33573	0
SUN	-266.7663	3.791948	-70.35072	0
HOL	-200.3581	10.08139	-19.87406	0
SEMHOL	-91.28916	11.00838	-8.292695	0
JAN	1447.237	17.91878	80.76645	0
FEB	1433.715	17.41262	82.3377	0
MAR	1430.369	16.4482	86.96203	0
APR	1417.975	16.0734	88.21876	0
MAY	1379.833	15.3571	89.84984	0
JUN	1323.086	15.68576	84.34949	0
JUL	1389.042	16.41597	84.61527	0
AUG	1332.239	16.50586	80.7131	0
SEP	1329.56	16.20853	82.02844	0
OCT	1347.754	16.3802	82.27948	0
NOV	1371.403	18.0695	75.89603	0
DEC	1380.118	18.86849	73.14407	0
HDD55	7.699998	0.972151	7.920578	0
HDD45	5.83812	1.565293	3.729731	0.0002
CDD60	7.342016	0.77372	9.489239	0
TREND	-4.098599	0.331538	-12.36238	0
AR(1)	0.666663	0.020096	33.17319	0

R-squared	0.900496	Mean dependent var	1262.566
Adjusted R-squared	0.899113	S.D. dependent var	177.6834
S.E. of regression	56.43704	Akaike info criterion	10.91841
Sum squared resid	4583415	Schwarz criterion	10.99444
Log likelihood	-7949.437	Hannan-Quinn criter.	10.94677
Durbin-Watson stat	2.510989		

Inverted AR Roots	0.67

Dependent Variable: UPC4026
Method: Least Squares
Date: 02/24/16 Time: 16:27
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 6 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	-1403.862	38.97741	-36.01733	0
SUN	-1495.097	38.91342	-38.42112	0
HOL	-1076.225	105.8741	-10.16515	0
SEMHOL	-435.0666	116.3191	-3.740286	0.0002
JAN	12588.54	73.05936	172.3056	0
FEB	12578.49	70.43751	178.5766	0
MAR	12567.56	67.05414	187.4241	0
APR	12052.14	67.58648	178.3218	0
MAY	12364.07	67.38191	183.4924	0
JUN	12517.22	70.63068	177.2208	0
JUL	12677.25	79.32301	159.818	0
AUG	12646.48	81.09168	155.9529	0
SEP	12617.29	71.90221	175.4785	0
OCT	12505.03	70.47623	177.4361	0
NOV	12473.41	74.60515	167.1923	0
DEC	12576.32	78.68421	159.8328	0
HDD45	61.96409	6.938535	8.930429	0
CDD60	75.89806	5.986616	12.67796	0
TREND	-53.20138	1.325019	-40.15142	0
AR(1)	0.226222	0.025756	8.78328	0

R-squared	0.806513	Mean dependent var	10993.23
Adjusted R-squared	0.80396	S.D. dependent var	1169.778
S.E. of regression	517.9363	Akaike info criterion	15.35119
Sum squared resid	3.86E+08	Schwarz criterion	15.4236
Log likelihood	-11186.37	Hannan-Quinn criter.	15.3782
Durbin-Watson stat	2.107161		

Inverted AR Roots	0.23

Dependent Variable: UPC4031
Method: Least Squares
Date: 02/24/16 Time: 16:42
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 7 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	-3573.01	122.0294	-29.27992	0
SUN	-4005.217	121.5177	-32.95995	0
HOL	-3548.78	331.8341	-10.69444	0
SEMHOL	-2464.198	362.8073	-6.792029	0
JAN	37879.53	235.2485	161.0192	0
FEB	37605.01	227.1	165.5879	0
MAR	38057.71	216.1944	176.0346	0
APR	38397.17	217.9664	176.161	0
MAY	38082.5	217.3813	175.1875	0
JUN	38800.73	227.6246	170.4593	0
JUL	39192.36	255.0457	153.668	0
AUG	39873.07	260.451	153.0924	0
SEP	39153.11	231.8107	168.9012	0
OCT	38260.65	227.3426	168.2951	0
NOV	38234.07	240.6589	158.8725	0
DEC	37700.83	253.4849	148.7301	0
HDD45	73.30794	22.16963	3.306683	0.001
CDD60	192.563	19.01613	10.1263	0
TREND	-103.1039	4.28115	-24.08322	0
AR(1)	0.251406	0.02596	9.684337	0

R-squared	0.72151	Mean dependent var	35204.58
Adjusted R-squared	0.717835	S.D. dependent var	3049.428
S.E. of regression	1619.831	Akaike info criterion	17.63163
Sum squared resid	3.78E+09	Schwarz criterion	17.70405
Log likelihood	-12851.09	Hannan-Quinn criter.	17.65865
Durbin-Watson stat	2.112141		

Inverted AR Roots	0.25

Dependent Variable: UPC43
Method: Least Squares
Date: 02/24/16 Time: 16:44
Sample (adjusted): 1/02/2012 12/31/2015
Included observations: 1460 after adjustments
Convergence achieved after 10 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
SAT	-1184.321	23.21031	-51.02564	0
SUN	-1215.246	23.21772	-52.34132	0
HOL	-793.0201	61.99845	-12.79097	0
SEMHOL	-756.1445	68.16606	-11.09268	0
JAN	2628.661	102.1038	25.74499	0
FEB	2517.021	100.0354	25.1613	0
MAR	2338.809	94.32734	24.79461	0
APR	2141.248	88.71203	24.13707	0
MAY	1892.37	75.5786	25.03843	0
JUN	1659.943	72.7819	22.80709	0
JUL	1243.293	76.39519	16.2745	0
AUG	1447.027	76.80102	18.84125	0
SEP	1866.984	74.54949	25.04355	0
OCT	2013.424	82.65271	24.36004	0
NOV	2291.304	99.88453	22.93953	0
DEC	2362.717	105.6792	22.35744	0
HDD65	32.19862	3.992834	8.064103	0
HDD45	62.55843	7.452588	8.394188	0
CDD60	21.10975	4.736711	4.456625	0
TREND	-3.153869	1.357896	-2.322615	0.0203
AR(1)	0.522748	0.022888	22.83909	0

R-squared	0.894869	Mean dependent var	2089.613
Adjusted R-squared	0.893407	S.D. dependent var	1005.99
S.E. of regression	328.4408	Akaike info criterion	14.44087
Sum squared resid	1.55E+08	Schwarz criterion	14.5169
Log likelihood	-10520.83	Hannan-Quinn criter.	14.46923
Durbin-Watson stat	1.853887		

Inverted AR Roots	0.52

Description of the Variables Included in the Electric Rate Schedule Models

JAN, FEB, …., DEC	Monthly Dummy Variables
SAT	Saturday Dummy Variable
SUN	Sunday Dummy Variable
HOL	Holiday Dummy Variable
SEMHOL	Semi-Holiday Dummy Variable (The day after Thanksgiving; Christmas Eve)
HDD65	Heating Degree Days at base temperature 65º F
HDD55	Heating Degree Days at base temp 55º F
HDD45	Cooling Degree Days at base temp 45º F
CDD60	Cooling Degree Days at base temp 60º F
TREND	Monthly Trend Variable (2012.01=1, 2012.02=2, etc.)
AR(1)	The First-Order Autoregressive Term of Residuals