

Chapter 3 – Appendix A

Weather Normalized Energy Models¹

Residential Weather Normalization Energy Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	81,884,501	2,029,560	40.35	0.00%
DOWBinary.Monday	-1,903,214	233,954	-8.14	0.00%
DOWBinary.Tuesday	-2,048,085	232,467	-8.81	0.00%
DOWBinary.Wednesday	-1,808,305	228,732	-7.91	0.00%
DOWBinary.Thursday	-1,797,965	234,403	-7.67	0.00%
DOWBinary.Friday	-1,760,050	230,841	-7.63	0.00%
DOWBinary.Saturday	-867,956	225,654	-3.85	0.01%
MonthBinary.Jan	4,160,028	316,031	13.16	0.00%
MonthBinary.Feb	3,996,584	323,862	12.34	0.00%
MonthBinary.Mar	1,096,129	277,190	3.95	0.01%
MonthBinary.Apr	-2,335,049	297,999	-7.84	0.00%
MonthBinary.May	-2,978,956	269,815	-11.04	0.00%
MonthBinary.Jul	876,265	294,030	2.98	0.30%
MonthBinary.Aug	636,910	281,343	2.26	2.38%
MonthBinary.Sep	-1,777,380	275,079	-6.46	0.00%
MonthBinary.Oct	-2,132,275	270,313	-7.89	0.00%
MonthBinary.Dec	3,154,991	298,514	10.57	0.00%
ResSplines.AvgT	-2,148,540	233,279	-9.21	0.00%
ResSplines.XColdAvgT	1,342,900	238,164	5.64	0.00%
ResSplines.CoolAvgT	238,371	31,836	7.49	0.00%
ResSplines.MILDAvgT	533,553	69,551	7.67	0.00%
ResSplines.WarmAvgT	959,194	97,208	9.87	0.00%
ResSplines.HotAvgT	564,120	69,253	8.15	0.00%
ResSplines.ShoulderWarm	-360,625	114,931	-3.14	0.18%
US_Holidays.RES_HolidaysX	1,711,395	338,321	5.06	0.00%
GMI_Transform.MO_Residential	140,532	14,587	9.63	0.00%

¹ 20 CSR 4240-22.030(2)(C)3

Residential Weather Normalization Energy Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	1096
Deg. of Freedom for Error	1070
R-Squared	0.96
Adjusted R-Squared	0.96
F-Statistic	1062.88
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	4.14%
Durbin-Watson Statistic	1.13

Commercial SGS Weather Normalization Energy Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	13,683,219	156,480	87.44	0.00%
DOWBinary.MonFri	960,971	114,698	8.38	0.00%
DOWBinary.TWT	1,129,287	115,704	9.76	0.00%
MonthBinary.Feb	271,633	70,145	3.87	0.01%
MonthBinary.Mar	130,671	67,098	1.95	5.19%
MonthBinary.May	-315,476	72,892	-4.33	0.00%
MonthBinary.Jun	-360,685	62,212	-5.80	0.00%
MonthBinary.Oct	-271,245	65,581	-4.14	0.00%
MonthBinary.Nov	137,405	81,998	1.68	9.42%
COMSGSSplines.AvgT	-139,999	3,492	-40.09	0.00%
COMSGSSplines.CoolAvgT	31,896	9,420	3.39	0.08%
COMSGSSplines.MildAvgT	114,858	15,205	7.55	0.00%
COMSGSSplines.WarmAvgT	114,993	20,497	5.61	0.00%
COMSGSSplines.HotAvgT	119,810	16,744	7.16	0.00%
COMSGSSplines.WkndAvgT	-6,178	1,821	-3.39	0.07%
COMSGSSplines.ShoulderAvgT	-6,132	1,341	-4.57	0.00%
US_Holidays.ComSGS_HolidayX	-596,732	121,284	-4.92	0.00%
GMI_Transform.MO_Workspaces	11,508	2,163	5.32	0.00%
MonthBinary.COVID_April_May2020	-557,561	84,421	-6.61	0.00%

Note: Some of the explanatory variables were retained in the model despite being only marginally statistically significant ($p\text{-value} > .05$). The direction and magnitude of the coefficient are reasonable, the standard error is consistent with other variables, and the interpretation of all the weather variables is cleaner with the inclusion of this variable.

ComSGS Weather Normalization Energy Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	730
Deg. of Freedom for Error	711
R-Squared	0.94
Adjusted R-Squared	0.94
F-Statistic	613.29
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	3.87%
Durbin-Watson Statistic	1.01

ComLGS Weather Normalization Energy Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	22,719,487	221,548	102.55	0.00%
DOWBinary.Monday	3,159,894	93,125	33.93	0.00%
DOWBinary.TWT	3,204,393	81,147	39.49	0.00%
DOWBinary.Friday	2,584,051	85,725	30.14	0.00%
DOWBinary.Saturday	622,492	75,228	8.28	0.00%
MonthBinary.May	526,856	91,534	5.76	0.00%
MonthBinary.Jun	-953,001	80,997	-11.77	0.00%
MonthBinary.Oct	839,881	85,731	9.80	0.00%
COMLGSSplines.AvgT	-189,682	6,262	-30.29	0.00%
COMLGSSplines.CoolAvgT	31,889	9,009	3.54	0.04%
COMLGSSplines.WarmAvgT	193,423	9,222	20.98	0.00%
COMLGSSplines.HotAvgT	202,991	11,324	17.93	0.00%
COMLGSSplines.SummerAvgT	31,712	1,454	21.81	0.00%
COMLGSSplines.WkdayWarmAvgT	51,377	4,148	12.39	0.00%
GMI_Transform.MO_Workspaces	33,020	2,561	12.90	0.00%
US_Holidays.July4thHol	-1,302,451	397,110	-3.28	0.11%
US_Holidays.MemorialDay	-2,096,004	407,515	-5.14	0.00%
US_Holidays.LaborDay	-2,328,396	403,637	-5.77	0.00%
US_Holidays.Thanksgiving	-1,333,772	410,505	-3.25	0.12%
MonthBinary.Yr2021_Shift	523,006	47,745	10.95	0.00%

ComLGS Weather Normalization Energy Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	730
Deg. of Freedom for Error	710
R-Squared	0.96
Adjusted R-Squared	0.96
F-Statistic	826.67
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	2.41%
Durbin-Watson Statistic	1.01

ComSPS Weather Normalization Energy Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	7,936,270	85,453	92.87	0.00%
DOWBinary.Friday	-136,196	23,470	-5.80	0.00%
DOWBinary.Saturday	-652,842	27,591	-23.66	0.00%
DOWBinary.Sunday	-729,559	26,591	-27.44	0.00%
COMSPSSplines.AvgT	-34,755	1,954	-17.79	0.00%
COMSPSSplines.CoolAvgT	40,156	2,866	14.01	0.00%
COMSPSSplines.MildAvgT	37,349	10,003	3.73	0.02%
COMSPSSplines.WarmAvgT	26,530	10,591	2.51	1.25%
COMSPSSplines.SummerAvgT	1,099	619	1.78	7.63%
US_Holidays.ComSPS_HolidayX	-137,494	36,659	-3.75	0.02%
GMI_Transform.MO_Workspaces	7,763	959	8.10	0.00%
MonthBinary.Jan	175,829	34,950	5.03	0.00%
MonthBinary.Feb	394,181	37,687	10.46	0.00%
MonthBinary.Apr	-84,959	32,633	-2.60	0.94%
MonthBinary.May	-130,863	33,862	-3.87	0.01%
MonthBinary.Jul	377,206	36,809	10.25	0.00%
MonthBinary.Aug	219,561	36,202	6.07	0.00%
MonthBinary.Sep	157,569	38,303	4.11	0.00%
MonthBinary.Nov	96,575	30,189	3.20	0.15%

Note: One of the explanatory variables were retained in the model despite being only marginally statistically significant (p-value>.05). The direction and magnitude of the coefficient are reasonable, the standard error is consistent with other variables, and the interpretation of all the weather variables is cleaner with the inclusion of this variable.

Com SPS Weather Normalization Energy Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	730
Deg. of Freedom for Error	711
R-Squared	0.92
Adjusted R-Squared	0.91
F-Statistic	424.03
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	2.35%
Durbin-Watson Statistic	0.79

Com LPS Weather Normalization Energy Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	3,412,149	40,091	85.11	0.00%
DOWBinary.Saturday	-122,467	17,742	-6.90	0.00%
DOWBinary.Sunday	-160,788	17,781	-9.04	0.00%
MonthBinary.Jan	-332,997	25,846	-12.88	0.00%
MonthBinary.Jul	65,261	27,302	2.39	1.71%
MonthBinary.Aug	120,892	26,378	4.58	0.00%
MonthBinary.Oct	65,689	23,069	2.85	0.45%
MonthBinary.Dec	35,992	23,796	1.51	13.09%
MonthBinary.apr2020	-137,003	31,862	-4.30	0.00%
COMLPSSplines.AvgT	3,849	881	4.37	0.00%
COMLPSSplines.HotAvgT	20,570	3,280	6.27	0.00%
COMLPSSplines.WarmAvgT	18,941	2,145	8.83	0.00%
US_Holidays.ComLPS_HolidayX	-73,241	30,663	-2.39	1.72%
MonthBinary.Customer_Com_Outage	-397,869	39,291	-10.13	0.00%

Note: One of the explanatory variables were retained in the model despite being only marginally statistically significant (p-value>.05). The direction and magnitude of the coefficient are reasonable, the standard error is consistent with other variables, and the interpretation of all the weather variables is cleaner with the inclusion of this variable.

Com LPS Weather Normalization Energy Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	730
Deg. of Freedom for Error	716
R-Squared	0.88
Adjusted R-Squared	0.88
F-Statistic	417.978
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	3.31%
Durbin-Watson Statistic	0.58

Ind SGS Weather Normalization Energy Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	322,533	6,257	51.55	0.00%
DOWBinary.Monday	75,369	3,093	24.37	0.00%
DOWBinary.Tuesday	77,520	3,093	25.06	0.00%
DOWBinary.Wednesday	75,696	3,094	24.47	0.00%
DOWBinary.Thursday	75,090	3,093	24.28	0.00%
DOWBinary.Friday	65,726	3,105	21.17	0.00%
DOWBinary.Sunday	-12,561	3,086	-4.07	0.01%
MonthBinary.Feb	7,406	3,767	1.97	4.97%
MonthBinary.May	-10,941	3,457	-3.17	0.16%
MonthBinary.Oct	38,730	3,213	12.06	0.00%
MonthBinary.Nov	69,488	3,361	20.68	0.00%
MonthBinary.Dec	28,347	3,328	8.52	0.00%
INDSGSSplines.AvgT	-3,657	140	-26.08	0.00%
INDSGSSplines.MILDAvgT	2,639	269	9.80	0.00%
INDSGSSplines.WarmAvgT	6,700	401	16.70	0.00%
US_Holidays.IndSGS_HolidayX	-43,287	4,861	-8.91	0.00%
US_Holidays.July4thHol	-55,840	16,607	-3.36	0.08%
MonthBinary.Jul_2020	12,502	4,488	2.79	0.55%
MonthBinary.COVID_IndSGS	-8,280	3,476	-2.38	1.74%

Ind SGS Weather Normalization Energy Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	730
Deg. of Freedom for Error	711
R-Squared	0.85
Adjusted R-Squared	0.85
F-Statistic	227.84
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	8.33%
Durbin-Watson Statistic	1.25

Ind LGS Weather Normalization Energy Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	1,510,923	17,611	85.79	0.00%
DOWBinary.TWT	805,038	21,106	38.14	0.00%
DOWBinary.MonFri	689,700	20,350	33.89	0.00%
MonthBinary.Jan	147,625	25,615	5.76	0.00%
MonthBinary.Feb	95,073	26,588	3.58	0.04%
MonthBinary.May	46,972	26,146	1.80	7.28%
MonthBinary.Jun	139,444	30,760	4.53	0.00%
MonthBinary.Jul	345,825	34,650	9.98	0.00%
MonthBinary.Aug	272,775	31,322	8.71	0.00%
MonthBinary.Sep	207,351	26,781	7.74	0.00%
MonthBinary.Nov	136,368	27,403	4.98	0.00%
INDLGSSplines.HotAvgT	9,778	3,219	3.04	0.25%
GMI_Transform.MO_Workspaces	3,935	821	4.79	0.00%
US_Holidays.NYHol	-639,364	132,869	-4.81	0.00%
US_Holidays.GoodFridays	-933,956	127,458	-7.33	0.00%
US_Holidays.MemorialDay	-1,031,656	134,139	-7.69	0.00%
US_Holidays.LaborDay	-928,377	135,757	-6.84	0.00%
US_Holidays.WedB4Thanks	-397,861	128,922	-3.09	0.21%
US_Holidays.Thanksgiving	-1,169,310	137,451	-8.51	0.00%
US_Holidays.FriAftThanks	-1,080,303	131,934	-8.19	0.00%
US_Holidays.SatAftThanks	-414,986	128,826	-3.22	0.13%
US_Holidays.XMasEve	-755,682	128,174	-5.90	0.00%
US_Holidays.XMasHol	-890,474	133,529	-6.67	0.00%
US_Holidays.XMASAft	-285,207	54,875	-5.20	0.00%
US_Holidays.July4Total	-831,551	93,866	-8.86	0.00%

Note: One of the explanatory variables were retained in the model despite being only marginally statistically significant ($p\text{-value} > .05$). The direction and magnitude of the coefficient are reasonable, the standard error is consistent with other variables, and the interpretation of all the weather variables is cleaner with the inclusion of this variable.

Ind LGS Weather Normalization Energy Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	730
Deg. of Freedom for Error	705
R-Squared	0.83
Adjusted R-Squared	0.82
F-Statistic	141.10
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	7.48%
Durbin-Watson Statistic	1.34

Ind SPS Weather Normalization Energy Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	3,305,208	35,233	93.81	0.00%
DOWBinary.Tuesday	155,332	18,949	8.20	0.00%
DOWBinary.Wednesday	166,713	18,904	8.82	0.00%
DOWBinary.Thursday	109,051	18,890	5.77	0.00%
DOWBinary.Saturday	-481,993	18,942	-25.45	0.00%
DOWBinary.Sunday	-665,778	18,970	-35.10	0.00%
MonthBinary.Feb	84,728	25,700	3.30	0.10%
MonthBinary.May	80,096	25,398	3.15	0.17%
MonthBinary.Jun	77,580	33,540	2.31	2.10%
MonthBinary.Jul	85,670	35,940	2.38	1.74%
MonthBinary.Aug	244,663	34,021	7.19	0.00%
MonthBinary.Sep	63,986	27,966	2.29	2.24%
INDSPSSplines.AvgT	-2,709	698	-3.88	0.01%
INDSPSSplines.WarmAvgT	13,637	1,906	7.16	0.00%
MonthBinary.COVIDSPS2	-105,897	24,230	-4.37	0.00%
US_Holidays.IndSPS_HolidayX	-513,906	24,381	-21.08	0.00%

Ind SPS Weather Normalization Energy Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	730
Deg. of Freedom for Error	714
R-Squared	0.84
Adjusted R-Squared	0.84
F-Statistic	254.71
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	3.94%
Durbin-Watson Statistic	0.83

Ind LPS Weather Normalization Energy Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	6,105,449	81,896	74.55	0.00%
DOWBinary.WeekEnd	-335,412	54,689	-6.13	0.00%
DOWBinary.Monday	-175,816	22,845	-7.70	0.00%
MonthBinary.Jan	-140,971	40,570	-3.48	0.06%
MonthBinary.Feb	-354,742	41,863	-8.47	0.00%
MonthBinary.Mar	-157,151	34,263	-4.59	0.00%
MonthBinary.Apr	201,318	42,797	4.70	0.00%
MonthBinary.Jun	102,336	46,936	2.18	2.96%
MonthBinary.Jul	299,325	47,368	6.32	0.00%
MonthBinary.Aug	296,471	42,946	6.90	0.00%
MonthBinary.Sep	95,909	54,880	1.75	8.10%
MonthBinary.Oct	159,989	34,224	4.68	0.00%
MonthBinary.Nov	174,482	36,244	4.81	0.00%
MonthBinary.apr2020	-727,157	59,390	-12.24	0.00%
INDLPSSplines.AvgT	-6,201	1,822	-3.40	0.07%
INDLPSSplines.MildAvgT	14,696	2,949	4.98	0.00%
INDLPSSplines.WarmAvgT	26,669	3,605	7.40	0.00%
INDLPSSplines.WkndAvgT	-3,291	884	-3.72	0.02%
MonthBinary.Customer_Idle	-231,170	39,721	-5.82	0.00%
MonthBinary.LPS_Winter_Storm	-484,652	101,790	-4.76	0.00%
MonthBinary.Sept2020	-143,707	61,810	-2.33	2.04%
MonthBinary.COVIDLPS	-99,322	29,456	-3.37	0.08%

Note: One of the explanatory variables were retained in the model despite being only marginally statistically significant ($p\text{-value} > .05$). The direction and magnitude of the coefficient are reasonable, the standard error is consistent with other variables, and the interpretation of all the weather variables is cleaner with the inclusion of this variable.

Ind LPS Weather Normalization Energy Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	691
Deg. of Freedom for Error	669
R-Squared	0.85
Adjusted R-Squared	0.85
F-Statistic	182.20
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	2.65%
Durbin-Watson Statistic	0.90

Weather Normalized Peak Demand Models²

Residential Weather Normalization Peak Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	3,816,626	165,239	23.10	0.00%
DOWBinary.Sunday	49,334	16,818	2.93	0.34%
MonthBinary.Jan	45,107	26,563	1.70	8.98%
MonthBinary.Feb	60,850	27,310	2.23	2.61%
MonthBinary.Mar	-83,093	24,676	-3.37	0.08%
MonthBinary.Apr	-244,218	24,881	-9.82	0.00%
MonthBinary.May	-252,464	22,885	-11.03	0.00%
MonthBinary.Sep	-104,729	21,836	-4.80	0.00%
MonthBinary.Oct	-223,983	23,640	-9.48	0.00%
MonthBinary.Nov	-138,720	24,136	-5.75	0.00%
ResSplines.AvgT	-84,281	16,710	-5.04	0.00%
ResSplines.MildAvgT	42,961	4,594	9.35	0.00%
ResSplines.xColdAvgT	50,919	16,937	3.01	0.27%
ResSplines.WarmAvgT	37,189	20,573	1.81	7.09%
ResSplines.WkndMildAvgT	2,423	960	2.52	1.18%
ResSplines.HotAvgT	36,248	18,302	1.98	4.79%
MonthBinary.June2019	-80,901	34,183	-2.37	1.81%
GMI_Transform.MO_Residential	4,510	1,235	3.65	0.03%
US_Holidays.RES_HolidaysX	100,129	28,377	3.53	0.05%

Note: One of the explanatory variables were retained in the model despite being only marginally statistically significant ($p\text{-value} > .05$). The direction and magnitude of the coefficient are reasonable, the standard error is consistent with other variables, and the interpretation of all the weather variables is cleaner with the inclusion of this variable.

² 20 CSR 4240-22.030(2)(C)3

Residential Weather Normalization Peak Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	1096
Deg. of Freedom for Error	1077
R-Squared	0.92
Adjusted R-Squared	0.91
F-Statistic	640.99
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	6.37%
Durbin-Watson Statistic	1.48

Com SGS Weather Normalization Peak Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	621,877	8,909	69.80	0.00%
DOWBinary.TWT	127,894	4,345	29.44	0.00%
DOWBinary.MonFri	110,701	4,211	26.29	0.00%
MonthBinary.Feb	11,743	5,191	2.26	2.40%
MonthBinary.Mar	14,840	4,591	3.23	0.13%
MonthBinary.May	-39,064	4,679	-8.35	0.00%
MonthBinary.Jun	-35,031	4,988	-7.02	0.00%
MonthBinary.Jul	-16,120	5,227	-3.08	0.21%
COMSGSSplines.AvgT	-5,965	186	-31.99	0.00%
COMSGSSplines.MildAvgT	5,902	1,044	5.66	0.00%
COMSGSSplines.WarmAvgT	8,667	1,361	6.37	0.00%
COMSGSSplines.HotAvgT	7,949	854	9.31	0.00%
COMSGSSplines.WkndMildAvgT	-2,101	226	-9.29	0.00%
COMSGSSplines.ShoulderMildAvgT	-2,119	580	-3.65	0.03%
US_Holidays.ComSGS_HolidayX	-38,175	9,059	-4.21	0.00%
MonthBinary.April2020	-43,286	7,161	-6.05	0.00%
GMI_Transform.MO_Workspaces	1,443	159	9.07	0.00%

Com SGS Weather Normalization Peak Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	730
Deg. of Freedom for Error	713
R-Squared	0.92
Adjusted R-Squared	0.92
F-Statistic	508.33
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	5.71%
Durbin-Watson Statistic	1.25

Com LGS Weather Normalization Peak Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	1,076,950	16,216	66.41	0.00%
DOWBinary.MonFri	183,798	5,683	32.34	0.00%
DOWBinary.TWT	205,744	5,891	34.92	0.00%
DOWBinary.Saturday	36,501	5,272	6.92	0.00%
MonthBinary.Jan	-67,948	8,382	-8.11	0.00%
MonthBinary.Feb	-59,882	8,786	-6.82	0.00%
MonthBinary.Mar	-38,488	6,391	-6.02	0.00%
MonthBinary.May	-19,730	5,745	-3.43	0.06%
MonthBinary.Jul	41,390	6,524	6.35	0.00%
MonthBinary.Aug	65,542	6,169	10.62	0.00%
MonthBinary.Sep	73,032	5,965	12.24	0.00%
MonthBinary.Nov	-12,364	6,544	-1.89	5.93%
MonthBinary.Dec	-33,535	7,738	-4.33	0.00%
COMLGSSplines.AvgT	-8,527	273	-31.28	0.00%
COMLGSSplines.MildAvgT	15,336	592	25.91	0.00%
COMLGSSplines.HotAvgT	12,114	852	14.22	0.00%
COMLGSSplines.ShoulderMildAvgT	-4,189	750	-5.59	0.00%
COMLGSSplines.WkndMildAvgT	-3,906	281	-13.91	0.00%
GMI_Transform.MO_Workspaces	2,247	214	10.48	0.00%
MonthBinary.March_10_2021	-106,211	37,338	-2.85	0.46%
MonthBinary.Yr2021_Shift	44,917	3,644	12.33	0.00%

Note: One of the explanatory variables were retained in the model despite being only marginally statistically significant ($p\text{-value} > .05$). The direction and magnitude of the coefficient are reasonable, the standard error is consistent with other variables, and the interpretation of all the weather variables is cleaner with the inclusion of this variable.

Com LGS Weather Normalization Peak Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	682
Deg. of Freedom for Error	661
R-Squared	0.95
Adjusted R-Squared	0.95
F-Statistic	600.52
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	3.22%
Durbin-Watson Statistic	1.47

Com SPS Weather Normalization Peak Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	314,539	5,249	59.93	0.00%
DOWBinary.Monday	41,754	1,542	27.08	0.00%
DOWBinary.TWT	42,564	1,254	33.95	0.00%
DOWBinary.Friday	37,160	1,536	24.20	0.00%
DOWBinary.Saturday	5,370	1,532	3.51	0.05%
MonthBinary.Feb	7,001	1,784	3.92	0.01%
MonthBinary.May	-12,268	2,121	-5.78	0.00%
MonthBinary.Jun	-9,379	1,770	-5.30	0.00%
MonthBinary.Sep	-5,677	1,915	-2.96	0.31%
MonthBinary.Oct	-9,897	2,294	-4.31	0.00%
COMSPSSplines.ColdAvgT	906	211	4.30	0.00%
COMSPSSplines.AvgT	-1,270	178	-7.16	0.00%
COMSPSSplines.HotAvgT	1,648	273	6.05	0.00%
COMSPSSplines.WarmAvgT	2,687	226	11.89	0.00%
COMSPSSplines.WinterAvgT	-240	45	-5.39	0.00%
COMSPSSplines.ShoulderAvgT	-211	40	-5.29	0.00%
MonthBinary.COVIDSPS	-19,971	1,261	-15.84	0.00%
US_Holidays.ComSPS_HolidayX	-21,247	1,667	-12.75	0.00%

Com SPS Weather Normalization Peak Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	1096
Deg. of Freedom for Error	1078
R-Squared	0.87
Adjusted R-Squared	0.87
F-Statistic	439.01
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	3.29%
Durbin-Watson Statistic	0.86

Com LPS Weather Normalization Peak Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	141,365	996	141.98	0.00%
MonthBinary.Feb	14,912	1,499	9.95	0.00%
MonthBinary.Mar	17,528	1,387	12.63	0.00%
MonthBinary.May	16,283	1,535	10.61	0.00%
MonthBinary.Jun	15,705	2,068	7.60	0.00%
MonthBinary.Jul	19,409	2,167	8.96	0.00%
MonthBinary.Aug	19,843	2,090	9.50	0.00%
MonthBinary.Sep	17,636	1,809	9.75	0.00%
MonthBinary.Oct	20,467	1,465	13.97	0.00%
MonthBinary.Dec	19,367	1,692	11.45	0.00%
DOWBinary.WeekEnd	-10,058	637	-15.78	0.00%
COMLPSSplines.WarmAvgT	1,597	65	24.67	0.00%
COMLPSSplines.ShoulderAvgT	289	23	12.73	0.00%
MonthBinary.Dec15_Jan1	-4,066	1,902	-2.14	3.28%
US_Holidays.ComLPS_HolidayX	-3,537	1,479	-2.39	1.71%
MonthBinary.Customer_Com_Outage	-21,387	2,703	-7.91	0.00%

Com LPS Weather Normalization Peak Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	730
Deg. of Freedom for Error	714
R-Squared	0.88
Adjusted R-Squared	0.88
F-Statistic	346.92
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	3.51%
Durbin-Watson Statistic	0.78

Ind SGS Weather Normalization Peak Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	19,301	609	31.67	0.00%
DOWBinary.Monday	7,204	321	22.46	0.00%
DOWBinary.Tuesday	7,118	319	22.28	0.00%
DOWBinary.Wednesday	7,003	318	22.01	0.00%
DOWBinary.Thursday	7,039	321	21.90	0.00%
DOWBinary.Friday	6,259	324	19.32	0.00%
DOWBinary.Sunday	-1,522	316	-4.82	0.00%
MonthBinary.Feb	1,196	379	3.16	0.17%
MonthBinary.Mar	2,026	358	5.66	0.00%
MonthBinary.Jun	970	541	1.79	7.32%
MonthBinary.Jul	2,586	569	4.55	0.00%
MonthBinary.Aug	1,629	542	3.01	0.28%
MonthBinary.Sep	806	486	1.66	9.78%
MonthBinary.Oct	3,315	433	7.65	0.00%
MonthBinary.Nov	2,702	380	7.11	0.00%
INDSGSSplines.AvgT	-217	14	-15.81	0.00%
INDSGSSplines.MildAvgT	87	50	1.72	8.54%
INDSGSSplines.WarmAvgT	418	60	6.95	0.00%
INDSGSSplines.SummerAltAvgT	-11	8	-1.48	14.00%
INDSGSSplines.mild_shoulder	174	57	3.06	0.23%
MonthBinary.COVIDpeak_IndSGS	-1,625	376	-4.32	0.00%

Note: Some of the explanatory variables were retained in the model despite being only marginally statistically significant (p-value>.05). The direction and magnitude of the coefficient are reasonable, the standard error is consistent with other variables, and the interpretation of all the weather variables is cleaner with the inclusion of this variable.

Ind SGS Weather Normalization Peak Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	705
Deg. of Freedom for Error	684
R-Squared	0.79
Adjusted R-Squared	0.78
F-Statistic	127.92
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	13.24%
Durbin-Watson Statistic	1.36

Ind LGS Weather Normalization Peak Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	74,531	1,197	62.25	0.00%
DOWBinary.Monday	36,385	1,380	26.37	0.00%
DOWBinary.TWT	38,233	1,052	36.33	0.00%
DOWBinary.Friday	28,089	1,377	20.40	0.00%
MonthBinary.Jan	5,388	1,642	3.28	0.11%
MonthBinary.Apr	-4,320	1,689	-2.56	1.07%
MonthBinary.May	-4,870	1,959	-2.49	1.31%
MonthBinary.Jun	-4,367	1,630	-2.68	0.76%
MonthBinary.Oct	-4,712	1,797	-2.62	0.89%
US_Holidays.IndLGS_HolidayX	-29,840	1,697	-17.58	0.00%
INDLGSSplines.SummerAvgT	61	30	2.01	4.49%
INDLGSSplines.WkdayWarmAvgT	2,476	642	3.86	0.01%
INDLGSSplines.SummerWkdayWarmAvgT	-2,056	646	-3.18	0.15%
INDLGSSplines.MildAvgT	108	65	1.66	9.66%

Note: One of the explanatory variables were retained in the model despite being only marginally statistically significant (p-value>.05). The direction and magnitude of the coefficient are reasonable, the standard error is consistent with other variables, and the interpretation of all the weather variables is cleaner with the inclusion of this variable.

Ind LGS Weather Normalization Peak Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	730
Deg. of Freedom for Error	716
R-Squared	0.76
Adjusted R-Squared	0.76
F-Statistic	178.77
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	9.57%
Durbin-Watson Statistic	1.22

Ind SPS Weather Normalization Peak Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	119,591	2,120	56.41	0.00%
DOWBinary.Monday	45,830	1,233	37.16	0.00%
DOWBinary.Tuesday	50,250	1,211	41.48	0.00%
DOWBinary.Wednesday	49,749	1,185	41.98	0.00%
DOWBinary.Thursday	47,035	1,225	38.39	0.00%
DOWBinary.Friday	40,601	1,097	37.02	0.00%
DOWBinary.Saturday	9,151	1,064	8.60	0.00%
MonthBinary.Feb	3,521	1,319	2.67	0.78%
MonthBinary.Mar	-4,119	1,193	-3.45	0.06%
MonthBinary.Apr	-3,010	1,191	-2.53	1.17%
MonthBinary.Aug	10,179	1,117	9.11	0.00%
MonthBinary.Nov	-2,966	1,182	-2.51	1.23%
MonthBinary.Dec	-3,405	1,260	-2.70	0.70%
INDSPSSplines.AvgT	-131	44	-3.01	0.27%
INDSPSSplines.WarmAvgT	519	186	2.79	0.53%
INDSPSSplines.MildAvgT	287	164	1.75	8.09%
US_Holidays.INDSPS_Holidays2	-17,701	1,515	-11.69	0.00%
GMI_Transform.MO_Workspaces	313	36	8.80	0.00%

Note: One of the explanatory variables were retained in the model despite being only marginally statistically significant ($p\text{-value} > .05$). The direction and magnitude of the coefficient are reasonable, the standard error is consistent with other variables, and the interpretation of all the weather variables is cleaner with the inclusion of this variable.

Ind SPS Weather Normalization Peak Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	730
Deg. of Freedom for Error	712
R-Squared	0.87
Adjusted R-Squared	0.87
F-Statistic	287.22
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	4.30%
Durbin-Watson Statistic	0.96

Ind LPS Weather Normalization Peak Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	262,453	1,611	162.87	0.00%
DOWBinary.Monday	-4,636	964	-4.81	0.00%
DOWBinary.WeekEnd	-17,596	2,340	-7.52	0.00%
MonthBinary.Feb	-10,547	1,416	-7.45	0.00%
MonthBinary.Mar	-5,373	1,368	-3.93	0.01%
MonthBinary.Apr	9,643	1,749	5.51	0.00%
MonthBinary.Jul	13,390	1,474	9.08	0.00%
MonthBinary.Aug	13,093	1,479	8.85	0.00%
MonthBinary.Oct	7,573	1,333	5.68	0.00%
MonthBinary.Nov	7,919	1,359	5.83	0.00%
MonthBinary.Apr2020	-25,465	2,386	-10.68	0.00%
MonthBinary.Sept2020	-4,898	1,785	-2.74	0.62%
INDLPSSplines.ColdAvgT	-171	68	-2.50	1.26%
INDLPSSplines.MildAvgT	1,229	110	11.19	0.00%
INDLPSSplines.WarmAvgT	629	191	3.30	0.10%
INDLPSSplines.WkndAvgT	-221	38	-5.87	0.00%
MonthBinary.Customer_Idle	-6,039	1,222	-4.94	0.00%
US_Holidays.XMASAft	-20,755	2,656	-7.81	0.00%
US_Holidays.XMasHol	-25,661	6,404	-4.01	0.01%
US_Holidays.July4thHol	-20,582	6,339	-3.25	0.12%
US_Holidays.DAJuly4th	-17,666	6,249	-2.83	0.48%
GMI_Transform.MO_Workspaces	491	37	13.31	0.00%

Ind LPS Weather Normalization Peak Models Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	730
Deg. of Freedom for Error	708
R-Squared	0.87
Adjusted R-Squared	0.86
F-Statistic	218.66
Prob (F-Statistic)	0
Mean Abs. % Err. (MAPE)	2.71%
Durbin-Watson Statistic	1.07

Energy Sales and Customer Forecast Models³

Note: The F-Statistic and associated probability cannot be computed in a regression model, such as the usual SAE specification, that does not include an intercept. Therefore, F-Statistic and associated probability were not reported whenever an SAE model was developed for forecasting purpose, or an intercept was not included in the model.

Residential Energy Sales Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
ResidentialVars_Billed.XHeat	1.34	0.03	44.01	0.00%
ResidentialVars_Billed.XCool	2.01	0.04	51.42	0.00%
ResidentialVars_Billed.XOther	0.75	0.02	45.88	0.00%
ResidentialVars_Billed.xCool_shoulder	-0.16	0.08	-2.00	4.98%

³ 20 CSR 4240-22.030(3)(B)

Residential Energy Sales Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	75
Deg. of Freedom for Error	71
R-Squared	0.98
Adjusted R-Squared	0.98
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	2.29%
Durbin-Watson Statistic	1.67

Residential Customer Count Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
UtilityData.Households	1,108	7	163.75	0.00%
BinaryVars.Apr	-1,191	298	-3.99	0.01%
BinaryVars.May	-1,959	398	-4.92	0.00%
BinaryVars.Jun	-1,976	456	-4.34	0.00%
BinaryVars.Jul	-2,244	487	-4.61	0.00%
BinaryVars.Aug	-2,494	497	-5.02	0.00%
BinaryVars.Sep	-2,833	487	-5.81	0.00%
BinaryVars.Oct	-3,374	456	-7.40	0.00%
BinaryVars.Nov	-3,053	398	-7.67	0.00%
BinaryVars.Dec	-762	298	-2.55	1.22%
AR(1)	0.99	0.02	55.90	0.00%

Residential Customer Count Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	110
Deg. of Freedom for Error	99
R-Squared	1.00
Adjusted R-Squared	1.00
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	0.06%
Durbin-Watson Statistic	1.42

Commercial SGS Energy Sales Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CommercialVars_Billing.SGS_XHeat	29,106	1,169	24.90	0.00%
CommercialVars_Billing.SGS_XCool	17,055	638	26.74	0.00%
CommercialVars_Billing.SGS_XOther	879	10.6	82.75	0.00%

Commercial SGS Energy Sales Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	75
Deg. of Freedom for Error	72
R-Squared	0.93
Adjusted R-Squared	0.93
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	2.41%
Durbin-Watson Statistic	1.51

Commercial SGS Customer Count Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
BinaryVars.Jan	12,496	1,443	8.66	0.00%
BinaryVars.Feb	12,460	1,444	8.63	0.00%
BinaryVars.Mar	12,439	1,445	8.61	0.00%
BinaryVars.Apr	12,372	1,441	8.59	0.00%
BinaryVars.May	12,399	1,442	8.60	0.00%
BinaryVars.Jun	12,465	1,443	8.64	0.00%
BinaryVars.Jul	12,523	1,444	8.68	0.00%
BinaryVars.Aug	12,465	1,445	8.63	0.00%
BinaryVars.Sep	12,430	1,446	8.60	0.00%
BinaryVars.Oct	12,386	1,447	8.56	0.00%
BinaryVars.Nov	12,374	1,448	8.55	0.00%
BinaryVars.Dec	12,454	1,449	8.60	0.00%
BinaryVars.TimeTrend	3.11	0.03	93.50	0.00%

Commercial SGS Customer Count Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	87
Deg. of Freedom for Error	74
R-Squared	0.99
Adjusted R-Squared	0.99
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	0.12%
Durbin-Watson Statistic	0.12

Commercial LGS Energy Sales Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CommercialVars_Billing.LGS_XCool	17,123	374	45.75	0.00%
CommercialVars_Billing.LGS_XHeat	36,520	1,748	20.89	0.00%
CommercialVars_Billing.LGS_XOther	975.15	6.3	155.78	0.00%

Commercial LGS Energy Sales Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	60
Deg. of Freedom for Error	57
R-Squared	0.97
Adjusted R-Squared	0.97
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	1.28%
Durbin-Watson Statistic	1.52

Commercial LGS Customer Count Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
BinaryVars.Jan	9,852	128	76.98	0.00%
BinaryVars.Feb	9,851	128	77.06	0.00%
BinaryVars.Mar	9,843	128	77.09	0.00%
BinaryVars.Apr	9,836	128	77.02	0.00%
BinaryVars.May	9,835	128	76.91	0.00%
BinaryVars.Jun	9,854	128	76.98	0.00%
BinaryVars.Jul	9,864	128	76.99	0.00%
BinaryVars.Aug	9,874	128	77.03	0.00%
BinaryVars.Sep	9,882	128	77.08	0.00%
BinaryVars.Oct	9,868	128	76.97	0.00%
BinaryVars.Nov	9,862	128	76.95	0.00%
BinaryVars.Dec	9,855	128	76.94	0.00%
AR(1)	0.98	0.01	138.76	0.00%

Commercial LGS Customer Count Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	107
Deg. of Freedom for Error	94
R-Squared	1.00
Adjusted R-Squared	1.00
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	0.09%
Durbin-Watson Statistic	1.90

Commercial SPS Energy Sales Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CommercialVars_Billing.SPS_XHeat	21,478	3,674	5.85	0.00%
CommercialVars_Billing.SPS_XCool	5,433	343.49	15.82	0.00%
CommercialVars_Billing.SPS_XOther	1,142	14.96	76.39	0.00%

Commercial SPS Energy Sales Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	51
Deg. of Freedom for Error	48
R-Squared	0.88
Adjusted R-Squared	0.87
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	2.11%
Durbin-Watson Statistic	1.13

Commercial SPS Customer Count Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
BinaryVars.Jan	480	1.69	284.19	0.00%
BinaryVars.Feb	480	1.59	302.47	0.00%
BinaryVars.Mar	480	1.55	310.28	0.00%
BinaryVars.Apr	480	1.64	292.21	0.00%
BinaryVars.May	481	1.68	287.17	0.00%
BinaryVars.Jun	478	1.69	283.82	0.00%
BinaryVars.Jul	479	1.69	283.76	0.00%
BinaryVars.Aug	482	1.69	285.70	0.00%
BinaryVars.Sep	480	1.69	284.48	0.00%
BinaryVars.Oct	479	1.69	283.89	0.00%
BinaryVars.Nov	479	1.69	283.45	0.00%
BinaryVars.Dec	479	1.69	283.74	0.00%
AR(1)	0.61	0.12	5.02	0.00%

Commercial SPS Customer Count Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	50
Deg. of Freedom for Error	37
R-Squared	0.47
Adjusted R-Squared	0.29
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	0.36%
Durbin-Watson Statistic	2.09

Commercial LPS Energy Sales Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CommercialVars_Billing.LPS_XCool	14,076	666.71	21.11	0.00%
CommercialVars_Billing.LPS_XOther	877	8.29	105.87	0.00%

Commercial LPS Energy Sales Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	75
Deg. of Freedom for Error	73
R-Squared	0.83
Adjusted R-Squared	0.83
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	3.88%
Durbin-Watson Statistic	1.97

Commercial LPS Customer Count Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
Simple Smoothing	0.71	0.13	5.60	0

Commercial LPS Customer Count Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	63
Deg. of Freedom for Error	62
R-Squared	0.45
Adjusted R-Squared	0.45
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	0.65%
Durbin-Watson Statistic	1.87

Industrial SGS Energy Sales Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	10,410	2,269	4.59	0.00%
Weather_Trans.Billed_HDD	4	0.23	15.34	0.00%
Weather_Trans.Billed_CDD	6.85	0.43	16.13	0.00%
Binary_Vars.January	1,332	314.42	4.24	0.01%
Binary_Vars.October	1,116	158.74	7.03	0.00%
Binary_Vars.November	1,869	160.26	11.67	0.00%
Binary_Vars.December	2,082	231.41	9.00	0.00%
Econ_Trans.SGS_Index	-176.50	81.63	-2.16	3.63%
Binary_Vars.Pandemic_Shift	-739.97	80.17	-9.23	0.00%

Industrial SGS Energy Sales Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	51
Deg. of Freedom for Error	42
R-Squared	0.95
Adjusted R-Squared	0.94
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	2.43%
Durbin-Watson Statistic	1.76

Industrial SGS Customer Count Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
Binary_Vars.January	2,311	104.96	22.02	0.00%
Binary_Vars.February	2,312	104.99	22.02	0.00%
Binary_Vars.March	2,313	104.98	22.03	0.00%
Binary_Vars.April	2,304	105.15	21.91	0.00%
Binary_Vars.May	2,303	105.27	21.87	0.00%
Binary_Vars.June	2,303	105.36	21.86	0.00%
Binary_Vars.July	2,301	105.41	21.83	0.00%
Binary_Vars.August	2,298	105.42	21.80	0.00%
Binary_Vars.September	2,296	105.39	21.79	0.00%
Binary_Vars.October	2,300	105.33	21.84	0.00%
Binary_Vars.November	2,302	105.24	21.87	0.00%
Binary_Vars.December	2,305	105.12	21.92	0.00%
AR(1)	0.98	0.01	196.71	0.00%

Industrial SGS Customer Count Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	62
Deg. of Freedom for Error	49
R-Squared	1.00
Adjusted R-Squared	1.00
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	0.13%
Durbin-Watson Statistic	2.02

Industrial LGS Energy Sales Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
CONST	46,950	6,584	7.13	0.00%
Weather_Trans.Billed_CDD	19	1	14.25	0.00%
Binary_Vars.February	2,336	804	2.91	0.53%
Binary_Vars.April	-2,398	822	-2.92	0.51%
Binary_Vars.May	-2,371	808	-2.94	0.49%
Binary_Vars.June	-2,997	768	-3.90	0.03%
Econ_Trans.LGS_Index	808	223	3.62	0.07%
Binary_Vars.Pandemic_Shift	-3,729	527	-7.08	0.00%
Binary_Vars.End_shift_2018	-4,205	545	-7.71	0.00%

Industrial LGS Energy Sales Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	63
Deg. of Freedom for Error	54
R-Squared	0.92
Adjusted R-Squared	0.91
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	1.77%
Durbin-Watson Statistic	1.30

Industrial LGS Customer Count Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
Binary_Vars.January	881	89.42	9.85	0.00%
Binary_Vars.February	880	89.42	9.84	0.00%
Binary_Vars.March	880	89.41	9.84	0.00%
Binary_Vars.April	878	89.44	9.82	0.00%
Binary_Vars.May	877	89.46	9.80	0.00%
Binary_Vars.June	879	89.48	9.83	0.00%
Binary_Vars.July	879	89.49	9.82	0.00%
Binary_Vars.August	881	89.49	9.85	0.00%
Binary_Vars.September	883	89.49	9.87	0.00%
Binary_Vars.October	881	89.48	9.85	0.00%
Binary_Vars.November	881	89.46	9.85	0.00%
Binary_Vars.December	880	89.44	9.84	0.00%
AR(1)	0.99	0.01	118.47	0.00%

Industrial LGS Customer Count Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	134
Deg. of Freedom for Error	121
R-Squared	0.99
Adjusted R-Squared	0.99
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	0.21%
Durbin-Watson Statistic	2.60

Industrial SPS Energy Sales Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
Econ_Trans.SPS_Index	-4,266	1,525	-2.80	0.84%
Weather_Trans.Billed_CDD	26	13	1.93	6.15%
Binary_Vars.January	240,814	49,775	4.84	0.00%
Binary_Vars.February	222,071	44,472	4.99	0.00%
Binary_Vars.March	223,482	44,481	5.02	0.00%
Binary_Vars.April	223,536	45,163	4.95	0.00%
Binary_Vars.May	220,969	44,731	4.94	0.00%
Binary_Vars.June	226,483	46,979	4.82	0.00%
Binary_Vars.July	226,270	47,428	4.77	0.00%
Binary_Vars.August	223,949	46,006	4.87	0.00%
Binary_Vars.September	224,816	47,016	4.78	0.00%
Binary_Vars.October	222,614	45,375	4.91	0.00%
Binary_Vars.November	223,149	45,476	4.91	0.00%
Binary_Vars.December	233,663	47,955	4.87	0.00%
Binary_Vars.COVID_Lockdowns_SPS	-4,741	1,410	-3.36	0.19%
Binary_Vars.Flooding_SPS	7,895	3,573	2.21	3.40%

Note: One of the explanatory variables were retained in the model despite being only marginally statistically significant ($p\text{-value} > .05$). The direction and magnitude of the coefficient are reasonable, the standard error is consistent with other variables, and the interpretation of all the weather variables is cleaner with the inclusion of this variable.

Industrial SPS Energy Sales Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	50
Deg. of Freedom for Error	34
R-Squared	0.83
Adjusted R-Squared	0.75
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	1.61%
Durbin-Watson Statistic	0.91

Industrial SPS Customer Count Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
Binary_Vars.January	185	0.58	320	0.00%
Binary_Vars.February	185	0.56	329	0.00%
Binary_Vars.March	185	0.56	332	0.00%
Binary_Vars.April	184	0.57	322	0.00%
Binary_Vars.May	185	0.58	320	0.00%
Binary_Vars.June	184	0.58	318	0.00%
Binary_Vars.July	185	0.58	320	0.00%
Binary_Vars.August	185	0.58	320	0.00%
Binary_Vars.September	184	0.58	318	0.00%
Binary_Vars.October	184	0.58	317	0.00%
Binary_Vars.November	184	0.58	318	0.00%
Binary_Vars.December	185	0.58	319	0.00%
AR(1)	0.56	0.08	7.20	0.00%

Industrial SPS Customer Count Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	122
Deg. of Freedom for Error	109
R-Squared	0.36
Adjusted R-Squared	0.29
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	0.59%
Durbin-Watson Statistic	2.19

Industrial LPS Energy Sales Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
Econ_Trans.LPS_Index	5,278	29	179.8	0.00%
Binary_Vars.March	11,947	1,777	6.73	0.00%
Binary_Vars.April	19,016	2,009	9.47	0.00%
Binary_Vars.May	33,659	2,399	14.03	0.00%
Binary_Vars.June	27,962	2,019	13.85	0.00%
Binary_Vars.July	41,672	1,921	21.70	0.00%
Binary_Vars.August	44,060	1,909	23.08	0.00%
Binary_Vars.September	24,758	1,920	12.90	0.00%
Binary_Vars.October	27,516	1,910	14.41	0.00%
Binary_Vars.November	16,242	1,916	8.48	0.00%
Binary_Vars.Flooding	-13,658	3,094	-4.41	0.01%
Binary_Vars.COVID_Lockdowns	-21,928	3,094	-7.09	0.00%
Binary_Vars.Customer_Outage_May21	-14,530	4,411	-3.29	0.18%

Industrial LPS Energy Sales Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	63
Deg. of Freedom for Error	50
R-Squared	0.94
Adjusted R-Squared	0.93
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err. (MAPE)	1.58%
Durbin-Watson Statistic	2.13

Industrial LPS Customer Count Forecast Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
Binary_Vars.January	34	0.32	107	0.00%
Binary_Vars.February	34	0.31	108	0.00%
Binary_Vars.March	34	0.31	108	0.00%
Binary_Vars.April	34	0.32	107	0.00%
Binary_Vars.May	34	0.32	107	0.00%
Binary_Vars.June	34	0.32	106	0.00%
Binary_Vars.July	34	0.32	106	0.00%
Binary_Vars.August	34	0.32	106	0.00%
Binary_Vars.September	34	0.32	105	0.00%
Binary_Vars.October	34	0.32	105	0.00%
Binary_Vars.November	34	0.32	106	0.00%
Binary_Vars.December	34	0.32	106	0.00%
AR(1)	0.85	0.05	19	0.00%

Industrial LPS Customer Count Forecast Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	86
Deg. of Freedom for Error	73
R-Squared	0.84
Adjusted R-Squared	0.81
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err (MAPE)	0.65%
Durbin-Watson Statistic	2.29

Non-Coincident System Peak Model Coefficients

Variable	Coefficient	StdErr	T-Stat	P-Value
Heating Variable	32	3.09	10	0.00%
Cooling Variable	84	9.83	9	0.00%
Base Variable	1	0.04	29	0.00%
January	799	172.70	5	0.00%
February	868	160.54	5	0.00%
March	457	137.58	3	0.15%
May	584	162.27	4	0.06%
June	1026	220.41	5	0.00%
July	1083	230.10	5	0.00%
August	1157	209.10	6	0.00%
September	820	200.20	4	0.01%
October	318	164.54	2	5.81%
November	536	137.51	4	0.02%
December	511.32	157.93	3	0.20%

Note: One of the explanatory variables were retained in the model despite being only marginally statistically significant ($p\text{-value} > .05$). The direction and magnitude of the coefficient are reasonable, the standard error is consistent with other variables, and the interpretation of all the weather variables is cleaner with the inclusion of this variable.

Non-Coincident System Peak Model Statistics

Model Statistic	Value of the Statistic
Adjusted Observations	75
Deg. of Freedom for Error	61
R-Squared	0.94
Adjusted R-Squared	0.93
F-Statistic	#NA
Prob (F-Statistic)	#NA
Mean Abs. % Err (MAPE)	3.06%
Durbin-Watson Statistic	2.04

Time of Use Adjustments

	Hours Reduced	Summer Reduction (Jun - Sept)	Winter Reduction (Oct - May)	Estimated Customer Participation Rate																			
				2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Evening/Morning Savers	Between 9 am and 9 pm, everyday for all seasons	0.3%	0.3%	40.10%	47.15%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%	54.19%
Overnight Savers	6am to 10pm everyday for all seasons	6.8%	3.5%	0.06%	0.07%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Smart Savers	3 pm to 7 pm on summer (June – September) non-holiday weekdays, and 6 to 8 am and pm (both morning and evening) on non-summer (all other months) non-holiday weekdays	11.8%	9.0%	0.04%	0.05%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%
Ultimate Savers	3 pm to 7 pm on summer (June – September) non-holiday weekdays, and 6 to 8 am and pm (both morning and evening) on non-summer (all other months) non-holiday weekdays	12.9%	9.3%	0.03%	0.04%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%

Abbreviations

- Res: Residential
- Com: Commercial
- Ind: Industrial
- SGS: Small General Service
- LGS: Large General Service
- SPS: Small Primary Service
- LPS: Large Primary Service
- WN: Weather Normalized
- LTS: Large Transmission Service

Compliance References

20 CSR 4240-22.030(2)(C)3 1, 12
20 CSR 4240-22.030(3)(B) 21