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Figure 1: Baltimore Gas and Electric Load Region

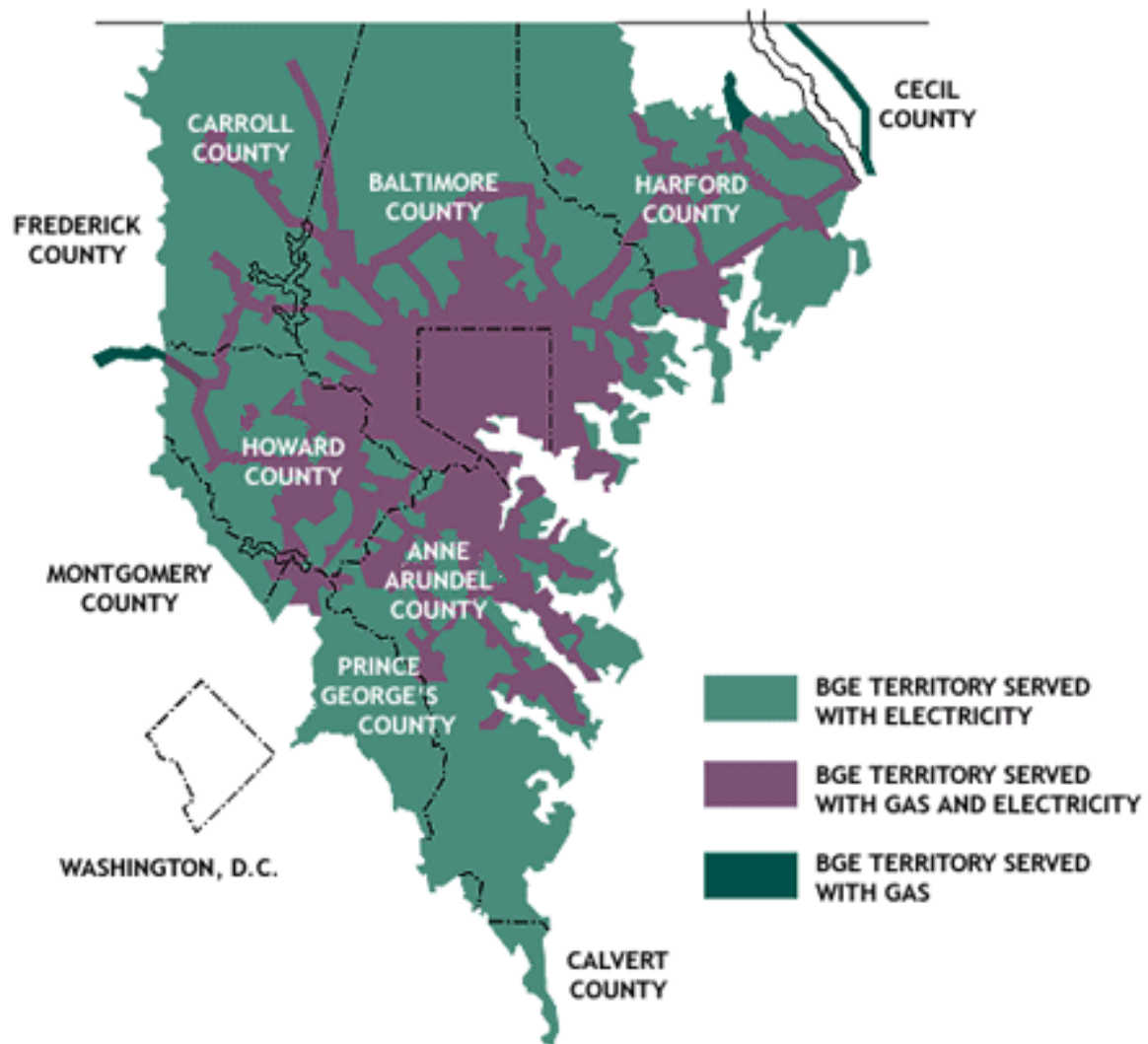


Figure 2: January Hourly Load Curves

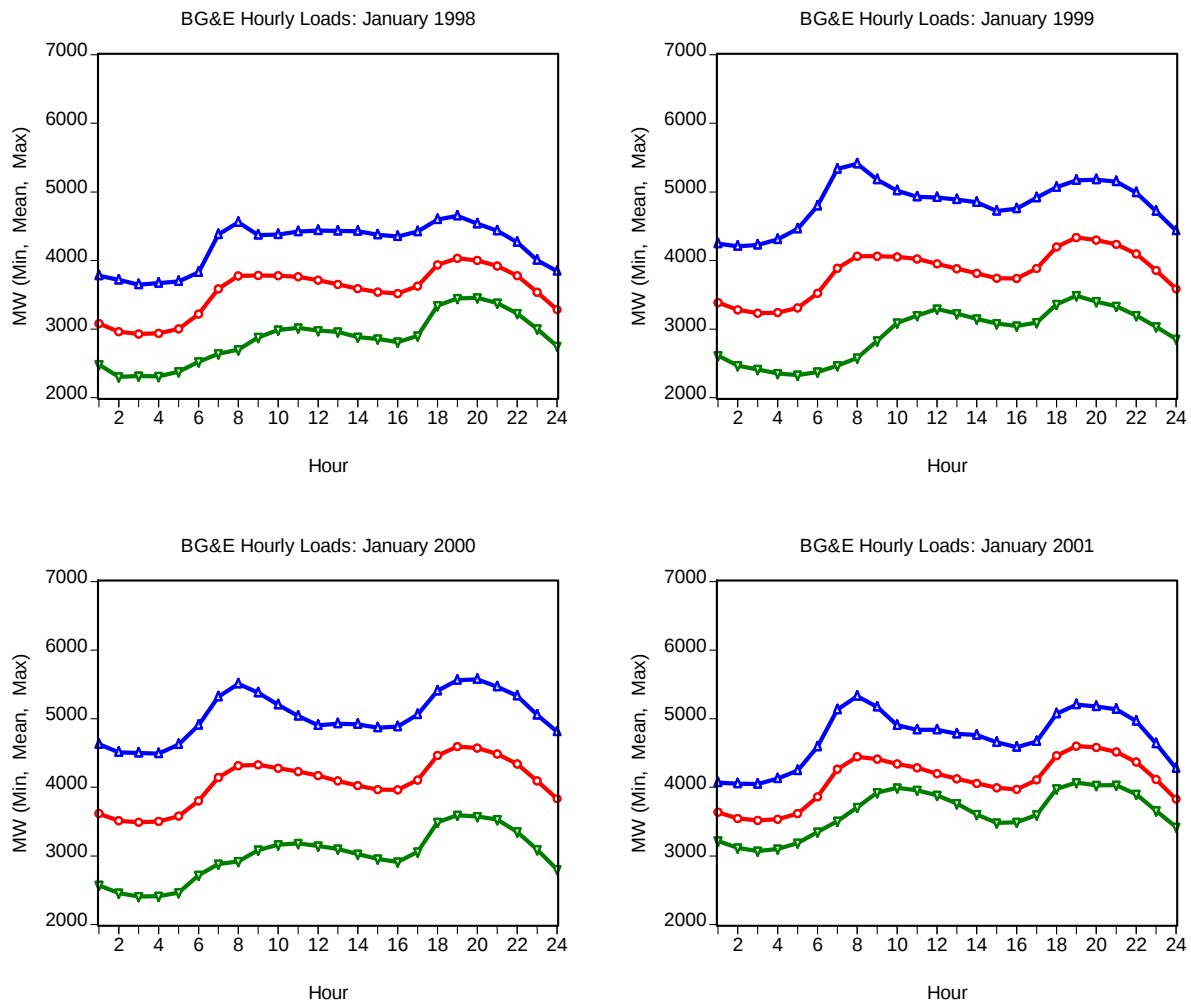


Figure 3: July Hourly Load Curves

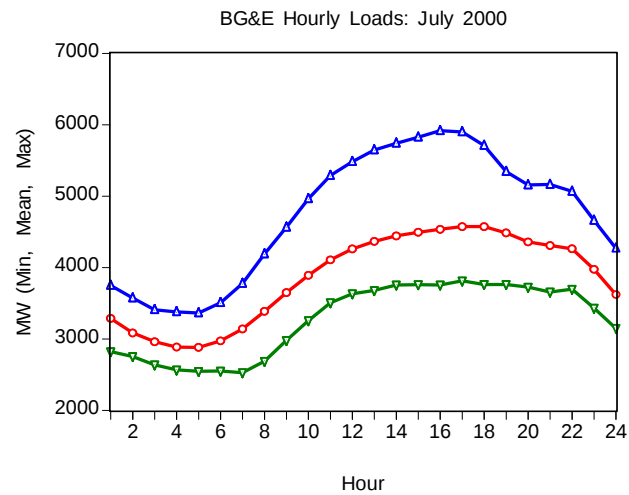
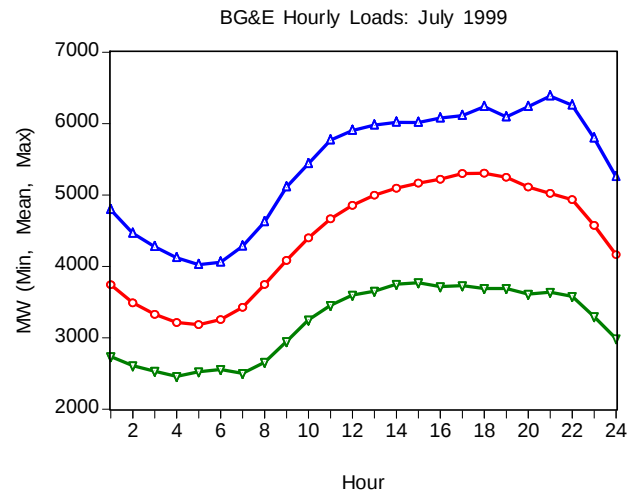
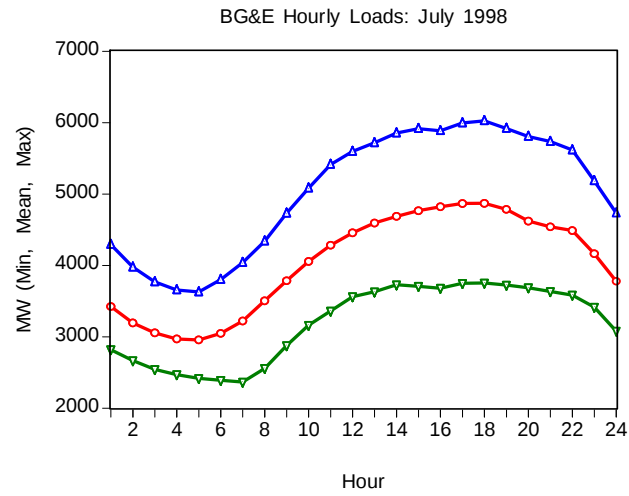


Figure 4: The Relationship Between Hourly Loads and Heating Degree Days

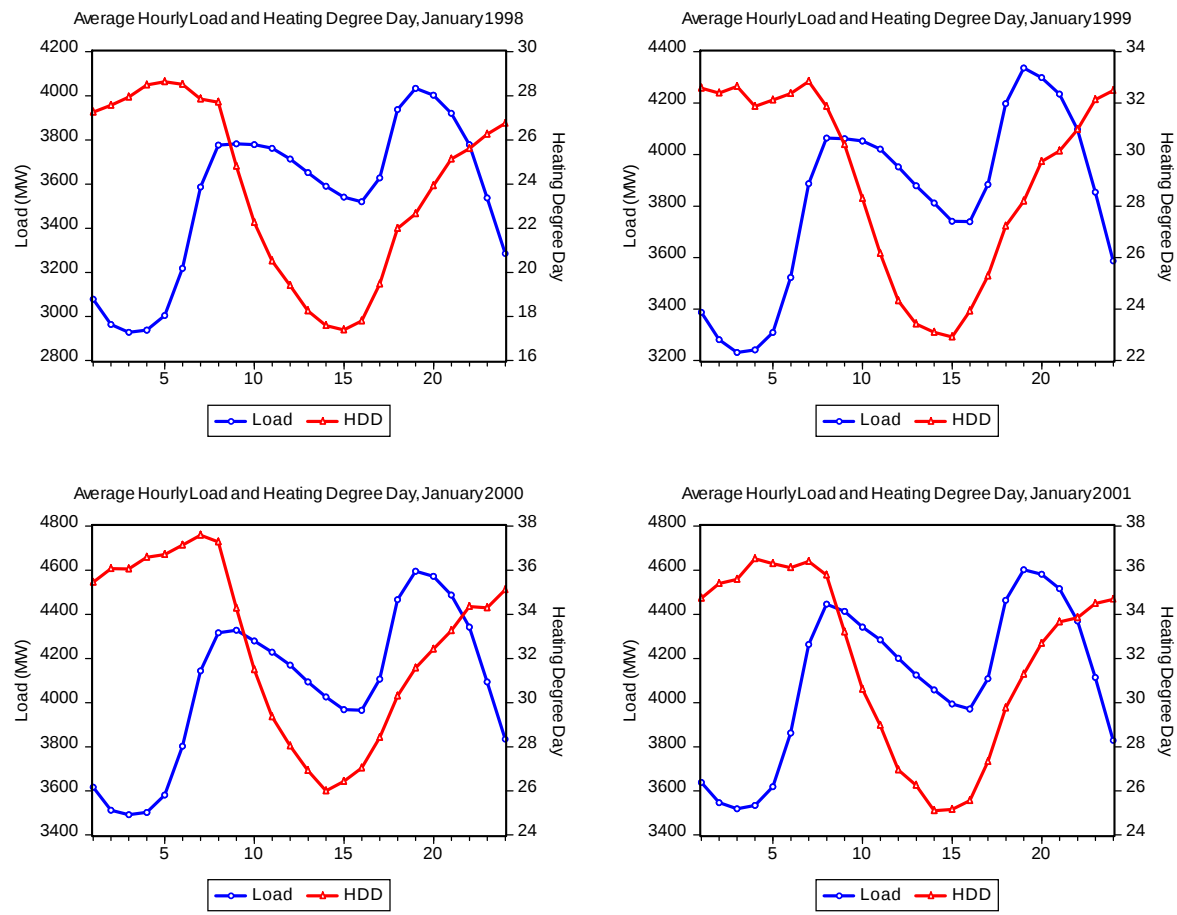


Figure 5: The Relationship Between Hourly Loads and Cooling Degree Days

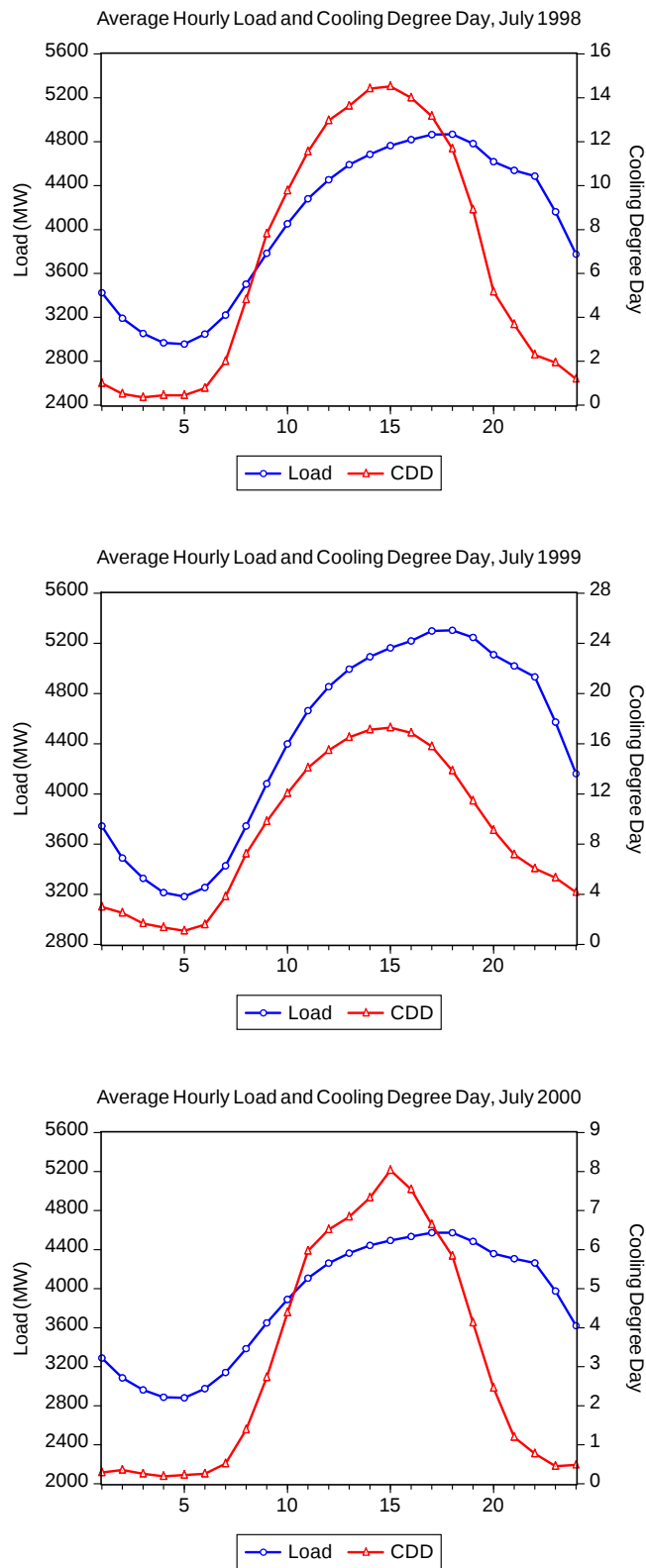


Figure 6: Estimated Heating Degree Day Residual Histogram for Hour 19

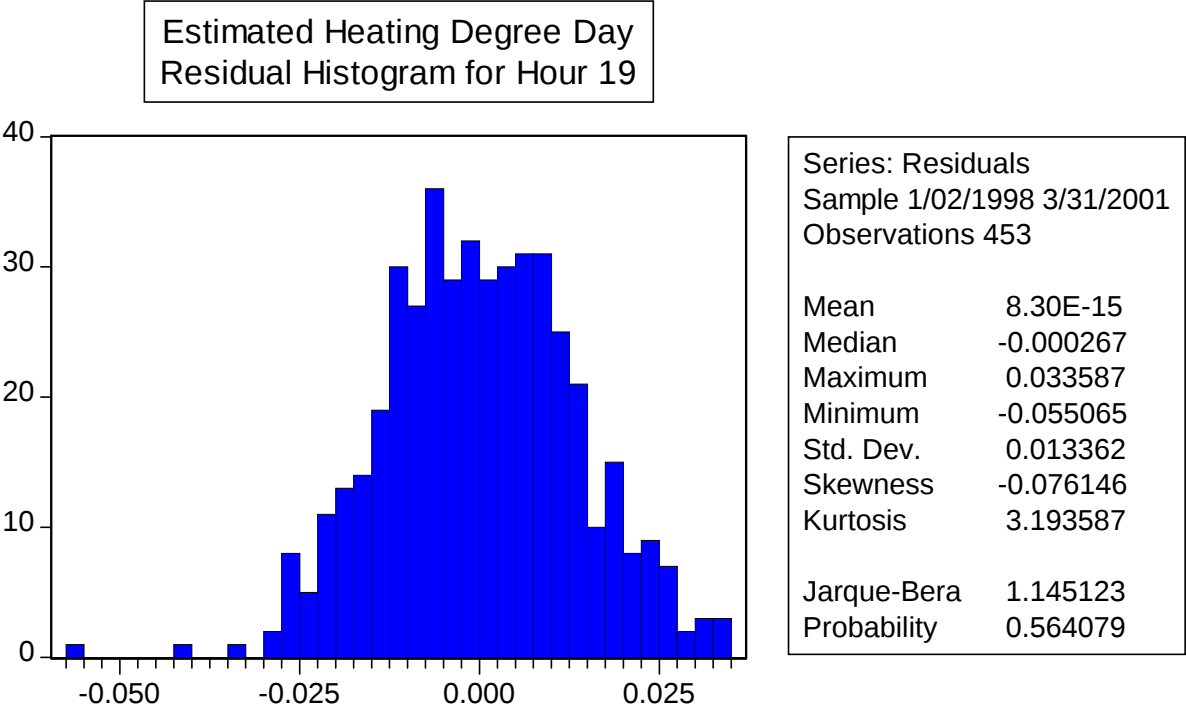


Figure 7: Estimated Cooling Degree Day Residual Histogram for Hour 17

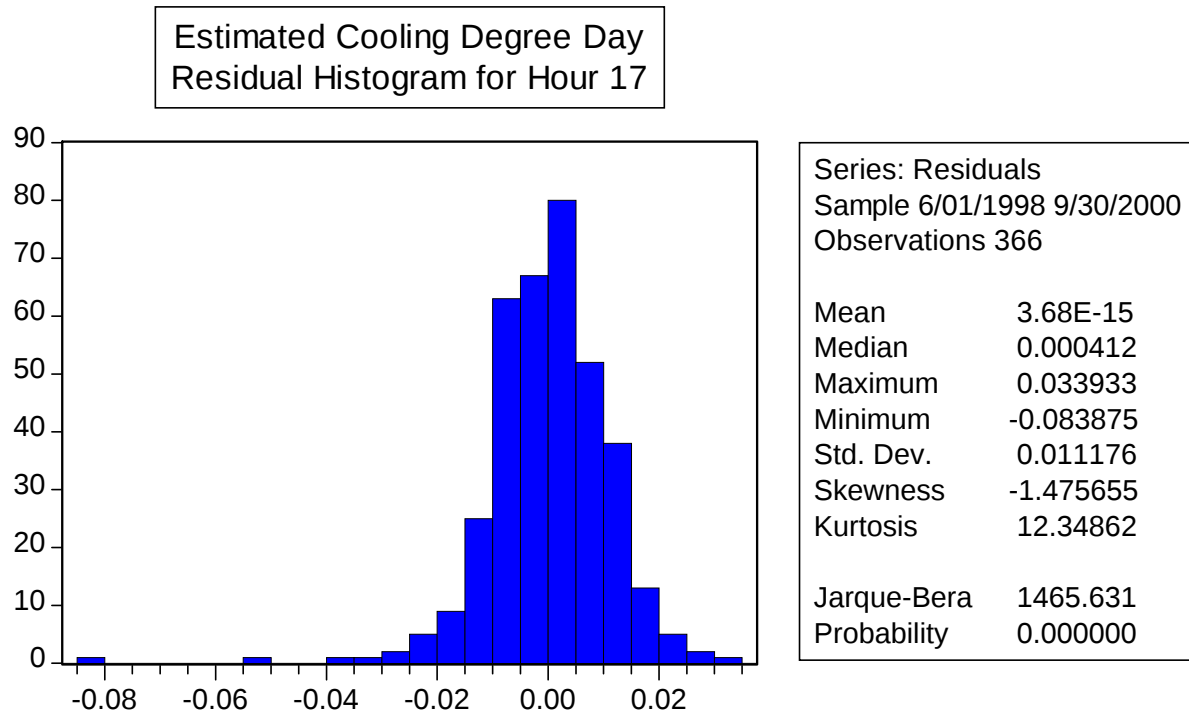


Figure 8: Heating Degree Day Elasticity and Level in January Hourly Load

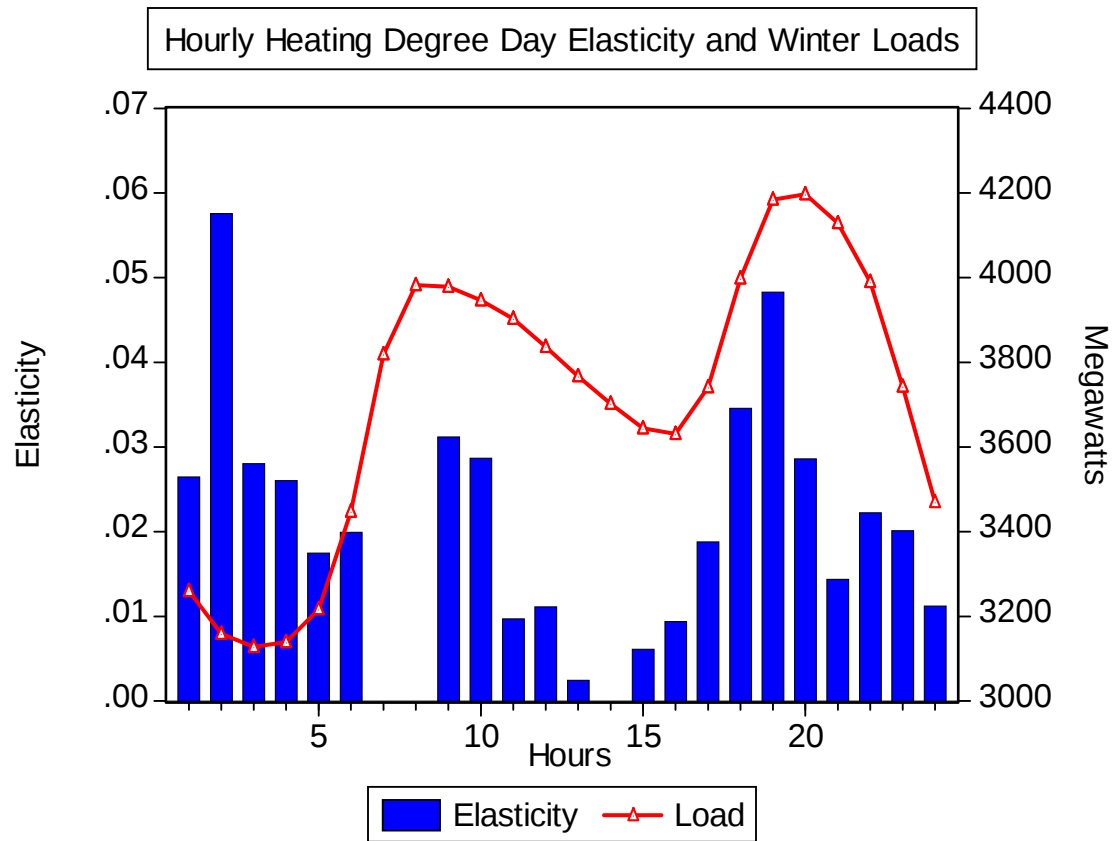


Figure 9: CDD Elasticity and Level in July Hourly Load

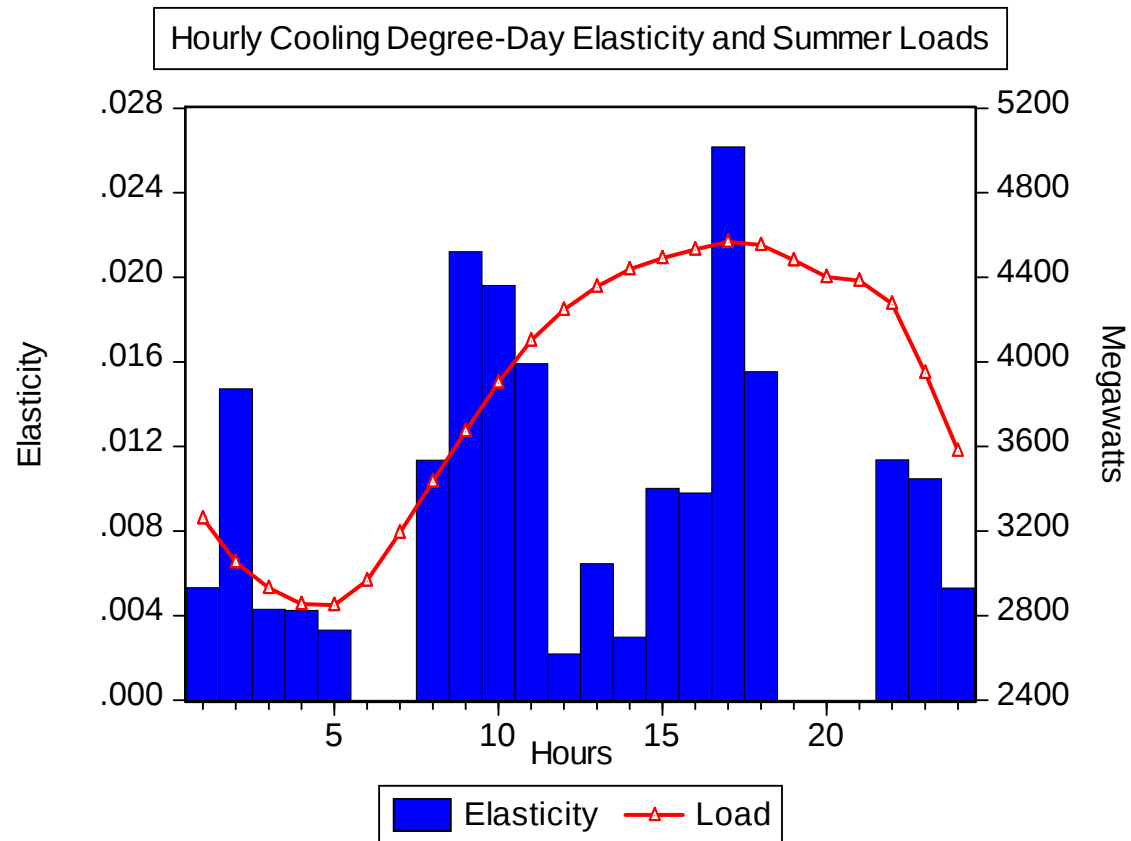


Figure 10: Ratio of Simulation Temperature Forecast to
Baseline Forecast July 1999, Hr 13-18

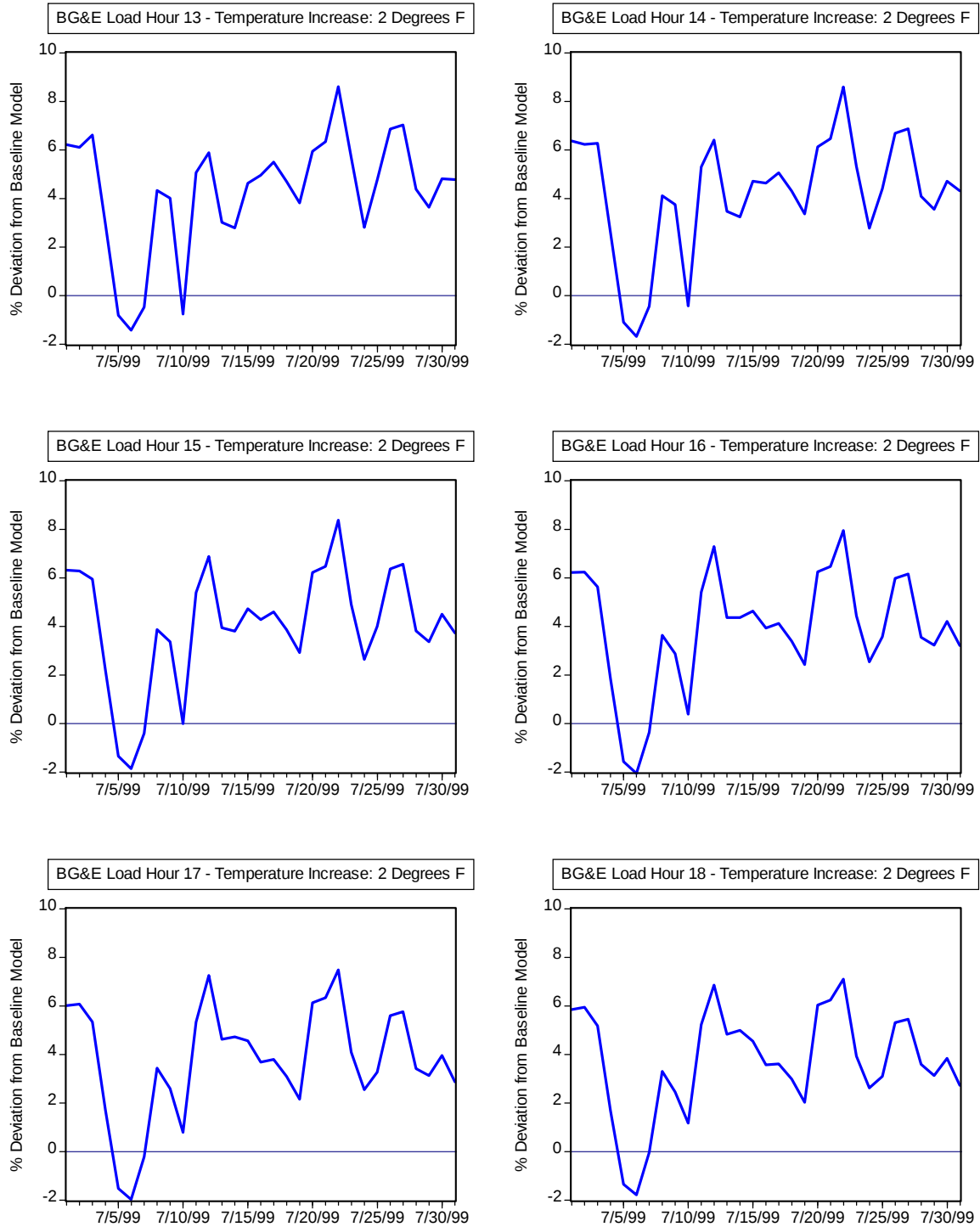


Table 1: Baltimore Gas & Electric (BC) Hourly Load Summary Statistics, January 1, 1998 to April 30, 2001

AM Loads - Mw		Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9	Hour 10	Hour 11	Hour 12
	Average	3072	2931	2864	2841	2883	3064	3378	3570	3666	3739	3795	3813
	St Deviation	470	456	451	453	466	504	592	597	525	498	519	565
	Median	3023	2887	2812	2782	2821	2994	3307	3517	3602	3667	3695	3678
	Maximum	4792	4512	4501	4491	4626	4907	5332	5508	5378	5435	5766	5901
	Minimum	2257	2197	2130	2110	2097	2117	2143	2275	2501	2692	2807	2792
	Count	1216	1216	1216	1216	1216	1216	1216	1216	1216	1216	1216	1216
PM Loads - Mw		Hour 13	Hour 14	Hour 15	Hour 16	Hour 17	Hour 18	Hour 19	Hour 20	Hour 21	Hour 22	Hour 23	Hour 24
	Average	3816	3811	3797	3802	3869	3990	4052	4047	4028	3908	3632	3323
	St Deviation	616	664	705	732	735	718	677	619	580	568	532	498
	Median	3635	3613	3561	3559	3666	3838	3945	3949	3921	3806	3538	3259
	Maximum	5976	6016	6014	6075	6110	6234	6091	6234	6383	6254	5793	5252
	Minimum	2775	2696	2612	2573	2513	2506	2525	2662	2847	2836	2649	2404
	Count	1216	1216	1216	1216	1216	1216	1216	1216	1216	1216	1216	1216

Source: www.pjm.com (PJM website)

Table 2: Baltimore Gas & Electric Hourly Load Summary Statistics
January (1998, 1999, 2000, 2001) and July (1998, 1999, 2000)

January 1998, 1999, 2000, 2001													
AM Loads - Mw		Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9	Hour 10	Hour 11	Hour 12
	Average	3430	3326	3293	3304	3378	3601	3970	4151	4146	4113	4074	4009
	St Deviation	453	465	471	481	496	529	604	617	538	473	447	440
	Median	3373	3296	3250	3262	3339	3636	4017	4161	4144	4097	4052	3956
	Maximum	4629	4512	4501	4491	4626	4907	5332	5508	5378	5202	5038	4919
	Minimum	2483	2305	2316	2312	2328	2376	2469	2578	2830	2986	3018	2979
	Count	124	124	124	124	124	124	124	124	124	124	124	124
PM Loads - Mw		Hour 13	Hour 14	Hour 15	Hour 16	Hour 17	Hour 18	Hour 19	Hour 20	Hour 21	Hour 22	Hour 23	Hour 24
	Average	3937	3871	3811	3799	3931	4266	4391	4364	4290	4147	3900	3634
	St Deviation	441	451	453	459	475	474	478	478	469	461	447	441
	Median	3913	3847	3776	3756	3889	4272	4388	4343	4278	4107	3854	3594
	Maximum	4928	4919	4868	4886	5061	5408	5561	5575	5465	5334	5056	4811
	Minimum	2961	2883	2858	2811	2900	3342	3447	3401	3334	3197	3004	2754
	Count	124	124	124	124	124	124	124	124	124	124	124	124
July 1998, 1999, 2000													
AM Loads - Mw		Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9	Hour 10	Hour 11	Hour 12
	Average	3485	3255	3114	3023	3006	3092	3262	3544	3839	4114	4351	4523
	St Deviation	424	390	365	346	332	346	406	461	474	497	530	559
	Median	3428	3196	3077	2985	2968	3097	3248	3528	3858	4036	4268	4462
	Maximum	4792	4461	4274	4119	4023	4057	4282	4622	5109	5435	5766	5901
	Minimum	2735	2609	2530	2458	2416	2388	2363	2556	2875	3160	3358	3559
	Count	93	93	93	93	93	93	93	93	93	93	93	93
PM Loads - Mw		Hour 13	Hour 14	Hour 15	Hour 16	Hour 17	Hour 18	Hour 19	Hour 20	Hour 21	Hour 22	Hour 23	Hour 24
	Average	4650	4740	4807	4857	4913	4915	4838	4696	4622	4561	4237	3853
	St Deviation	594	617	634	647	659	663	658	641	617	576	521	476
	Median	4570	4722	4767	4845	4930	4904	4823	4655	4587	4512	4174	3811
	Maximum	5976	6016	6014	6075	6110	6234	6091	6234	6383	6254	5793	5252
	Minimum	3629	3727	3706	3678	3728	3689	3691	3610	3632	3578	3296	2988
	Count	93	93	93	93	93	93	93	93	93	93	93	93

Source: www.pjm.com (PJM website)

Table 3: Summary Statistics for Hourly Temperature: Baltimore/Washington International Airport (° F)

WBAN# 724060; Call Sign KBWI

January (1998, 1999, 2000, 2001) and July (1998, 1999, 2000)

January 1998, 1999, 2000, 2001

AM Temp ° F		Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9	Hour 10	Hour 11	Hour 12
	Average	32.5	32.0	32.2	31.4	31.7	31.6	31.2	31.8	34.6	36.7	38.7	40.4
	St Deviation	11	11	10	11	11	11	11	11	10	10	11	11
	Median	32	30	32	30	30	32	32	32	34	37	37	39
	Maximum	64	64	64	63	63	63	63	63	64	66	66	68
	Minimum	9	10	10	9	9	9	9	10	14	16	18	18
	Count	119	115	119	118	114	115	121	122	117	118	119	115
PM Temp ° F		Hour 13	Hour 14	Hour 15	Hour 16	Hour 17	Hour 18	Hour 19	Hour 20	Hour 21	Hour 22	Hour 23	Hour 24
	Average	41.4	42.7	42.9	41.4	40.1	37.5	36.6	35.3	34.2	33.8	33.2	32.9
	St Deviation	12	12	12	11	11	10	10	10	10	10	10	10
	Median	41	43	43	43	39	37	36	36	34	34	32	32
	Maximum	70	70	68	66	66	64	66	64	64	64	64	64
	Minimum	19	18	19	19	19	18	18	12	12	12	14	12
	Count	111	117	112	118	117	117	118	120	120	116	119	117

July 1998, 1999, 2000

AM Temp ° F		Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9	Hour 10	Hour 11	Hour 12
	Average	70.3	69.7	68.8	68.1	67.6	69.0	72.2	75.8	78.4	80.6	82.4	83.4
	St Deviation	6	6	6	6	6	5	5	6	6	6	7	7
	Median	71	72	70	70	68	70	73	75	79	81	82	82
	Maximum	85	82	82	79	79	79	85	90	91	95	97	97
	Minimum	60	57	57	55	55	57	63	64	64	66	66	66
	Count	91	91	92	92	91	92	88	92	92	92	91	91
PM Temp ° F		Hour 13	Hour 14	Hour 15	Hour 16	Hour 17	Hour 18	Hour 19	Hour 20	Hour 21	Hour 22	Hour 23	Hour 24
	Average	84.3	84.8	85.2	84.8	83.8	82.2	79.8	77.1	74.7	73.1	72.1	71.1
	St Deviation	7	8	8	7	7	7	6	6	6	6	6	6
	Median	84	84	84	84	84	82	80	77	75	73	73	72
	Maximum	99	100	100	100	99	97	95	91	90	88	86	86
	Minimum	66	66	66	64	64	63	63	63	64	63	61	61
	Count	90	91	90	87	89	89	93	90	91	92	93	89

Table 4: Hourly Degree Day Statistics for Temperature in Baltimore: Baltimore/Washington International Airport (° F)

WBAN# 724060; Call Sign KBWI

January (1998, 1999, 2000, 2001) and July (1998, 1999, 2000)

January 1998, 1999, 2000, 2001 Heating Degree Days (65° - Temp)													
AM Degree Days		Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9	Hour 10	Hour 11	Hour 12
	Average	32.5	32.9	33.1	33.4	33.5	33.6	33.7	33.2	30.7	28.1	26.2	24.6
	St Deviation	33	35	33	35	35	35	33	33	31	28	28	26
	Median	11	11	11	11	11	11	11	11	10	10	11	11
	Maximum	56	55	55	56	56	56	56	55	51	49	47	47
	Minimum	1	1	1	2	2	2	2	2	1	0	0	0
	Count	119	115	119	118	114	115	121	122	117	118	119	115
PM Degree Days		Hour 13	Hour 14	Hour 15	Hour 16	Hour 17	Hour 18	Hour 19	Hour 20	Hour 21	Hour 22	Hour 23	Hour 24
	Average	23.6	22.8	22.7	23.3	24.9	27.2	28.4	29.7	30.6	31.2	31.8	32.3
	St Deviation	24	22	22	22	26	28	29	29	31	31	31	33
	Median	11.4	11.6	11.4	11.3	10.8	10.5	10.3	10.2	10.3	10.3	10.1	10.2
	Maximum	46.5	47.0	46.1	46.0	46.0	47.0	47.0	53.0	53.0	53.0	51.0	53.0
	Minimum	0	0	0	0	0	0	0	1	1	1	1	1
	Count	111	117	112	118	117	117	118	120	120	116	119	117
July 1998, 1999, 2000 Cooling Degree Days (Temp - 72°)													
AM Degree Days		Hour 1	Hour 2	Hour 3	Hour 4	Hour 5	Hour 6	Hour 7	Hour 8	Hour 9	Hour 10	Hour 11	Hour 12
	Average	1.4	1.1	0.8	0.7	0.6	0.9	2.1	4.5	6.8	8.7	10.5	11.7
	St Deviation	0	0	0	0	0	0	1	3	7	9	10	10
	Median	2	2	2	2	1	2	3	5	6	6	6	7
	Maximum	13	10	10	7	7	7	13	18	19	23	25	25
	Minimum	0	0	0	0	0	0	0	0	0	0	0	0
	Count	91	91	92	92	91	92	88	92	92	92	91	91
PM Degree Days		Hour 13	Hour 14	Hour 15	Hour 16	Hour 17	Hour 18	Hour 19	Hour 20	Hour 21	Hour 22	Hour 23	Hour 24
	Average	12.3	13.0	13.3	12.8	11.9	10.5	8.2	5.6	4.0	3.0	2.6	1.9
	St Deviation	12	12	12	12	12	10	8	5	3	1	1	0
	Median	7	7	7	7	7	6	6	5	4	4	4	3
	Maximum	27	28	28	28	27	25	23	19	18	16	14	14
	Minimum	0	0	0	0	0	0	0	0	0	0	0	0
	Count	90	91	90	87	89	89	93	90	91	92	93	89

Source: National Climatic Data Center

Table 5: Deterministic Variables in Hourly Load Models

Table 5 Deterministic Variables in Hourly Load Models	
Days of the Week	One for each day
Weekend	1 – Saturday and Sunday 0 – otherwise
Seasons	Winter (Jan, Feb, Mar) Summer (Jun, Jul, Aug)
Martin Luther King Day	The third Monday in January
President’s Day	The third Monday in February
Independence Day	July 4 th
Labor Day	The first Monday in September
Christmas Day	Dec 25 th
New Years Day	Jan. 1 st
Holiday	<i>Combines all Holidays into a Single Variable</i>

Table 5 Deterministic Variables in Hourly Load Models	
Days of the Week	One for each day
Weekend	1 – Saturday and Sunday 0 – otherwise
Seasons	Winter (Jan, Feb, Mar) Summer (Jun, Jul, Aug)
Martin Luther King Day	The third Monday in January
President’s Day	The third Monday in February
Independence Day	July 4 th , and the work week of the 4 th
Labor Day	The first Monday in September
Veteran’s Day	November 11 * When Veteran’s Day falls on a Saturday, November 10 (Friday) is a holiday. * When Veteran’s Day falls on a Sunday, November 12 (Monday) is a holiday.
Christmas	Dec. 23 rd - Dec. 26 th , Individually and all four days
New Years Day	Dec. 31 st , Jan. 1 st , Monday after and the Weekend
Holiday	<i>Combines all Holidays into a Single Variable</i>

Table 6: Heating Degree Day Hypotheses

Unrestricted Model: $\log\text{Load}(i)$ C Tue Wed Thu Fri Sat Sun Holiday Feb Mar Dec JanHDD FebHDD MarHDD DecHDD JanHDD ² FebHDD ² MarHDD ² DecHDD ² $\log\text{Load}(i-1)$ $\log\text{Load}(i-2)$ $\log\text{Load}(i-3)$ $\log\text{Load}(i-24)$	
Restricted Models	Specification
H0:1 There are no Day or Holiday effects	Tue = Wed = Thu = Fri = Holiday = 0
H0:2 There are no Weekend or Holiday effects	Sat = Sun = Holiday = 0
H0:3 There are no Weekend effects	Sat = Sun = 0
H0:4 There are no Sunday or Holiday Effects	Sun = Holiday = 0
H0:5 There are no Weekend effects; Weekday effects are all the same	Sat = Sun = 0; Tue = Wed = Thu = Fri
H0:6 There are no Month effects	Feb = Mar = Dec = 0
H0:7 There are no Day or Holiday or Month effects	Tue = Wed = Thu = Fri = Sat = Sun = Holiday = Feb = Mar = Dec = 0
H0:8 There are no Weekend or Holiday or Month effects	Sat = Sun = Holiday = Feb = Mar = Dec = 0
H0:9 There are no Weekend or Month effects	Sat = Sun = Feb = Mar = Dec = 0
H0:10 There are no Sunday or Holiday or Month Effects	Sun = Holiday = Feb = Mar = Dec = 0
H0:11 There are no Weekend or Month effects; Weekday effects are all the same	Sat = Sun = Feb = Mar = Dec = 0; Tue = Wed = Thu = Fri
H0:12 There are no Weekday effects; Weekend and Holiday effects are the same	Tue = Wed = Thu = Fri = 0, Sat = Sun = Holiday
H0:13 There are no Weekday or Month effects; Weekend and Holiday effects are the same	Tue = Wed = Thu = Fri = Feb = Mar = Dec = 0; Sat = Sun = Holiday
H0:14 There are no DD Level effects	Jan HDD = Feb HDD = Mar HDD = Dec HDD = 0
H0:15 There are no DD Level effects for March or December	Mar HDD = Dec HDD = 0
H0:16 There are no DD Level effects for December	Dec HDD = 0
H0:17 There are no DD Level effects for March	Mar HDD = 0
H0:18 There are no DD Level effects for December; DD Level effects for other months are all equal	Dec HDD = 0; Jan HDD = Feb HDD = Mar HDD
H0:19 There are no DD Level effects for March; DD Level effects for other months are all equal	Mar HDD = 0; Feb HDD = Mar HDD = Dec HDD
H0:20 There are no DD Level effects for March or December; DD Level effects for January and February are equal	Mar HDD = Dec HDD = 0; Jan HDD = Feb HDD
H0:21 DD Level effects for March and December are equal; DD Level effects for January and February are equal	Mar HDD = Dec HDD; Jan HDD = Feb HDD
H0:22 DD Level effects for all months are equal	Jan HDD = Feb HDD = Mar HDD = Dec HDD
H0:23 There are no DD Squared effects	Jan HDD ² = Feb HDD ² = Mar HDD ² = Dec HDD ² = 0
H0:24 There are no DD Squared effects for March or December	Mar HDD ² = Dec HDD ² = 0
H0:25 There are no DD Squared effects for March	Mar HDD ² = 0
H0:26 There are no DD Squared effects for December	Dec HDD ² = 0
H0:27 There are no DD Squared effects for December; DD Squared effects for other months are all equal	Dec HDD ² = 0; Jan HDD ² = Feb HDD ² = Mar HDD ²
H0:28 There are no DD Squared effects for March; DD Squared effects for other months are all equal	Mar HDD ² = 0; Jan HDD ² = Feb HDD ² = Mar HDD ²
H0:29 There are no DD Squared effects for March or December; DD Squared effects for January and February are equal	Mar HDD ² = Dec HDD ² = 0; Jan HDD ² = Feb HDD ²
H0:30 DD Squared effects for March and December are equal; DD Squared effects for January and February are equal	Mar HDD ² = Dec HDD ² ; Jan HDD ² = Feb HDD ²
H0:31 DD Squared effects for all months are equal	Jan HDD ² = Feb HDD ² = Mar HDD ² = Dec HDD ²
H0:32 There are no DD Level or Squared effects	Jan HDD = Feb HDD = Mar HDD = Dec HDD = Jan HDD ² = Feb HDD ² = Mar HDD ² = Dec HDD ² = 0
H0:33 There are no DD Level or Squared effects for March or December	Mar HDD = Dec HDD = Mar HDD ² = Dec HDD ² = 0
H0:34 There are no DD Level or Squared effects for December	Dec HDD = Dec HDD ² = 0
H0:35 There are no DD Level or Squared effects for March	Mar HDD = Mar HDD ² = 0
H0:36 There are no DD Level or Squared effects for December; DD effects for other months are all equal	Dec HDD = 0; Jan HDD = Feb HDD = Mar HDD; Dec HDD ² = 0; Jan HDD ² = Feb HDD ² = Mar HDD ²
H0:37 There are no DD Level or Squared effects for March; DD effects for other months are all equal	Mar HDD = 0; Jan HDD = Feb HDD = Dec HDD; Mar HDD ² = 0; Mar HDD ² = Feb HDD ² = Dec HDD ²
H0:38 There are no DD Level or Squared effects for March or December; DD effects for January and February are equal	Mar HDD = Dec HDD = 0; Jan HDD = Feb HDD; Mar HDD ² = Dec HDD ² = 0; Jan HDD ² = Feb HDD ²
H0:39 DD effects for March and December are equal; DD effects for January and February are equal	Jan HDD = Feb HDD; Mar HDD ² = Dec HDD ² ; Jan HDD ² = Feb HDD ²
H0:40 DD effects for all months are equal	Jan HDD ² = Feb HDD ² = Mar HDD ² = Dec HDD ² ; Jan HDD ² = Feb HDD ² = Mar HDD ² = Dec HDD ²

Table 7: Likelihood Ratio P-Values for HDD Hypothesis Tests for the sample period January 1, 1998 to April 30 2001

HDD period restricted to the months of January, February, March and December (BC/BWI, Baltimore, MD)

Unrestricted	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
H0:1	*	**	***	***	***	***	***	***	***	***	***	***	***	***	***		***	***	***	***	***	***	***	***
H0:2	***	*	***	***	***	***	***	***	**		**		***	***	***		***	**	***	***	***	***	***	***
H0:3	**		***	**		***		***	**				***	***			**	**	***	***	***	***	***	***
H0:4	**	**	***	***	***	***	***	*			**	**		**	***		**	*	***		***			
H0:5				***	**	***		***	***	*			***	*			***	***	***	***	***	***	***	***
H0:6	*	***	***	***	***	***	***	***	***	***	***	***	***	***	***		***	***	***	***	***	***	***	***
H0:7	*	***	***	***	***	***	***	***	***	***	***	***	***	***	***		***	***	***	***	***	***	***	***
H0:8	***	**	***	***	***	***	***	***	**		**		***	***	**		***	***	***	***	***	***	***	***
H0:9	**	*	***			***	***	***	**				***	**			***	***	***	***	***	***	***	***
H0:10	**	***	***	***	***	***	***	**			**	*			**		***	***	***	***	***	***	***	**
H0:11		**	***	***	**	***	**	***	***				***				***	***	***	***	***	***	***	***
H0:12	*	**		***	***	***		***	***	***	**	*	***	*			***	***	***	***	***	***	***	***
H0:13	*	***	***	***	***	***	***	***	***	***	**	*	***				***	***	***	***	***	***	***	***
H0:14	***	***	***	***	***	**		**					**			***	***	***	***	***	**	***	***	***
H0:15	**	***	***	**	**	**		***					*		*	***	***	***	***	***	**	***	***	
H0:16		***	***				*	*								***	***		*	***		***	*	
H0:17	**	***	***	**	***	**		***					**		**		***	***	***	***	**	***	**	
H0:18		**	***					**							*	***	***	*		***		**	*	
H0:19	**	***	***	**	**	*		**					**				***	***	**	***		***	***	
H0:20	**	***	***	*	**	**		***					*			***	***	***	**	***	*	***	**	
H0:21			**		*			***								*	**	**		***				
H0:22			***					***							*		**	**		***				
H0:23			**					**	***	**		***	***		**		**	*	***	***				
H0:24	*			*				**	***	**		***	*		***	*			*	***				
H0:25	**			*					***							**	*	*						
H0:26								***	*	**	*	***	**		***				*	***				
H0:27			**						***					*	*	**				*				
H0:28								**	*		**	**	**	**	**		***		***					
H0:29								**	***	*		**	*		**	*	**		***					
H0:30			*					**					*				***		***					
H0:31			**					**					*		*		***			**				
H0:32	***	***	***	***	***	***		***	***	***	***	***	***	*	***	***	***	***	***	***	***	***	***	***
H0:33	***	***	***	***	***	***	*	***	***	***	***	***			***	***	***	***	***	***	***	***	***	***
H0:34	***	***	***	***	***	***	**	**	***	***	***	**			***	***	***	***	***	***	***	***	***	***
H0:35	***	***	***	***	***	***		**	***	***	***	***	*	*	***	**	***	***	***	***	***	***	***	***
H0:36	***	***	***	***	***	***		**	***	***	***	**		*	**	***	***	***	***	***	***	***	***	***
H0:37	***	***	***	***	***	***		*	***	***	***	***	**	*	**	**	***	***	***	***	***	***	***	***
H0:38	***	***	***	***	***	***		***	***	***	***	***			***	***	***	***	***	***	***	***	***	***
H0:39			***					**									*	***		***				
H0:40			***					**					**				**	***		***				

Legend: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 8: Cooling Degree Day Hypotheses

Unrestricted Model: $\log\text{Load}(i)$ C Tue Wed Thu Fri Sat Sun Holiday Jul Aug Sep JunCDD JulCDD AugCDD SepCDD
 JunCDD^2 JulCDD^2 AugCDD^2 SepCDD^2 $\log\text{Load}(i-1)$ $\log\text{Load}(i-2)$ $\log\text{Load}(i-3)$ $\log\text{Load}(i-24)$

Restricted Models	Specification
H0:1 There are no Day or Holiday effects	Tue = Wed = Thu = Fri = Holiday = 0
H0:2 There are no Weekend or Holiday effects	Sat = Sun = Holiday = 0
H0:3 There are no Weekend effects	Sat = Sun = 0
H0:4 There are no Sunday or Holiday Effects	Sun = Holiday = 0
H0:5 There are no Weekend effects; Weekday effects are all the same	Sat = Sun = 0; Tue = Wed = Thu = Fri
H0:6 There are no Month effects	Jul = Aug = Sep = 0
H0:7 There are no Day or Holiday or Month effects	Tue = Wed = Thu = Fri = Sat = Sun = Holiday = Jul = Aug = Sep = 0
H0:8 There are no Weekend or Holiday or Month effects	Sat = Sun = Holiday = Jul = Aug = Sep = 0
H0:9 There are no Weekend or Month effects	Sat = Sun = Jul = Aug = Sep = 0
H0:10 There are no Sunday or Holiday or Month Effects	Sun = Holiday = Jul = Aug = Sep = 0
H0:11 There are no Weekend or Month effects; Weekday effects are all the same	Sat = Sun = Jul = Aug = Sep = 0; Tue = Wed = Thu = Fri
H0:12 There are no Weekday effects; Weekend and Holiday effects are the same	Tue = Wed = Thu = Fri = 0, Sat = Sun = Holiday
H0:13 There are no Weekday or Month effects; Weekend and Holiday effects are the same	Tue = Wed = Thu = Fri = Jul = Aug = Sep = 0; Sat = Sun = Holiday
H0:14 There are no DD Level effects	Jun CDD = Jul CDD = Aug CDD = Sep CDD = 0
H0:15 There are no DD Level effects for June or September	Jun CDD = Sep CDD = 0
H0:16 There are no DD Level effects for June	Jun CDD = 0
H0:17 There are no DD Level effects for September	Sep CDD = 0
H0:18 There are no DD Level effects for September; DD Level effects for other months are all equal	Sep CDD = 0; Jun CDD = Jul CDD = Aug CDD
H0:19 There are no DD Level effects for June; DD Level effects for other months are all equal	Jun CDD = 0; Jul CDD = Aug CDD = Sep CDD
H0:20 There are no DD Level effects for June or September; DD Level effects for July and August are equal	Jun CDD = Sep CDD = 0; Jul CDD = Aug CDD
H0:21 DD Level effects for June and September are equal; DD Level effects for July and August are equal	Jun CDD = Sep CDD; Jul CDD = Aug CDD
H0:22 DD Level effects for all months are equal	Jun CDD = Jul CDD = Aug CDD = Sep CDD
H0:23 There are no DD Squared effects	$\text{Jun CDD}^2 = \text{Jul CDD}^2 = \text{Aug CDD}^2 = \text{Sep CDD}^2 = 0$
H0:24 There are no DD Squared effects for June or September	$\text{Jun CDD}^2 = \text{Sep CDD}^2 = 0$
H0:25 There are no DD Squared effects for June	$\text{Jun CDD}^2 = 0$
H0:26 There are no DD Squared effects for September	$\text{Sep CDD}^2 = 0$
H0:27 There are no DD Squared effects for September; DD Squared effects for other months are all equal	$\text{Sep CDD}^2 = 0$; $\text{Jun CDD}^2 = \text{Jul CDD}^2 = \text{Aug CDD}^2$
H0:28 There are no DD Squared effects for June; DD Squared effects for other months are all equal	$\text{Jun CDD}^2 = 0$; $\text{Jul CDD}^2 = \text{Aug CDD}^2 = \text{Sep CDD}^2$
H0:29 There are no DD Squared effects for June or September; DD Squared effects for July and August are equal	$\text{Jun CDD}^2 = \text{Sep CDD}^2 = 0$; $\text{Jul CDD}^2 = \text{Aug CDD}^2$
H0:30 DD Squared effects for June and September are equal; DD Squared effects for July and August are equal	$\text{Jun CDD}^2 = \text{Sep CDD}^2$; $\text{Jul CDD}^2 = \text{Aug CDD}^2$
H0:31 DD Squared effects for all months are equal	$\text{Jun CDD}^2 = \text{Jul CDD}^2 = \text{Aug CDD}^2 = \text{Sep CDD}^2$
H0:32 There are no DD Level or Squared effects	Jun CDD = Jul CDD = Aug CDD = Sep CDD = $\text{Jun CDD}^2 = \text{Jul CDD}^2 = \text{Aug CDD}^2 = \text{Sep CDD}^2 = 0$
H0:33 There are no DD Level or Squared effects for June or September	Jun CDD = Sep CDD = $\text{Jun CDD}^2 = \text{Sep CDD}^2 = 0$
H0:34 There are no DD Level or Squared effects for June	Jun CDD = $\text{Jun CDD}^2 = 0$
H0:35 There are no DD Level or Squared effects for September	Sep CDD = $\text{Sep CDD}^2 = 0$
H0:36 There are no DD Level or Squared effects for September; DD effects for other months are all equal	Sep CDD = 0; Jun CDD = Jul CDD = Aug CDD; $\text{Sep CDD}^2 = 0$; $\text{Jun CDD}^2 = \text{Jul CDD}^2 = \text{Aug CDD}^2$
H0:37 There are no DD Level or Squared effects for June; DD effects for other months are all equal	Jun CDD = 0; Jul CDD = Aug CDD = Sep CDD; $\text{Jun CDD}^2 = 0$; $\text{Jul CDD}^2 = \text{Aug CDD}^2 = \text{Sep CDD}^2$
H0:38 There are no DD Level or Squared effects for June or September; DD effects for July and August are equal	Jun CDD = Sep CDD = 0; Jul CDD = Aug CDD; $\text{Jun CDD}^2 = \text{Sep CDD}^2 = 0$; $\text{Jul CDD}^2 = \text{Aug CDD}^2$
H0:39 DD effects for June and September are equal; DD effects for July and August are equal	Jun CDD = Sep CDD; Jul CDD = Aug CDD; $\text{Jun CDD}^2 = \text{Sep CDD}^2$; $\text{Jul CDD}^2 = \text{Aug CDD}^2$
H0:40 DD effects for all months are equal	$\text{Jun CDD}^2 = \text{Jul CDD}^2 = \text{Aug CDD}^2 = \text{Sep CDD}^2$; $\text{Jun CDD}^2 = \text{Jul CDD}^2 = \text{Aug CDD}^2 = \text{Sep CDD}^2$

Table 9: Likelihood Ratio P-Values for CDD Hypothesis Tests for the sample period January 1, 1998 to April 30 2001
CDD period restricted to the months of June, July, August and September (BC/BWI, Baltimore, MD)

Unrestricted	Hour 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
H0:1			***	***	***	***	***	***	***	***	***	***	***	***	***	***	**	***	***	***	***	***	***	***
H0:2					***	***	***	***	***	***	***	***	***			***	**	***		***	***	***	***	***
H0:3					***	***	***	***	***	**		***	***			*	*	**		***	***	***	***	***
H0:4					**	***	***	***	***	***	***					***	*	**					**	***
H0:5			***		*	***	*	***	***	**		***	***				*	***	***	***	***	**	***	***
H0:6	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	**	***	***	***	***	***	***	***
H0:7	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	**	***	***	***	***	***	***	***
H0:8	***	***	***		**	***	***	***	***	***	***	***	***			***		***	***	***	***	***	***	***
H0:9	***	***	***		**	***	***	***	***	***	**	***	***					***		***	***	***	***	***
H0:10	***	***	**		*	***	***	***	***	***	***				*	***		***		***	***	***	***	***
H0:11	***	***	***			***	***	***	***	***	**	***	***				*	***	***	***	***	***	***	***
H0:12			***	*	***	***	*	***	***	**	**	***	**			**	*	***	***	***	***	***	***	***
H0:13	***	***	***		**	***	***	***	***	***	***	***	***			*		***	**	***	***	***	***	***
H0:14	*	***	*	***	***	*		***	***	***	***	***	***	***	***	***	***	***	**	***	***	***	***	***
H0:15		***	*	**				***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	**
H0:16		**	**					***	***	***	***	***	***	***	***	***	***	***	***	***	***		**	*
H0:17		**		***				***	***	***	***	***	***	***	***	***	***	***	**		***	***	***	**
H0:18		***		***				**	***	***	***	***	***	***	***	***	***	***	*	**	***	***	**	
H0:19		***						***	***	***	***	***	***	***	***	***	***	***	**	***	***	***	**	
H0:20		***		**				***	***	***	***	***	***	***	***	***	***	***	**	***	***	***	**	*
H0:21		**		**																	**	***	*	
H0:22		**		*						*								**		*	***	***	*	
H0:23		***		***	***	*		***	**	***		***	***	***	***	***	*	**		*	**	***		
H0:24		*		*				***	**	***		***	***	***	***	***	**	***		**	**	***		
H0:25								**	**			***	***	***	***	***	**	***		**				
H0:26		*		**				***		***	*	*	***	**		**	**				***	***		
H0:27	***	***	**	*		***	***	***		**		*	**				**	**		***	**	***	**	**
H0:28	***	***	**			***	***	***	*			***	***	*	**	***	*	**	*	***	**	***	**	**
H0:29		***		*				***	**	***		***	***	***	***	***	**	**		*	**	***		
H0:30	*	***		**		*		***												*	***			
H0:31		***		*				**												**	**	***		***
H0:32	***	***	***	***	***	**	**	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
H0:33		***	**	***			***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
H0:34	**	***	***	**				***	***	***	***	***	***	***	***	***	***	***	***	***	**	**	*	**
H0:35		*		***			***	**	***	***	***	***	***	***	***	***	***	***	**		***	***	***	**
H0:36	***	***	**	**		***	***	***	***	***	***	***	***	***	***	***	***	***	**	***	***	***	***	***
H0:37	***	***	***	**		***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***
H0:38	*	***	**	***		**	**	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	***	**
H0:39		**		*		**	***	***												**	*	***		
H0:40		**				**	**	***	*	**								*		**	***	***	**	

Legend: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

Table 10: Heating Degree Day Final Model Results Example: Hour 19

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=====
Dependent Variable: LOG(BC_19) Included observations: 453
Sample(adjusted): 1/02/1998 3/31/1998 12/01/1998 3/31/1999
12/01/1999 3/31/2000 12/01/2000 3/31/2001
Newey-West HAC Standard Errors & Covariance (lag truncation=5)
=====

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Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.571240	0.168778	9.309502	0.0000
TUESDAY	-0.007696	0.002135	-3.605414	0.0003
WEDNESDAY	-0.007877	0.002386	-3.301381	0.0010
THURSDAY	-0.008210	0.002338	-3.511487	0.0005
FRIDAY	-0.023883	0.002540	-9.403181	0.0000
SATURDAY	-0.029934	0.003097	-9.666576	0.0000
SUNDAY	-0.018996	0.002448	-7.760165	0.0000
HOLIDAY	-0.014382	0.005104	-2.817755	0.0051
FEB	0.027361	0.003245	8.430515	0.0000
MAR	0.032543	0.004178	7.788736	0.0000
DEC	-0.010589	0.002892	-3.661710	0.0003
(DEC+JAN+FEB+MAR)*HDD0	0.001029	0.000274	3.757664	0.0002
(DEC+JAN+FEB+MAR)*HDD1	8.3E-0519	6.28E-06	2.914936	0.0037
LOG(BC_18(0))	0.872182	0.060496	14.41708	0.0000
LOG(BC_17(0))	-0.183159	0.076631	-2.390147	0.0173
LOG(BC_16(0))	0.059283	0.051880	1.142691	0.2538
LOG(BC_19(-1))	0.062195	0.012313	5.051045	0.0000

R-squared	0.984279	Mean dependent var	8.333501
Adjusted R-squared	0.983703	S.D. dependent var	0.106574
S.E. of regression	0.013605	Akaike info criter	-5.719897
Sum squared resid	0.080706	Schwarz criterion	-5.565437
Log likelihood	1312.557	F-statistic	1706.154
Durbin-Watson stat	1.291054	Prob(F-statistic)	0.000000

Correlogram of Residuals

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
. ***	. ***	1	0.349	0.349	55.503 0.000
. **	. *	2	0.250	0.146	84.126 0.000
. **	. *	3	0.212	0.100	104.62 0.000
. **	. *	4	0.221	0.114	127.09 0.000
. *	. .	5	0.161	0.027	139.08 0.000
. *	. .	6	0.161	0.053	150.97 0.000
. *	. .	7	0.151	0.043	161.56 0.000

Table 11: Cooling Degree Day Final Model Results Example: Hour 17

=====

Dependent Variable: LOG(BC_17) Included observations: 366

Sample: 6/01/1998 9/30/1998 6/01/1999 9/30/1999 6/01/2000 9/30/2000

Newey-West HAC Standard Errors & Covariance (lag truncation=5)

=====

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.459509	0.089324	5.144268	0.0000
TUESDAY	0.000697	0.002111	0.330134	0.7415
WEDNESDAY	0.001620	0.002301	0.704142	0.4818
THURSDAY	-0.001813	0.002406	-0.753447	0.4517
FRIDAY	-0.002884	0.002117	-1.362272	0.1740
SATURDAY	-0.006103	0.004075	-1.497571	0.1351
SUNDAY	-0.001960	0.002742	-0.714892	0.4752
HOLIDAY	-0.008219	0.003871	-2.123015	0.0345
JUL	0.003272	0.001882	1.738110	0.0831
AUG	-0.000910	0.002150	-0.423255	0.6724
SEP	0.000567	0.001919	0.295628	0.7677
(JUN+JUL+AUG+SEP)*CDD	0.001657	0.000490	3.379015	0.0008
(JUN+JUL+AUG+SEP)*CD	-2.19E-05	1.43E-05	-1.531950	0.1264
LOG(BC_16(0))	1.332956	0.072168	18.47024	0.0000
LOG(BC_15(0))	-0.277129	0.126745	-2.186503	0.0294
LOG(BC_14(0))	-0.118943	0.070515	-1.686766	0.0925
LOG(BC_17(-1))	0.007562	0.005449	1.387690	0.1661

R-squared	0.995934	Mean dependent var	8.411819
Adjusted R-squared	0.995748	S.D. dependent var	0.175263
S.E. of regression	0.011429	Akaike info criter	-6.060025
Sum squared resid	0.045586	Schwarz criterion	-5.878756
Log likelihood	1125.985	F-statistic	5342.946
Durbin-Watson stat	1.844032	Prob(F-statistic)	0.000000

Correlogram of Residuals

Autocorrelation	Partial Correlation	AC	PAC	Q-Stat	Prob
. *	. *	1 0.078	0.078	2.2646	0.132
. .	. .	2 0.050	0.044	3.1783	0.204
. *	. *	3 0.085	0.079	5.8700	0.118
. *	. *	4 0.083	0.069	8.4086	0.078
. .	. .	5 -0.008	-0.026	8.4325	0.134
. *	. .	6 0.067	0.057	10.097	0.121
. .	* .	7 -0.050	-0.070	11.017	0.138

Table 12: Symmetry Tests for HDD Coefficients

January – March 1998; December 1998 – March 1999; December 1999 – March 2000;
December 2000 – March 2001

Null Hypothesis, H_0 : estimates for June/September equal those for July/August
(BC/BWI, Baltimore, MD)

Hour	Level Terms		Quadratic Terms		Joint Test	
	Wald χ^2	P-Value	Wald χ^2	P-Value	Wald χ^2	P-Value
1	0.30	0.5847	1.63	0.2010	3.30	0.0380
2	0.80	0.3710	1.54	0.2140	1.60	0.2038
3	3.69	0.0548	2.95	0.0859	1.99	0.1383
4	1.62	0.2030	2.55	0.1102	1.57	0.2102
5	0.01	0.9303	0.07	0.7855	1.31	0.2706
6	0.03	0.8656	0.02	0.8964	0.03	0.9732
7	0.12	0.7292	0.22	0.6358	0.24	0.7898
8	0.23	0.6350	0.19	0.6606	0.12	0.8842
9	1.31	0.2524	0.72	0.3965	1.00	0.3686
10	0.01	0.9062	0.00	0.9739	0.13	0.8746
11	1.90	0.1681	0.86	0.3529	1.55	0.2133
12	0.93	0.3355	0.40	0.5274	0.93	0.3951
13	0.00	0.9476	0.62	0.4325	2.86	0.0581
14	0.57	0.4510	1.50	0.2208	1.60	0.2023
15	3.12	0.0776	2.42	0.1197	1.59	0.2055
16	0.22	0.6423	1.11	0.2911	1.47	0.2303
17	5.37	0.0205	4.78	0.0288	2.69	0.0692
18	2.06	0.1517	1.74	0.1866	1.03	0.3569
19	1.68	0.1944	1.96	0.1615	0.98	0.3752
20	3.36	0.0669	3.14	0.0764	1.68	0.1878
21	0.01	0.9436	0.00	0.9962	0.04	0.9653
22	3.11	0.0778	2.35	0.1252	1.68	0.1869
23	0.06	0.7999	0.47	0.4914	0.80	0.4512
24	0.00	0.9457	0.37	0.5456	1.97	0.1403

Table 13: Symmetry Tests for CDD Coefficients

June – September 1998, 1999 and 2000

Null Hypothesis, H_0 : estimates for Decmber/March equal those for January/February (BC/BWI, Baltimore, MD)

Hour	Level Terms		Quadratic Terms		Joint Test	
	Wald χ^2	P-Value	Wald χ^2	P-Value	Wald χ^2	P-Value
1	0.76	0.3842	0.70	0.4041	0.38	0.6825
2	0.50	0.4794	1.53	0.2156	1.42	0.2439
3	2.00	0.1576	1.39	0.2385	1.08	0.3420
4	0.00	0.9688	0.02	0.8956	0.03	0.9683
5	0.04	0.8466	0.04	0.8332	0.02	0.9777
6	3.08	0.0794	3.50	0.0615	1.75	0.1751
7	0.64	0.4243	1.48	0.2238	1.26	0.2845
8	0.37	0.5452	0.18	0.6739	0.25	0.7769
9	4.96	0.0260	2.73	0.0987	3.35	0.0363
10	4.45	0.0349	2.03	0.1541	3.77	0.0241
11	0.74	0.3895	0.04	0.8396	2.09	0.1247
12	3.29	0.0699	1.86	0.1729	2.48	0.0854
13	2.05	0.1523	1.93	0.1647	1.03	0.3587
14	0.82	0.3642	0.41	0.5202	0.55	0.5766
15	0.44	0.5089	0.05	0.8220	3.27	0.0391
16	0.34	0.5621	0.18	0.6693	0.26	0.7689
17	1.52	0.2179	2.90	0.0885	1.75	0.1753
18	5.69	0.0171	4.13	0.0422	2.93	0.0545
19	1.31	0.2529	1.67	0.1961	0.85	0.4286
20	3.67	0.0553	4.49	0.0340	2.26	0.1054
21	6.25	0.0124	6.73	0.0095	3.38	0.0353
22	4.50	0.0339	4.59	0.0321	2.33	0.0992
23	4.34	0.0371	6.21	0.0127	3.85	0.0223
24	1.69	0.1941	2.00	0.1573	1.01	0.3654

Table 14: Heating Degree Day Load Elasticities – Significant Coefficients Only

January – March 1998; December 1998 – March 1999; December 1999 – March 2000; December 2000 – March 2001
(BC/BWI, Baltimore, MD)

Hour	Asymetric Model						Symmetric Model		
	December and March the Same			January and February the Same			All Winter Months the Same		
	Level	Quad	Sum	Level	Quad	Sum	Level	Quad	Sum
1	0.0231	0.0207	0.0438	0.0298	0.0000	0.0298	0.0265	0.0000	0.0265
2	0.0541	0	0.0541	0.0690	0	0.0690	0.0576	0	0.0576
3	0.0389	0	0.0389	0	0	0	0.0280	0	0.0280
4	0.0208	0	0.0208	0.0311	0	0.0311	0.0260	0	0.0260
5	0.0172	0	0.0172	0	0	0	0.0175	0	0.0175
6	0.0198	0	0.0198	0.0219	0	0.0219	0.0199	0	0.0199
7	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0
9	0	0.0422	0.0422	0.0224	0.0276	0.0500	0	0.0312	0.0312
10	0	0	0	0	0.0223	0.0223	0.0118	0.0168	0.0287
11	0	0.0175	0.0175	0.0129	0	0.0129	0	0.0097	0.0097
12	0	0.0177	0.0177	0	0	0	0	0.0111	0.0111
13	0	0	0	0	0.0171	0.0171	-0.0091	0.0116	0.0025
14	0	0	0	0	0	0	0	0	0
15	0	0.0168	0.0168	0	0	0	0	0.0061	0.0061
16	0.0149	0	0.0149	0.0115	0	0.0115	0.0094	0	0.0094
17	0.0330	0	0.0330	0	0	0	0.0188	0	0.0188
18	0.0500	0	0.0500	0	0	0	0.0346	0	0.0346
19	0.0383	0	0.0383	0	0.0420	0.0420	0.0256	0.0227	0.0483
20	0	0.0527	0.0527	0.0172	0	0.0172	0	0.0286	0.0286
21	0.0163	0	0.0163	0.0156	0	0.0156	0.0144	0	0.0144
22	0.0299	0	0.0299	0.0177	0.0113	0.0290	0.0222	0	0.0222
23	0.0205	0	0.0205	0.0225	0	0.0225	0.0201	0	0.0201
24	0	0	0	0	0	0	0.0112	0	0.0112

Note: Elasticity coefficient estimates not significant at 5% are reported as zeros

Table 15: Cooling Degree Day Load Elasticities
June – September 1998, 1999 and 2000 (BC/BWI, Baltimore, MD)

Hour	Asymetric Model						Symmetric Model		
	<i>June and September the Same</i>			<i>July and August the Same</i>			<i>All Summer Months the Same</i>		
	Level	Quad	Sum	Level	Quad	Sum	Level	Quad	Sum
1	0.0000	0.0000	0.0000	0.0011	0	0.0011	0.0053	0.0000	0.0053
2	0.0029	-0.0002	0.0027	0.0022	0	0.0022	0.0147	0	0.0147
3	0.0018	0	0.0018	0.0008	0	0.0008	0.0054	-0.0011	0.0043
4	0.0005	0	0.0005	0.0006	-0.00001	0.0005	0.0058	-0.0015	0.0043
5	0.0007	0	0.0007	0.0006	-0.00003	0.0006	0.0050	-0.0017	0.0033
6	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0
8	0.0086	0	0.0086	0.0069	-0.0011	0.0058	0.0247	-0.0134	0.0114
9	0.0192	-0.0041	0.0150	0.0110	0	0.0110	0.0396	-0.0184	0.0212
10	0.0248	-0.0066	0.0182	0.0179	-0.0040	0.0140	0.0530	-0.0334	0.0196
11	0.0169	0	0.0169	0.0139	-0.0031	0.0108	0.0357	-0.0197	0.0159
12	0.0224	-0.0108	0.0116	0.0140	-0.0057	0.0082	0.0380	-0.0358	0.0022
13	0.0274	-0.0131	0.0143	0.0214	-0.0087	0.0127	0.0474	-0.0410	0.0065
14	0.0207	-0.0095	0.0112	0.0168	-0.0072	0.0096	0.0389	-0.0359	0.0030
15	0.0268	-0.0090	0.0178	0.0235	-0.0098	0.0137	0.0531	-0.0431	0.0100
16	0.0247	-0.0101	0.0145	0.0223	-0.0087	0.0136	0.0460	-0.0362	0.0098
17	0.0161	-0.0061	0.0100	0.0113	0	0.0113	0.0262	0.0000	0.0262
18	0.0179	-0.0056	0.0123	0.0094	0	0.0094	0.0271	-0.0115	0.0155
19	0	0	0	0	0	0	0	0	0
20	0.0102	0	0.0102	0	0	0	0	0	0
21	0.0125	-0.0041	0.0084	0	0	0	0	0	0
22	0.0087	-0.0027	0.0060	0	0	0	0.0114	0	0.0114
23	0.0049	-0.0010	0.0039	0.0015	0	0.0015	0.0105	0	0.0105
24	0.0031	-0.0005	0.0027	0.0017	-0.0001	0.0015	0.0109	-0.0055	0.0053

Note: Elasticity coefficient estimates not significant at 5% are reported as zero

