

Outlook for Natural Gas Demand for 2007-2008 Winter

Energy Ventures Analysis, Inc. (EVA)

Overview

Natural gas demand this winter is projected to increase 2.5 percent, or 278 BCF. The primary reason for this increase is the likelihood that the forthcoming winter, while projected to be slightly warmer than normal, will be colder than last winter. Offsetting some of the increase in demand due to weather factors is continued price-induced conservation and a lack of any recovery within the industrial sector.

Exhibit 1. Outlook For Winter Gas Demand

Sector	Coming Winter (2007/2008)		Last Winter (2006/2007)		Change	
	BCF	Average BCFD	BCF	Average BCFD	BCF	Average BCFD
Residential	3,472	22.8	3,348	22.2	124	0.8
Commercial	1,907	12.5	1,863	12.3	44	0.3
Industrial	2,957	19.5	2,910	19.3	47	0.3
Electric	2,158	14.2	2,119	14.0	39	0.3
Lease, Plant and Pipeline Fuel	786	5.2	762	5.0	24	0.1
Total	11,280	74.2	11,002	72.9	278	1.8

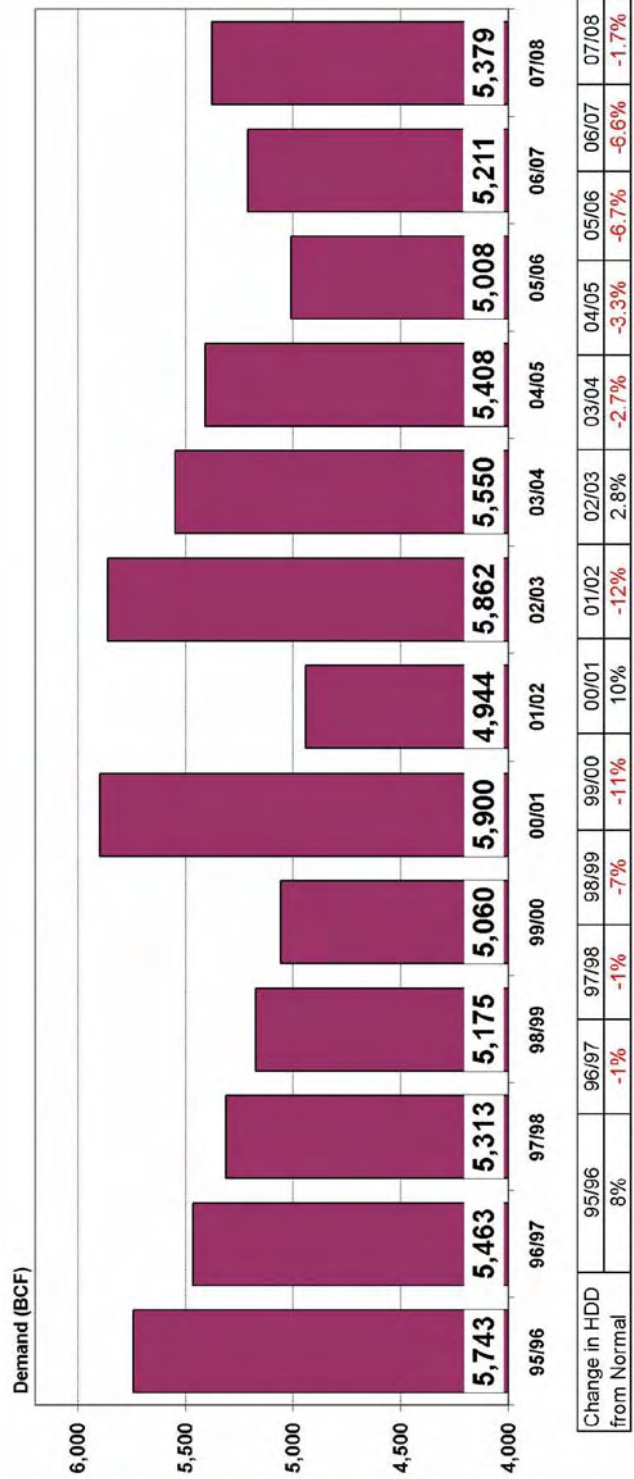
As with most forecasts for gas demand during the winter season, the weather is the major point of uncertainty. Current forecasts for the forthcoming winter are for the weather to be 1.7 percent warmer than normal, however this still will be colder than either of the last two winters, both of which were about 6.6 percent warmer than normal. Also, fuel switching in the electric sector, which tends to reduce natural gas demand, should not be a factor this winter, because oil prices likely will be well above natural gas prices. This is almost identical to the conditions that existed last winter. Lastly, while a relatively small factor, it should be noted that an extra day is included in the projections for the forthcoming winter, because 2008 is a leap year, which would of and by itself increase winter gas demand 0.7 percent.

Outlook For Demand

Residential And Commercial

The residential and commercial sectors are the sectors most heavily impacted by changes in winter weather, as illustrated in Exhibit 2. This is illustrated clearly by the pattern in gas demand for these two sectors over the last six winters.

Exhibit 2. Comparison Of Winter Gas Demand For Residential And Commercial Sectors



Note: The winter period is November through March. Winter 07/08 data is estimated.
Source: EIA.

For the forthcoming winter, early weather forecasts project that the winter weather will be milder than normal (i.e., 1.7 percent warmer than normal), however this will be substantially colder than the near record mild winters for the last two years.¹ As a result, gas demand in these two sectors is expected to be 3.2 percent, or 168 BCF, above that for the last winter. However, as noted in Exhibit 2, gas demand for these two sectors likely will not reach the levels attained during the winter of 2004/2005, even though the weather will be slightly colder.

The primary reason for this phenomenon is that conservation (i.e., primarily price-induced conservation) has been occurring within these two sectors. For the most part, this conservation has occurred as a result of consumer responses to high gas prices (i.e., behavioral), although there are indications of some structural conservation, as a result of the installation of additional insulation and remodeling of homes that includes installing double and triple pane windows. While this structural conservation is permanent, it is more difficult to judge the degree of permanence for behavioral conservation (e.g., wearing a sweater and adjusting the heating thermostat to a lower level). However, there is some indication that this behavioral conservation still may be growing and some of it could be permanent. Empirical evidence of the combination of this behavioral and structural conservation within the residential sector is presented in Exhibit 3, which illustrates that even though the weather was colder demand actually declined.

Exhibit 3. Recent Conservation Within The Residential Sectors

	November		December		Total For Two Months		Percent Change
	2004	2003	2004	2003	2004	2003	
Heating Degree Days Consumption (BCF)	487	477	802	784	1,289	1,261	2.2%
Residential	409	414	728	739	1,137	1,153	(1.4%)

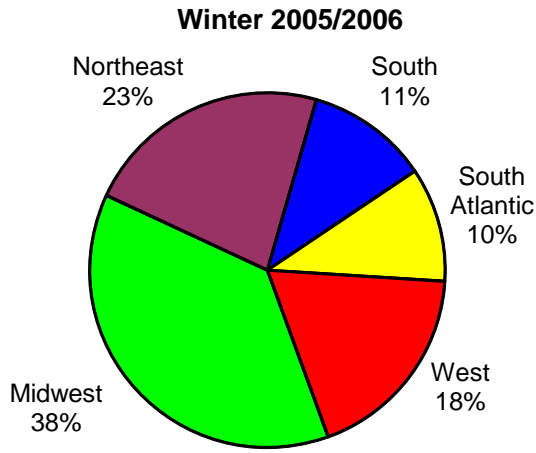
Source: NOAA and EIA.

While Exhibit 3 highlights the November/December period for two consecutive winters, this phenomenon of declining demand during periods of increased heating degree days has occurred in other periods (e.g., November 2004 versus November 2003 for the commercial sector and February 2006 versus February 2005 for the residential and commercial sectors).

The net result is that empirical evidence to date suggests that consumers in the residential and commercial sectors are responding to high natural gas prices. This forecast assumes that this recent level of conservation within these two sectors will continue and increase, albeit very moderately. With respect to the regional nature of gas demand for these two sectors, Exhibit 4 highlights the gas demand for the residential and commercial sectors by census region for the winter season.

¹ Last winter was 6.6 percent warmer than normal, while the winter for 2005/2006 was 6.7 percent warmer than normal. These are two of the six warmest winters in the last 50 years.

Exhibit 4. Residential And Commercial Sectors 2006 Gas Demand By Region



Demand = 5,007 BCF

Note: Winter=Nov and Dec 2005 and Jan-March 2006.
Source: U.S. DOE, Energy Information Administration.

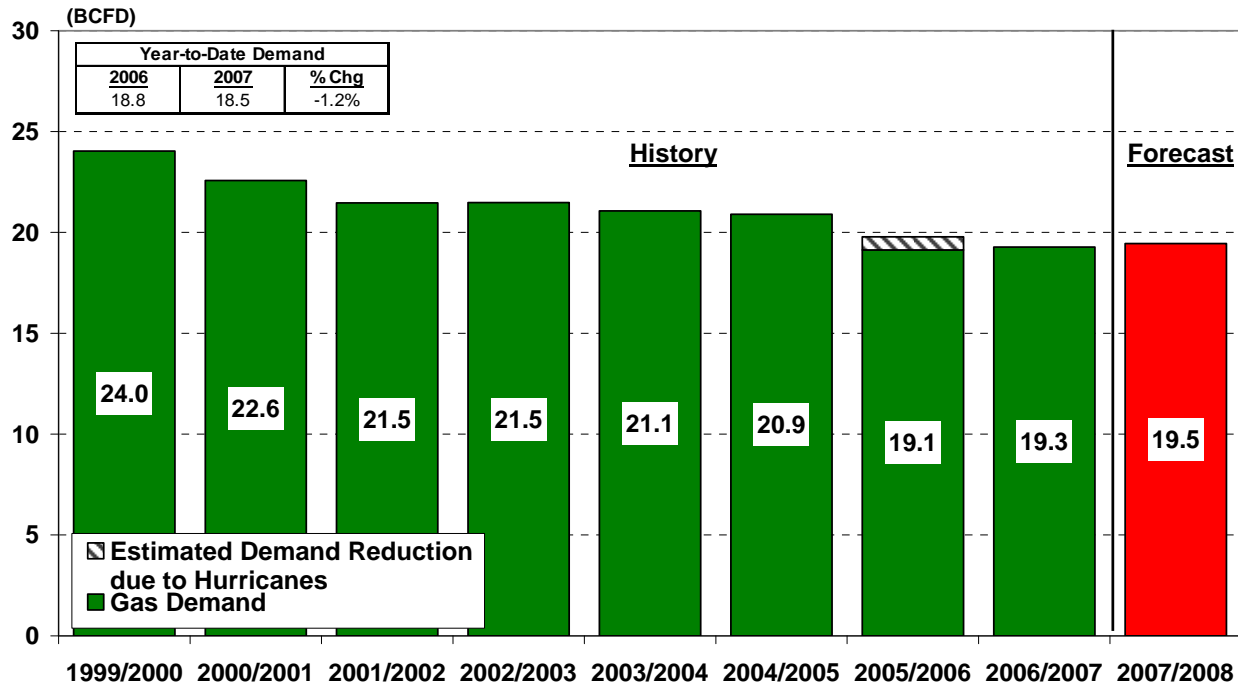
Industrial Sector

At present there is no empirical evidence of a recovery in industrial sector gas demand, as increases in demand due to economic growth in certain segments of the industrial sector are being offset by further ‘demand destruction’ in other segments. The latter is the net result of the relatively high prices for natural gas, particularly future prices, while the former includes increased natural gas demand due to expanding ethanol production.² For 2007 the net result of all the factors affecting industrial sector gas demand has been a 1.2 percent decline in gas consumption on a year-to-date basis (i.e., through May).

However, with respect to winter gas demand for the industrial sector the colder weather predicted for the forthcoming winter will be a factor. As illustrated in Exhibit 5, for the forthcoming winter the weather effect on industrial sector gas demand likely will offset the previously discussed underlying erosion for gas demand within the sector, with the net result being a modest 1.6 percent increase in demand. With respect to the industrial sector gas demand noted in Exhibit 5, for the winter of 2005/2006 the impact of Hurricane Katrina and Rita temporarily suppressing industrial sector demand along the Gulf Coast is noted, in order to identify more clearly the underlying trends for the sector.

² At present ethanol plants account for about 0.5 BCFD of total industrial gas consumption (i.e., less than three percent). This figure likely will increase about 0.2 BCFD per year over the next several years, as there are plans to add 77 new ethanol plants (i.e., about 6,200 MM gallons) by year end 2009. One gallon of ethanol requires approximately 0.035 MCF, assuming steam and power is generated by a gas-fired unit, which is not true for all plants.

Exhibit 5. Winter Industrial Sector Gas Demand



Source: EIA and EVA, Inc.

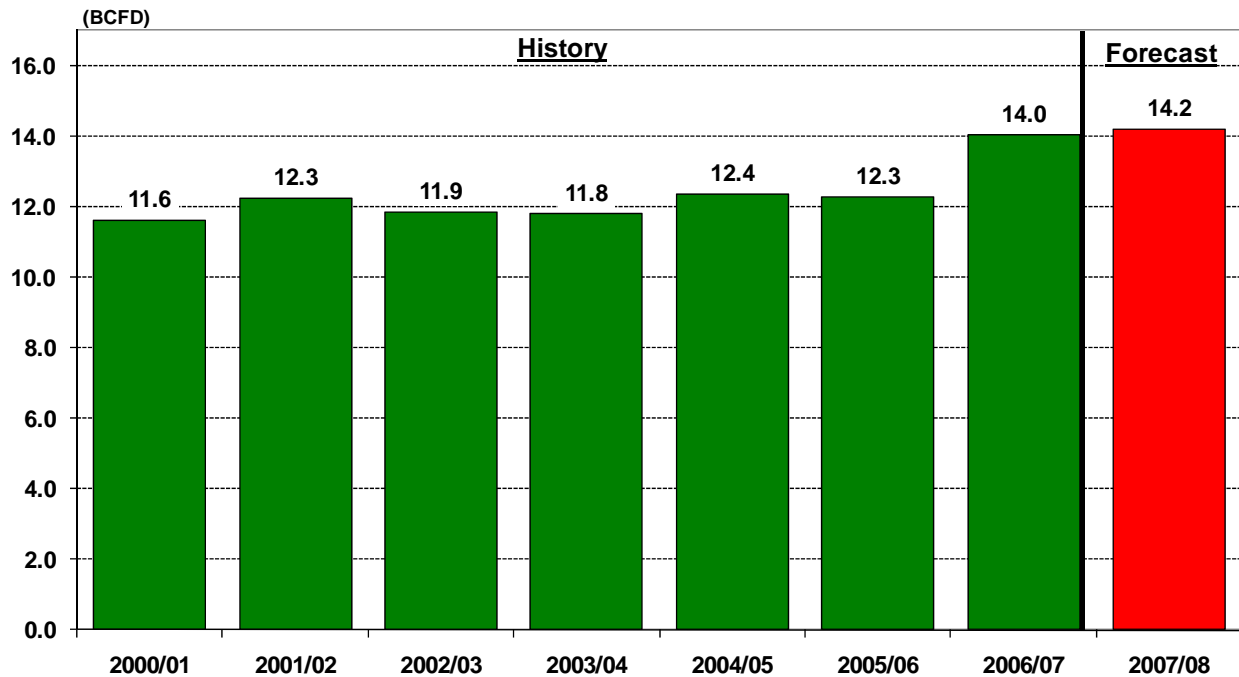
Lastly, Exhibit A-2 in the Appendix illustrates how, on average, production levels for the six energy intensive industries that account for about 65 to 70 percent of industrial sector demand have not kept pace with the overall increase in U.S. industrial production. This is one indication that the impact of additional demand destruction continues to offset the net impact of economic growth within the sector.

Electric Sector

While the electric sector is a major factor in overall gas demand during the summer, the same set of conditions do not exist during the winter. Within most regions of the country gas-fired generation is the marginal unit for economic dispatch. As a result, during periods of heightened electricity demand (i.e., during the summer) gas-fired generation captures most of the incremental load. However, during the winter season, when average electricity demand levels can be about 20 percent below demand levels during the heat of the summer, there is a significant reduction in the need for the marginal unit. As a result, the growth in gas-fired generation during the winter months historically has been rather modest, with most of the variance accounted for by significant fuel switching episodes.

The recent history for winter electric sector gas demand is presented in Exhibit 6. Except the winter of 2006/2007, which includes an anomalous event, described below, there has been very limited variance in winter gas demand for the sector.

Exhibit 6. Winter Electric Sector Gas Demand



Anomalous Event

With respect to the winter of 2006/2007 gas-fired generation, and hence, electric sector gas demand, during February was unusually high. For example, average daily electricity generation in February was 1.6 percent higher than the equivalent figure for January 2007, however gas-fired generation for February increased 7.8 percent over the average daily results for January. This unusual situation occurred because the reduced generation levels by other types of fuels, as some units were offline. The net result was that February 2007 electric sector gas demand soared to 15.7 BCFD, which is 9.2 percent higher than the equivalent figure for any winter month in the last five years.³

While unplanned outages can occur at any time, the anomalous events for February 2007 are not likely to repeat themselves during the forthcoming winter, at least to the degree that occurred last February. As a result, winter electric sector gas demand for the forthcoming winter is projected to increase only 1.8 percent over last winter's results. However, when the month of February is excluded from this comparison, the projected growth rate is 5.4 percent. Key drivers behind the latter figure are the overall average growth in electricity demand (i.e., about 2.1 percent) and the likelihood of colder winter weather this year, which will force electricity demand to increase in some regions.

³ Also, as illustrated in Exhibit A-3 in the Appendix, the February 2007 daily electric sector gas demand figure was 16 percent above the second highest daily gas consumption figure during the last five years.

Other Factors

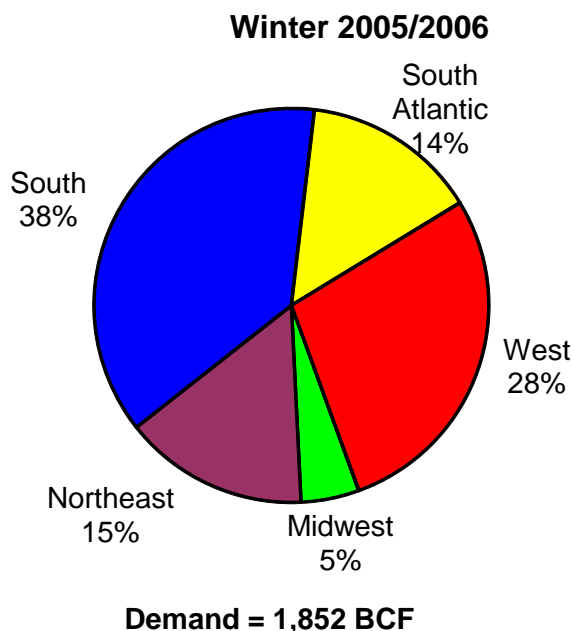
Historically, two other factors that have had a significant impact on winter gas demand in the electric sector were fuel switching and the ‘efficiency effect’. For the forthcoming winter neither of these phenomena will have an impact.

With respect to fuel switching electric sector gas demand is reduced when either oil prices decline or gas prices increase, which results in oil-fired generation being the more economic alternative and, as a result, displacing gas-fired generation. While this happened in the past (e.g., the winters of 2000/2001, 2003/2004 and 2005/2006), it did not happen last winter and it is not expected to occur this winter because both cash and futures gas prices are well below the equivalent oil prices.

With respect to the ‘efficiency effect’, which reduced gas demand within the electric sector because of the transition to the more efficient combined cycle technology from the older steam generator technology, this transition basically has been completed and thus, is no longer a factor in determining changes in electric sector gas consumption.⁴

Exhibit 7 provides a breakdown of winter electric sector gas consumption by region of the U.S. for the year 2006. For the forthcoming winter the breakdown of electric sector gas consumption is projected to be similar to the prior year.⁵

Exhibit 7. Electric Power Sector Gas Demand By Region



Note: Winter=Nov and Dec 2005 and Jan-March 2006.

Source: U.S. DOE, Energy Information Administration.

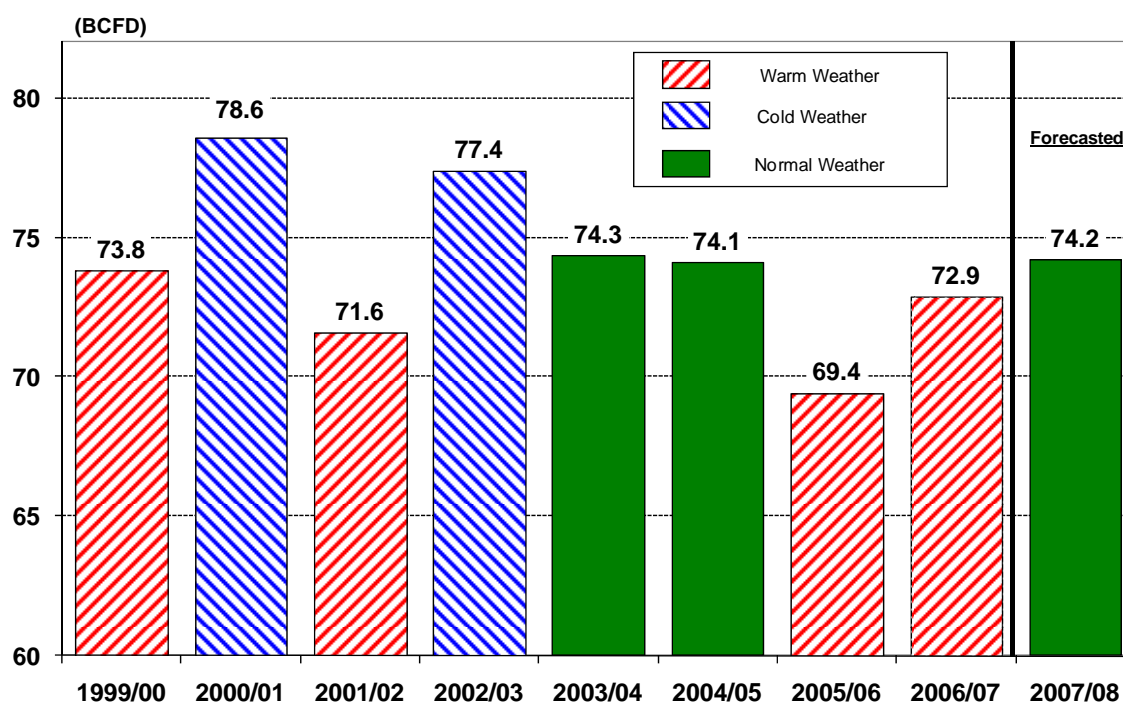
⁴ With respect to the outlook for gas-fired capacity additions, for 2007 gas-fired capacity additions, as illustrated in Exhibit A-8 in the Appendix, are projected to be approximately 6.2 GW. This figure represents about a three percent increase in the total combined cycle and simple cycle capacity added between 1998 and 2006.

⁵ Additional regional comparisons are presented in the Appendix.

Conclusion

Price-induced conservation is still having an impact on most of the major sectors for natural gas demand. As a result, gas demand for the forthcoming winter is projected to increase only 2.5 percent,⁶ with almost all of this growth attributable to the projected colder weather for the winter this year versus last year. More specifically this winter is projected to be slightly warmer than normal (i.e., 1.7 percent warmer based upon heating degree days), while last winter was one of the warmest on record (i.e., 6.6 percent warmer than normal). Exhibit 8 compares and contrasts natural gas demand for the last five winters, with the significantly colder and warmer than normal winters identified.

Exhibit 8. Average Winter Demand

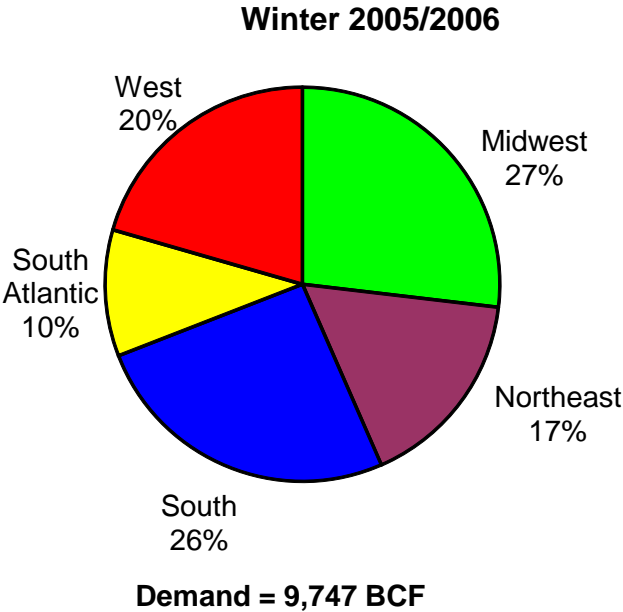


As has been the case historically, the biggest uncertainty in this outlook is the severity of winter weather. A very cold winter like the winters of 2002/2003 and 2000/2001 will cause projected gas demand to increase significantly, particularly in the residential and commercial sectors. Conversely, a milder winter like the winters of 2005/2006 and 2006/2007 will cause gas consumption to be reduced and could result in a net decline period over period for the industrial sector.

Finally, Exhibit 9 summarizes the likely breakdown of winter gas demand by region.

⁶ Because 2008 is a leap year on a unit basis (i.e., BCFD) the projected growth rate is only 1.9 percent.

Exhibit 9. Total Primary Gas Demand By Region



Note: Winter = Nov-Dec 2005 plus Jan-Mar2006
Source: U.S. DOE, Energy Information Administration.

APPENDIX

Exhibit A-1. Natural Gas Consumption (BCF)

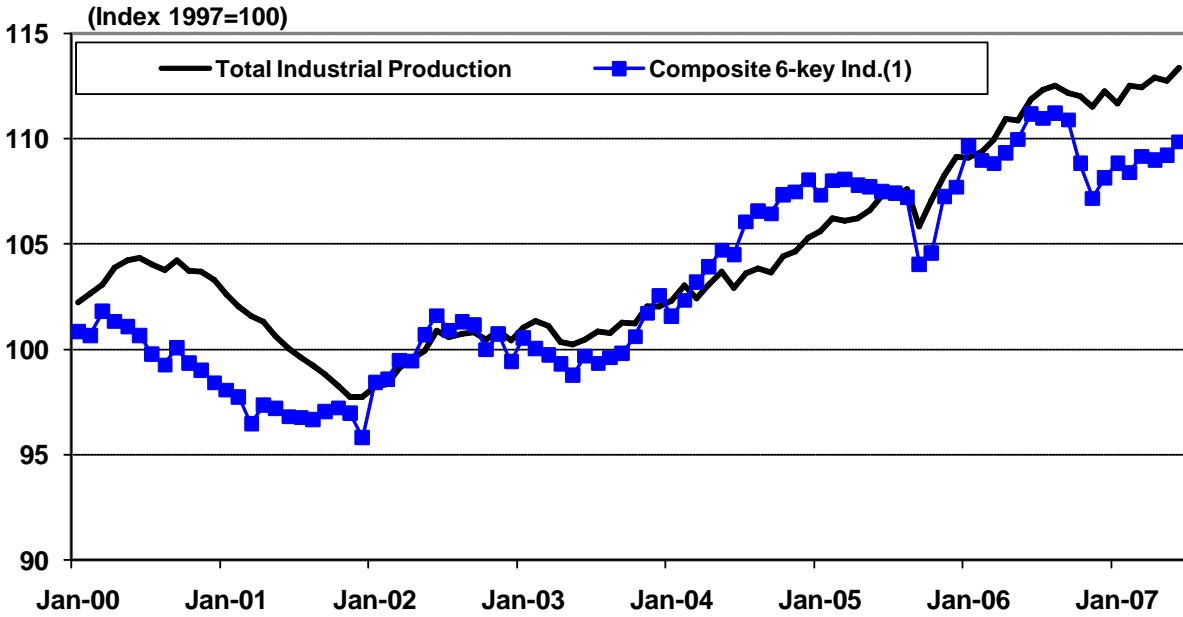
	Annual										Winter (Nov-Mar)							
	2002	2003	2004	2005	2006	2007	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08
Residential	4,890	5,080	4,869	4,806	4,356	4,869	3,760	3,564	3,453	3,192	3,348	3,472	3,760	3,564	3,453	3,192	3,348	3,472
Commercial	3,143	3,179	3,130	3,102	2,863	3,105	2,102	1,986	1,955	1,816	1,863	1,907	2,102	1,986	1,955	1,816	1,863	1,907
Industrial	7,508	7,151	7,242	6,745	6,621	6,629	3,236	3,193	3,147	2,878	2,900	2,947	3,236	3,193	3,147	2,878	2,900	2,947
Electric	5,672	5,136	5,462	5,869	6,246	6,538	1,790	1,793	1,865	1,852	2,119	2,158	1,790	1,793	1,865	1,852	2,119	2,158
Other	1,780	1,715	1,662	1,696	1,712	1,764	789	755	758	737	762	786	789	755	758	737	762	786
Transport	15	18	21	22	24	25	7	8	9	10	10	10	7	8	9	10	10	10
Total Cons	23,008	22,279	22,386	22,240	21,822	22,930	11,684	11,299	11,187	10,485	11,002	11,280	11,684	11,299	11,187	10,485	11,002	11,280

Note: 2007 & 2008 is estimated.

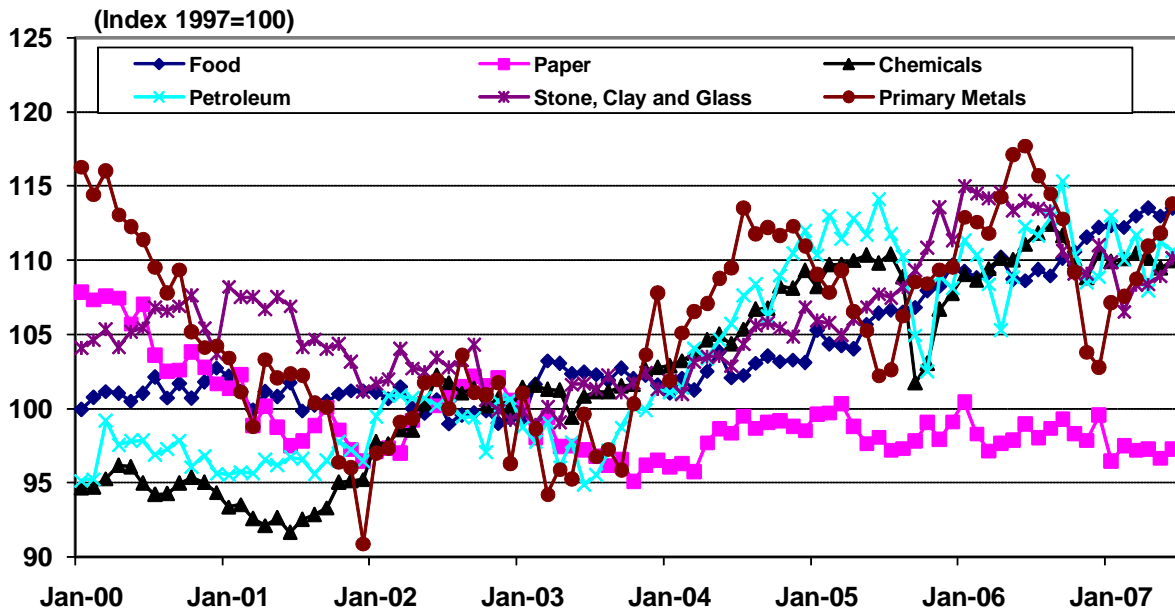
Source: EIA and EVA, Inc.

Exhibit A-2. Industrial Production Growth Rates

Total and Composite

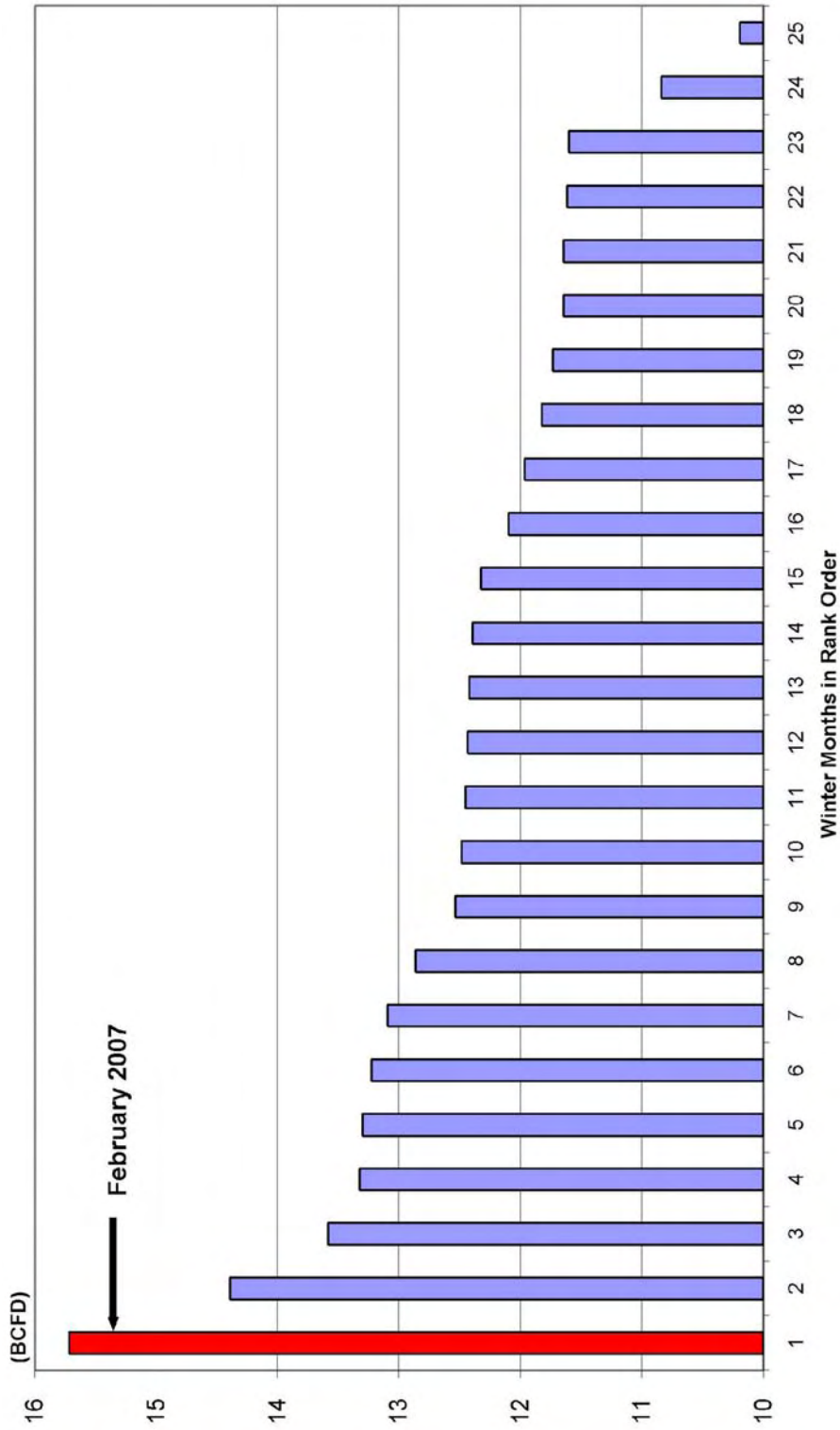


Six Energy Intensive Industries



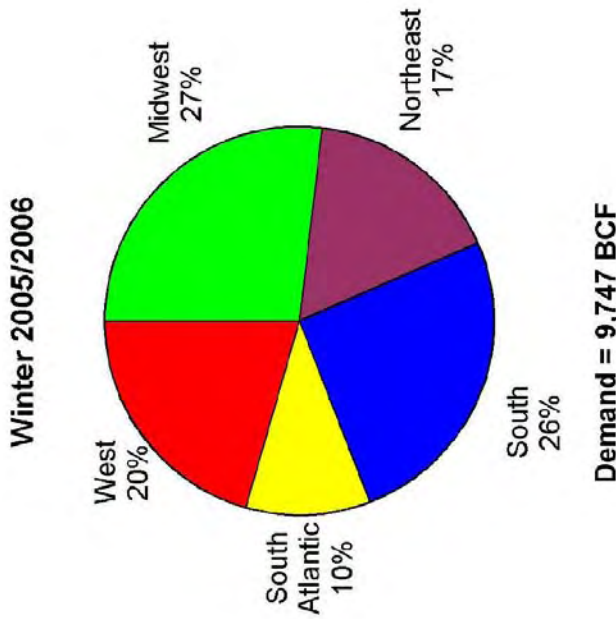
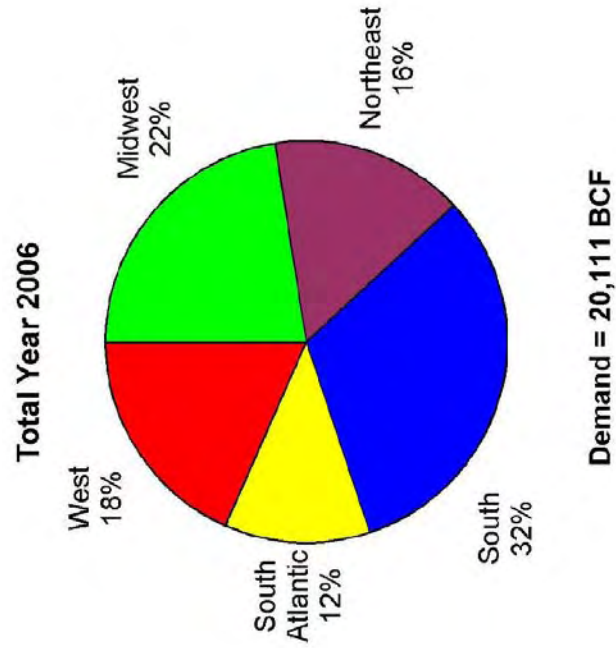
Source: Federal Reserve, Department of Commerce, Moodys-Economy.com.

Exhibit A-3. Monthly Electric Sector Demand For Winter Season



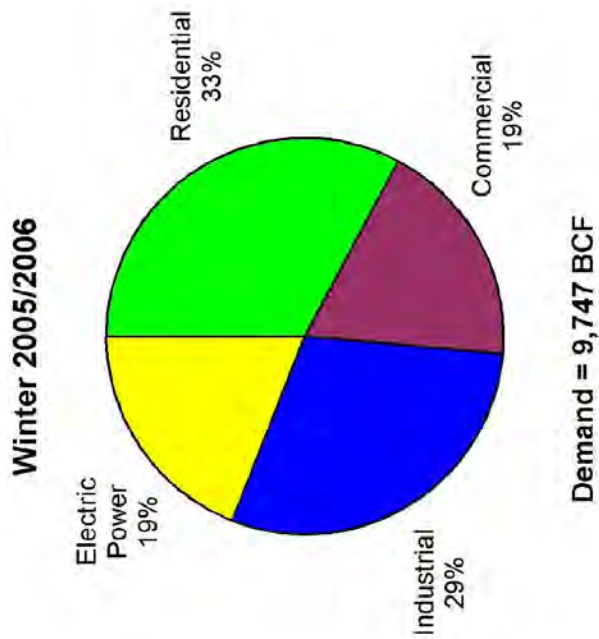
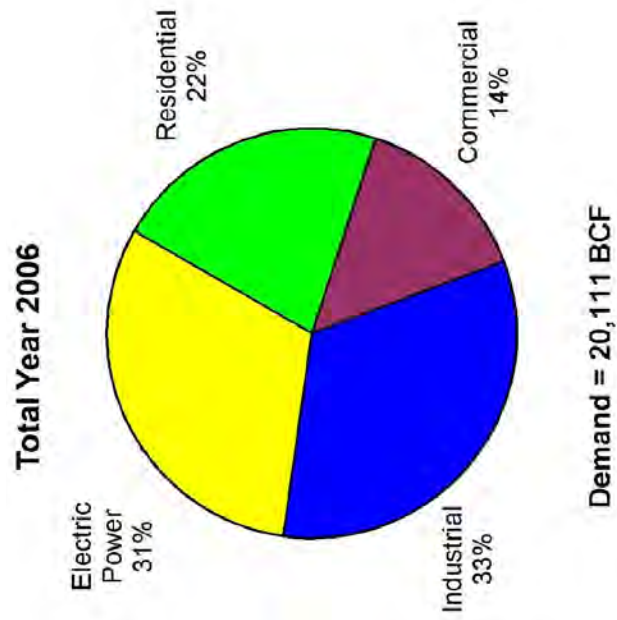
Note: The X-axis presents in rank order the electric sector gas demand for each winter month for the last five winters.
Source: EIA.

Appendix A-4. Total Primary Gas Demand By Region And Time Of Year



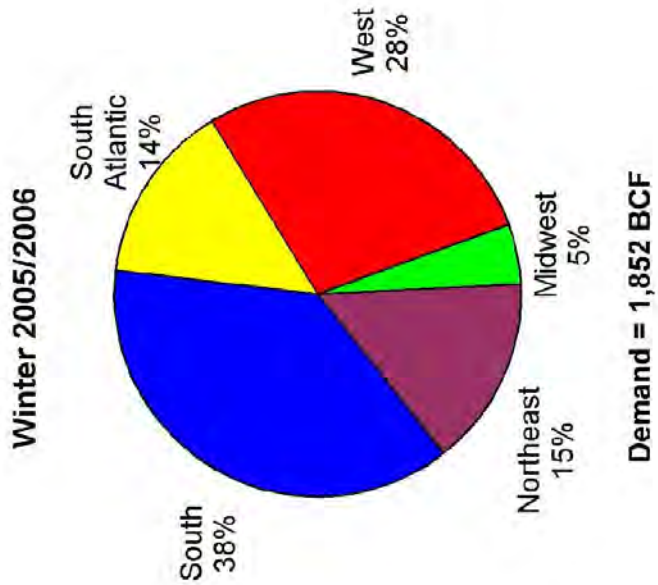
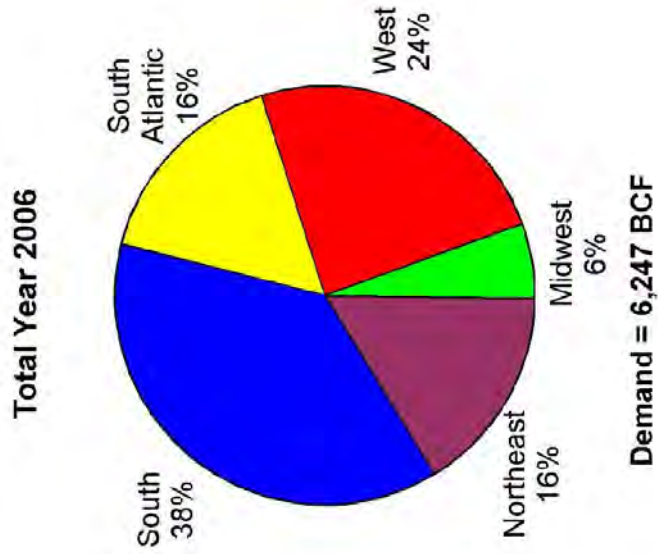
Note: Winter = Nov-Dec 2005 plus Jan-Mar 2006.
Source: U.S. DOE, Energy Information Administration.

Appendix A-5. Total Primary Gas Demand By Sector And Time Of Year



Note: Winter=Nov and Dec 2005 and Jan-March 2006.
Source: U.S. DOE, Energy Information Administration.

Exhibit A-6. Electric Power Sector Gas Demand By Region And Time Of Year



Note: Winter=Nov and Dec 2005 and Jan-March 2006.
 Source: U.S. DOE, Energy Information Administration.

Exhibit A-7. U.S. Census Regions

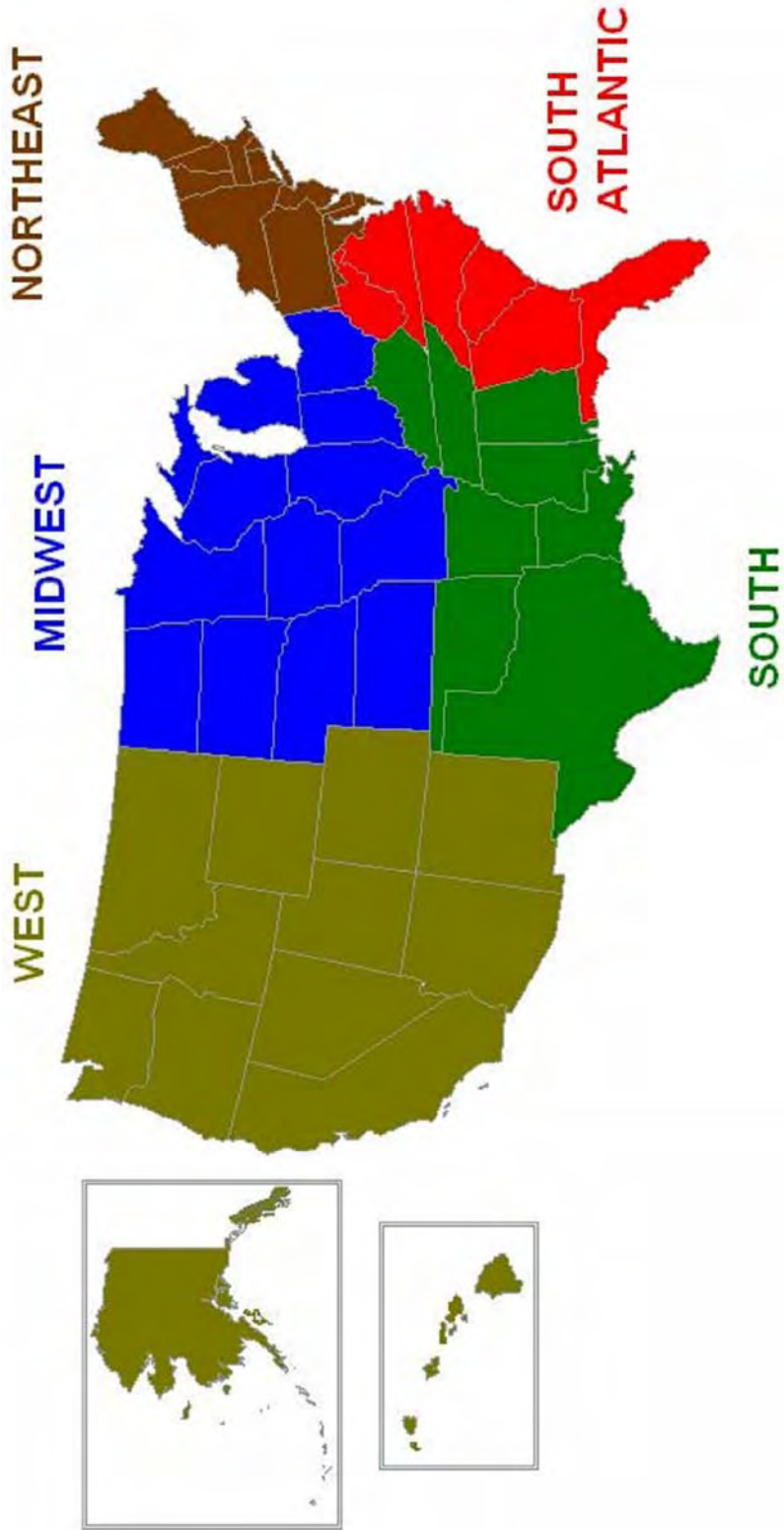
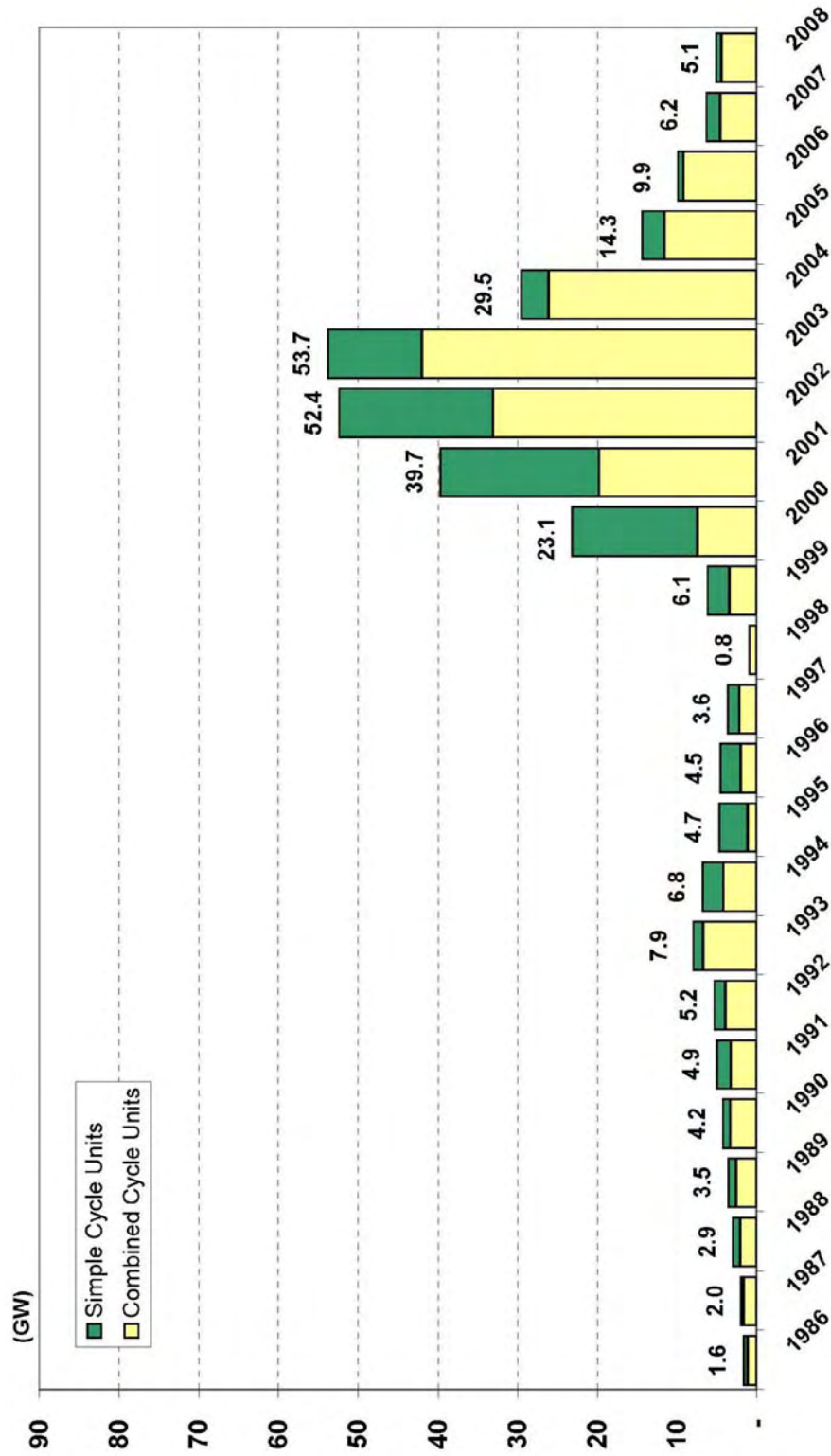
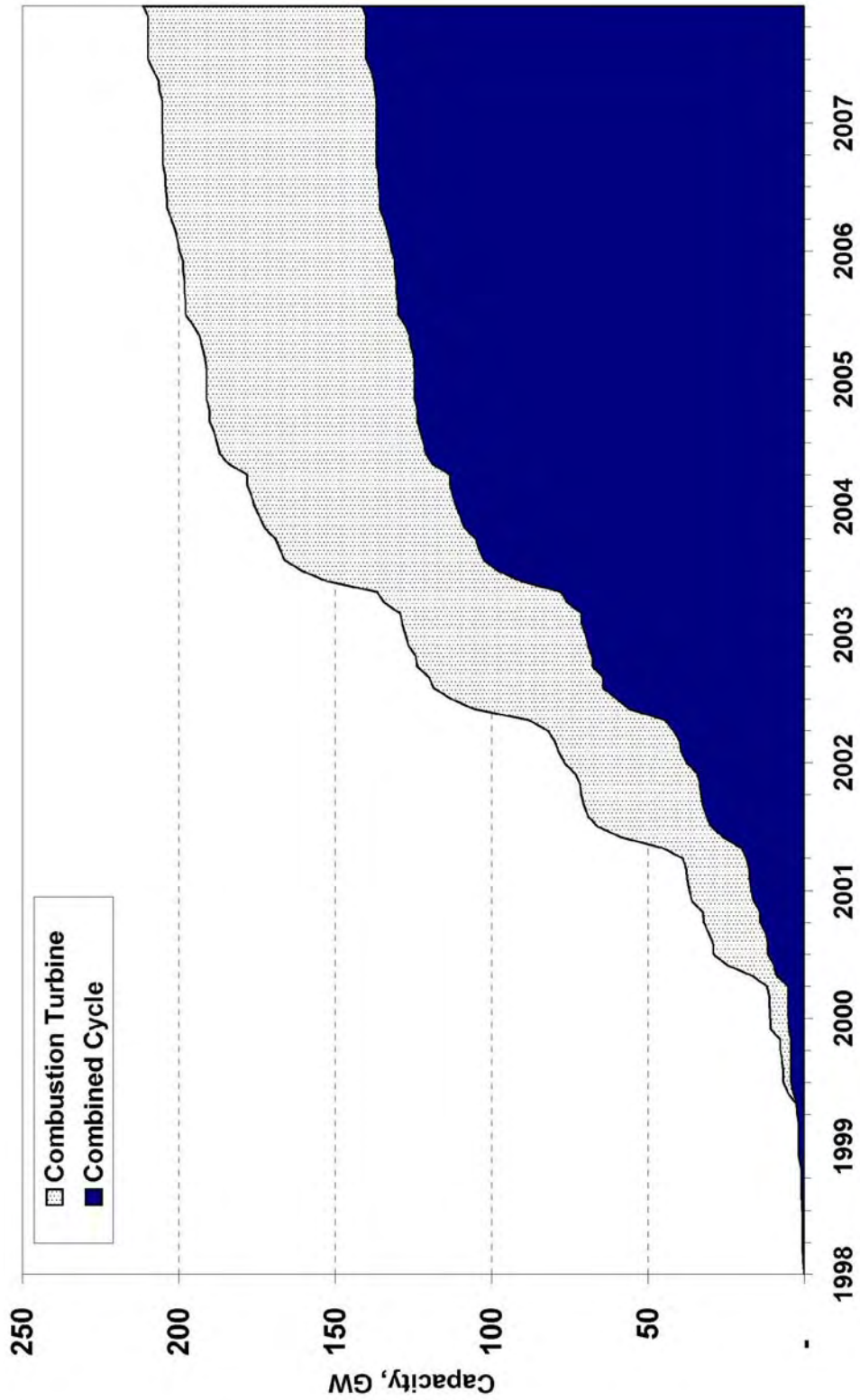


Exhibit A-8. Annual Additions Of Gas-Fired Capacity 1986-2007



Note: Projected additions only include categories 1 through 4.
 Source: EIA, EEI, and EVA for 1986 to 1998. EVA for 1999 and later.

Exhibit A-9. Cumulative U.S. Capacity By Technology, 1998-2005



Source: EVA CCGT Database.

Exhibit A-10. Total Weekly Electricity Output (48 States)

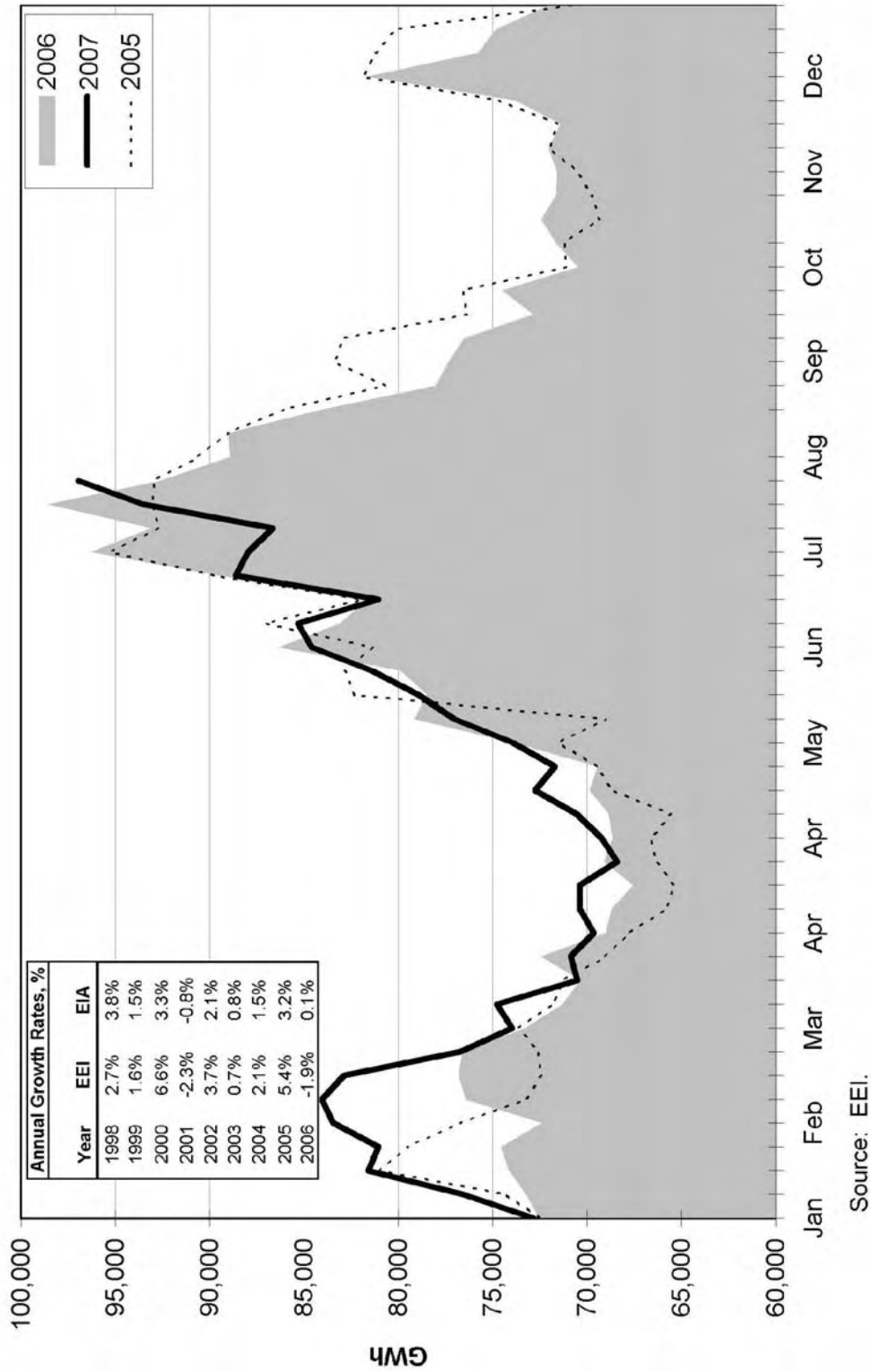


Exhibit A-11. Relevant Data

	Annual						Nov-Mar						% Diff 07/08 06/07
	2004	2005	2006	2007	2008	% Diff 08/07	2003/04	2004/05	2005/06	2006/07	2007/08	% Diff 07/08 06/07	
Residential Housing Stock (Thousands)	110,004	111,073	112,149	113,626	115,008	1.2%	110,012	111,040	112,537	113,915	115,415	1.3%	
Electric													
Weather													
Heating Degree Days (HDD) (Degrees)	4,290	4,315	3,995	4,451	4,455	0.1%	3,492	3,472	3,350	3,354	3,530	5.2%	
% Change of Normal	-3.7%	-3.2%	-10.4%	-0.1%	0.0%		-2.7%	-3.3%	-6.7%	-6.6%	-1.7%		
New Gas-Fired Capacity ¹													
CC (MW)	15,453	9,807	8,581	5,768	4,641	-19.5%	9,452	1,804	5,431	0	1,810	N/A	
CT (MW)	2,465	2,438	937	1,572	2,064	31.3%	1,106	589	0	314	160	-49.0%	
Hydro and Nuclear Generation													
Hydro Generation (GWh)	137,929	143,370	167,685	140,000	143,000	2.1%	56,868	57,609	68,391	60,306	58,000	-3.8%	
Nuclear Generation (GWh)	788,528	781,986	787,219	797,500	805,500	1.0%	325,389	319,870	332,897	335,418	339,500	1.2%	
Industrial (Index: 1996=100)													
Food	102.6	105.3	109.8	112.1	114.8	2.4%	101.6	104.0	109.0	112.3	115.9	3.2%	
Paper	98.0	98.6	98.5	97.0	98.1	1.1%	96.1	99.4	98.6	97.7	97.5	-0.2%	
Chemicals	105.7	108.0	110.3	111.2	113.6	2.1%	103.0	109.0	108.3	110.0	111.6	1.5%	
Petroleum	106.2	110.0	110.3	111.9	114.1	2.0%	101.6	111.5	109.4	110.4	112.3	1.7%	
Stone, Clay and Glass	104.1	108.2	112.7	106.9	108.2	1.2%	101.9	105.7	113.7	109.0	109.5	0.5%	
Primary Metals	109.3	107.1	112.1	108.8	111.1	2.1%	105.0	109.9	111.3	106.0	105.6	-0.4%	
Total Industrial Production	103.6	106.9	111.2	112.3	113.6	1.2%	102.4	105.6	109.2	112.1	113.3	1.1%	
Composite 6-key Ind.	105.2	107.1	109.6	109.3	111.5	2.0%	102.3	107.8	108.5	108.4	109.6	1.2%	
Petro-Chemical Production	112.7	112.0	114.5	115.9	117.3	1.2%	105.6	119.9	111.2	115.0	116.4	1.2%	
Economy													
Real GDP (\$ Billions)	10,704	11,049	11,415	11,657	11,998	2.9%	11,372	11,621	11,261	11,543	11,808	2.3%	
Employment (Thousands)	139,242	141,715	144,419	146,342	147,075	0.5%	138,420	138,421	143,644	145,556	146,286	0.5%	
CPI (Index: 1982=100)	188.9	195.3	201.6	206.6	210.6	1.9%	185.5	191.4	198.2	202.9	204.7	0.9%	