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Natural Gas Markets: Overview and Policy Issues

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Summary

The functioning of the natural gas market in 2007 appeared relatively stable and infrastructure development continued at an appropriate pace. A tighter demand/supply balance for 2008, however, has generated more upward spot price movement in this latest period. From the beginning to the end of the 2007-2008 heating season, the average wellhead price rose more than 30%, according to Energy Information Administration estimates. In the foreseeable future, weather and economic performance appear most likely to influence prices.

Natural gas provided about 22% of U.S. energy requirements in 2007. It will continue to be a major element of the overall U.S. energy market for the foreseeable future. Given its environmental advantages, it will likely maintain an important market share in the growing electricity generation applications, along with other clean power sources.

As Congress seeks to address energy security issues, the increasing importation of liquefied natural gas (LNG) is also a matter deserving careful attention. In 2007, LNG imports reached a record high and plans are to increase this fuel source.

This report provides an update to Congress on recent natural gas market developments and trends that have implications for important energy policy considerations, such as prices, natural gas use for power generation, and liquefied natural gas imports.

From 2006 to 2007, the average wellhead price reported to the U.S. Energy Information Administration (EIA) remained essentially unchanged at $6.39 per thousand cubic feet (mcf), down $0.01. The average citygate price increased about 3% to $6.98 per mcf. Domestic production grew, up about 0.8 trillion cubic feet, and domestic consumption increased more than 1 trillion cubic feet. This was the first increase in end-use consumption since 2004, according to EIA.

Natural gas use for electric power generation increased in 2007 by 10.5% and for the first time became the largest sector for natural gas consumption in the period covered by EIA records. Residential use increased 8.2%, with weather as a major factor. Commercial and industrial consumption also increased, by 6% and 2%, respectively. The industrial growth reversed a decline of 1.5% from 2005 to 2006.

On the supply side, onshore production in areas such as the Rocky Mountains and the Barnett Shales of Texas grew and liquefied natural gas (LNG) imports increased. LNG imports reached a record level of 0.8 trillion cubic feet.

EIA's Short Term Energy Outlook anticipates the Henry Hub spot price increasing almost 20% in 2008, reflecting strong demand, relatively low working gas in storage, and domestic production growth of almost 3%. The Henry Hub spot price did increase about 20% between the first quarter 2007 and first quarter 2008.

This report will be updated. This report supersedes CRS Report RL33714.

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Natural Gas Markets: Overview and Policy Issues

Introduction

Natural gas markets in North America remained relatively stable compared to oil markets in 2007. The situation has tightened and prices have regained some upward momentum in 2008.

This report examines current conditions and trends in the U.S. natural gas markets. Key market elements examined include prices, consumption, production, imports, and infrastructure. Expectations about the future, as reflected in recent official forecasts, are also incorporated here.

Natural gas remains an important and environmentally attractive energy source for the United States. Its share of the power generation market has grown. Domestic supply has remained stable and even increased in recent months. New developments in Alaska increase the likelihood that a pipeline from the North Slope will proceed. The natural gas industry continues to attract capital for new pipeline and storage infrastructure. Liquefied natural gas (LNG) imports hit a record level in 2007, even as import facilities continue to have low utilization rates. Weather and the economy remain important factors in natural gas prices, as well.

Given the generally adequate functioning of natural gas markets, congressional interest in the near term is likely to focus on unexpected price volatility or importation (or other supply) issues. In the longer term, industry pressure for increased access to public lands for exploration and production is expected to continue receiving congressional attention.

This report reviews key factors likely to affect market outcomes. These factors include weather, the economy, oil prices, and infrastructure development. **Tables A1 to A4** (in the Appendix) present selected highlight statistics that illustrate current market status.

Briefly, important developments in natural gas markets include the following:

- The growth in natural gas for power generation has contributed to increased consumption and reduced seasonal variation in use because gas-for-power peaks in summer, versus the total natural gas use winter peak.

- In 2007, for the first time, the power generation sector used more natural gas than any other sector.

- The first quarter 2008 average spot price at Henry Hub increased 20% from the first quarter 2007 to $8.92 per thousand cubic feet (mcf), versus a 6% year-to-year increase from 2006 to 2007.[1] During the 2007-2008 heating season (October to March), average wellhead prices increased more than 30%, according to EIA estimates.[2]

- Storage levels towards the end of the heating season dropped below five year averages. In the first storage report after the 2007-2008 heating season, working gas storage was at 1,234 billion cubic feet — the lowest level since April 30, 2004.[3] This may indicate that slack in the supply side is decreasing.

- The United States had record LNG imports in 2007, and increased LNG imports appear likely.

- Natural gas infrastructure development continued to advance, with many pipeline and storage projects successfully completed in 2007 and more underway in 2008 (including LNG import facilities).

- Industrial natural gas use had a small rebound in 2007.

Background

Unlike the global oil market, natural gas markets remain generally regional, with global trade in LNG growing. For the most part, North America has a continent-wide market that is integrated through a pipeline network that connects the lower-48 states, the most populous provinces of Canada, and parts of Mexico. Prices throughout this integrated market are influenced by demand (which may be influenced by weather, economic conditions, alternative fuel prices, and other factors), supply, and the capacity available to link supply sources and demand loads (transmission and distribution systems).

The U.S. natural gas market is the major component of the North American natural gas market. It accounts for about 81% of North American consumption and about 69% of North American supply.

The key price point in North America is Henry Hub. Henry Hub is a major pipeline hub in Erath, Louisiana, that is used as the designated pricing and delivery point for the New York Mercantile Exchange (NYMEX) gas futures contract and

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[1] Energy Information Administration (EIA), *Short-Term Energy and Summer Fuel Outlook,* April 2008, Table 5c.

[2] EIA, *Natural Gas Weekly Update*, April 10, 2008, p. 3.

[3] Ibid., p. 3.

other transactions. The price difference between other locations and Henry Hub is called the "basis differential." When there is spare capacity available to move natural gas from Henry Hub, or the Gulf of Mexico region in general, to the relevant price point area, the basis differential tends to be low, approximating the costs of fuel used to move the gas to the location. When capacity availability is tight, basis differentials can grow because the driving force can become the value of the natural gas at the delivery point, rather than the cost of getting the natural gas to that point.

Natural gas prices also incorporate costs for distributing the gas from the wholesale marketplace to retail customers. These rates are generally determined by state regulators and involve both (1) the approval of costs and rates of return and (2) the allocation of costs among customer classes (e.g., residential, commercial, industrial).

Although the North American natural gas market remains a distinct regional market, it is increasingly connecting to a global gas marketplace through international LNG trade. Oil prices still affect U.S. natural gas prices and this relationship is changing.

Market Conditions

The key elements of the market are prices, consumption, and supply. This section provides highlights from recent market developments relating to these factors.

Prices

Prices remained fairly stable between 2006 and 2007. Early 2008 prices have increased at a faster pace than in 2007. According to EIA figures, average spot prices at Henry Hub increased about 6% between 2006 and 2007. (See **Table 1** for price data.)

The U.S. Energy Information Administration (EIA) reports producer price data for its wellhead price series. This price remained stable from 2006 to 2007, decreasing by $0.01 to $6.39 per mcf in 2007 (average). During the 2007-2008 heating season (October to March), EIA estimates the average wellhead price increased more than 30%, to $8.29 per mcf.[4]

The EIA citygate price series reflects the unit prices delivered to consuming areas.[5] The U.S. average citygate price decreased $0.49 to $8.11 per mcf from 2006 to 2007.

Complete import price data for 2007 are not yet available from EIA. From 2005 to 2006, LNG import prices decreased 11.6% to $7.14 per mcf.

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[4] Ibid., p.3.

[5] The "citygate" is the transfer point from a high pressure natural gas pipeline to a local distribution company.

Table 1. U.S. Natural Gas Wholesale Price Overview

($ per thousand cubic feet)

Month	2007			2006		
	Henry Hub	Wellhead	Citygate	Henry Hub	Wellhead	Citygate
January	6.75	5.92	7.89	8.92	8.02	10.80
February	8.24	6.66	8.59	7.76	6.86	9.34
March	7.32	6.56	8.81	7.10	6.44	8.81
April	7.83	6.84	8.19	7.38	6.38	8.29
May	7.87	6.98	8.39	6.45	6.24	7.99
June	7.57	6.86	8.38	6.39	5.78	7.39
July	6.40	6.19	7.94	6.35	5.92	7.40
August	6.37	5.90	7.46	7.35	6.56	8.10
September	6.26	5.61	6.89	5.04	6.06	7.68
October	6.94	6.25	7.36	6.02	5.09	6.42
November	7.31	6.37	8.05	7.61	6.72	8.47
December	7.32	6.53	8.13	6.90	6.76	8.66
Average	7.17	6.39	8.11	6.74	6.37	8.60

Source: EIA, *Natural Gas Monthly* (NGM), April 2008, Table 3, for citygate and wellhead; EIA, *Short-Term Energy Outlook*, May 2008, Table 2 and backup data, for Henry Hub 2007 and May 2007, Table 4 for Henry Hub 2006.

At the retail level, average U.S. residential natural gas prices were $13.01 per mcf in 2007, with a high of $16.65 in July. This average was a 5.4% decrease from 2006. The average commercial price was $11.31 per mcf, a decrease of 5.7% from 2006. Industrial prices decreased 4.6% on average to $7.58 per mcf. Natural gas sold for electric power use increased prices 2.8% to average $7.30 per mcf. See **Table 2** for these data.

Table 2. U.S. Retail Price overview

($ per thousand cubic feet)

Month	2007				2006			
	Residential	Commercial	Industrial	Electric power	Residential	Commercial	Industrial	Electric power
January	12.09	11.14	7.33	7.05	14.94	14.15	10.84	9.15
February	12.12	11.21	8.23	8.16	14.00	12.95	9.35	8.00
March	12.86	11.81	8.40	7.64	13.29	12.07	8.23	7.36
April	13.27	11.51	8.13	7.76	13.29	11.57	7.91	7.32
May	14.61	11.50	8.10	7.96	14.43	11.60	7.62	6.89
June	16.20	11.87	7.98	7.80	15.09	11.09	6.90	6.69
July	16.65	11.63	7.54	7.01	15.73	10.98	6.77	6.69
August	16.64	11.18	6.57	6.80	16.19	11.20	7.35	7.56
September	15.94	10.90	6.11	6.35	15.73	11.16	7.20	6.27
October	14.25	10.80	6.85	7.04	12.52	10.04	5.62	5.76
November	12.82	11.04	7.63	7.27	12.47	11.05	7.74	7.48
December	12.17	11.02	7.97	7.93	12.54	11.61	8.23	7.57
Aver	13.01	11.31	7.58	7.30	13.75	11.99	7.86	7.11

Source: EIA, NGM, April 2008, Table 3.

Consumption

Power sector use of natural gas increased most rapidly in 2007, followed by the weather-sensitive residential and commercial sectors. Total U.S. consumption of natural gas grew 6.5% from 2006 to 2007, according to EIA. Gas-for-power led the sectoral growth, increasing 10.5%. Residential consumption increased about 8.2%, primarily due to colder weather than 2006. The commercial and industrial (without lease and plant use) sectors also had modest increases in consumption, reversing drops in use in these sectors for 2005 to 2006. The power sector led end-use consumption for the first time in 2007.

Table 3 shows these consumption data.

Table 3. U.S. Natural Gas Consumption Overview

Billion cubic feet (Bcf)

Year	Residential	Electric power	Commercial	Industrial	Other	Total
2005	4,827	5,869	2,999	6,597	1,719	22,011
2006	4,368	6,222	2,835	6,495	1,733	21,653
2007	4,724	6,874	3,008	6,635	1,817	23,058
% change 2006/07	8.2%	10.5%	6.1%	2.2%	N.A.	6.5%

Source: EIA, NGM, April 2008, Table 2.

Supply

U.S. natural gas supply comes from domestic production, pipeline imports, imported LNG, and net withdrawals from storage. Both domestic and imported supplies increased between 2006 and 2007.

Dry gas production increased by 4.3% from 2006 to 2007, to 19,278 billion cubic feet (Bcf). This reflects the increase in drilling activity in response to price increases, as indicated in the natural gas rig count. The U.S. natural gas rig count has trended upward since 2002. In 2002, the average monthly rig count was about 600. Recent data show the count at approximately 1,500.[6]

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[6] FERC, *Division of Market Oversight, OE, Winter 2007/2008 Energy Market Assessment*, Item No. A-3, October 18, 2007, "Gas Drilling Continues to Rise," no page, citing Baker Hughes and EIA.

The U.S. natural gas reserve base increased recently. EIA reserves and production data indicate the latest reserves-to-production ratio[7] (2006) is 11.4, an increase from the prior year's ratio of 11.1 and 2000's ratio of 9.2.[8]

In 2007, U.S. consumers received most of their supply, 84%, from domestic production. The domestic supply has shifted from shallow Gulf of Mexico to deep Gulf of Mexico and unconventional sources, in the Rocky Mountains and elsewhere.[9] As these new resources grow in importance, industry pressure for increased gas leasing of on- and offshore federal lands is likely to be a continuing issue.[10]

Net imports (pipeline and LNG) increased almost 10%, to 3,793 Bcf. Imports via pipeline from Canada increased 5%. LNG imports increased more than 32%, growing from 584 Bcf in 2006 to 771 Bcf in 2007.[11]

Table 4 show these data.

Table 4. U.S. Natural Gas Supply Overview

(Bcf)

Year	Dry Gas production	Net imports	Net storage withdrawals	Other/ balancing	Total
2005	18,051	3,612	52	296	22,011
2006	18,476	3,462	-436	151	21,653
2007	19,278	3,793	177	-193	23,055
% change 2006/07	4.3%	9.6%	N.A.	N.A.	6.6%

Source: EIA, NGM, April 2008, Table 1 and CRS calculations.

In 2007, the available spot LNG supplies were sometimes bid away to European terminals for higher prices. Nevertheless, new U.S. LNG infrastructure went into service in early 2008 and still more received approvals from the Federal Energy Regulatory Commission (FERC). To compete effectively for supply in the global LNG market, natural gas prices at the delivery points may have to increase further to

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[7] The reserves-to-production ratio divides the nation's proven reserve figure by the annual production to get this metric of supply inventory.

[8] EIA, available at [http://tonto.eia.doe.gov/dnav/ng/ng_enr_dry_dcu_NUS_a.htm].

[9] Conventional natural gas supplies are produced by conventional drilling and extraction. Unconventional gas involves more advanced technology, such as extraction of methane from coal beds or from tight formations requiring fracturing and other techniques.

[10] For more discussion, see CRS Report RL33493, *Outer Continental Shelf: Debate over Oil and Gas Leasing and Revenue Sharing*, by Marc Humphries.

[11] EIA, NGM, April 2008, Table 4.

attract LNG deliveries. Location of import facilities is an important factor in the value of landed LNG.[12]

Table 5. Lower-48 LNG Overview

(Bcf/d)

Terminal	Deliver-ability EOY 2006	Average delivery 2006	Deliver-ability EOY 2007	Average delivery 2007	Estimated deliver-ability 2008
Cove Point, MD	1.0	0.32	1.0	N.A.	1.0
Everett, MA	0.725	0.48	1.035	N.A.	1.035
Elba Island, GA	1.2	0.40	1.2	N.A.	1.2
Lake Charles, LA	1.8	0.39	1.8	N.A.	1.8
Northeast Gateway, MA (offshore)	-	-	0.8	N.A.	0.8
Gulf Gateway, TX (offshore)	0.5	N.A.	0.5	N.A.	0.5
Freeport, TX	-	-	-	-	1.5
Sabine Pass, LA	-	-	-	-	2.6
Hackberry Cameron, LA	-	-	-	-	1.8

Source: EIA, *US Natural Gas Imports and Exports:2006*, March 2008, figure 1 and EIA, *Short-Term Energy Outlook Supplement: U.S. LNG Imports - The Next Wave*, January 2007, pp. 9-10.

EIA forecasts U.S. imports of 1,080 Bcf LNG for 2008, including regasified LNG from Mexico's Costa Azul terminal in Baja California.[13] In addition, an LNG import facility in eastern Canada largely focused on exporting to the United States is expected to enter service in 2008.

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[12] This siting issue is discussed in greater detail in CRS Report RL32386, *Liquefied Natural Gas (LNG) in U.S. Energy Policy: Infrastructure and Market Issues*, by Paul Parfomak, updated January 31, 2006.

[13] EIA, *Short-Term Energy Outlook*, January 2007, p. 8.

Market Trends

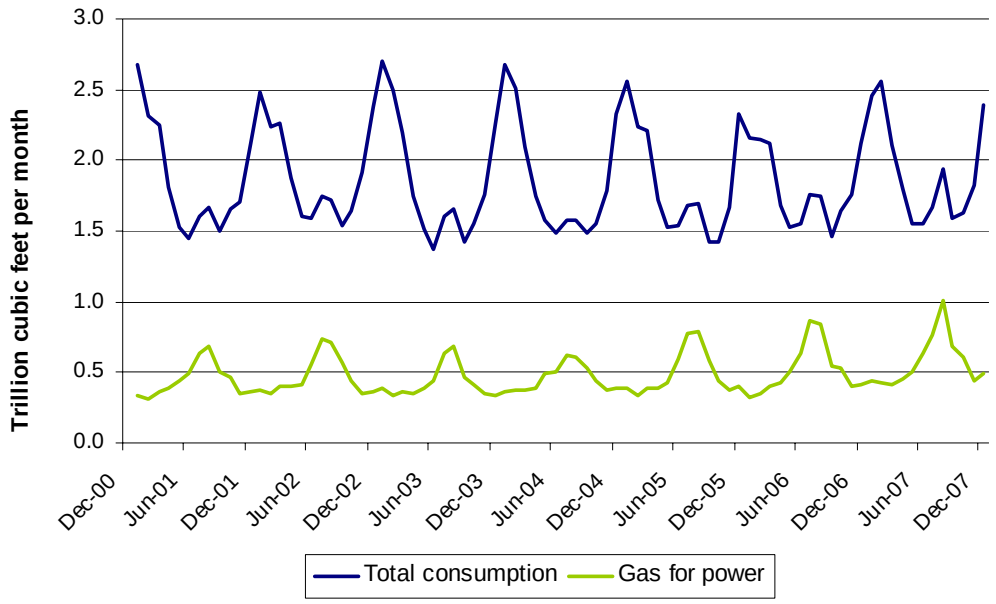
There are several trends under way in natural gas markets of interest to policy makers. They include:

- a decrease in seasonal demand swings
- a growth in gas-for-power use
- a small rebound in industrial use of natural gas
- a growing international trade in LNG
- continuing progress in natural gas infrastructure development.

Seasonality

Consumption of natural gas in the United States remains highly seasonal for three important sectors. Reflecting the importance of space heating, residential and commercial use of natural gas peaks in winter. Reflecting the importance of air conditioning load and the role of natural gas as the marginal fuel source for power generation, electric power use of natural gas peaks in summer.

Figure 1. Monthly Natural Gas Consumption: Total and Electric Power Use



Source: CRS graphic, data from U.S. Energy Information Administration, Natural Gas Navigator, available at [http://tonto.eia.doe.gov/dnav/ng/ng_cons_sumc_duc_nus_m.htm]

Figure 1 illustrates that the combination of these seasonal patterns has led to a decrease in the overall seasonal swing and the development of a secondary peak in the summer due to gas-for-power use. Interestingly, while some continue to call for more storage because of the growing consumption of natural gas, the decrease in the seasonal swing (through a decrease in the high month volume and an increase in the

low month volume) means that less storage may be able to serve the annual cycling needs of the U.S. markets. Those trading natural gas may want additional storage for arbitrage uses, but the fundamental needs related to system reliability may decrease somewhat with a decrease in the difference between the minimum and maximum consumption rates.

Another noteworthy seasonal feature observed in 2007 by EIA found that natural gas price volatility is "considerably higher" in colder months than in other times.[14]

Increasing Gas-for-Power Use

The natural gas consumption sector with the greatest increase from 2006 to 2007 was electric power. Deliveries to electric power customers increased by 615 Bcf, more than 45% of the consumption growth for the year. For the first time, electric power use of natural gas became the largest end-use sector for natural gas.[15]

Perhaps even more striking is the relative increase in electric generator use of natural gas during winter. In 2007, FERC's Division of Energy Market Oversight noted that November-March volumes increased 14% between winter 2005/06 and winter 2006/07.[16]

Industrial Gas Use Rebound

Industrial natural gas use in 2006 was approximately 13% lower than the 7,507 Bcf consumed in 2002. In 2007, industrial use increased by 2% over the 2006 level. The decrease in price to industrial users may have played a role in this effect.

Global LNG Trade

In 2007, LNG monthly imports varied from a high of 98.7 Bcf in April to a low of 20.8 Bcf in December. Because little of the LNG is imported under long term contracts, U.S. importers compete on the global LNG spot market for deliveries.

In December 2007, European natural gas prices were in the $10.20-$10.66 per million Btu range. U.S. prices varied above and below this. New England citygates were at $12.16 per million Btu and Henry Hub was at $7.15 (the Algonquin citygate figure represents several citygates in New England). Thus, some import points could compete successfully in the global spot market for LNG and others could not.[17] There is excess physical capacity at existing LNG import facilities to handle more than three times the record imports of 2007.

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[14] EIA, *An Analysis of Price Volatility in Natural Gas Markets*, August 2007, p.2.

[15] This excludes lease and plant gas use from the industrial sector, where it sometimes is included.

[16] FERC, Division of Market Oversight, *Winter 2007/2008 Energy Market Assessment*, Item No.: A-3, October 18, 2007, "Electric Generators Using More Winter Gas," no page.

[17] FERC, Division of Market Oversight, Office of Enforcement, *OE Energy Market Snapshot*, February 2008, National Version, p. 28.

Infrastructure Progress

During 2007, the North American natural gas industry continued its progress in adding new infrastructure to the system. According to EIA and the FERC, the following facilities went into service in the United States in 2007. These facilities appear responsive to serving fundamental market needs, such as new capacity from the growing Rocky Mountains production area. Although no new LNG facilities became operational in 2007, facilities are expected to achieve commercial operation in 2008.

Table 6. Infrastructure Complete in 2007

Type of project	Number of projects	Capacity
Pipelines	more than 50	14.9 Bcf/d
LNG import terminals	0	-
Storage facilities	9	1.8 Bcf/d

Sources: EIA, Office of Oil and Gas, *Natural Gas Year-In-Review*, March 2008, p.5 and FERC, *Winter 2007/2008 Energy Market Assessment, Item No.: A-3*, October 18, 2007, "What has been placed into service," no page.

Forecasts

There are a few noteworthy elements of recent EIA forecasts for the natural gas markets.

In its Short Term Energy Outlook, EIA forecasts a 1% increase in natural gas use for 2008, relative to 2007. Weather changes and economic conditions are the reasons EIA mentioned for the slowed growth. Prices are also likely to reinforce a short term slowdown in use. EIA forecasts record U.S. consumption of 23.4 trillion cf in 2009. EIA forecasts increased U.S. production in 2008 of almost 3%, primarily from growth in deepwater Gulf of Mexico and unconventional gas production. LNG imports are expected to decline about 14% from 2007. EIA forecasts supply area natural gas prices (Henry Hub) to increase almost 20% in 2008 to $8.34 per million Btu.

In EIA's long term forecast (through 2030), the reference case forecasts natural gas prices at the wellhead gradually decreasing to $5.27 per mcf during the 2015 to 2020 period before gradually increasing to $6.42 per mcf (2006 dollars) in 2030. EIA forecasts natural gas consumption growth to 24.4 trillion cubic feet (tcf) in 2015, declining to 23.4 tcf by 2030. Most of this increased use and the drop come from growth, then decline, in natural gas for power generation. EIA forecasts the arrival

of Alaska Natural Gas to the lower-48 via pipeline in 2020, with deliveries reaching 2.4 tcf per year by 2030. This is a two year delay from EIA's 2007 forecast.[18]

Uncertainties

EIA's forecast of gradual reductions in natural gas prices depends on certain assumptions embedded in the forecast. These factors have uncertainty associated with them, as discussed next.

Weather

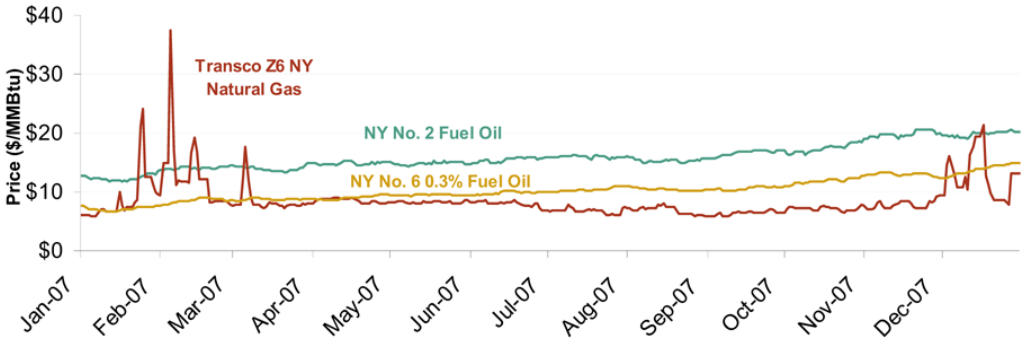
Weather affects natural gas consumption through both the significant space heating loads in the residential and commercial sectors and the cooling load served by gas-fired power generation. EIA incorporates National Oceanic Atmospheric Administration (NOAA) weather forecasts in its short and long term forecasts. To the extent that actual heating degree days exceed the temperature scenario from NOAA, that will tend to increase demand for natural gas in the relevant heating seasons and increase prices for natural gas during those periods. Similarly, if the actual cooling degree day requirements exceed those incorporated in the EIA scenario, then this will increase natural gas use in the cooling season via increased gas-fired power for air conditioning and increase the price for natural gas in the relevant cooling season.

Oil Prices

Natural gas prices and oil prices have long had a correlation. As the extent of oil/gas fuel switching has declined, this linkage has changed. During 2007, as crude oil and petroleum product prices increased, relative prices for natural gas became lower than the historical pattern. In the recent past, natural gas and oil product price competition tended to exhibit itself most clearly around the New York metropolitan area, where there remained a fair amount of fuel switching capability. This fuel switching capability tended to keep natural gas prices at the New York citygate in a range bounded on the high side by distillate fuel oil prices and on the low side by low sulfur residual fuel oil prices. In 2007, the relevant natural gas prices tended to be below this range (see **Figure 2**).

[18] EIA, *Annual Energy Outlook 2008*, p.10.

Figure 2. Comparison of Natural Gas and Competing Oil Product Prices



Source: FERC, Division of Market Oversight, Office of Enforcement, *OE Energy Market Snapshot*, National Version - December 2007 data, January 2008, p. 23.

The shift to outside this fuel price range suggests that the consumers had done all the fuel switching to natural gas that remained feasible. Then, as oil prices moved above the relevant range, gas-on-gas competition could have become the market force determining the natural gas prices.

Economy

Economic growth affects consumers' demand for natural gas and their ability to purchase it. EIA appears to have incorporated an economic outlook for 2008 that expects less growth than in its recent forecasts. Given the relative stability in the residential and commercial sector demand, any change in economic outlook would most likely affect industrial natural gas use most directly, but it could also affect commodity prices and world oil prices.

Recent Developments

Since the end of 2007, several noteworthy developments have occurred in the natural gas markets:

- EIA reports natural gas price increases in 2008. For the 2007-2008 heating season (November-March), the average spot price at the wellhead increased more than 30% from the beginning to the end of heating season, to $8.06 per million Btu.[19]

- Storage levels towards the end of the heating season dropped below five year averages. In the first storage report after the 2007-2008 heating season, working gas storage was at 1,234 billion cubic feet,

[19] EIA, *Natural Gas Weekly*, April 10, 2008, p. 3.

the lowest level since April 30, 2004.[20] This may indicate that slack in the supply side is decreasing.

- The opening of the Rockies Express natural gas pipeline out of the Rocky Mountain production region appears to have relieved transmission congestion there. This improved the net back price within the production area.[21] The wellhead price in the Rockies area increased from $4.82 per million Btu in November 2007 to $8.41 in March 2008.[22] This improves the incentives for producers to find and develop new supplies in this area.

- The natural gas pipeline from the North Slope of Alaska has made progress. In January 2008, the Governor of Alaska announced that one of the pipeline project applications under the state Alaska Gasline Inducement Act (AGIA) was judged complete. In April 2008, two of the North Slope gas producers, BP and ConocoPhillips, announced that they had joined together to start a potentially competing effort, the Denali Alaska Gas Pipeline, which has an open season target date (date when capacity will be offered to potential shippers) of 2010 and an in-service target of 2018 (stated by the producers as a 10-year target).[23]

- In early April, the Independence Trail pipeline that serves the Independence Hub platform in the Gulf of Mexico was taken out of service for pipeline repairs that could take until mid-year to complete. Independence Hub produces almost 1 billion cubic feet per day, roughly 10% of U.S. Gulf of Mexico production.

- In May, the North American Electric Reliability Corporation concluded the natural gas supply outlook for the summer of 2008 is "healthy."[24]

Generally, these developments indicate that the nation's natural gas market is functioning in tune with fundamental supply and demand conditions.

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[20] Ibid., p.3.

[21] The "net back price" is the price a producer receives based on the price at the end-use market minus the cost of transmission to that market.

[22] Ibid., p.4.

[23] Denali, presentation, April 8, 2008.

[24] North American Electric Reliability Corporation, *2008 Summer Reliability Assessment*, May 2008, p. 12.

Conclusion

Despite the problems arising in some parts of the energy system, natural gas fuel markets in North America have operated relatively well. The smooth natural gas market situation of 2007 appears to have evolved into different, tighter circumstances for 2008. If gas-on-gas competition declines and natural gas prices shift back into a competitive range with petroleum products, this will intensify the adverse effects of high oil prices.

The decline in seasonal consumption swings, primarily due to the increased use of gas-for-power, can improve the efficiency with which the nation's natural gas pipeline and storage infrastructure is used. Construction of new pipeline and storage infrastructure has continued to progress in a way apparently consistent with supply and demand fundamentals.

Finally, LNG infrastructure development also continues. The low current capacity factors at the capital-intensive existing LNG import facilities may indicate that the U.S. LNG purchasing power is not proving as competitive in the international LNG market as project developers or those reviewing the projects had anticipated. The location of LNG facilities has an important effect on this potential competitiveness, and this factor may require greater consideration for future projects.

How weather and the economy perform will play an important role in whether prices continue to increase or downward pressure develops for natural gas as a commodity.

Appendix

Table A1. Selected Natural Gas Market Statistics Prices

($/mcf)

	2007		2006		5-year range (2003-2007)
	Annual Average	December	Annual Average	December	
Wellhead	6.39	6.53	6.40	6.76	4.88-7.33
NY citygate	8.61	7.35	9.22	10.09	N.A.
IL citygate	7.89	7.82	8.26	8.15	N.A.
CA citygate	6.82	7.35	6.76	7.13	N.A.
U.S. Citygate	8.11	8.13	8.61	8.66	5.85-8.67
Residential consumer	13.01	12.17	13.75	12.54	9.63-13.75

Table A2. Consumption

(trillion cubic feet)

	2007	2006	5-year range (2003-2007)
Total	23.0	21.7	21.7-23.0
Electric power	6.8	6.2	5.1-6.8
Residential	4.7	4.4	4.4-5.1
Commercial	3.0	2.8	2.8-3.2
Industrial	6.6	6.5	6.5-7.2
	2007	**2006**	**Normal**
Heating degree days (Nov-Jan)	2,392	2,157	2,465

Table A3. Supply

(trillion cubic feet)

	2007	2006	5-year range (2003-2007)
U.S. dry gas production	19.3	18.5	18.1-19.3
Net imports	3.8	3.5	3.3-3.8

Table A4. Infrastructure Projects into Service in 2007

	Number	Capacity
Pipeline	50	14.9 Bcf/d
LNG	0	-
Storage	9	1.8 Bcf/d

Sources: Energy Information Administration (EIA) and Federal Energy Regulatory Commission (FERC), various documents, detailed in body of report.

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