Natural Gas Prices Continue at Higher Levels

I. Summary

This white paper on natural gas prices addresses the prospect of natural gas prices staying at overall higher levels, especially prices during the winter heating season. The average spot price at the Henry Hub for 2006 is forecasted to drop slightly to $7.61 per thousand cubic feet (Mcf) from $8.86 per Mcf in 2005, but it is anticipated to move back up to approximately $8.13 per Mcf for 2007.[1] Additionally, the Energy Information Administration (EIA) notes concerns about potential future supply tightness and continuing pressure from high oil market prices will likely drive spot natural gas prices to just over $10.00 per Mcf this December and January.

The Board foresees that Iowans may experience continued high natural gas prices during the upcoming winter heating season. Should the weather during the winter heating season be unseasonably cold, consumers need to be prepared for higher-than-normal heating bills.

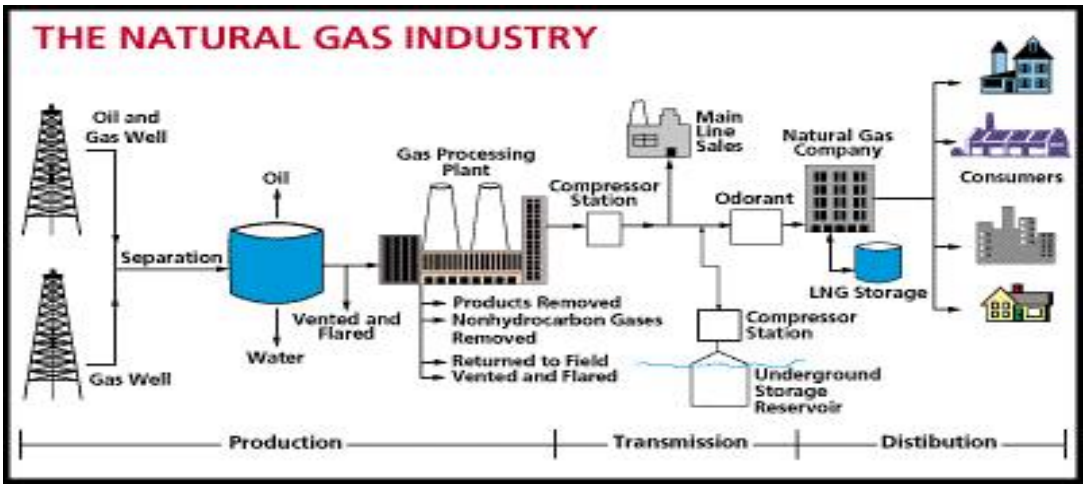
II. Introduction

The price of natural gas is affected by numerous factors such as weather, economic activity, and availability of supplies. Depending upon the strength and timing of these factors, the price of natural gas can increase or decrease dramatically.

An analysis of natural gas prices should begin with an overview of natural gas production and transmission. Natural gas is, for the most part, a domestically produced commodity. The Gulf region, Southwestern states, the Rocky Mountain area, and portions of the Appalachian Mountain area are the main production areas within the United States. An increasing portion is being imported from Canada, but most of the natural gas consumed in the United States is still produced within its borders. Once natural gas is released from production wells, it goes into a pipeline system that delivers it to customers throughout the country. Because production and transportation of natural gas are fairly constant, the short-term fluctuations in demand are dealt with by injections into and removals from storage. The storage "fields" are usually constructed from old natural gas production formations, salt caverns, or large aquifers located near distribution areas. Long-term supplies can be increased by finding new sources of supply, adding more production capacity, and if necessary, building more pipelines.

[1] Energy Information Administration, *Short-Term Energy Outlook,* July 11, 2006.

The diagram below shows an overview of the flow of natural gas from the well to the consumer.



Source: www.eia.doe.gov/kids/energyfacts/sources/non-renewable/naturalgas.html

Because natural gas storage is so critical to balancing the demand for natural gas, it is considered by many to be the most important supply-side factor in determining the price of natural gas in the near term. It serves as a hedge against price volatility in addition to its role in assuring operational integrity/deliverability of natural gas to customers. Storage levels must be adequate to cover the increased demand in the heating season, including peak day use. These necessary levels are achieved by injections into the storage fields during the non-heating season (April-October).

III. Market Forces that Impact Natural Gas Prices

Demand Factors

Like any other freely traded good or service, there are numerous market forces that determine the demand for natural gas. Demand has been divided into short-term and long-term factors that influence the demand for natural gas and ultimately the price for natural gas.

Short-Term Demand

Weather

One of the main demand factors impacting market prices is the weather. During the heating season cold weather causes demand for natural gas to increase; and warm weather has the opposite effect. If one is concerned about volatile prices, the obvious weather pattern to look for is colder than normal winter weather. If winter is colder than normal, especially if the winter is much colder in the first month or two of the heating season (e.g., the winter of 2000-2001), demand for gas will increase, perceptions of potential shortages may arise, and the price of natural gas will increase. Not so obvious is the impact that summer weather has on the demand for natural gas and storage. Many of the electric generating units used in the United States for intermediate and peaking purposes (e.g., air conditioning on warm days) use natural gas for fuel. Because of this, warmer than normal weather in the summer

means that more natural gas will be used for electrical generation purposes, and less will be available for additions to storage. According to EIA data, in 2005 Iowa used less than one percent of the total amount of natural gas delivered in the U.S for electric power consumption.

Prices of Alternative Fuels

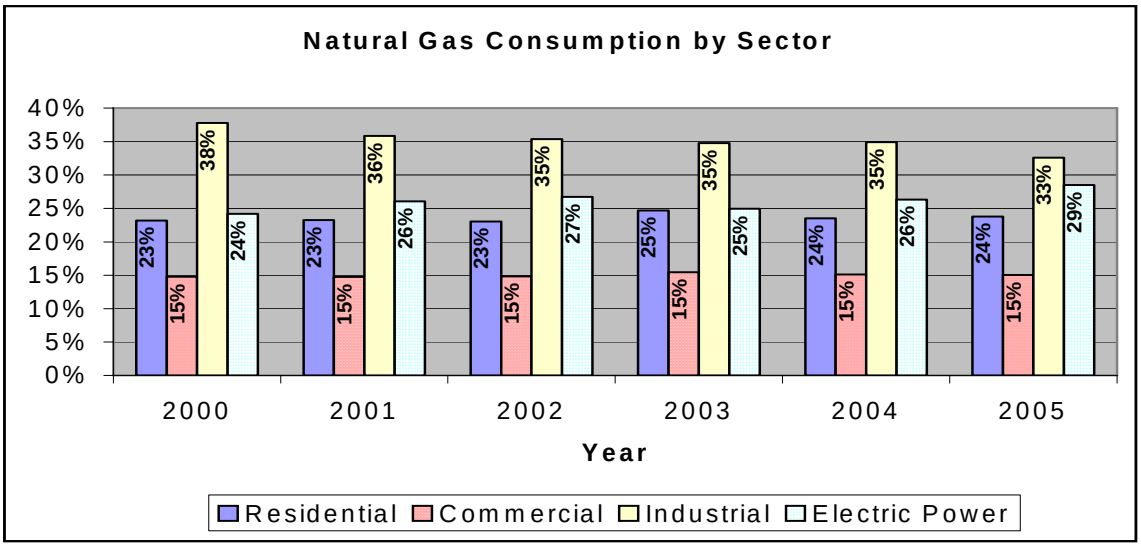
Another important factor to watch when estimating natural gas prices is the price of alternate or competing fuels. In many industrial processes, the manufacturer can either burn natural gas or some type of heating oil. For electric generation, if the price of fuel oil is high enough, generation that burns natural gas becomes more economical and will displace some of the units that burn fuel oil. This year has seen record prices for crude oil, over $70 per barrel. The price of crude oil has been over $40 per barrel since the fall of 2004. The increased price of crude oil and the products that are derived from it (like heating oil) could cause demand for natural gas to increase.

U.S. Economy

Overall economic activity is also a major factor that determines the demand for natural gas. If there is more economic activity, particularly industrial activity that uses natural gas as a fuel, there is increased demand for natural gas. A thriving economy provides opportunities, but it must be recognized that increased economic activity in the face of limited supplies of natural gas will cause upward pressure on prices.

Long-Term Demand

Demand for natural gas can be divided between residential, commercial, industrial, and electric power generation sectors. Below is a chart showing each sector's percentage of the total natural gas consumption from 2000 to 2005. It shows that since 2000, industrial consumption has decrease from 38 percent to 33 percent in 2005, while electric power consumption has increased from 24 percent in 2000 to 29 percent in 2005. Residential and commercial consumption have remained relatively constant at 24 percent and 15 percent, respectively.



Source: Energy Information Administration

Residential and Commercial Demand

A major long-term driver of natural gas demand in the residential sector is residential heating. According to NaturalGas.org, an increasing number of new homes are using natural gas furnaces to heat them. In 2000, 70 percent of new homes used natural gas heat compared to 47 percent in 1986.[2] Although houses are getting larger, increasingly efficient natural gas furnaces and other appliances temper the increase in consumption of natural gas in the residential sector. However, even with more efficient furnaces, the sheer number of homes built will continue to be a strong driver of natural gas demand.

The commercial sector includes restaurants, hotels, schools and office buildings. Their uses for natural gas are much like those of the residential sector. They use natural gas for heat, cooking and water heaters. Like the residential sector, the number and size of new commercial buildings is increasing, potentially offset by their use of more energy efficient natural gas furnaces and appliances.

Industrial Demand

In this sector, there has been a decline in the energy-intensive manufacturing industries (examples of energy-intensive industries are fertilizer, aluminum or steel manufacturing) and an increase in non energy-intensive manufacturing industries. (Energy intensity is the energy used per unit of output.) NaturalGas.org reports that this change is caused by an increase in energy efficiency of equipment and processes used in the industrial sector as well as a shift to manufacturing goods that require less energy input. The EIA's Short-Term Energy Outlook, released July 11, 2006, reported industrial demand in 2005 at 7.66 trillion cubic feet (Tcf) and predicts a modest increase to 7.76 Tcf in 2006 and to 8.13 Tcf in 2007.

[2] 13 U.S. Census Bureau, *Current Construction Reports—Characteristics of New Housing* Series C25, 1989 and 1999 (Washington, DC: U.S. Department of Commerce, 1990 and 2000).

Electric Generation Demand

The demand for natural gas in the electric generation sector has increased and is expected to continue to increase in the future. That increase can be attributed to several factors. Natural gas electric plants are flexible and normally require a lower capital investment than nuclear or coal-fired plants. The plants can range in size from small micro turbines to large-scale generation. Often, a natural gas fired plant has a shorter construction and lead-time than a nuclear or coal plant. Additionally, the natural gas fired plants have operational flexibility that can be used to meet short-term peak electricity demands. They can be turned on or off quickly – a feature that coal or nuclear generation plants do not have. Another factor that makes natural gas electric plants a popular choice is that they tend to produce lower emissions than coal plants. This is an important factor since stricter emission limits are being imposed by some states.

Supply Factors

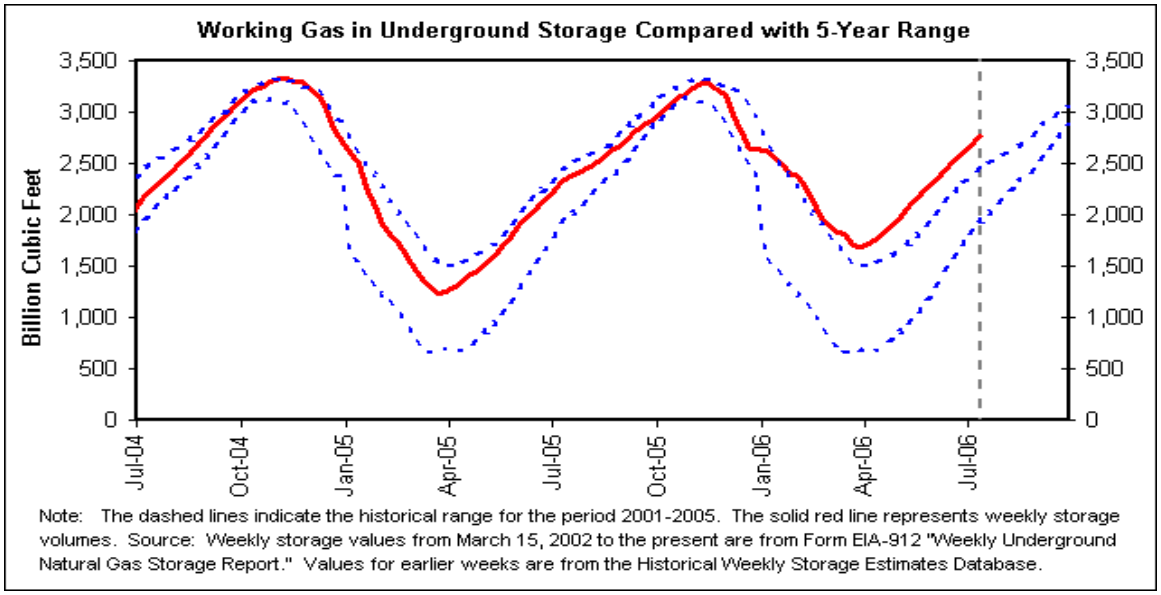
Factors such as summer weather and economic activity can add to the demand for natural gas during the time period when most of the injections into storage take place. All these factors take away from the supply of natural gas that could be used to increase storage supplies. The result can be even tighter supplies in the winter with the possibility for increased natural gas prices.

Storage Levels of Natural Gas

To accommodate the increase in demand during the winter heating season, natural gas is injected into storage from April through October and withdrawn from storage as needed during the winter months. Storage levels are tracked by the EIA and compared to a 5-year average. The storage levels for the 2006-2007 heating season are currently at record high levels and were 53 percent above the 5-year average. The week ended May 12, 2006, marks the earliest date at which natural gas volumes have surpassed 2,000 billion cubic feet (Bcf) since record keeping began in 1994.[3]

The chart below is a sample of the storage level data compiled by the EIA. This shows the storage levels compared to the previous two years as well as the 5-year range as of July 14, 2006.

[3] Energy Information Administration, *Natural Gas Weekly Update*, May 18, 2006



Given the nearly constant production levels throughout the year, the main factors that impact the supply of natural gas tend to be the ones that impact storage levels. For example, one of the main producing areas of natural gas is the Gulf Coast region. Hurricanes can interrupt the flow of natural gas from this area. Hurricanes not only can cause immediate disruption in the flow of natural gas but may also have longer-term effects on production if the facilities sustain damage and repairs are required.

Last year, the Gulf Coast experienced two major hurricanes that significantly decreased the production and supply of natural gas. The effects of hurricanes Katrina and Rita are still being felt. The Minerals Management Service (MMS) reported that 1.3 Bcf per day of natural gas projection in the Gulf of Mexico remains shut in as of May 3, 2006. This is significantly down from October 2005 when shut-ins reached about 5.6 Bcf per day. [4] As of June 2006, a total of 784 Bcf of natural gas production from Federal offshore fields has been lost since Katrina and Rita struck, which equates to approximately 21 percent of a normal year's natural gas production from the Federal offshore fields.[5]

Forecasters are predicting that 2006 will be another active hurricane season but also predict that there will be fewer storms than last year. When and where the hurricanes land may influence natural gas storage and prices.

Prices during the Storage Season

In the past when natural gas was trading for under $5.00 per Mcf, the price for natural gas would drop 30 to 40 cents per Mcf in the warmer months. This allowed companies to inject gas into storage and have a lower delivered price to the consumer when compared to purchasing the gas during the winter heating season. During the past two years there has been a much larger spread (sometimes as much

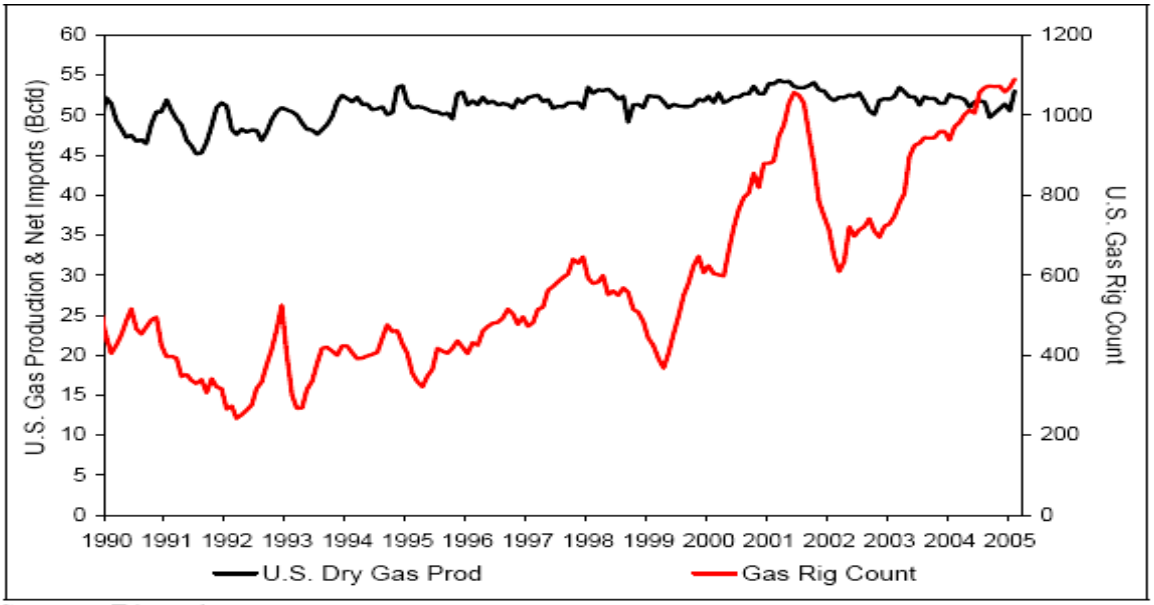
[4] Ibid.
[5] Energy Information Administration *Short-Term Energy Outlook*, June 6, 2006.

as $4.00 per Mcf) between the storage price and the winter price. This has encouraged not only utility companies to inject gas into storage, but also traders. Traders, who could lease storage, see a potential opportunity for profit by purchasing gas during the storage season and then selling during the winter heating season.

Natural Gas Well Depletion and Lack of New Drilling Areas

Natural gas wells are depleting more quickly in traditional production areas of the United States and Canada. As they deplete, less gas flows. In order to maintain production, producers have had to drill more wells or extract gas more efficiently from existing wells. Below the diagram shows the number of U.S. gas rigs is increasing while U.S. gas production remains fairly constant.

U.S. Natural Gas Production vs. Rig Count



Source: Bloomberg.

The EIA's March 30, 2006, *Natural Gas Weekly Update* reported that an average of 1,300 natural gas drilling rigs were in production for February and March 2006, which is more than double the monthly average for April 2002.

Liquefied Natural Gas (LNG)

Interest in increasing supplies of LNG remains high, but the location of new facilities is a problem. Many communities and areas do not want these plants located nearby. Even if this problem is overcome, LNG is looked at as a way to increase long-term supply.

IV. The Role of Speculative Trading

Speculative traders buy and sell natural gas (and other commodities) to make a profit. They have played an increasingly large and influential role in the natural gas market. According to a report released by Energy Solutions, Inc., on October 29,

2004, price moves caused by speculative buying or selling are referred to as "technical" moves. Technical moves cannot usually be sustained without underlying fundamentals to support them. There is some concern, however, that as speculative activity continues to increase, it is becoming more and more difficult to explain natural gas pricing behavior.

V. The Role of Gas Hedging

Local distribution gas utilities purchase natural gas on behalf of their customers, generally on a short-term basis, at prevailing market prices. In recent years, these short-term market prices have been significantly more volatile during the heating season, compounded by cold weather variability and its effect on gas usage. Natural gas hedging activities involve the use of financial instruments to stabilize the utility's gas purchase costs and include both price and volume hedging. Price hedging reduces the risk from price fluctuations, and volume hedging reduces risk related to weather, but hedging does not necessarily yield the lowest price of natural gas to the consumer. These activities augment the utility's traditional use of gas storage contracts for reducing price and weather risk.

VI. Actions Taken by Iowa's Investor Owned Natural Gas Utilities (LDCs)

The Board maintains close contact with natural gas LDCs on issues related to customer bill volatility and overall price levels. Each of the utilities has a plan, known as a hedging plan, to manage the risk of customer bill volatility. These plans are updated annually to include the effects of projected increases or decreases in demand and include gas storage efforts, and financial hedges. The hedging plans typically cover approximately 65 to 75 percent of the projected heating season demand. The remaining quantities are purchased in the open market. Board staff has had in-person hedging plan meetings and additional telephone conversations with each of those utilities. Each utility also has a Board-approved energy efficiency plan.

The Board is generally satisfied with utility risk management activities, as exercised through their hedging plans. However, it should be noted that hedging only deals with price volatility, not with broad, long-term trends in market supply and demand factors. Hedging plans have their place because they can help deal with unexpected short-term price changes. However, factors affecting prices that are beyond utilities' control are at work in the U.S. natural gas marketplace. Neither hedging plans nor other unilateral actions by utilities should be expected to deal completely with the prices customers may face in coming winters.

The Board will continue to monitor the factors that would affect the price of natural gas this winter. The Board believes many, and hopefully most, customers are once again aware of the potential for high natural gas bills during this winter heating season.