NATURAL GAS PRICES TO REMAIN AT HIGHER LEVELS

I. Summary

This brief white paper on natural gas prices is intended to discuss the continued and sustained level of natural gas prices at overall higher levels. The Energy Information Administration (EIA), in its *Natural Gas Weekly Update of April 7, 2005*, reported the average spot price at the Henry Hub for the 2004-2005 heating season exceeded levels of the past two seasons by 15 to 16 percent. There are no indications that the price for natural gas will drop significantly in the near future. The EIA revised its predictions for natural gas prices in its May 10, 2005 *Short Term Energy Outlook*. They expect the Henry Hub prices to remain relatively high, averaging over $7.00 per mcf for 2005 and 2006.

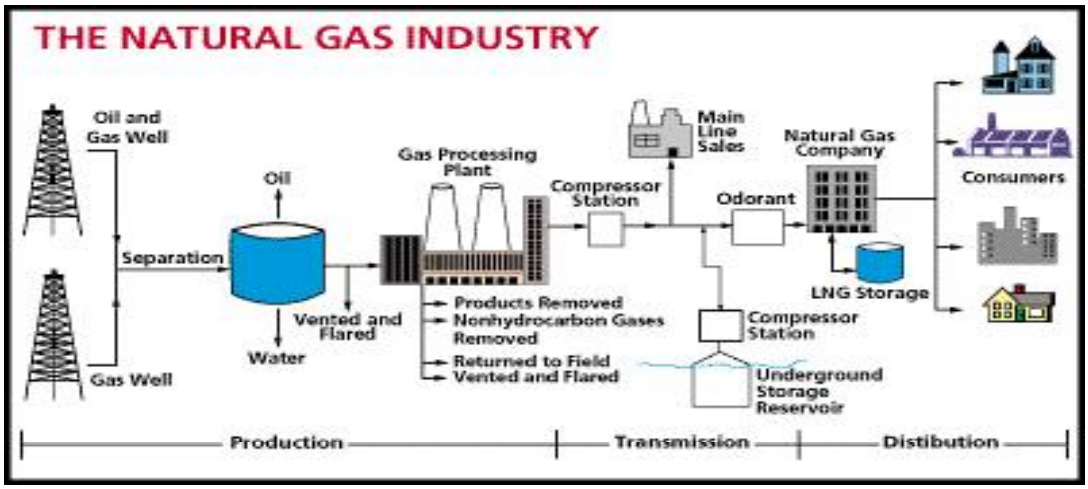
Though the Board does not predict natural gas prices, we can foresee that Iowans may experience continued high natural gas prices during the upcoming winter heating season. Should the weather during the winter heating season be unseasonably cold, consumers need to be prepared for high heating bills.

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 is, perhaps, best understood 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. A larger and larger 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 transport of natural gas are fairly constant, the 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 and adding more production capacity and, if necessary, pipelines. However, in the short-term, fluctuations in demand are usually met by injections into, or withdrawals from storage.

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 in 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. As such, 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

As might be expected, 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 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 (air conditioning on warm days) use natural gas for fuel.

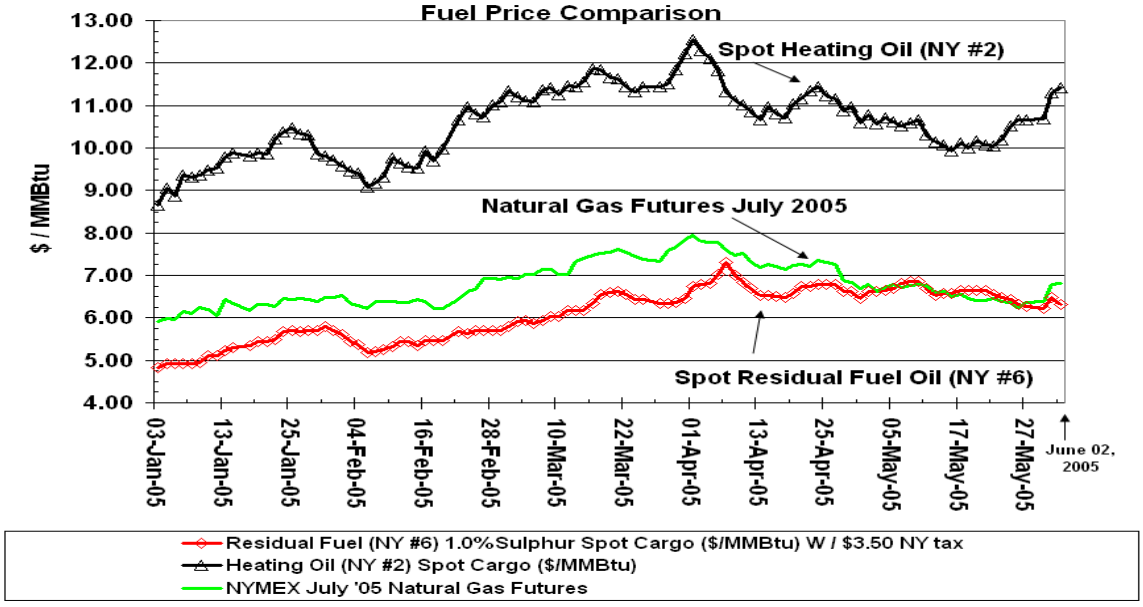
Because of this, warmer than normal weather in the summer (earlier in some parts of the South and West) means that more natural gas will be used for electrical generation purposes, and less will be available for additions to storage.

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 $60 per barrel. The price of crude oil has been over $40 per barrel since the fall of 2004. The increasing price of crude oil and the products that are derived from it could cause demand for natural gas to increase.

The chart below illustrates the relationship between the price of natural gas and the price of residual fuel oil. Residual fuel oil is one example of an alternate fuel used.

N.Y. Harbor Fuel Prices
All prices in $ / MMBtu



Source: Aquila BTU report dated June 2, 2005

U.S. Economy

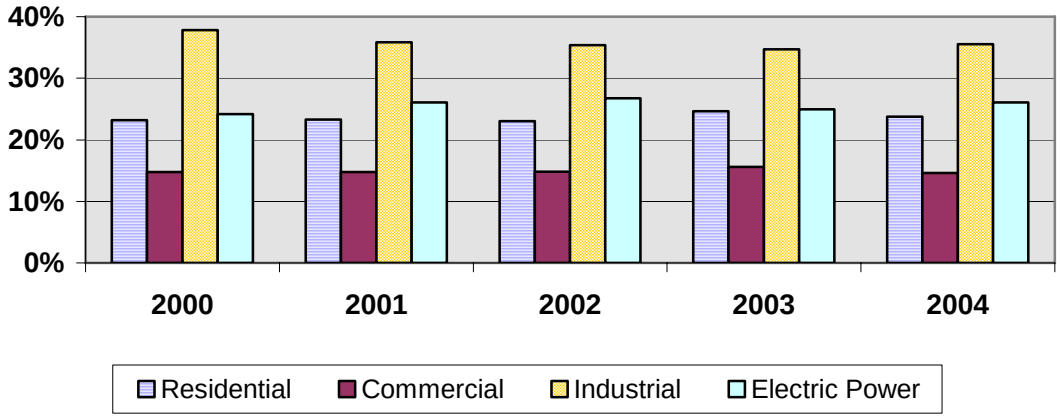
The economy, or overall economic activity is also a major factor that determines the demand for natural gas. If there is more economic activity, particularly industrial activity that uses natural gas as a fuel, there is increased demand for natural gas. Of course everyone wants to see a thriving economy that provides opportunities for everyone, 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 is divided between residential, commercial, industrial and electric power generation sectors. Below is a chart showing the each sector's percentage of the total natural consumption from 2000 to 2004.

Natural Gas Consumption by Sector



Source: Energy Information Administration

Residential and Commercial Demand

The biggest long-term driver of natural gas demand in the residential sector is the future residential heating applications. According to NaturalGas.org, an increasing number of new homes built are using natural gas furnaces to heat them. In 2000, 70 percent of new homes constructed used natural gas heat compared to 47 percent in 1986.[1] Although houses are getting larger, increasingly more energy efficient natural gas furnaces and other appliances temper the 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 homes in the residential sector, the number and size of new commercial buildings is increasing.

[1] 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).

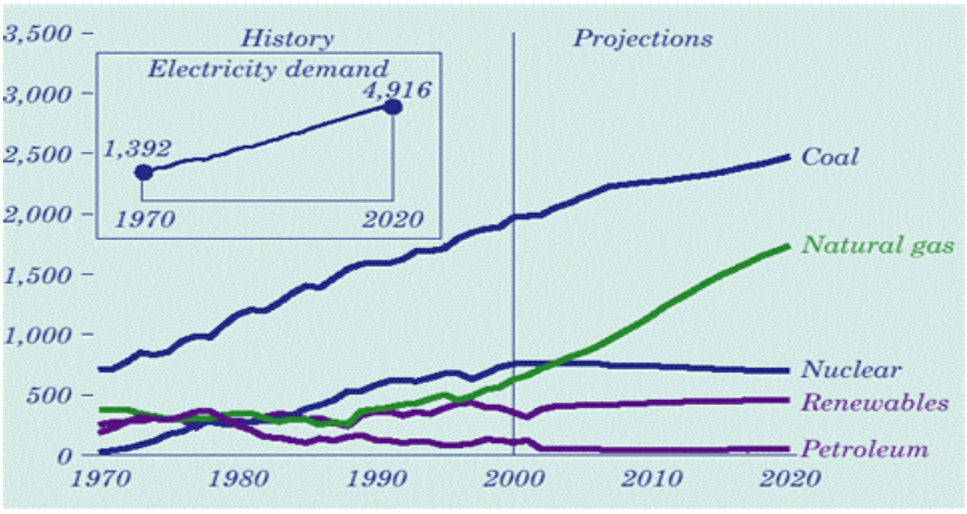
Industrial Demand

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 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 manufacture goods that require less energy input. Overall, there is expected to be a modest increase in demand from the industrial sector.

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. The chart below shows the different types of fuels used for electricity generation. As can be seen, the use of natural gas is projected to dramatically 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 times, a natural gas fired plant has a shorter construction and lead-time compared to that of 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 on a moments notice – a feature that coal or nuclear generation plants do not have. Another factor, which makes natural gas electric plants a popular choice, is that they produce lower emissions than coal plants. This is an important factor since stricter emission limits are being imposed by some states.

Energy Consumption by fuel 1970-2020 (Quadrillion Btu)



Source: EIA – Annual Energy Outlook 2004 with Projections to 2020.

Supply Factors

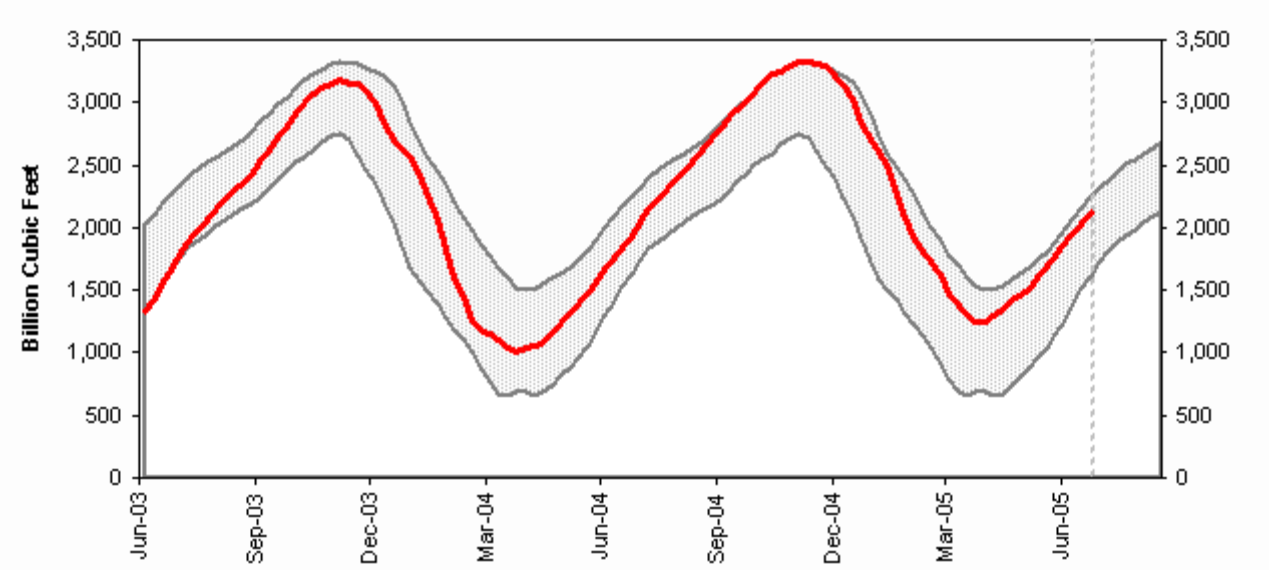
As mentioned earlier, factors such as summer weather and economic activity can add to the demand for natural gas during the time period when most of the injections into storage take place. All these factors take away from the supply of natural gas that could be used to increase storage supplies. The result is 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 2004-2005 heating season remained at record high levels and were 26 percent above the 5-year average at the end of the heating season.

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.

Working Gas in Underground Storage Compared with 5-Year Range



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. The more hurricanes they have in that region, and the more severe they are, the smaller amount of natural gas that can be produced and sent to storage facilities. The effect of the hurricane is not only the immediate disruption in the flow of natural gas, but may also have longer-term affects on production if the facilities sustain damage and repairs are required.

Prices during the Storage Season

In the past, the price for natural gas would drop in the warmer months. This allowed companies to inject gas into storage and still have a lower delivered price to the consumer than purchasing the gas during the winter heating season. High prices of gas during the storage season make firms think twice about making purchases for injection to storage. In states where regulatory agencies look at the prudency of gas purchase decisions, the companies may face some regulatory risk and balk at purchases at such high price levels.

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. Producers and exploration companies have had a large number of drilling rigs exploring for natural gas during the past two years. The average number of drilling rigs for 2004 was 1,025 rigs. This is an increase of 17.5 percent from the 872 gas rigs in 2003.[2] Even with the increase in the number of rigs, production has increased only slightly.

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 because of the potential danger in case of explosion. 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/or 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 prepared by Energy Solutions Inc., 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 those "technical" moves. There is some concern, however, that as speculative activity continues to increase, and 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 volatility 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

[2] "Natural Gas Weekly Update

hedging. Price hedging reduces the risk from price fluctuations, and volume hedging reduces risk related to weather, but it 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 include their gas storage efforts discussed above, plus financial hedges that covers approximately 30 to 40 percent of their supply. 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.