

How Katrina Will Impact Energy Markets

September 6, 2005

We've all heard the terrible news. Devastation in coastal areas of Alabama, Louisiana and Mississippi. Millions without power. Natural gas and oil prices again on the rise. But what does this really mean for the natural gas and electricity business?

Louisiana is Critical to U.S. Natural Gas Supply

From the standpoint of vulnerability to natural gas supply interruptions there is no more critical spot in the U.S. than Louisiana. Gulf Coast production is 20% of U.S. natural gas supply. Approximately 40% of U.S. gas supply flows through pipelines and/or gas processing facilities in Louisiana. One of the five LNG terminals in the continental U.S. is located on the coast of Louisiana with a second terminal off the coast in the Gulf. When Hurricane Ivan hit the Gulf Coast last September the result was an initial loss of 6 Bcf/d in gas production (approximately 11% of daily U.S. production). Due to seven destroyed offshore platforms and damage to 100 underwater pipelines, production remained reduced by about 1.5 Bcf/d for a number of months. Natural gas prices, which had been falling and appeared to be headed to lower levels than in previous years, shot up and began the rise that has run unabated through 2005. The market clearly demonstrated that any significant interruption in Gulf supplies will have a strong impact on gas pricing.

What Hurricane Katrina Has Done to Gas Supply

Moving forward one year, Hurricane Katrina has dealt a second blow to the Gulf. In the first days after the hurricane, an estimated 8.8 Bcf/d (equivalent to 16% of U.S. production) was initially shut-in. By the end of the week, this number had declined to 7.2 Bcf/d. Hopefully much of this will be temporary as many platforms were evacuated and shut-in for safety reasons. However, during the week of August 29-September 2 alone over 1.5% of *annual* gas production was lost. This will result in lower storage inventories as we enter the winter season.

The big question is how many platforms will be found damaged as crews return and attempt to restore

operations. Initial surveys indicate that as many as 30 platforms may be damaged with 18 platforms destroyed. And what about the pipelines that deliver the gas from the offshore location? It was pipeline damage, not platform damage, that caused most of the production loss following Ivan. It will still be several days before the status of the pipelines can be determined. An additional concern is the hurricane's impact on onshore facilities. Luckily Henry Hub and the Lake Charles LNG terminal were not significantly damaged. It appears however that the hurricane may have damaged key natural gas processing facilities on the Gulf Coast. Without these facilities, available production is useless since the gas cannot flow to market without processing. Initial reports are that four plants with a combined capacity of 5.5 Bcf/d may have been damaged.

Impacts on Natural Gas Prices

The direct impact of all of this is a reduction in already tight natural gas supplies, which inevitably results in price spikes. A year ago, prices jumped about 12% as Ivan approached the coast, then fell back when word reached the market that offshore platforms were relatively undamaged, and then jumped again when it became clear that significant amounts of production would remain shut-in for months while pipeline repairs were made. Later in the fall of 2004 prices continued their climb as gas supplies proved tight as the U.S. went into the heating season.

Although the long-term impacts of Katrina remain to be seen, prices in the marketplace have already jumped much more significantly than post-Ivan. Trading at Henry Hub was suspended on August 29 as the hurricane battered the Gulf Coast, but between Friday the 26th and Tuesday the 30th when trading reopened, prices jumped 25% from \$9.86/MMBtu to \$12.35/MMBtu. While prices will adjust once we know the extent of the damage, we are looking at the possibility of unprecedented high price levels throughout the winter of 2005-2006. Indeed the futures price for the six-month period October-March is currently sitting at \$11.85/MMBtu.

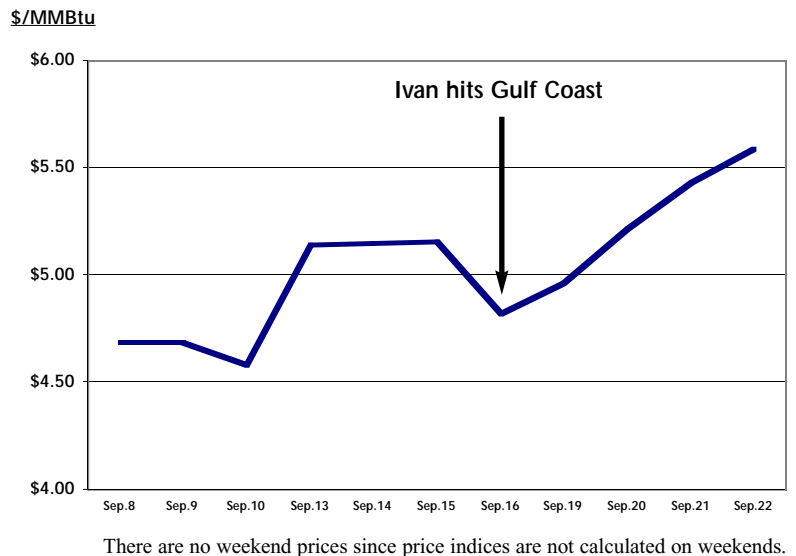
Impacts of High Prices on Natural Gas Markets

So if we are in for a period of very high natural gas prices, what does this mean? Clearly residential customers can expect to pay more to heat their homes this winter. How much more will depend a lot on how their gas utility or retail marketer buys gas and how they price the gas that is sold to customers. The key variables are how much of the supplier's gas purchases have been locked-in at fixed prices or are already in storage and how the supplier prices gas to the consumer. Most gas purchasers use a portfolio approach to buying that mixes fixed priced (or hedged) purchases, gas bought ahead of time and put into storage, and gas with indexed or spot market pricing. As prices escalate, the amount of gas subject to index or spot pricing will determine a lot about how much a supplier's overall gas costs will rise. In many cases the exposure to price increases may be less than 50% of the overall portfolio for the winter season. As for pricing, many utilities adjust gas prices only once or twice per year. That means that customers of these utilities may see much of the price increase due to Katrina put into future rate cycles (although it's also possible we'll see a flurry of emergency filings for rate adjustments from utilities in this situation). Other utilities adjust prices monthly and customers of these utilities will likely see rates increase more rapidly. In many cases, we can expect to see gas heating costs increase by at least 30 to 50% over last year.

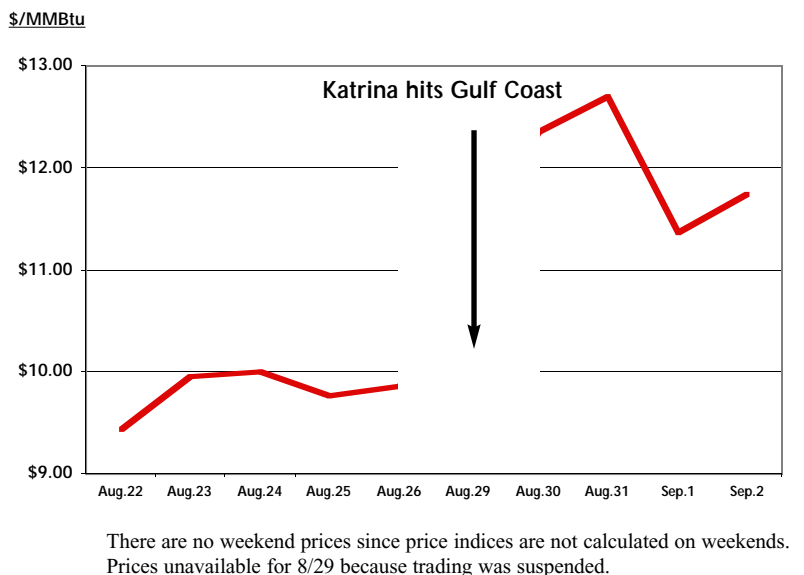
Most large commercial, industrial and power plant customers in the U.S. buy their supply from gas marketers. Again, they may have locked-in fixed pricing or may have some or all of their purchases indexed to spot prices. Clearly any large customer without a locked-in fixed price contract can expect to see significant cost increases. Since large customers pay less in distribution costs than smaller customers, any increase in gas supply costs has a larger proportional impact on their bill. It is possible that many large customers could see gas bills as much as double what they paid last year. Clearly this

will have a large impact on any businesses that cannot pass this cost increase on to their customers. A recent survey among Colorado businesses indicated that 70% of businesses felt they would be unable to pass increased energy costs on to customers. Thus gas-intensive industries such as chemicals, primary metals, paper, and food processing may be in for a rough year.

Hurricane Ivan Prices



Hurricane Katrina Prices



Many gas utilities are protected from market increases in gas prices by fuel cost adjustment clauses. However, some are at risk for gas price increases during rate cycles. Any such utilities that have not locked-in gas prices for all or most of their volumes are at extreme risk of financial distress. And even utilities with fuel cost adjustment clauses are likely to find strong regulatory scrutiny on rate increase requests as customer outcries over high prices grow.

Gas marketers will benefit or suffer depending on whether they are long (holding extra supply) or short (needing to buy supply to cover their customer needs). Any gas marketer that is short and has not hedged its exposure to gas prices in financial markets is due for severe financial distress. We may see another wave of traders leaving the market – especially if a number of new participants lose their taste for energy markets after seeing such volatility.

In the longer term, high prices should support development of new infrastructure, including LNG terminals and pipelines from Alaska and Arctic Canada, as the U.S. realizes its vulnerability to interruptions of Gulf Supply. High prices should also encourage consumers to invest in energy efficiency technology and will likely result in a reduction in future demand increases.

Impacts on the Electricity Marketplace

The utilities of the Gulf Coast, especially Entergy, will be asked to perform a herculean task in restoring power in devastated areas. This will take millions of

dollars not currently authorized in rates. While regulators are usually generous in authorizing rate increases to cover disaster recovery efforts, costs are expected to be massive and until the regulators take action the utilities are at risk for recovery of their expenditures. The credit agencies have already put these utilities on credit watch.

In areas of the country where natural gas is a key part of the generation mix – especially California, Texas, and parts of the Northeast – power prices will rise. Indeed, in the last few days we have seen power prices near or above \$100 in each of these markets. Individual's and company's exposure to these prices will again depend on factors associated with ratemaking and how they buy power as described above for gas costs. But it is clear the impact on electric costs will be real and significant. Meanwhile merchant generators with large fleets of nuclear and coal generation can look for windfall profits as they will generate at low costs and sell into markets where prices are set by the high cost of gas generation. Longer-term impacts will again provide support for energy efficiency and for development of other generation resources including coal, nuclear, and renewables as well as for distributed generation that is less susceptible to major interruption.

Summary

It appears that the U.S. is in for a long period of high gas prices along with the collateral rise in electricity prices. This will squeeze personal budgets and will put pressure on the profits of many businesses. Meanwhile gas producers and non-gas generators can look for windfall profits. It appears possible that high natural

gas prices coupled with a similar expected rise in oil prices may become a drain on the U.S. economy. But in the longer term, we may be encouraged to invest in energy efficiency, fuel supply diversity and new generation technologies. In future years, we may look back at Hurricane Katrina as the event that kicked off a new more sustainable energy paradigm for the future.

Winners and Losers

Winners

- Consumers with fixed-price contracts
- Gas producers outside of the Gulf
- LNG facilities and developers
- Marketers long on supply
- Gas storage facilities
- Merchant generators with coal or nuclear units
- Renewable energy developers

Losers

- Ratepayers in damaged areas who will carry the burden of recovery costs for years to come
- Consumers exposed to market prices
- Gas producers with damaged facilities
- Marketers short on supply
- Utilities at risk for gas costs and/or electric supply

EnergDynamics' Los Angeles Seminar Schedule:

The Omni Los Angeles Hotel, Los Angeles, CA

- **Natural Gas Market Dynamics**
- **Renewable Energy Overview** **New Class!**
- **Electric Market Dynamics**
- **LNG – From Bust to Boom**

Natural Gas Market Dynamics (September 19 and 20) \$1190

This advanced level two-day seminar presents an in-depth study of today's natural gas markets. Understand why prices have climbed so high, how they will impact the market and whether they are likely to last. Also learn about the current market structure in the U.S. and Canada, the players and their functions in each market sector, today's supply/demand equation, gas transportation and storage options, how the marketplace may evolve, the business strategies and decision-making processes of participants in each key market sector, and much more.

More information: <http://www.energodynamics.com/section03/GasMarketDynamics.asp>

Renewable Energy Overview (September 20) \$695

Green power is one of the fastest growing segments of the energy industry. This one-day seminar will provide an in-depth look at this dynamic and fast-moving industry and is designed for those with limited knowledge of renewable energy. Topics covered include how renewables fit into the current electric generation mix, the various sources of renewable energy and the pros, cons and environmental considerations of each, how green power can be purchased - both onsite and off - and the benefits of each, the value proposition for renewables from the perspective of the energy provider as well as the energy consumer, regulatory and government issues, and a look at the future of renewable energy.

More information: <http://www.energodynamics.com/section03/Renewable.asp>

Electric Market Dynamics (September 21 and 22) \$1190

This advanced level two-day seminar presents an in-depth study of today's electricity markets. Find out how the market is back in growth mode, how renewables and energy efficiency are booming, why coal and nuclear power are experiencing a resurgence, and how the Energy Policy Act of 2005 will lead to radical new changes. Course details include electric market structures (ranging from monopoly utility to the various ISO markets), how participants interact in each of these structures, an exploration of the business strategies and decision-making processes used by participants in each market sector, new models for growth in generation and transmission, how wholesale trading operates in today's marketplace, retail marketing business models and services that have proved successful, and much more.

More information: <http://www.energodynamics.com/section03/ElectricMarketDynamics.asp>

LNG – From Bust to Boom! (September 21 and 22) \$990

This day-and-a-half seminar provides an overview of the fast-paced LNG industry and is designed for those with limited knowledge of the industry. Find out why the LNG industry is critical to the United States' energy future, how the new LNG industry is likely to develop and who the winners are likely to be. Course details include a look at the increasingly important role of LNG in the natural gas marketplace, the LNG supply chain, issues with regulation, safety and security, the dynamics of the LNG marketplace, why LNG is so important at this time, the financials that make LNG viable, as well as a look at the future of the industry.

More information: <http://www.energodynamics.com/section03/LNG.asp>

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