

2006 State of the Markets Report

EXECUTIVE SUMMARY

In 2005 and 2006, electric and natural gas markets in the United States proved sufficiently robust to successfully meet various supply- and demand-related challenges with no major failures of service.

While these markets continued to produce evidence of long-term developmental trends, the most striking forces affecting these markets since late 2005 were short-term:

- Hurricanes Katrina and Rita severely disrupted natural gas supplies in fall 2005, with resulting high prices.
- Generally mild weather – including the warmest U.S. January on record – resulted in a temporary glut of natural gas in the latter half of 2006, just one year after the hurricanes.
- Significant heat waves drove new peak electric loads in summer 2006, with brief increases in price.
- Two large hedge funds active in energy speculation failed as natural gas prices sagged from immediate post-hurricane levels.

The longer term trends over this period tended to elaborate on the trends identified previously by the Commission’s market oversight staff:¹

- Market responses to several incidents showed the continuing need for investment in domestic infrastructure in some regions.
- Electric generation increased its reliance on natural gas, with important implications for both industries.
- Supply and demand for liquefied natural gas (LNG) continued its global expansion, with important effects on U.S. energy markets.
- Futures and financial markets for energy commodities continued their rapid growth and integrated more tightly with cash physical markets, accompanied by increased concerns about possible effects of speculation.

Continued evolution of these energy markets in the face of short-term supply and demand disruptions provided challenges to market oversight efforts, and shows no prospect of slowing.

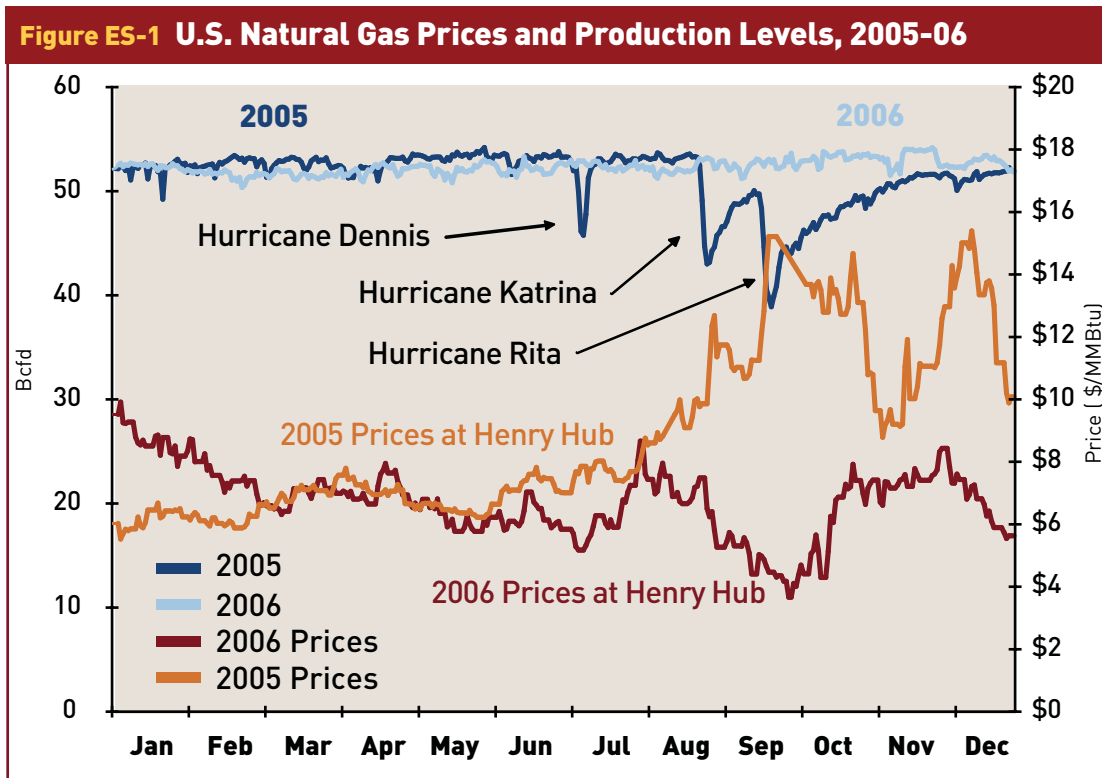
1. Comprehensive access to Commission staff work on market oversight is *available at*: www.ferc.gov/oversight.

SHORT-TERM ISSUES

Natural Gas: Extreme Weather Ends in Supply Abundance

Late in 2005, hurricanes Katrina and Rita inflicted unprecedented natural gas supply disruptions on the United States (see Figure ES-1). At the worst point, immediately after Hurricane Rita, domestic U.S. production dropped by more than 20 percent. At the time, however, U.S. natural gas storage was relatively full and injections continued in the face of disruptions to demand as well as supply.

The sharp price increases that resulted from the hurricanes were most severe in the eastern United States, which is more directly connected to the damaged Gulf Coast production facilities than other areas of the country. When the winter turned out to be unusually mild, the initially high storage inventories remained higher than historical averages into summer 2006, pushing prices down throughout the year. By fall 2006, storage had reached near-record levels, and LNG cargoes waited offshore in anticipation of higher winter prices, an unprecedented form of “offshore storage” that dissipated only in December.²



Derived from Platts and Bentek Energy Supply/Demand Balance data.

2. The U.S. Waterborne LNG Report, 2006 issues: Sept. 6; Oct. 5, 18, and 31; Nov. 10, 16, and 29; Dec. 7, 14, and 20.

Electric Power: Heat Waves, Record Loads, Significant Demand Response

The U.S. electric power industry faced a series of severe heat waves that affected almost every region during summer 2006. Most regions set peak load records, in some cases as much as 10% above previous records (see Table ES-1). The electric industry met these record loads with no major wholesale outages.

Table ES-1
New RTO Record Loads Set, 2006

Peak Loads				
RTO	Pre-06 (GW)	2006 (GW)	Increase %	2006 Peak Date
CAISO	45.4	50.3	10.7%	July 24
ERCOT	60.3	62.3	3.3%	August 17
SPP	40.5	42.2	4.2%	July 19
MISO	112.2	116.3	3.7%	July 31
PJM	133.8	144.6	8.1%	August 2
NYISO	32.1	33.9	5.6%	August 2
ISO-NE	26.9	28.1	4.5%	August 2

Derived from RTO data, using hourly integrated peak loads.

Reductions in demand for power from the grid by customers because of the stress of the heat waves seem to have proved important in preventing blackouts, particularly in areas that perennially face the threat of capacity shortages, including Connecticut and Long Island. These varied programs and efforts, known as demand response, tend to be poorly coordinated with short-term price signals from electricity markets but provided important relief to several electricity

systems during the stresses of the summer 2006 heat waves.

The larger weather pattern in 2006 was warmer than normal, and despite the new peaks, overall U.S. generation output fell a slight 0.1 percent in 2006.³

Financial Markets: Speculative Activity and Energy Markets

Continuing growth in financial trading of energy commodities in 2006 raised concerns about the possible effects of speculation on physical energy prices.

Speculation is the buying or selling of an interest in a commodity in the hope of profiting from future changes in the value of that commodity. Speculation is a necessary part of active markets, as is participation by buyers and sellers of the physical commodity. Robust markets rely on a variety of perspectives about current and future market conditions to reach workably competitive levels.

Several reports argued that speculators increased North American natural gas prices in 2006.⁴ In addition, the drop in natural gas prices in mid-2006 led to the collapse of two major speculators. The most notable of these was Amaranth Advisors LLC, which collapsed in September, apparently losing the most money ever by a hedge fund.⁵ A smaller fund, MotherRock L.P., failed at the end of July, wiping itself out as well as losing an additional \$60-\$100 million for its broker.⁶

3. Derived from Edison Electric Institute (EEI), Weekly Electric Output data.

4. Mark N. Cooper, for the Midwest Attorneys General Natural Gas Working Group (Illinois, Iowa, Missouri, Wisconsin), *The Role of Supply, Demand, and Financial Commodity Markets in the Natural Gas Price Spiral*, March 2006; U.S. Senate Permanent Subcommittee on Investigations, Committee on Homeland Security and Governmental Affairs, *The Role of Market Speculation in Rising Oil and Gas Prices: A Need to Put the Cop Back on the Beat*, (Washington, D.C., June 27, 2006); Robert J. Shapiro and Nam D. Pham, *An Analysis of Spot and Futures Prices for Natural Gas: The Roles of Economic Fundamentals, Market Structure, Speculation, and Manipulation*, August 2006. Work conducted by Sonecon LLC and supported by a grant from the National Legal and Policy Center.

5. "A Hedge Fund's Loss Rattles Nerves," Sept. 19, 2006, "Hedge Fund Shifts To Salvage Mode; Amaranth Trying to Shed Gas Portfolio," Sept. 20, 2006, by Gretchen Morgenson and Jenny Anderson, *The New York Times*; "Blue Flameout: How Giant Bets on Natural Gas Sank Brash Hedge-Fund Trader," Ann Davis, Sept. 19, 2006, *The Wall Street Journal*; "Amaranth - How to Lose \$5.0 Billion without Even Trying," By Cal Payne, Sept. 25, 2006, *IssueAlert@UtiliPoint.com*.

6. "MotherRock Cries Uncle," *thetstreet.com*, Aug. 3, 2006; "Energy Hedge Fund Closes Shop," *CNNMoney.com*, Aug. 4, 2006.

LONG-TERM ISSUES

Infrastructure: a Continuing Need for Investment

Natural gas and electric power markets signal infrastructure needs by raising prices where the balance of supply and demand is tight. The difference in prices between these locations and others is known as *congestion*. Examples of how transportation infrastructure can affect congestion include:

- **Coal.** Two train derailments in southern Wyoming reduced shipments of Powder River Basin coal in May 2005, drove down electric generator stockpiles, and changed the generation supply mix in some places.
- **Natural Gas and Hurricane Damage.** When hurricanes Katrina and Rita damaged gas production and transportation in the Gulf of Mexico, gas prices increased in the East, which attracted more gas from Texas, filled pipelines heading east, and led to persistently large East/West price differences.
- **Access to Gas Supplies in the Rocky Mountains.** As a result of tight pipeline capacity to export natural gas from western Wyoming, five times in the fall of 2006 relatively minor changes in pipeline infrastructure led to significant price changes.
- **Electric Prices in New York City and on Long Island.** Several new power plants in New York City reduced traditional transmission constraints into the city, dropping prices relative to still-constrained Long Island.

Natural gas and electric power markets remain

sensitive to infrastructure shortages, underscoring the importance of investment in transportation and transmission infrastructure before serious problems can arise.

Growing Reliance on Natural Gas for Electric Generation

Though U.S. electric power generation dropped slightly in 2006, power generators used 19.2 Bcf of natural gas per day through November 2006, up 6.2 percent from 2005.⁷ Gas use on the peak day in 2006 was estimated to be 31 percent greater than on the peak day in 2005, peaking at roughly 42 Bcf on August 2 (see Figure ES-2).⁸

Natural gas use in electric generation increased for several reasons. Much more natural gas generating capacity was added over the past few years, even as plants using other fuels retired. In addition, natural gas traded at prices lower than competing fuel oil products in some markets, resulting in a shift in fuel use to natural gas.

Electric power prices are increasingly influenced by natural gas prices. Though natural gas accounts for only about 20 percent of the power generated in the country,⁹ it is often the fuel used by the plants that are the first to be turned off or on and consequently the ones that set the price for power in a region.

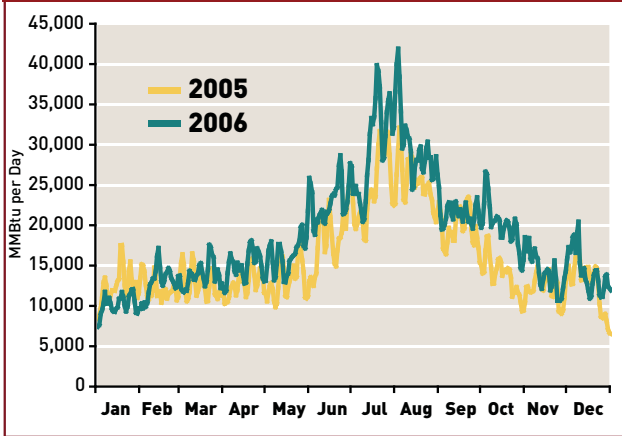
For natural gas, electric generation load has largely substituted for traditional industrial load that was lost as natural gas prices rose at the beginning of the decade. Generation load tends to be inflexible, resulting in additional volatility in natural gas prices.

7. EIA, *Monthly Flash Estimates of Electric Power Data*, "Table 5.1 Trends in Fossil Fuel Consumption For Electric Generation, Total (All Sectors)," Jan. 19, 2007.

8. According to Bentek Energy LLC's *U.S. Power – Gas Burn Report*. The peak day in 2005 was Aug. 3.

9. EIA, *Electric Power Annual 2005* and *Electric Power Monthly*, January 2007.

Figure ES-2 Estimated Natural Gas Delivered to U.S. Power Plants, 2005-06



Derived from Platts and Bentek Energy Supply/Demand Balance data.

Evolving Global LNG Market

Because of short-term market drivers, LNG imports into the United States actually declined in both 2005 and 2006.¹⁰ Over the long term, however, imports are expected to grow as natural gas production in North America becomes increasingly difficult and

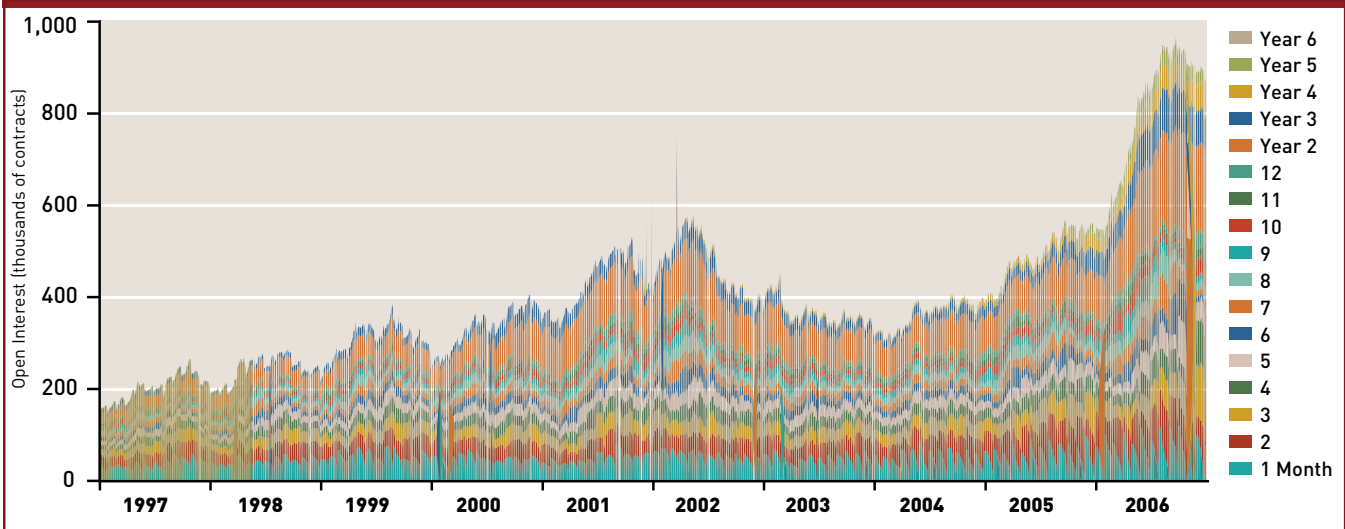
expensive. LNG import projects continue to move forward in the Gulf of Mexico as well as on the East and West coasts and in Mexico and Canada.

In prior years, we observed a growing North Atlantic spot market for LNG that could flow either to North America or to Europe. In 2006, the LNG market in the Atlantic and Mediterranean basins expanded to send tankers as far away as Asia.

Futures and Financial Markets Continue to Grow in Size and Influence

Futures and financial trading in energy commodities including natural gas and electricity continued to increase in 2005 and 2006.¹¹ Indicators from transparent parts of these energy markets show that participants developed new products to trade, traded greater volumes, and showed a greater willingness to hold on to sales or purchase commitments (measured as *open interest*, see Figure ES-3). Futures and financial trading was particularly apparent in natural gas, but trading in electricity increased as well.

Figure ES-3 Natural Gas Open Interest Growth, 1997-2006



Derived from Nymex data.

10. EIA, *U.S. Natural Gas Imports by Country*, and *The U.S. Waterborne LNG Report*.

11. Nymex futures is a physical market in that the commitments traded provide for physical delivery and are occasionally used for that purpose. More generally, however, traders sell (or buy) their futures commitments before settlement, allowing for participants without physical interests to participate. Consequently, we will treat futures and financial markets together because of their interactions with cash physical markets, notwithstanding the very real differences between futures and financial trading.

Futures and financially traded natural gas markets interact with other commodity trading. For example, some interest in trading natural gas comes from speculators, and some from those, like pension funds, that have little interest in energy in its own right but want changing value for natural gas (and other basic commodities) as part of a balanced portfolio that includes many other investments.

Futures and financial trading also interacts with various physical natural gas markets. Observers tend to think of futures and financial energy commodity trading as *derivative* of an underlying physical market, with futures and financial trading reflecting both speculation and short-term physical supply and demand conditions.

Over time, some successful futures markets have become robust and transparent enough that their prices are used directly to set cash physical prices. For example, monthly indices used in much of the eastern half of the United States have become directly dependent on the final monthly settlement price of futures contracts traded on the New York Mercantile Exchange (Nymex) to set their prices. Publishers of these indices use *physical basis* transactions to calculate some or all of their price indices. In effect, the flow of information regarding these physical prices now comes directly from futures trading.

HOW TO USE THIS REPORT

In the past, Commission staff produced three comprehensive *State of the Markets Reports* in document form, usually significantly after the period in question. With this report, we are changing the form of the *State of the Markets Report* to take advantage of the speed and flexibility of the Commission's new Market Oversight pages on its Web site.

These pages are available at www.ferc.gov/oversight.

Instead of providing significant amounts of regional data within the report itself, the annual *State of the Markets Report* will now consist of a summary of significant national electric and natural gas market developments over the previous year. Regional detail will be provided, and updated more regularly, within the Web pages themselves.

We hope that the Market Oversight section of the Commission Web site will engage stakeholders in a meaningful review of energy market activity by sharing much of the information we use to assess that activity. Over the course of the year, with the addition of information as it becomes available, we expect that the site will become increasingly comprehensive and useful.