WINTER ★ 2002-03

2003 Natural Gas Market Assessment

Staff Report by the

Office of Market Oversight and Investigations

Federal Energy Regulatory Commission

Preface

This market assessment results from the Federal Energy Regulatory Commission's ongoing commitment to identify and monitor the significant issues facing wholesale electric and natural gas markets.

The assessment focuses primarily on natural gas. The Office of Market Oversight and Investigations (OMOI) seeks to identify issues important to customers and market participants and to signal the areas of greatest concern and vigilance for the Commission at this time. The Federal Energy Regulatory Commission created the OMOI in April 2002 to focus its efforts in energy market oversight. Any errors are the responsibility of the OMOI alone and not of the Commission as a whole.

We encourage readers to provide feedback on this OMOI product by sending comments to an e-mail address specifically set up for this report, natural.gas.assessment@ferc.gov, or by contacting staff referenced in the acknowledgements. They can be reached as follows:

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A fair energy marketplace is everyone's responsibility. Please do your part. If you encounter inappropriate energy market behavior, contact our Enforcement Hotline toll-free by telephone at 1-877-FERC-MOI or via e-mail at hotline@ferc.gov.

Thank you.

William F. Hederman
Director
Office of Market Oversight and Investigations

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2003 Natural Gas Market Assessment

The North American natural gas marketplace has shown itself to be remarkably robust through the many trials of recent years. Nevertheless, wholesale natural gas markets face challenges as 2003 gets underway. Quick, thoughtful and effective action can address these challenges successfully and can maintain the benefits of a competitive natural gas industry for customers and the overall economy.

The healthy functioning – or distress – of natural gas markets has profound effects on the overall economy. In 2001, customers spent $142 billion on natural gas in the United States,[1] about 1.4 percent of the gross domestic product.[2] Almost one-quarter of the natural gas sold was used by residential customers.[3] The average annual natural gas bill for residential customers that year in the contiguous 48 states, stated in 2002 dollars, was $844.[4] Other uses include the generation of electricity and the manufacture of other goods and services and for transportation fuel.

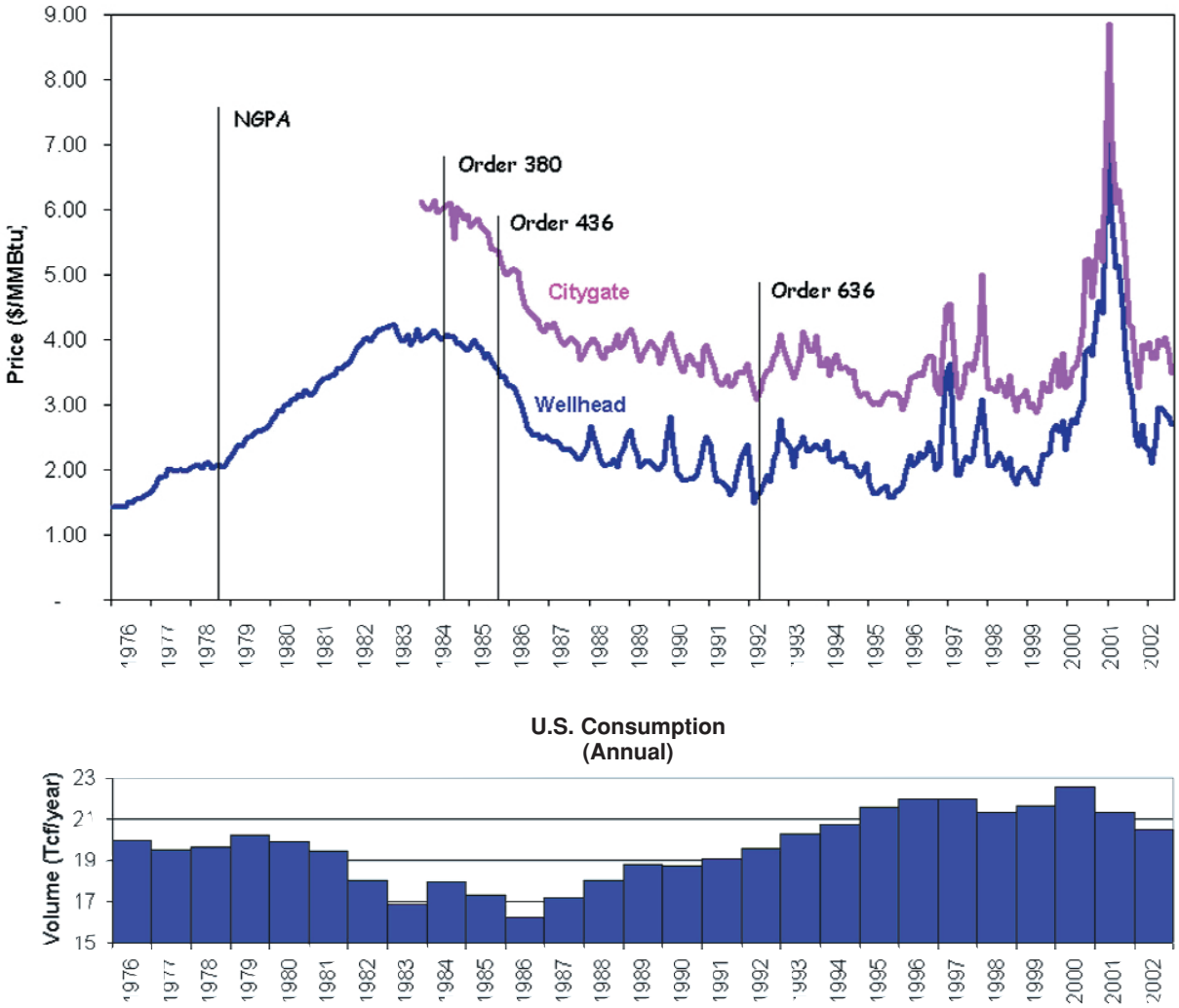
Competitive forces have created benefits for natural gas customers. Reform of natural gas markets in the United States by Congress and the Federal Energy Regulatory Commission generated significant customer benefits over the past quarter century. Prior to passage of the Natural Gas Policy Act (NGPA) of 1978,[5] the natural gas industry faced chronic supply shortages arising from uneconomically low regulated wellhead prices.

The NGPA permitted suppressed market forces to work by phasing out price caps on wellhead natural gas prices. During the late 1970s and in the early 1980s, prices rose to meet high interim price caps as an incentive for drilling for more supply. By the latter half of the

Wellhead **prices are prices paid to producers at the well, before the gas enters an interstate pipeline.**

[1] OMOI analysis of statistics compiled by the Energy Information Administration and published in *Natural Gas Monthly*, December 2002.
[2] U.S. Department of Commerce, Bureau of Economic Analysis, National Accounts Data, "Current-Dollar and 'Real' Gross Domestic Product," at www.bea.gov.
[3] Energy Information Administration, *Natural Gas Annual 2002*, Table 1, "Summary Statistics for Natural Gas in the United States, 1996-2000," pp. 5-6.
[4] Energy Information Administration, Natural Gas Use in American Households, at www.eia.doe.gov/emeu/consumptionbriefs/recs/natgas/nat_gas_piece.html. 2002 value was derived from EIA estimate of $10.07 per Mcf residential fuel cost at 1997 residential consumption level of 83 Mcf. OMOI inflated this value using a 1% GDP deflator obtained from the U.S. Department of Commerce, Bureau of Economic Analysis.
[5] 15 U.S.C. 3301-3432

Figure 1: Natural Gas Market Growth and Price Moderation After Passage of the NGPA (1976-2002, in 2002 Dollars)



Sources: Energy Information Administration at www.eia.doe.gov; Bureau of Economic Analysis at www.bea.gov

The *spot market* is the natural gas market for contractual commitments that are short-term (usually a month or less) and that begin in the near future (usually the next day).

1980s, prices fell in direct response to oversupply. That oversupply lasted through most of the 1990s. Figure 1 tracks prices through this period, showing how they rose and fell.

Subsequent Commission orders that addressed evolving market conditions, including Order Numbers 380 (1984), 436 (1985) and 636 (1992), contributed to the efficient operation of market forces to benefit customers. Order 380 enabled utilities to purchase spot market gas, and Orders 436 and 636 provided for open access on pipelines, ended bundled pipeline sales service and introduced capacity release and other innovative rate designs.

In 2000 and 2001, natural gas prices rose for slightly more than a year. That price pattern marked the end of more than a decade of oversupply within the production segment of the North American gas market, and it was driven by a variety of factors. These market-changing factors included a tighter supply-demand balance, regional occurrences of pipeline congestion and participant behavior, factors we will discuss in greater detail later in this assessment.

With the exception of the period of the price plateau, real wellhead prices have remained below those of the early 1980s. Figure 1 also shows that competitive markets have brought close to 20 years of moderate prices for gas delivered to the citygate. Importantly, competitive markets have increased the efficiency of long dis-

Citygate prices are those paid for natural gas delivered out of major pipelines at the gate station, or citygate, where local distribution companies take control of the gas from interstate pipelines.

tance transportation. The wholesale delivery cost of natural gas – the difference between citygate and wellhead prices – has fallen in real terms about 40 percent between 1984 and 2002, a compound reduction of 2.8 percent per year.

The Commission's Office of Market Oversight and Investigations (OMOI) has prepared this report to provide the Commission and the public with an assessment of current developments, trends and issues in natural gas markets. In particular, OMOI explores the effectiveness of competition in natural gas markets and focuses on industry and government actions to address any problems or identified threats. This assessment does not release privileged information related to current investigations; it does discuss current issues and industry, regulatory and investigatory efforts to deal with these issues.

The Issues

Based on our analysis, OMOI considers the five most pressing concerns for natural gas markets as of the winter of 2002-03 to be:

1. ***Deteriorating financial conditions of market participants***
Natural gas companies heavily engaged in trading – in a trend shared with electric traders – are in the forefront of a traumatic financial shakeout. Many past leaders of energy trading are either out of business or retrenching. Their problems have adversely affected other natural gas companies as well. This serious financial situation could cause price increases and (in the longer run) delivery problems for natural gas customers. Thus far this winter, however, there have been no reports of significant delivery problems.

2. ***Managing credit exposure***
Managing credit is one of the most important components of long-term financial health of energy market participants. Poor risk management of credit exposure contributed to recent financial problems. New approaches to managing credit that have not been extended to energy markets in the past are being introduced to natural gas companies. Introducing these sophisticated new tools in effective ways will be critical for the successful control of risk associated with volatile natural gas prices.

3. ***Shaken confidence in price discovery methods***
Reports of wash trades and intentional false reporting of transactions and prices by industry sources over the past half-year have undermined the credibility of published natural gas price indexes. Given the importance of these indexes to customer confidence as well as to the functioning of many natural gas contracts, the industry must respond effectively.

4. ***Continuing need for efficient investment in infrastructure***
The natural gas industry requires ongoing investment to maintain adequate supply, delivery facilities and operational flexibility. As competitive markets for natural gas have evolved, they have provided a basis for investment designed to benefit customers and provide adequate returns from facilities' market value. Assuring adequate investment in infrastructure aligned with competitive market forces is a critical and continuing need for the natural gas industry.

5. ***Continuing potential for manipulation***
The potential for manipulation of energy markets remains a concern. Without proper monitoring, the likelihood of successful manipulation could increase under the current tight supply conditions. Market manipulation can adversely affect the dependability, affordability and competitiveness of gas markets. Solutions require a commitment to vigilant oversight.

The remainder of this assessment will focus on each of these challenges. We document the issues and present highlights of current efforts by industry and the Commission to resolve them.

OMOI considers the issues facing the effective competitive functioning of the industry to be manageable. Both industry participants and regulators must seek out and aggressively promote solutions to assure efficient, cost-effective and reliable natural gas service to all U.S. customers.

Issue 1

Deteriorating Financial Conditions of Market Participants

The energy sector faces unprecedented financial challenges. While initially affecting trading companies, financial stress has touched electric utilities, pipelines and distributors as well. In response to these new challenges, some companies have abandoned energy trading. Having fewer, less financially strong market participants could result in the less-efficient functioning of competitive energy markets. We will focus on the effects on natural gas markets, though these conclusions could extend to electricity as well.

The Situation

Financial weakness currently extends across many industries. Every segment of the energy industry important to the Commission's jurisdictional markets has recently experienced difficulties. Figure 2 shows 2002 changes in stock prices for a group of 111 key market participants in the energy sector. Financial conditions for the energy sector overall deteriorated dramatically in 2002.

Problems for companies heavily engaged in natural gas trading are even greater than they appear in Figure 2. While Figure 2 groups companies by service, energy companies often tend to be integrated across fuel and activities. This point deserves a brief discussion. The group of companies identified as predominantly natural gas distributors has seen almost no reduction in share values, but these companies have not been at the forefront of natural gas trading. Pipelines ("mid-stream gas" in Figure 2) and electric wholesalers ("utility parent w/significant wholesale"), which were far more likely to be active in natural gas trading, have dropped substantially in value.

In 2001 and 2002, energy traders revealed a variety of improprieties in financial reporting and trading activity. The malfeasance initially associated with Enron, and to varying degrees with other specific energy trading companies, has led to the financial challenges that now confront the entire industry. Market discomfort remains, a natural response to uncovered deceptions and to numerous ongoing investigations of trading activity by government agencies.

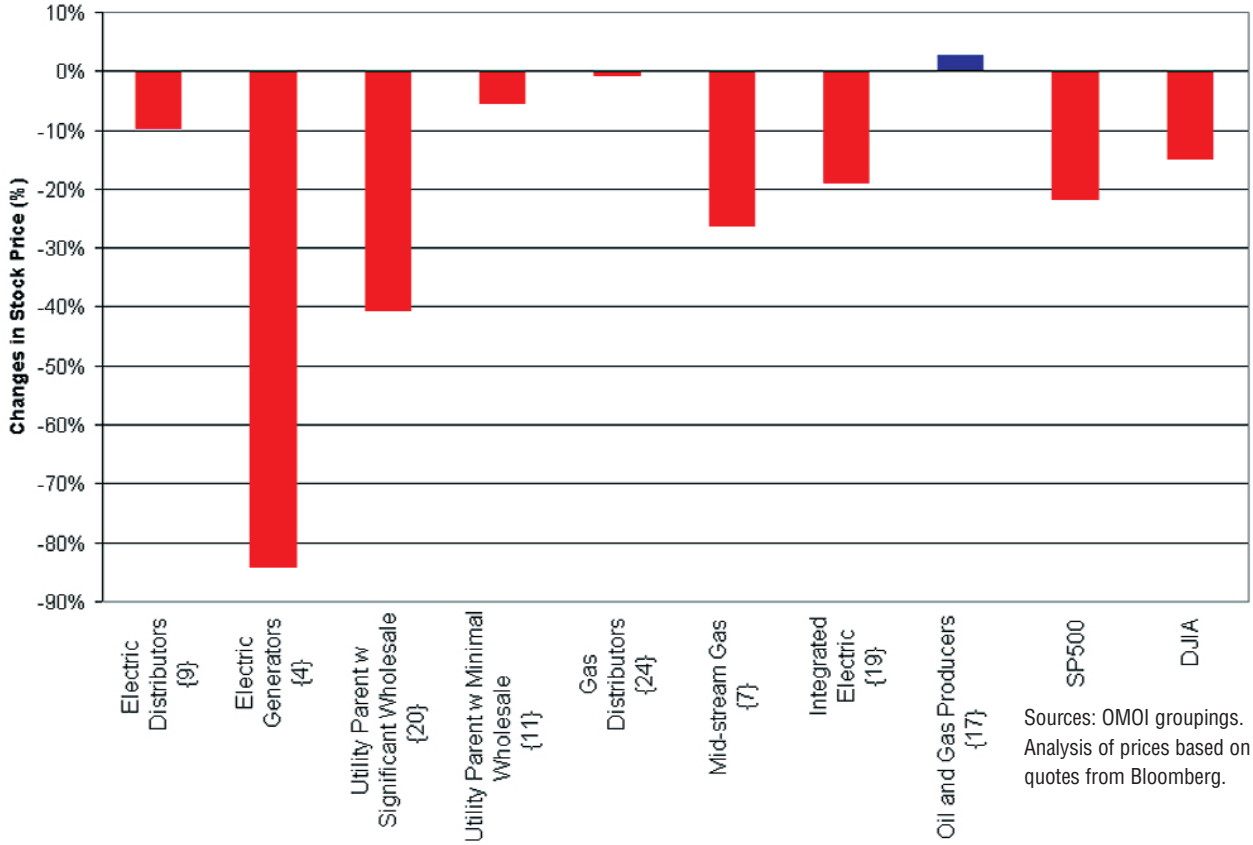
The difficulties have cascaded to debt-holders, reducing company credit ratings. Rating downgrades by the major rating agencies – Standard & Poor's (S&P), Moody's and Fitch – recognize this financial stress and contribute to the challenge. Figure 3 shows the trend toward downgrades for energy companies by S&P.

There is potential for further financial instability stemming from the amount of energy-company debt scheduled to be renegotiated over the next few years. Figure 4 shows the maturities of long-term debt for selected classes of energy companies. Overall, about a third of long-term debt will mature for energy companies over the next five years, from 2003 through 2007. Short-term debt maturities will put additional stress on the system. It is likely that some companies will not be able to manage through these debt maturities and will fail. Many of these companies are active participants in the natural gas market.

To manage investor and debt-holder concerns about viability, many companies either withdrew from or announced reductions in energy trading activity in late 2001 and in 2002, including:

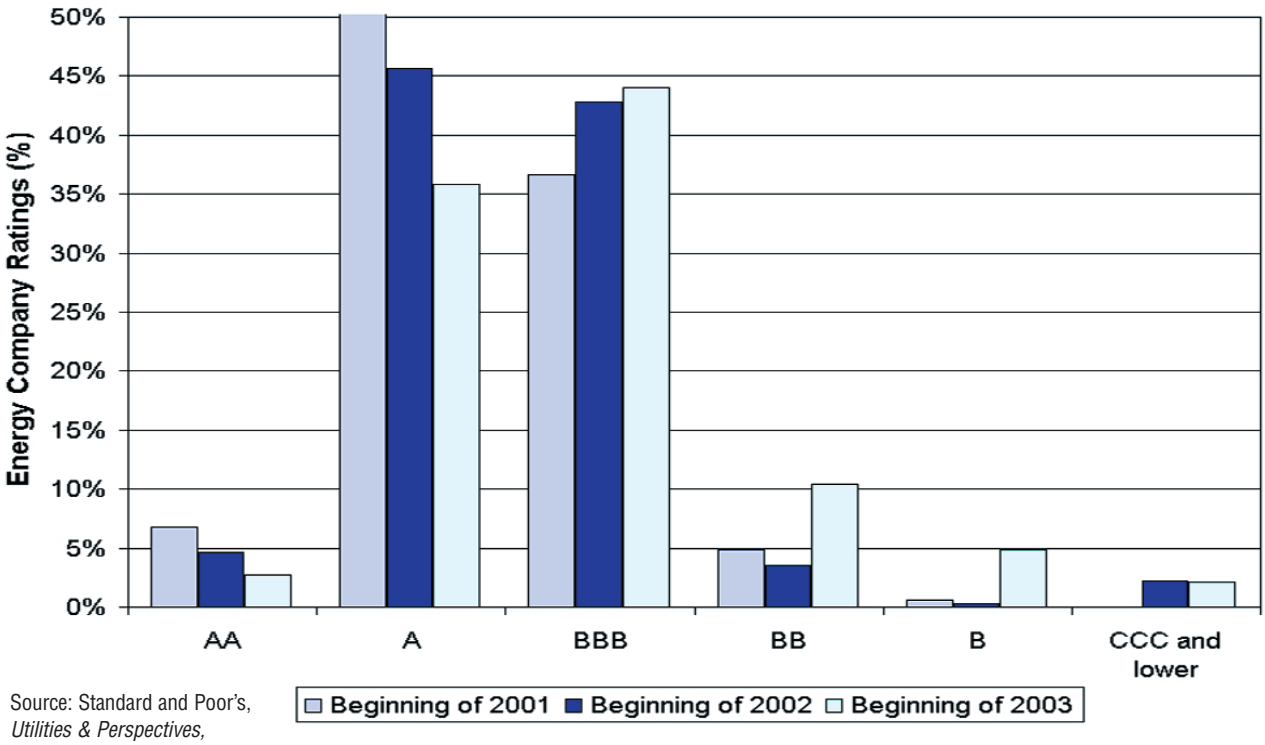
- Allegheny Energy
- American Electric Power
- Aquila
- Calpine
- CMS
- Dynegy
- El Paso Energy
- Enron
- IdaCorp
- Mirant
- PG&E
- Reliant
- TXU
- USB Warburg
- Williams

Figure 2: Most Energy Stock Prices Declined in 2002



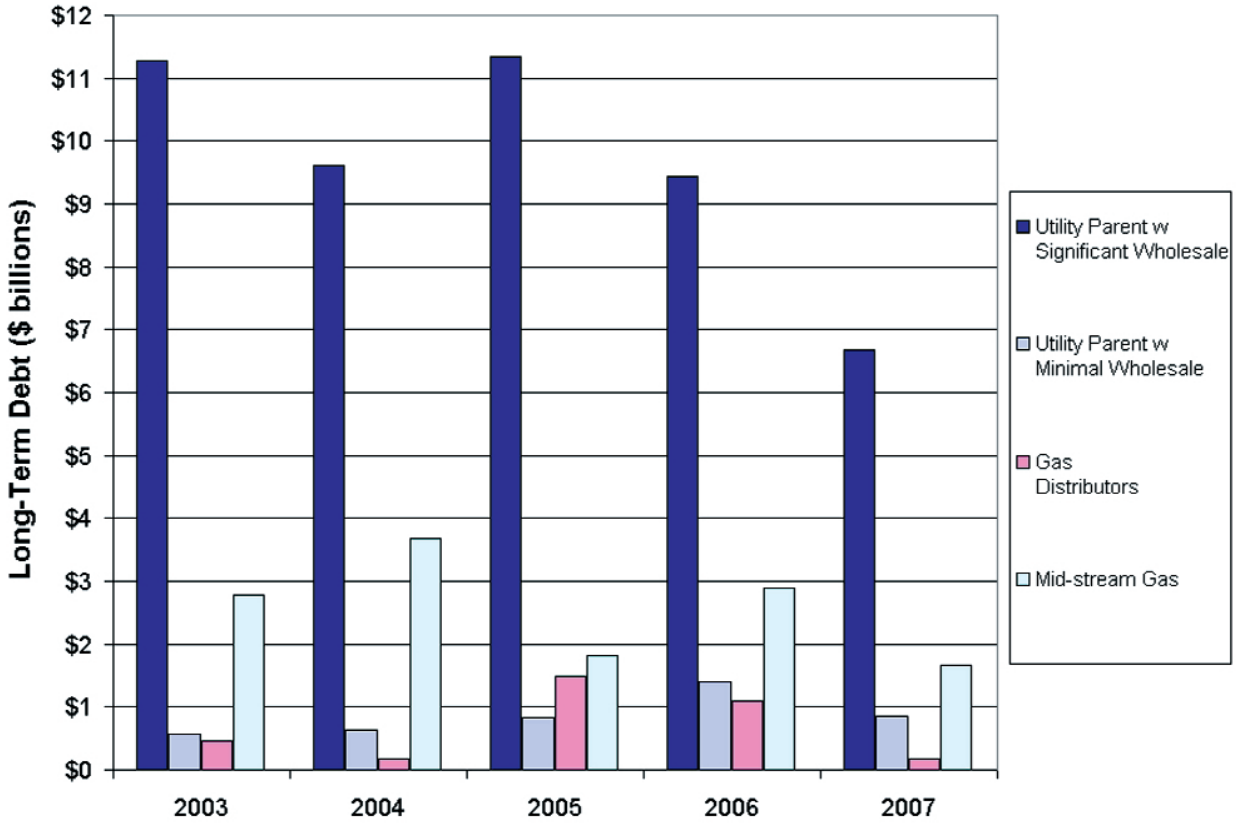
Sources: OMOI groupings. Analysis of prices based on quotes from Bloomberg.

Figure 3: Decline in Quality of S&P Energy Company Ratings, 2001–2003



Source: Standard and Poor's, *Utilities & Perspectives,* January 20, 2003

Figure 4: Magnitude of Long-Term Debt Coming Due for Energy Companies in the Next Five Years



Source: OMOI groupings. Analysis of debt projections based on data from Bloomberg.

Market liquidity **describes the ease with which a buyer can buy or a seller can sell at the prevailing price in a marketplace.**

Market power **can include, but not be limited to, the ability of a firm to raise its price or withhold its output with the effect of raising market prices above competitive levels for a sustained period of time.**

Deterioration in the financial condition of energy companies has many serious implications for natural gas markets, such as:

Companies ceasing natural gas trading can impair markets and cause higher prices for consumers. The reduction in the number of energy traders in the marketplace reduces market liquidity – the ability of a market participant to buy and sell readily in a marketplace at a prevailing price.

The reduction in the number of natural gas traders is particularly troublesome in the natural gas marketplace because there are so many regional markets, already somewhat illiquid due to fragmentation. Dividing these markets by fewer traders can give remaining traders market power, permitting them to increase above competitive levels the difference between what they are willing to pay sellers and demand in payment from buyers. Some difference in prices paid and charged – the bid-ask spread – is necessary for traders to exist. In particularly thin markets, however, if a trading company increased the bid-ask spread beyond competitive levels, it could be exercising inappropriate market power.

Bid-ask spread **is the difference in price between what a buyer will pay for a commodity and what a seller charges for it.**

Agency agreements **allow traders to manage their customers' natural gas assets as agent in exchange for the additional value they derive from them.**

Reduced use of agency agreements can shift risk away from marketers and toward consumers. Through agency agreements (also known as asset management contracts), natural gas traders contract with gas purchasing companies such as natural gas distributors and electric generators to manage their fuel supply

portfolios, including pipeline transmission, storage assets, daily purchases and seasonal supply. These agreements allow natural gas purchasing companies and their customers to share profits derived from remarketing unused capacity and supply with the marketer. At the same time, the marketer assumes some of the associated price risk and ensures availability.

Competition for agency agreements among marketing companies had, until the recent collapse of the business, been intense. But as merchants abandon wholesale trading, the number of asset management arrangements between trading companies and distribution companies is declining.[6] This decline will shift many of the risks the marketers had been bearing back to their customers, many of whom may not have the necessary risk management skills. Depending on the trading ability, planning skills, regulation and financial incentives of utility staff, price risks to end-use customers may increase.

Constrained finances could lead to deferral of necessary infrastructure maintenance, harming reliability. As we have seen, energy companies often are integrated across functions, so energy traders often have pipelines or electric utilities as affiliated companies. There are indications – most recently from Williams[7] – that trading-related financial problems can cause personnel cutbacks in regulated affiliates. Lack of maintenance could decrease service or safety.

Constrained finances could lead to deferral of infrastructure builds. The erosion in industry funding may eventually hinder development of additional energy infrastructure. Recent credit downgrades mean higher interest rates and costlier projects. Energy companies are finding it difficult to complete costly new power plant projects. Delays and cancellations have increased.[8] These delays and cancellations can affect the efficacy of pipeline expansion.

Actions

Both industry and government agencies can help resolve financial issues related to natural gas companies.

Industry Actions

Where possible, market participants are working constructively to address their own deteriorating financial condition as well as manage deterioration in the financial strength of the companies with which they do business. These efforts include:

Improving finances. Natural gas players are cutting costs, renegotiating debt, selling assets and making other adjustments to improve financial strength. Many have announced asset sales, raising concerns that forced sales may be under-valuing these assets. However, firms with strong finances are acquiring good assets. For example, Mid-American Energy Holdings (owned by Berkshire Hathaway) purchased two large pipelines in 2002, the Kern River Gas Co., from Williams, and Northern Natural Gas Pipeline, a former Enron asset, from Dynegy.[9]

Developing best practices for energy trading and general business behavior. Since late spring 2002, industry has sponsored several efforts to improve industry performance in energy trading. These include:

- Chief risk officers from more than 30 integrated energy companies (most of which have energy merchant arms) formed the Committee of Chief Risk Officers (CCRO) to develop recommendations for best practices.[10] Among the CCRO's recommendations are financial disclosures more informative than the minimum required by the Securities and Exchange Commission (SEC), enhanced approaches to managing credit among traders, active use of state-of-the-art approaches to monitoring the risks taken on by corporations through energy trading and strict governance and control procedures.

- In June 2002, the Electric Power Supply Association (EPSA) launched an initiative directed by a high-level steering committee to describe and codify ethical standards for the power supply and trading industry. EPSA will require certification of these standards as a condition of membership.[11]

[6] OMOI conversations with multiple market participants in fall 2002 and winter 2002-03.
[7] "Williams Cutting Jobs at Pipelines Amid Losses at Trading Units," Bloomberg News Wire, November 27, 2002.
[8] "U.S Energy Sector Has Hit a Credit Crisis, S&P Reports," Rebecca Smith, *The Wall Street Journal*, October 14, 2002.

[9] Berkshire Hathaway has indicated that it has $10 billion to invest in energy assets. See "Editor's Notebook," Jeff Share, *Pipeline & Gas Journal*, January 2003.
[10] www.ccro.org/bestprac.html.
[11] Electric Power Supply Association, "Code of Ethics and Sound Trading Practices for Electric Power Suppliers," at www.epsa.org/Positions/index.cfm?section=positions.

▶ Seven brokers formed the Energy Brokers Association[12] to establish best practices and standards of conduct and to engage in other efforts to help restore confidence in the energy financial markets.

Increased use of exchanges. Initially, natural gas trading took place between buyers and sellers on telephones. In 1990, the New York Mercantile Exchange (NYMEX) introduced natural gas futures trading with a product associated with an existing liquid cash market at Henry Hub in Louisiana. Other attempts at exchange-traded futures contracts for natural gas have failed, but the Henry Hub contract remains and the terms of its trading contracts continue to lengthen, indicating greater faith by participants in this forward market.

NYMEX saw a record year in 2002 for natural gas futures volumes; more contracts were traded than for any other physical commodity but oil. The year-over-year increase in trading natural gas futures contracts was 48 percent, rising to 24.4 million contracts traded. The high level of trading is a positive sign for natural gas, possibly signaling a move by remaining natural gas traders away from the telephone and toward the visible, secure trading of a regulated exchange.

Other NYMEX trading data yield mixed signals. Figure 5 shows the level of open interest in the NYMEX Henry Hub natural gas market at the opening of each month in 2001 and 2002. Open interest is a good measure of how actively companies are participating in the futures market.

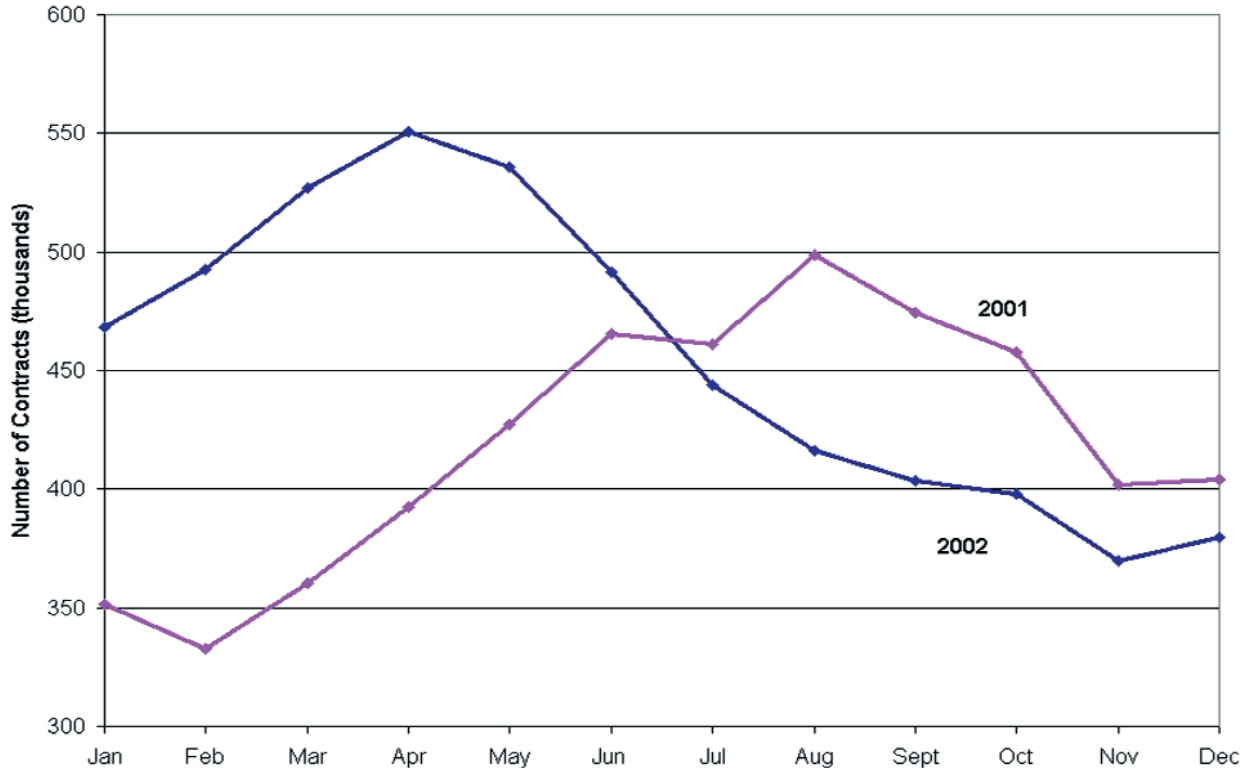
Open interest is the number of contracts that are still outstanding at a particular time for a particular futures contract.

Figure 5 shows that open interest in a month-to-month comparison has been higher in the first half of 2002 compared to 2001 and lower in the second half of 2002 compared to 2001. The pattern suggests that natural gas market participants began to reduce their activity in April 2002, four months earlier than the apparently seasonally driven reductions starting in late 2001.

In August 2000, a number of active energy traders launched the IntercontinentalExchange (ICE), which manages trading of a variety of physical natural gas and electric contracts[13]. ICE reports more than 100 equity partners, including energy and metals traders, brokers and

[12] The seven are Amerex, APB Financial, GFI Group, Natsource, Prebon Energy, Starsupply Petroleum and TFS Energy. Further information is available at www.energybrokersassoc.org.

Figure 5: Recent Relative Decline in Nymex Natural Gas Open Interest



Source: NYMEX

bankers. ICE also reports that its trading system is installed on more than 6,000 desktops, with the capability to trade more than 600 products in metals, petroleum, natural gas and power[14]. Figure 6 shows the activity in natural gas volumes traded on ICE.

Encouraging new entrants. New entrants, mainly financial players, are increasing their energy trading activity to provide risk management services and liquidity, supplementing the physical deliveries and energy trading of asset-based marketers. Banks and brokerage firms have financial stability, good credit ratings and cash, reducing the need for large borrowing and debt levels. They also have hedging and trading experience with other commodities that can be leveraged into diversified energy markets. Other advantages they bring include experience with regulatory bodies and tight risk control processes. Companies increasing their activity or entering energy trading include:

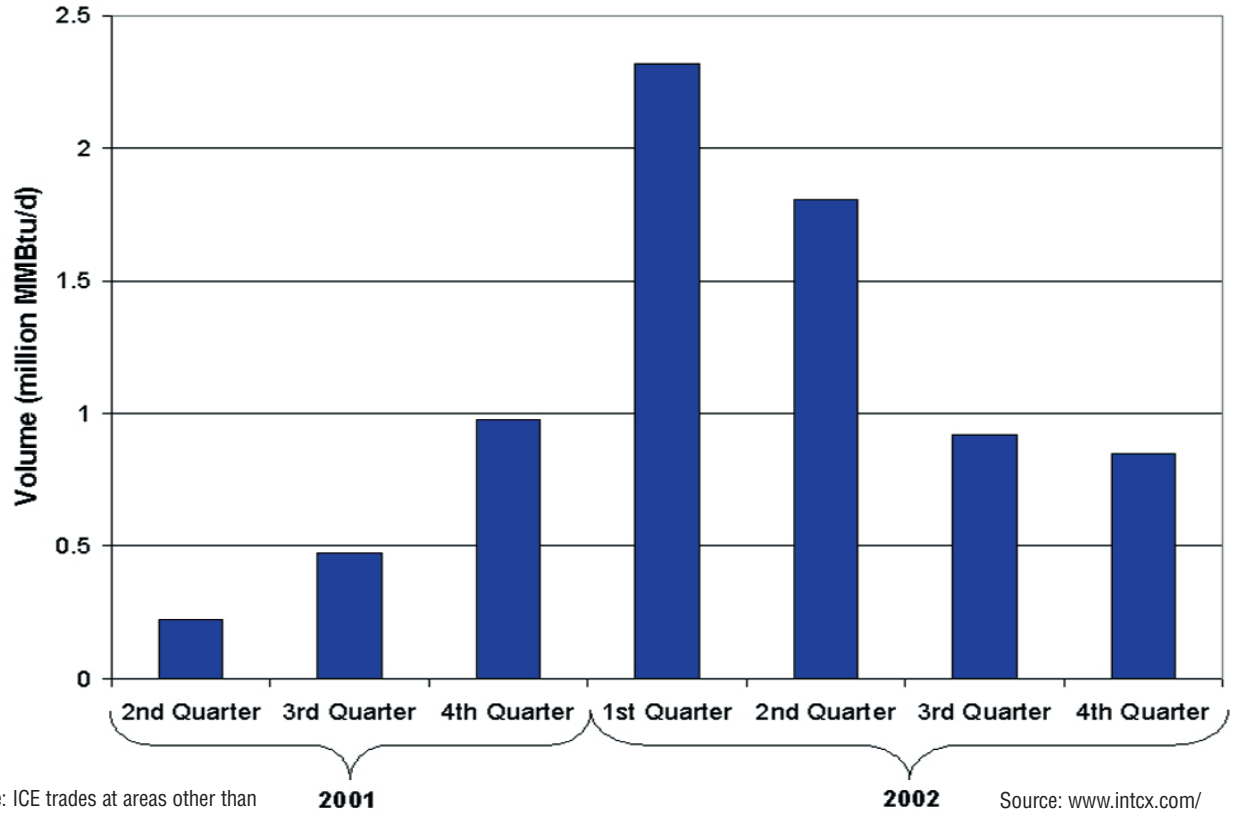
- American International Group
- Bank of America
- Centarus Energy
- Citadel
- ConocoPhilips
- Credit Lyonnais
- Goldman Sachs
- Louis-Dreyfus
- Morgan Stanley
- RWE

The positive effects of this new participation do not yet represent successes that balance the recent failures of trading leaders. OMOI expects that the services provided by the new entrants will be more expensive than past offer-

[13] ICE's original equity partners included BP Exploration & Oil Inc., Deutsche Bank Sharps Pixley Inc., Goldman Sachs Group Inc., MS Capital Group Inc. (Morgan Stanley), Societe Generale Financial Group, ST Exchange Inc. (Royal Dutch/Shell Group) and TFE Investment Inc. (TotalFinaElf). It was later joined by AEP Energy Services, Aquila Southwest Processing LP, Duke Energy Trading Exchange LLP, El Paso Merchant Energy Holding Co., Mirant Americas Energy Marketing LP and Reliant Energy Trading Exchange Inc. ICE acquired London's International Petroleum Exchange (IPE) in mid-2001.

[14] www.intcx.com/about.html.

Figure 6: Growth in Physical (Day-Ahead Henry Hub) Natural Gas Volumes Traded on ICE Was Affected by Trading Downturn



Note: ICE trades at areas other than Henry Hub, but because Henry Hub has existed the longest, OMOI is using it as a representative point to illustrate our line of reasoning.

Source: www.intcx.com/Subscriber?operation=gasIndexForm&hub=All

ings because they will likely incorporate more realistic credit risks into prices. Companies such as Enron and Dynegy were determined to create liquid markets in energy necessary for meeting their growth projections and profitability.

Together, these industry actions indicate a significant effort to address the financial challenges that natural gas markets face today. As long as that commitment continues, it provides a positive indication that these issues can be resolved.

Commission Actions.

Within the scope of its authority, the Commission seeks to play a positive role in the resolution of these financial issues. As the year progresses, the Commission plans the following actions to address deterioration in the financial condition of natural gas market players:

The Commission will continue to make policy as necessary to address the ramifications of the deteriorated financial condition of the industry.

Recent efforts include:

- Development of guidance on cash-management practices between regulated subsidiaries and their parent companies.
- Establishment, on a case by case basis, of the creditworthiness standards that interstate pipelines may require in their tariffs.

The Commission will continue to monitor the financial health of natural gas companies, with significant consideration of the implications of financial difficulties on the safe and dependable delivery of natural gas to customers.

OMOI will continue to monitor the behavior of natural gas markets, with particular concern for the reduction of market liquidity due to exits from natural gas trading and with attention to the potential for parent companies that are in financial straits to undermine the financial strength of regulated subsidiaries.

Issue 2

Managing Credit Exposure

Credit management approaches used in financial markets – approaches not extended to energy markets in the past – are being adapted and used in natural gas and electric markets. Given the large cash flows associated with energy contracts, managing credit well is one of the most important drivers of long-term financial health of energy traders. Using credit tools in effective ways will be critical for success.

While generally valuable, some of these new approaches are not well understood and their misuse could have unintended consequences. In particular, certain uses of credit clearing techniques have more limited benefits than is generally understood by energy-market participants. The first step toward a better credit management structure for the industry is better understanding of the available tools.

The Situation

One novel credit tool is over-the-counter (OTC) credit clearing. OTC transactions are not traded on exchanges, but are negotiated between two parties. Table 1 compares over-the-counter trading to exchange and bilateral deals. However, unlike other contracts negotiated between buyers and sell-

Credit clearing **is a mechanism for settling mutual claims, the result of which is that the risk that a company might fail to fulfill its contract is pooled among many companies.**

Table 1: Characteristics of Types of Trading

Bilateral	OTC	Exchange-Based
Contracts are negotiated directly between the two contract counterparties.	Contracts are negotiated via a broker who helps the two parties find each other and reach agreed terms.	Deals are made through a multilateral exchange, which provides a managed marketplace
▶ Contracts are often highly customized, and of long duration. ▶ Trading counterparties are known to each other. ▶ Pricing is opaque ▶ Execution is lengthy and expensive. ▶ Credit protections are customized and negotiated as part of the contract.	▶ Contract parameters can vary significantly, though customization is generally allowed. ▶ Anonymity of trading varies widely. ▶ Pricing is opaque ▶ Execution time and cost can vary significantly. ▶ Credit protections are customized and negotiated as part of the contract.	▶ Contracts are highly standardized. ▶ Trading is anonymous. ▶ Execution is quick and cheap. ▶ Processes often exist to safeguard market integrity. ▶ Credit exposure is to the exchange member, who is protected from other members through mandatory credit clearing mechanisms.

Source: Office of Market Oversight and Investigations

Netting: Netting occurs when market participants are required to pay (and receive) only the net amount of their financial obligations (that is, amounts owed by a market participant are reduced by the amounts of money that are owed to that same market participant).

ers – known as bilateral contracts – OTC trades are sufficiently standardized that they can be assigned readily to others.

Until recently, market participants relied on the credit quality of their counterparties to back each bilateral transaction. Not many used contractual provisions to net transactions between counterparties to limit financial exposure to each other.

Even fewer used a central clearing entity, or clearinghouse, to do multilateral netting to further limit credit exposure, where the clearinghouse would be backed by an entire group of financially strong clearing or participating members.[15] However, the International Swaps and Derivatives Association (ISDA), the Edison Electric Institute (EEI) and other industry groups have recently developed standardized agreements to enable greater use of bilateral netting across multiple transactions to limit exposures between two counterparties.

(EEI) and other industry groups have recently developed standardized agreements to enable greater use of bilateral netting across multiple transactions to limit exposures between two counterparties.

OTC credit clearing is still in its formative stages in the United States, having been established by the Commodity Futures Modernization Act of 2000. Since early 2002, Nymex and ICE have offered OTC credit clearing services for transactions executed in OTC markets in addition to their exchange-traded energy services. According to NYMEX representatives who spoke with OMOI staff, from May 31 through the end of 2002, Nymex cleared more than $5 billion worth in notional value of transactions that were executed in OTC markets and converted into futures contracts during the NYMEX clearing process. Similarly, ICE representatives stated that, starting in March, ICE cleared notional value surpassing $16 billion through year-end. Start-ups EnergyClear and Virtual Market Assurance Corp. (VMAC) also began offering clearing services jointly.[16] Table 2 summarizes the main features of these three offerings.

Notional value of transactions is the volume of each transaction multiplied by its price, and then added over all transactions.

NYMEX and ICE have introduced many new OTC credit clearing products.[17] They include clearing services for longer-term contracts, energy at a variety of geographical locations and options. The expansion of these services has the potential to significantly increase the value of tools available to energy traders and customers to manage their risk.

There are several market implications of the introduction of new methods for managing credit exposure in the energy industry, such as:

Traditional methods of managing credit exposure that rely on the credit quality of counterparties are being supplemented by new methods and increasing the robustness of credit management in the energy industry. The traditional method of credit management failed when many major energy counterparties either went bankrupt or could no longer meet their obligations due to debt downgrades. As a result, the quantity of energy trades has been severely reduced, resulting in a less-liquid and less-efficient market. New methods for managing risk can reduce the likelihood of contract failure due to credit failure. In its white paper, CCRO estimated that companies can save 75-90 percent of the collateral required to support transactions by going to this type of credit clearing from historical approaches embedded in bilateral contracts. The result would increase credit-related transaction capacity several times, allowing for improved market liquidity.[18]

Credit clearing mechanisms can serve market participants and markets well but market participants need to be aware of the limitations of clearing mechanisms and the differences between the services offered by alternative clearing organizations. One limitation concerns the limited benefits for nonmembers. A clearinghouse only protects members from the financial failure of other members. Some clearinghouses allow nonmembers to conduct business on the clearinghouse through members. If any side of the transaction experiences financial failure, all sides of the transaction

[15] Communication with W.J. Berger, graduate student, Harvard Business School.

[16] www.energyclear.com, www.vmac.com.

[17] www.nymex.com and www.intcx.com.

[18] Committee of Chief Risk Officers: *Introduction and Executive Summaries of CCRO Recommendations*, Volume 1 of 6, November 19, 2002.

Table 2: Summary of Clearing Services

Platform	New York Mercantile Exchange (Nymex)	Intercontinental Exchange (ICE)	EnergyClear
Status	Launched May 2002; Cleared more than $5 billion through the end of 2002.	Launched March 2002; Cleared more than $16 billion through the end of 2002.	Launched October 2002. EnergyClear did not provide information.
Clearing Source	Nymex Membership	Board of Trade Clearing Corp. (BOTCC) & London Clearing House (LCH)	EnergyClear with Virtual Markets Assurance Corporation (VMAC) financial guarantees, provided by Financial Security Assurance Ltd.
Financial Backing	Nymex Membership	BOTCC's Guaranteed Clearing Corporation for electricity and LCH for natural gas	$100 million credit facility from a group of leading commercial banks
Areas of Coverage	Natural Gas, Electricity, Crude Oil, Refined Products	Natural Gas, Electricity, Crude Oil	Natural Gas, Electricity
Protected Parties	Exchange Members	Clearing Members	Clearing Members
Business Attributes	• Margin positions are netted against other cleared positions on the Exchange. • Clearing orders are subject to risk acceptance parameter imposed by clearing members authorizing the two principals to submit trades for clearing. Source: www.nymex.com	• Transactions may be cleared by matching directly on the Exchange screen or through privately negotiated block trades. • Block trades can be done for any product cleared on ICE. Source: www.intcx.com	• The energy clearinghouse is not affliated with an exchange. • EnergyClear Corp. is owned by market participants. • EnergyClear Operations Co. is owned by Bank of New York, Prebon Yamane and Amerex, and provides operations and technology support.

Source: OMOI summary of information from www.nymex.com, www.intcx.com, www.energyclear.com and phone calls between OMOI and the clearing services.

are protected except the nonmember. Consequently, energy companies using an exchange with clearing by contracting through a clearing member must understand that they are *not* protected if the clearing member they are working with defaults.

Another limitation results from the need to adapt traditional clearing to energy markets. Traditional clearing settles transactions purely financially. Energy market participants typically demand physical delivery guarantees. Clearinghouses are working with market participants to develop new instruments that mitigate the risks associated with this mismatch between physical and financial delivery.

Actions

The energy industry must become more familiar with sophisticated credit tools. The Commission can help by bringing knowledgeable experts together to discuss these tools.

Industry Actions.

Education. The energy industry is already making use of credit clearing mechanisms in its interactions with NYMEX, ICE, EnergyClear, VMAC and others. Industry players need to master these tools and report on their use

effectively as part of their financial statements.

Legal disputes between some of the leaders (NYMEX and ICE) may hinder progress in this area.

Potential providers of clearing services and energy market participants still need to clearify market needs and craft products and services to meet those needs.

Commission Actions.

The Commission is co-sponsoring a technical conference on credit and credit clearing issues with the Commodity Futures Trading Commission early in 2003. The purpose of the conference is to encourage further self-help on the part of energy industry and promote dialogue among energy industry stakeholders. The conference also will help the Commission assess its future role in clearing and other credit-management solutions as they affect the effective functioning of the energy markets.

The Commission will offer its Alternative Dispute Resolution Services to resolve the NYMEX-ICE dispute.

The Commission also will monitor the use of new methods for managing credit exposure and showcase positive developments.

Issue 3

Shaken Confidence in Price Discovery Methods

Recent revelations about price indexes and related false reporting by industry have contributed to a crisis of confidence in price discovery. Reports of traders lying to the energy trade press – which compiles and publishes numerous price indices – with the intention of manipulating natural gas prices and volumes have undermined confidence in the industry.

No serious alternative to the trade press-developed price index system exists today. The trade press has not provided adequate details about price development to reach a public interest standard of use by the Commission, citing their First Amendment constitutional rights. Notably, major players appear to have been aware of and have provided for limitations inherent in the price indices. Smaller players, both buyers and sellers, have been disproportionately affected by the recent revelations.

Increasing numbers of natural gas traders have announced that they will not contribute price information to the trade press in fear of lawsuits alleging inaccurate prices.[19] This response is particularly counterproductive because it does not solve central process problems but does reduce meaningful price information. A critical component of any natural gas price discovery solution is the broadest possible participation.

[19] *Foster Electric Report*, "Platts Noticeably Absent from Meeting of Energy Companies and Trade Publications to Devise Appropriate Price Reporting Guidelines," December 11, 2002.

The Situation

A key product of any effective market is accurate information about the prevailing price in that market. This revelation of price information – price discovery – helps customers determine the cost of meeting their needs, helps sellers determine the value of their investment and, when working correctly, efficiently allocates resources to the customers who most value them.

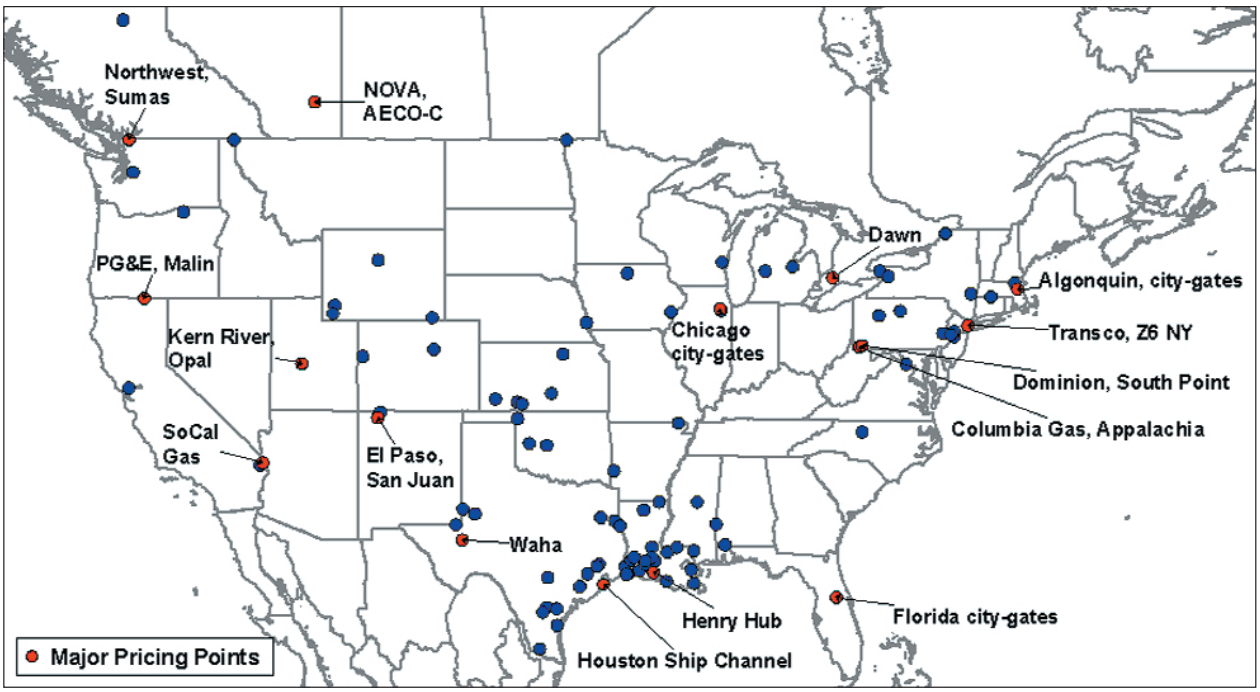
> ***Price discovery*** **is the revelation, through appropriate market mechanisms, of the prevailing price in a marketplace.**

The energy trade press creates natural gas price indices through systematic polling of market participants known to each publication. The quality of these indices depends on the quality of the particular processes used by the trade press when polling participants, as well as the number of active participants trading at a given price point. A drawback of the reported approaches are that the traders who traditionally provide the price quotes often have had financial incentives to influence market prices and behavior. The trade press attempts to adjust for this conflict of interest by using median and average prices to compensate for irregularities or by throwing out outlying price quotes – those that, without explanation, are significantly different than other prices gathered – that may be intended to move the market.

Confidence in indices has weakened with recent allegations and admissions of false reporting of price and volume information. It is not yet possible to quantify the harm caused by false price reporting to index publishers or the extent to which prices might have been distorted. However, doubt has been cast on available price index results.

Accurate and credible price indices for natural gas are crucial because they serve as the basis for many natur-

Figure 7: Selected Natural Gas Pricing Points in North America



Source: GASdat map based on *Gas Daily* pricing points

al gas and electric transactions across the United States.

Natural gas price indices are also difficult to monitor for accuracy because there are so many such indices. There is no one national market for natural gas; there are many regional markets. These markets contain hundreds of price points, including many market hubs, some of the most significant of which are shown in Figure 7.

Price discovery and pricing at hubs has never been completely transparent and some pricing points are more actively used for trading than others. For example, a recent study completed by Energy and Environmental Analysis on behalf of several New York natural gas distributors identified only three hubs that meet their definition of adequate liquidity in the Northeast: Columbia-Appalachian Pool; Dominion-South Point; and Dawn, Ontario.

The study defined "adequate liquidity" as "more upstream capacity than downstream, sufficient volumes at peak periods and year round, more than one pipeline serving the point, presence of storage and electronic trading at the point, reported price indexes, narrow bid-ask spread and sufficient volumes and numbers of buyers and sellers."[20]

[20] Energy and Environmental Analysis, "Analysis of Natural Gas Market Liquidity at Points Affecting New York State LDCs," preliminary draft prepared for the New York Gas Group, November 2002. Final report expected February 2003.

While we might not define liquidity in exactly the same way, the point remains broadly valid. Multiple pricing points will tend to challenge liquidity and, therefore, effective price discovery. On the other hand, as the trade press states, all price points are included because a sufficient number of market participants asked for that point to be included in a list of indices.

The implications for the market of decreased confidence in natural gas price indices include:

Concerns surrounding price indices may lead to the unraveling of existing natural gas contracts. If parties question the validity of the data upon which their contracts are based, they may attempt to dissolve contracts. Without an alternative price discovery mechanism, they would be left without a market basis for determining prices for new contracts.

Concerns surrounding price indices may affect the willingness of parties to enter new contracts. If parties are reluctant to enter into new contracts, the efficiency of gas markets and dependent electric markets could decrease. Disarray in natural gas price discovery could hinder traders, suppliers and customers from entering the market and creating liquidity. The result could be a dysfunctional system.

Actions

While the Commission can play a supporting role here, industry must develop and implement effective solutions to the current crisis. Both industry and Commission actions are discussed below.

Industry Actions.

Industry has taken confidence problems with natural gas price indices quite seriously. The most visibly constructive efforts include the following:

Developing best practices for price reporting. The CCRO is working on best practices for reporting natural gas prices with the hope that recommendations will be available for adoption by industry participants within the first quarter of 2003.

The Coalition for Energy Market Integrity and Transparency (EMIT), which includes independent natural gas producers, royalty owners, electric generators, energy distributors, consumers and others, has issued a challenge to the industry to produce a list of protocols publishers should follow in reporting and publishing prices.[21]

Some trade publications themselves are actively reviewing their price index development procedures to look for ways to increase confidence.

Shifting transactions to exchanges, where prices are more transparent. As noted in the discussion of the financial difficulties of market players, exchange-traded markets, such as ICE, have added new volume. To the extent that this creates more price information, it is a good sign. Price and trading information at NYMEX is transparent, in part because of its regulation by the CFTC. The transparency of price and trading information from ICE is less clear. ICE has begun marketing its price and volume data online under its brand name "10x." This pricing service may, in time, compete with the trade press. Because its regulatory requirements are different from NYMEX, however, it does not provide the same level of information to regulators as NYMEX.

Commission Actions.

On January 15, 2003, staff reported concerns regarding price index formation to the Commission at its open meeting. In addition to reviewing the current situation, staff explained the Commission's interest in price index formation, reviewed the public evidence that raises questions about price index formation, defined the high-level criteria important to developing trustworthy price information in the future and proposed some next steps.

Specifically, the Commission approves pipeline tariffs that refer to market price data. There are three areas where these references tend to happen:

Cash-out provisions. On most major pipelines, when deliveries and receipts of natural gas are not in balance, the differences may be valued and sold to the shipper or purchased by the pipeline using market price information. These cash-out provisions allow the industry to quickly and efficiently account for and eliminate imbalances.

Penalties. In the determination of pipeline penalties, the Commission sometimes allows pipelines to use market prices to deter shipper conduct that could threaten system operations.

Basis Differentials. Many negotiated rate transportation contracts establish transportation rates using the basis differentials between two or more price index trading points.

Staff proposed that in the future, the Commission require that natural gas price indexes meet certain minimum standards before natural gas pipelines are permitted to use these indexes in new tariffs or for other new regulatory purposes.

Staff proposed that evidence for these new filings would need to be presented and reviewed to assure that any referenced price index meet minimum index formation standards. In particular, the index would need to accurately reflect the market. For approval, a new tariff containing a reference to an index would need to demonstrate:

1. Confidence in the accuracy of price reporting – that is, the ability to verify that reporting is for deals actually done, not simply aggregate opinions.

2. Adequacy of coverage – that is, the ability to assure the collection of adequate information to represent prices across the relevant marketplace.

3. Information about market liquidity or some insight into

[21] Federal Energy Regulatory Commission, presentation by Arthur C. Corbin on behalf of Coalition for Energy Market Integrity and Transparency, October 25, 2002, at www.ferc.fed.us/gas/10-25-02-conf/EMIT-STATEMENT.pdf.

how much trading is going on at a particular point in order to generate warnings when markets are thin and confidence when they are liquid.

4. Verifiability – that is, the ability to assure integrity of the process through independent review by a trustworthy third party (preferably not by a governmental entity).

Staff suggested that only after assuring the Commission that these characteristics have been met should a natural gas price index be approved for use in a new pipeline tariff.

The Commission is analyzing natural gas price index issues in its Fact-Finding Investigation of Potential Manipulation of Electric and Natural Gas Prices in Western Markets (Docket No. PA02-2-000). On August 13, 2002, Commission staff made the initial report public. Staff inquired into the characteristics of publicly-reported price indices, including natural gas spot prices at California delivery points used in the California refund proceeding. Staff found significant problems with published price indices. The Commission response will depend in part on the findings of its fact-finding investigation. That investigation task force reported a number of price index concerns in 2002. The Commission has announced its intention to conclude this investigation in early 2003.

At the direction of the Commission, OMOI has begun planning a technical conference to address price index issues.

Issue 4

Continuing Need for Efficient Investment in Infrastructure

Despite its current financial problems, the natural gas industry requires continued investment to maintain adequate supply, delivery facilities and operational flexibility and safety. The challenge to the industry is to maintain adequate, efficient levels of investment in a competitive environment.

Competitive natural gas markets created more than a decade of moderate wholesale natural gas prices following the decontrol of significant volumes of wellhead prices in January 1985, which provided an enormous benefit to natural gas customers. To achieve these benefits, competitive forces restructured the way the industry functions. One change has been the direct linkage of investment to market signals.

In the 1960s and early 1970s, the federally regulated interstate market combined with the deregulated intrastate market created a dysfunctional dichotomy that led to shortages of delivered natural gas in the interstate markets in the mid-to-late 1970s and adequate supplies in major intrastate markets. That failure to serve interstate customers, especially during the harsh winter of 1975-76, became the impetus for Congressional passage of the Natural Gas Policy Act of 1978 (NGPA), which provided for the phased decontrol of the wellhead price of gas, starting substantially in January 1985.

Natural gas markets since the NGPA was passed have provided an investment environment that has benefitted customers and provided adequate returns for the gas industry. Regulatory policy continues to play a significant role as well, encouraging investment when necessary. For instance, to stimulate investment, the Commission recently signaled it will set a new policy in regulating new liquefied natural gas (LNG) projects where markets are competitive and other criteria are met.[22]

The Situation

In this section, we will address the challenge that current prices pose for developing gas supplies, the challenge of shifting supply and demand for maintaining sufficient transmission and delivery infrastructure, and the need for additional infrastructure as a result of current levels of operational flexibility.

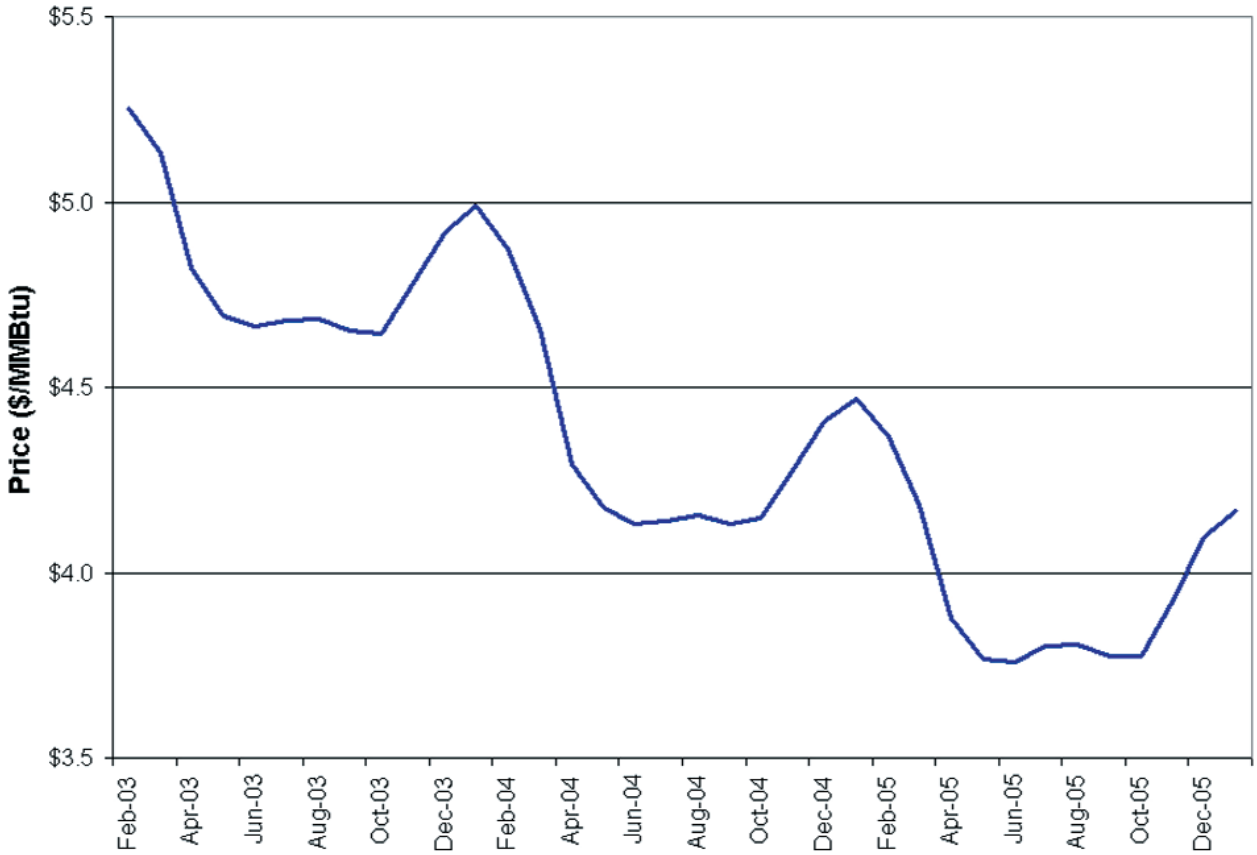
The Challenge that Current Prices Pose for Developing Gas Supplies

Price levels this winter have increased because of tightened market conditions due to a return of incremental heating load as compared to last year's unusually warm winter (the fifth warmest winter since records began in the late 1800s).[23] Without the threat of a supply shortage, the sustained early cold of the winter of 2002-03 created support for natural gas prices in the $4 to low $5/MMBtu range at Henry Hub. November 2002 was 11

[22] In a preliminary determination on December 18, 2002, to approve the Hackberry LNG project in Louisiana, the Commission said it would not require Commission-approved cost-based rates or an open-access tariff for the new LNG terminal service because its sponsors will bear the full economic risk of the project and customers will not be adversely affected by the project's costs. This approach is expected to remove economic and regulatory barriers to the development of onshore LNG import terminals (Docket No. CP02-374-000, et al.).

[23] www.noaanews.noaa.gov/stories/s878.htm,

Figure 8: Natural Gas Futures Prices Show Declining Pattern for the Next 3 Years



Source: NYMEX

percent colder than November 200l and storage withdrawals this heating season reached 728 Bcf at the end of 2002 (December 31) versus 265 Bcf at the end of 2001.[24]

As shown in Figure 8, however, market participants appear not to expect that the current high prices will last. NYMEX futures prices for delivery of natural gas over the next three years show prices generally lower each year for the same month. This is a futures market phenomenon known as backwardation, which indicates that support for higher prices is short term.

Backwardation is the situation in futures markets where prices for a commodity for delivery in future months are lower than for the near months.

The challenge then is for the industry to continue to invest in natural gas exploration and production in this shifting price environment. There is general consensus among industry observers that gas supply should be adequate to meet demand this winter.[25] However, there are lingering concerns – and some mixed predictions – about the outlook for U.S. gas production, imports and total gas supply.

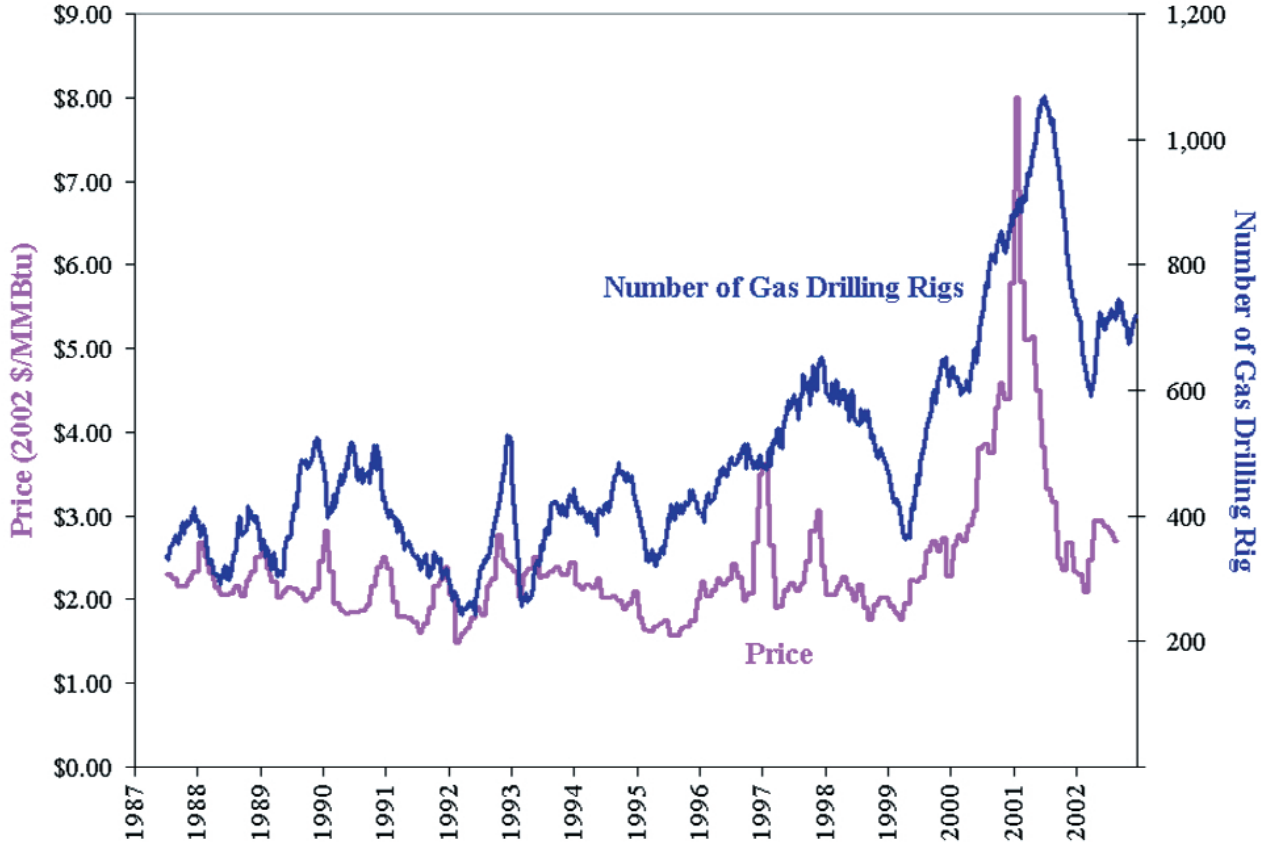
The Energy Information Administration (EIA) last November expected dry gas production plus imports to decline slightly for the fourth quarter of 2002 and first quarter of 2003 as compared to the same periods in 2001 and 2002.[26] By January, however, EIA was predicting slight increases for those quarters as well as slight but steady annual increases in production and imports for 2003 and 2004.[27] Some financial analysts reviewing quar-

[24] Energy Information Administration.

[25] Sources of information underlying this broad assessment include the Energy Information Administration, *Short-Term Energy Outlook*, December 2002; Cambridge Energy Research Associates, "CERA Monthly Briefing: High Anxiety," December 17, 2002; Natural Gas Supply Association, "NGSA Expects Upward Pressure in the Natural Gas Market This Winter," press release, September 19, 2002; American Gas Association, "Natural Gas Supply Fundamentals for Winter 2002-2003," October 1, 2002.

[26] Energy Information Administration, *Short-Term Energy Outlook*, November 2002.

Figure 9: Prices and Drilling Interact Over Time (Natural Gas Prices and Natural Gas Drilling Rigs, 1987—2002)



Sources: Baker-Hughes rig count from Bloomberg; Energy Information Administration, "Average Natural Gas Prices: U.S. Natural Gas Wellhead Price ($/Mcf)," 1976-2002.

terly filings last fall predicted production declines (year-on-year) of 5 percent to 6 percent, or an annual differential of almost 1.2 to 1.4 Tcf.[28] In January, EIA estimated that 2002 U.S. gas production would be down only 30 Bcf, or 0.15 percent, from the 2001 level.

Figure 9 shows that the overall number of drilling rigs searching for natural gas today has increased over time but decreased recently. This pattern does not raise as much concern as it might have in the past given the increased efficiency in the exploration and production sector. Nevertheless, exploration and production activity deserves continuing attention.

Current price patterns have several implications for natural gas infrastructure, such as:

Prices in competitive natural gas markets change more quickly than drilling decisions, resulting in price cyclicality. Figure 9 shows this tendency, common to many commodities. Cyclicality of natural gas prices results from a lag between the time the market signals a demand increase and the time it takes to increase supply through drilling and related development. In the short term, supply remains tight even though demand has risen, leading to higher prices. Later, as additional capacity is added, supply outstrips demand, driving down prices. As long as natural gas is considered a basic need, that cyclicality in prices will have a negative effect on customers' perceptions of reliability, price and fairness.

Competitive natural gas markets show volatility when demand and supply are closely balanced.

Volatility **is a measure of how much uncertainty there is about a price and is usually expressed as the rate of change in a price over a specified period of time.**

[27] Energy Information Administration, *Short-Term Energy Outlook*, January 2003.

[28] Salomon Smith Barney, "Exploration and Production, Third Quarter 2002 Preview," October 3, 2002, and Lehman Brothers, "Oil & Gas: E&P (Large Cap)," October 25, 2002.

In the short term, sharp increases in demand result in sharp increases in price. In the short term, price spikes can be painful for customers just as short-term price drops are painful for producers. In the longer run, higher prices result in new supplies being developed. Customers and producers can manage price volatility by obtaining fixed prices or engaging in other forms of risk management.[29]

The Challenge of Shifting Supply and Demand for Maintaining Sufficient Delivery and Transmission Infrastructure

The demand for natural gas supply shifts geographically as load centers grow or shrink in size and industrial and other uses of natural gas contract or increase. Similarly, the location of natural gas supply can shift over time. For instance, offshore Gulf of Mexico supply has increased recently while on and near shore Gulf of Mexico supply has decreased. These shifts in supply and demand can result in the need for expanded natural gas transmission capacity.

Places where delivery capacity is limited generally signal any tightness through prices. The difference between prices in different places is a useful indicator of the value of moving natural gas from one place to another. These differences are known as "basis" – a term that refers to the difference in prices between any two markets. In the U.S. natural gas industry, basis usually refers to geographical differences and typically reflects the value of gas transmission between those points (see Figure 7 for some illustrative geographic locations).

Basis is the difference in prices between identical products but in two different markets; in this report it refers to different geographical markets.

Shifts in supply and demand have resulted in several regions that are now short of transmission capacity. These regions include:

▶ ***The Rockies***, which produces more natural gas than it uses. Pipeline capacity from the Rockies has not kept pace with productive capacity. Consequently, prices tend to be low and drilling incentives reduced. The resulting basis differential for natural gas from the Rockies has encouraged new pipeline capacity from the Rockies to California, including a recent doubling of Kern River with expected completion by the second or third quarter of 2003 (under a new owner). Northwest Pipeline is improving its ability to transport gas to the Northwest to compete with volumes flowing from Canada. At least four new and similar pipelines have been proposed in the Rockies to move natural gas eastward; however, none has yet filed at the Commission for certification.

Capacity release is the ability for natural gas transportation service customers to re-sell their rights to another party.

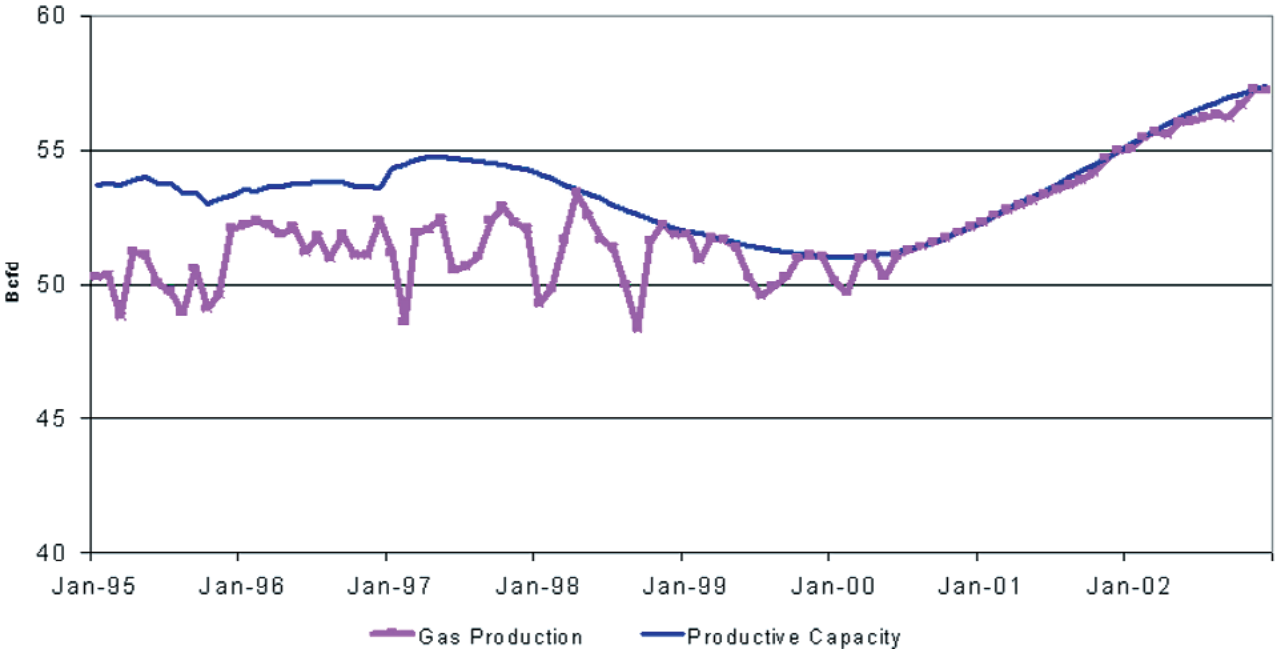
▶ ***The New York metropolitan area*** may need additional capacity to meet its demand. Analysis of capacity resale, or capacity release for pipelines serving the region, shows that transportation values have been high in recent winters, indicating some tightness in capacity.[30] To continue to meet potential demand growth, at least one of the proposed (or similar) pipeline projects into the city would need to be built. However, annual average basis differentials from both Chicago and Niagara to New York City do not yet support the projects. Until the market can support making the binding capacity commitments necessary for financing a project, the viability and timing of any proposals remains uncertain.

▶ ***Other areas in the Northeast*** may face capacity constraints as well. Tennessee Gas Pipeline Co. declared five emergency orders during the winter of 2001-02 in its Northeast market area. Tennessee received requests for gas flow in excess of available capacity, limiting the availability of interruptible service to New England and New York City. Analysis of Texas Eastern into New York, Pennsylvania, New Jersey, Delaware, Maryland and Virginia shows that capacity release prices were high during the colder-than-normal winter of 2000-2001. This winter, several pipelines in the Northeast, including Tennessee, Algonquin, Transco and Texas Eastern, have

[29] Natural gas price volatility and the use of risk-management techniques to manage it were discussed extensively in General Accounting Office, *Natural Gas: Analysis of Changes in Market Price*, December 2002 (Report No. GAO-03-46).

[30] Staff gathered and analyzed a considerable amount of data on capacity-release transactions over the two-and-one-half year period that the maximum rate ceiling for short-term releases was waived and published its analysis in a paper posted on the Commission's Website (May 30, 2002). Docket No. PL-02-4-000. The staff paper was intended to solicit comments regarding the price ceiling for short-term released capacity. Among the many points raised by commenters, several stated that the value of released capacity could be an indicator of additional capacity needs, arguing that releases made above the cap could signal that capacity is tight in that region at that time. Conversely, these commenters suggested that if capacity is not released above the cap, this could indicate that sufficient capacity exists during that particular time. Data on capacity release were downloaded from pipeline databases.

Figure 10: Gas Markets Move Toward Just-in-Time Delivery System for Natural Gas (AGA Graph of Gas Production compared to Capacity from 1995 through 2002)



Source: American Gas Association

restricted services at times. Restrictions have included little or no authorized overrun service, reduced tolerance for imbalances and a variety of warnings to shippers to stay in balance or be subject to operational flow orders.[31]

▶ ***Areas in the Southeast***, including parts of the Carolinas, Georgia and Florida, indicate some tightness in capacity. Analysis of capacity release data for Transco into the Carolinas and Georgia shows that the values for capacity release were high in the past two winters. In addition, Transco issued a number of constraint notices last winter limiting the availability of interruptible transportation service into an area stretching roughly from Alabama through Northern Virginia.

▶ ***Florida***, though a summer peaking market for natural gas deliveries, has experienced winter price spikes due to a lack of storage on Florida Gas Transmission combined with the demand for gas to meet heating load in other downstream markets.

Constrained areas are prone to price spikes and more susceptible to manipulation than non-constrained areas. Both scarcity-related price spikes and manipulation can reduce consumer confidence in markets. The price spikes will continue because of the high cost of building infrastructure to meet peak demand rather than some variation of average anticipated demand. Most customers would not opt to pay the high premium cost in order to avoid the occasional price spike. Nevertheless, despite such a rational economic decision, the presence of price spikes is inefficient for market participants until demand responses are facilitated.

The Need for Additional Infrastructure as a Result of Current Operational Efficiently

The same forces that have produced 20 years of moderate natural gas prices have also rid it of pockets of excess capacity. Markets tend to drive just-in-time approaches to capacity, building facilities that can pay for themselves through their value serving markets. The occasional disruption does not produce enough value to justify the investment required to prevent it.

Just-in-time **is an approach to efficiently delivering services as close as possible to just the amount needed, when it is needed and where it is needed.**

[31] Multiple trade press references including *Gas Daily, Natural Gas Intelligence* and *Btu Daily Gas Wire*.

This movement toward just-in-time delivery of natural gas is illustrated by Figure 10 – a graph published by the American Gas Association in its recent winter assessment.[32] Figure 10 tells the story of the end of the oversupply situation characteristic of the natural gas industry, starting in the early 1980s as a consequence of the NGPA, known as the "gas bubble." Gas production and productive capacity are charted together. The difference between the two lines is the excess natural gas production capacity that is available but not used.

Starting in the early 1980s (before the period included in Figure 10) the natural gas industry used this flexibility in wellhead production to help manage demand swings. Production, as long as it remained lower than capacity, moved up and down in response to relatively short-term demands. Around 2000, this flexible response diminished as production neared the ceiling of productive capacity with imports (which tripled between the mid-1980s and now) making up some of the volume.

The natural gas industry's experience of managing operational flexibility from the early 1980s through the late 1990s was made easier by the oversupply situation. The erratic nature of demand in the natural gas industry did not disappear in the late 1990s. Consequently, some other part of the industry has had to handle demand swings.

Pipeline operations, storage and distribution operations play a greater role now in volume management than when production capacity had surpluses. Price swings affecting some demand may also play a part. Looking back at Figure 1, we see that prices rose higher and for longer after the end of the oversupply situation than they had over the previous 20 years. The end of the "gas bubble" is not the only reason for the prices of 2000-01, but the shift in where supply flexibility must be managed likely contributed.

The implication of the reduced role of production as a viable source of operational flexibility is the increased demand on existing infrastructure to provide such flexibility.

Actions

Industry and government can take actions to assure adequate investment in gas supplies, constrained areas and infrastructure needed as a result of reduced operational flexibility.

[32] Energy and Environmental Analysis Inc., "Lower-48 Dry Gas Production vs. Dry Gas Productive Capacity," presented by the American Gas Association to the Federal Energy Regulatory Commission in a briefing titled "Outlook for Natural Gas Market Conditions," September 6, 2002.

Industry Actions

Industry should maintain existing infrastructure. The extensive facilities required to supply and deliver natural gas to customers make them inherently vulnerable to disruptions. Failure of any part of the system – rigs, pipelines, compression, storage, distribution facilities – can result in failure to deliver to certain customers for some period of time. Consequently, natural gas facilities providers must monitor and maintain their physical plant, inventories of replacement parts and safety procedures carefully

Industry should cooperate with improving the performance of price discovery mechanisms. Increased confidence in price discovery mechanisms can increase confidence in price signals, such as increased basis differentials, that provide industry with an indication of the value of investment in new infrastructure such as delivery facilities.

Industry should work to create viable forward markets for capacity. Viable forward markets would provide the mechanism for customers, producers and pipelines to invest in new capacity.

Finally, industry needs to make use of risk management services. As discussed, tightening supply, pipeline constraints and reduced operational flexibility can all increase short-term price volatility to customers. Industry focus on stability is critical for customer confidence. Use of price-risk management techniques, including fixed prices, and effective investment in infrastructure will be key to customer satisfaction.

Commission Actions

The Commission has undertaken efforts to improve the reliability and management of volatility in the natural gas industry. They include the following:

- OMOI will continue to monitor and assess regional markets and potential capacity constraints and resulting price and reliability effects.
- OMOI believes the Commission should support the development of forward capacity markets to facilitate gas infrastructure investment.
- The Commission will encourage state regulators to make rules that allow timely price signals to reach retail customers and encourage demand-side alternatives, adding important pricing signals and lower-cost demand flexibility to the natural gas industry.

Issue 5

Continuing Potential for Manipulation

Evidence indicates that price manipulation has occurred in certain natural gas marketplaces, and may be continuing.

Price manipulation accusations and admissions have had high visibility during this time of stress on energy markets, resulting in dramatic losses in confidence by customers and other participants. To regain lost confidence, natural gas markets must, going forward, develop adequate institutions to manage the potential for manipulation and deter it.

In addition to recent activity by certain market participants, much evidence of manipulation right now is likely the result of a high degree of scrutiny, a natural side effect of building robust market institutions. Nevertheless, it is likely that revelations of improper behavior will continue for some time. The Commission is likely to be at the forefront of much of this revelation.

The Situation

The fair and effective functioning of energy marketplaces requires robust industry institutions designed to prevent manipulation and promote customer confidence. To date, the natural gas industry has not adequately developed these institutions.

The Commission has investigated specific incidences of aberrant market behavior for some time, and it created OMOI in 2002 to help the Commission monitor existing marketplace institutions. OMOI's charge is to oversee market behavior on an ongoing basis and investigate improper behavior, such as the manipulation of energy markets. Manipulation consists of the violation of regulations and the use of market power and deception to profit from other market participants.

Since FERC's Enforcement Division moved to OMOI in August 2002, we have increased the number of active natural gas and electric market-related investigations steadily. Manipulation is more likely where market liquidity is low, price discovery is obscure and capacity is constrained, and this manipulation may move prices in either direction. The ongoing reduction in numbers of wholesale market participants and reduced liquidity and transparency at pricing points may increase the potential for manipulation. Having fewer traders may reduce the statistical significance of reporting for less-active trading points, reduce liquidity, increase bid-ask differentials, increase volatility and increase the potential for distorted price reporting.

> ***Manipulation*** **of of energy markets can include, but is not limited to, the exercise of market power; the dissemination of false or deceptive information; or other acts or practices that may or may not constitute violations of Commission-filed tariffs or Commission rules, orders or other applicable requirements.**

The Commission conducts investigations of natural gas market participants using the following five broad categories of price manipulation:

Controlling marketplaces through weak liquidity. As discussed above, the natural gas market consists of many relatively illiquid marketplaces. In some cases, individual trading companies dominate these marketplaces, giving the companies market power. Certain trading companies appear to have used market power to affect prices. The Commission, through OMOI and other staff investigations, is looking at particular situations where use of market power arising from weak market liquidity appears to have affected prices.

Witholding capacity. Another type of market power arises from control of facilities to or from areas where capacity is tight. In the natural gas business, having capacity generally means having access to transportation, storage or distribution. The Commission investigates cases where it is alleged that companies withheld capacity to the point where a price in a related market was affected.

Manipulating physical marketplaces to affect prices in associated financial marketplaces. Companies may be able to use market power to manipulate prices in physical markets in order to affect associated financial markets.

Communicating market information from pipelines to their marketing affiliates. The Commission has strict rules regarding communication of information from regulated capacity providers – generally pipelines – to their affiliated marketers. Affiliated marketers could use information about regulated capacity availability to take positions in a marketplace more advantageous than their competitors.

Providing false data about prices or volumes to index publishers. As we discussed more thoroughly above in the price discovery section, some companies have admitted lying to the trade press regarding prices. Lying about commodity prices can be a felony. The Commission and others have discovered extensive evidence of lying about prices to trade publications in the past.

This list of categories is not exhaustive, nor does it represent all the potential strategies for manipulating natural gas prices. Effective market oversight will require the ability to identify, investigate and resolve manipulation quickly, and to distinguish manipulation from price movements (up or down) resulting from market forces.

Actions

Coordinated efforts by industry and government can best prevent market manipulation.

Industry Actions

Participants in natural gas markets may, at times, believe that their short-term goals can be furthered through market manipulation. In the longer term, manipulation destroys confidence in the industry. In a real sense, the current situation in the natural gas industry is the direct result of certain participants' failure to consider the long-term consequences of their unethical and illegal actions.

Companies active in natural gas trading must take responsibility to stop manipulation of markets, either by their employees or by others. These efforts fall into two categories:

- Establishing and maintaining internal legal and risk management controls, and

- Reporting suspicious behavior to the appropriate authorities.

OMOI has seen an increasing interest by natural gas traders in both of these approaches. Some companies have taken actions to clean house internally in response to various internal and external investigations. Some companies have reported suspicious behavior to the Commission and other responsible governmental authorities.

Collective industry efforts have included those spearheaded by the CCRO related to appropriate controls and by EPSA related to ethical behavior.

Commission Actions

The Commission has made a strategic commitment to vigilant oversight of market manipulation in wholesale natural gas markets. Much of the Commission's efforts in this area, those related to specific investigations, is confidential and cannot be mentioned here. However, certain activities can be reported:

- The Commission formed OMOI in early 2002 explicitly to coordinate market monitoring and investigation capabilities.

▶ The Commission has received energy market briefings developed by OMOI at regular closed meetings since mid-2002. Issues reviewed include price movements, financial conditions, market intelligence, system outages, potential market manipulations and other observed behaviors.

▶ OMOI is developing a set of gas and electric market metrics and thresholds designed so that when anomalies occur, OMOI investigates to determine if the deviations can be explained by physical market imbalances, by market rule problems or by improper market behavior.

▶ The Commission is increasing its coordination with other regulatory bodies, including the Commodity Futures Trading Commission, the Securities and Exchange Commission, the Department of Justice, state commissions and others.

▶ OMOI operates the Commission's toll-free Enforcement Hotline (877-FERC-MOI), which received about 600 calls in 2002. These calls include inquiries, complaints and tips about inappropriate market behavior.

CONCLUSION

Competitive forces have created extraordinary benefits for natural gas customers. However, the competitive wholesale natural gas market faces many critical challenges as 2003 gets underway. These challenges include:

- Deteriorating financial conditions of market participants;
- Managing credit exposure;
- Shaken confidence in price discovery methods;
- Continuing need for efficient investment in infrastructure; and
- Continuing potential for manipulation.

The healthy functioning – or distress – of natural gas markets can have profound effects on the overall economy because of the gas market's size, pervasiveness and the critical needs it meets.

Operation of a competitive wholesale natural gas market generated significant customer benefits over the past quarter-entury. Quick, thoughtful and meaningful action can address the current challenges and maintain the benefits of a competitive natural gas industry for its customers and the overall economy.

The issues facing the effective competitive functioning of the natural gas market are manageable over time. Both industry participants and regulators should aggressively seek out and promote solutions to assure efficient, cost-effective, fair and valuable natural gas service to all customers in the United States.

Industry actions indicate a significant, responsible interest in dealing with the challenges that face natural gas markets today. As long as that interest remains, it provides a strong positive indication that these issues can be resolved.

The Commission continues to promote fair, efficient markets through a clear focus on its strategic initiatives to:

- Assure sufficient infrastructure;
- Create balanced market rules; and
- Maintain vigilant oversight and enforcement.

This *Natural Gas Market Assessment* has presented how OMOI is overseeing natural gas markets and enforcing the Commission's rules.

Acknowledgments

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Any errors are the responsibility of the OMOI alone.

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