2003/04 Winter Energy Market Assessment

November 13, 2003
Office of Market Oversight and Investigations
Federal Energy Regulatory Commission
Progress is being made on issues identified by OMOI in earlier assessments.

<table>
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<th>Concerns in previous assessments</th>
<th>November 2003 status</th>
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| Deteriorating financial conditions | $60 billion of market cap gained by major market participants in 2003  
  Credit deratings have slowed |
| Managing credit exposure         | More than $30 billion of stressed debt refinanced (only one company’s debt defaulted)  
  Continued credit clearing initiatives with mixed results, reducing capital requirements |
| Shaken confidence in price discovery | FERC *Policy Statement* (July 2003)  
  Revised trade press procedures  
  ICE-initiated price reporting |
| Continuing potential for manipulation | Isolated incidents |
| Strained natural gas supply      | Improved conditions going into the heating season due to record refill of storage |
After a decade of low prices, natural gas prices are now more volatile at a higher level.

Long-term supply uncertainty keeps up prices—e.g., NPC study shows prices likely to remain high through 2025.

Natural gas storage rebound significantly improved the prospects for winter 2003/04.

- Stronger storage position than anticipated, mitigating prices
- Storage position critical—relationship with price
- Protection comes at a cost
- Relative cost depends on weather
- Use of storage over the last two years has pushed the upper and lower limits of capacity

Storage inventory has a strong relationship with price levels and volatility.

Source: OMOI analysis based on RDI and EIA.
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But forward prices indicate that resulting storage inventory costs may be high.

Source: Platts’ Gas Daily, Nymex, and EIA. Cost of gas in storage is estimated using the volume-weighted average Henry Hub weekly gas prices over the 2003 injection cycle and does not reflect holding costs.
Last winter, storage inventory costs were relatively low.

Source: Platts’ Gas Daily and EIA. Cost of gas in storage is estimated using the volume-weighted average Henry Hub weekly gas prices over the 2003 injection cycle and does not reflect holding costs.
Weather for winter 2003/04 is the key short-term uncertainty regarding natural gas.

- In an extreme cold-weather scenario, prices are higher and volatile
  - Storage drained with high consumption
  - Heating oil prices remain high, discouraging fuel switching
  - Resulting storage inventory costs lower than wholesale prices
- In an extreme warm-weather scenario, wholesale prices drop but retail prices remain relatively higher
  - Late-winter storage withdrawals required for physical operations
  - Storage competition with production forces down prices
  - Resulting storage inventory costs raise average retail costs through winter
- Weather is unpredictable
  - For example, Northeast weather intensity (cumulative HDDs) over the last decade varied by 40%.
Weather for winter 2003/04 is the key short-term uncertainty regarding natural gas.

Cold winter in the Northeast resulted in large storage draw-down.

93% of variation in storage draw-down

$R^2 = 0.929$

Sources: HDD data for NYC LaGuardia from Chicago Mercantile Exchange (www.CME.com). Storage data for Eastern Consuming region from EIA/AGA.

Notes: Cumulative HDDs measured from Nov-1 through Mar-31. Storage draw-down measured from Nov-1 through Mar-31.
In general, winter natural gas system flexibility has declined.

- Higher reliance on baseload gas-fired electric generation
  - 56 GW of new combined cycle generation added since 2002
  - Equivalent of ~4.7 Bcfd (about 5–6% of typical winter peak demand)
- Low levels of demand elasticity
  - Feedstock fuel switching
    - Estimates of fuel switching capability as low as 5–10% of total industrial gas demand
  - Electric generation fuel switching
    - Dual-fueled units available in few regions
    - Fuel switching capability estimates as high as 30% of total gas-fired power generation, but actual capability may be limited by:
      - Access to alternate fuels
      - Warranty restrictions on using alternate fuels in newer vintage turbines
      - Environmental restrictions

Source: New generation data from EIA. Equivalent gas demand estimate based on 50% capacity factor.
In general, winter natural gas system flexibility has declined. (cont’d)

- During peak demand, or in cases of equipment failure, transmission congestion could occur.
  - Basis differentials increase in the market area during cold weather.
  - February Price Spike Study showed that pipeline and distribution flow restrictions can increase price levels and exacerbate volatility.
- Winter gas flexibility has improved in some areas in response to market forces.
  - West: 1 Bcf of new capacity from Rocky Mountains into central California and southern Nevada (Kern River)
  - Southeast: 1.5 Bcfd of new pipeline capacity into Florida (GulfStream and FGT)
  - East: Increased delivery capacity since last winter (Cove Point and DistriGas LNG)
  - Midwest: Additional gas deliverability into Wisconsin (Horizon and Guardian short-haul systems)
Gas value-added for generation versus space heating appears greatest in New England and California for winter 2003/04.

Survey responses reveal mixed industry reaction to Policy Statement.

- Commission’s Policy Statement on price discovery highlighted current problems and provided standards to improve accuracy, reliability and transparency of indices.
- Staff monitoring plan includes:
  - Survey of industry
  - Individual meetings with price index publishers
  - Meetings with associations
  - Liquidity workshop
- Slight decline in number of companies reporting transactions; gas lowest
- Slight decline in number of publishers to whom data is reported
- Some companies plan to resume reporting late 2003 or early 2004 (e.g., Constellation, El Paso Merchant, PG&E, Williams Power)
- Other companies are waiting for clarification of the Policy Statement or see no value in reporting their transactions
- Presentations at Nov. 4 workshop on liquidity reported more encouraging progress
Modest growth is evident in new electricity futures contract on NYMEX.

Credit remains an ongoing concern related to the operations of all energy markets.

- Financial credit ratings and liquidity issues
  - Successful refinancings and debt extension relieved short-term concerns (among those that did not file for bankruptcy)
  - Long-term prospects and solvency still under pressure of low spark spreads and weak electricity capacity markets
- Transactional credit issues
  - Studies like the *Price Spike Study* underscore the effects of credit on transaction costs (some market participants had difficulty finding creditworthy partners during February price spike)
  - Progress made in credit clearing
    - Nymex
      - Gas: 11.7 quadrillion Btus cleared
      - Electricity: 70 million MWh cleared
    - ICE
      - Gas: 20.6 quadrillion Btus cleared
    - Competitors have had more limited traction
  - Need to monitor margin levels for virtual bids and offers in some ISOs
Based on this and previous assessments, these are some of the factors OMOI will be monitoring this winter:

- Natural gas storage
  - Storage status
  - Quality of storage data
- Spread between spot gas prices and the cost of gas taken out of storage
- Interaction of electric generation and cold weather
  - Price effects
  - Reliability effects (e.g., pipeline constraints on fuel for power generation)
- Transaction reporting
  - Price and volume reporting
  - Cooperation with FERC’s Policy Statement
- Creditworthiness issues and implications