

2004/05 Winter Energy Market Assessment

November 18, 2004

**Office of Market Oversight and Investigations
Federal Energy Regulatory Commission**

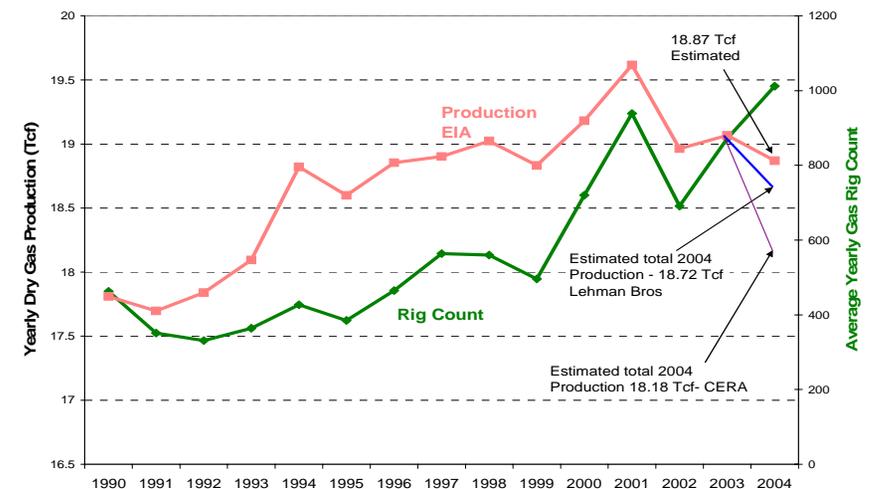
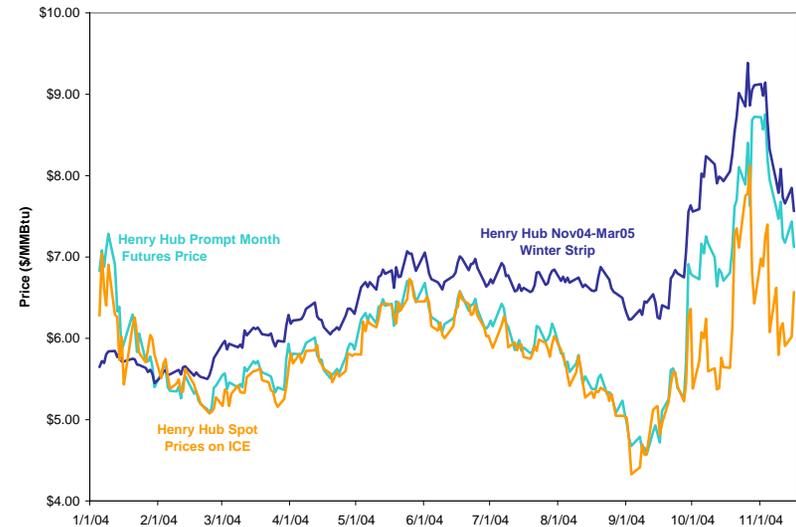
OMOI's Winter Assessment: Market's behavior is consistent with commodity markets under tight conditions

- **Supply Adequacy.** Despite record storage levels, market concerns about a tight supply/demand balance appear to be driving prices. Constraints include the status of production, demand growth and weather.
- **Status of Trading.** Speculative futures trading has probably exacerbated price volatility. We have found no evidence of sustained price levels caused by trading.
- **Infrastructure.** Market signals suggest that with severe cold infrastructure may be congested into the Northeast. The most significant concern is the possibility of a repeat of the extreme conditions in January 2004.
- **Electric Markets.** Higher gas, oil, and coal fuel prices are likely to raise power prices nationally.



Uncertainty and supply tightness appear to be driving markets

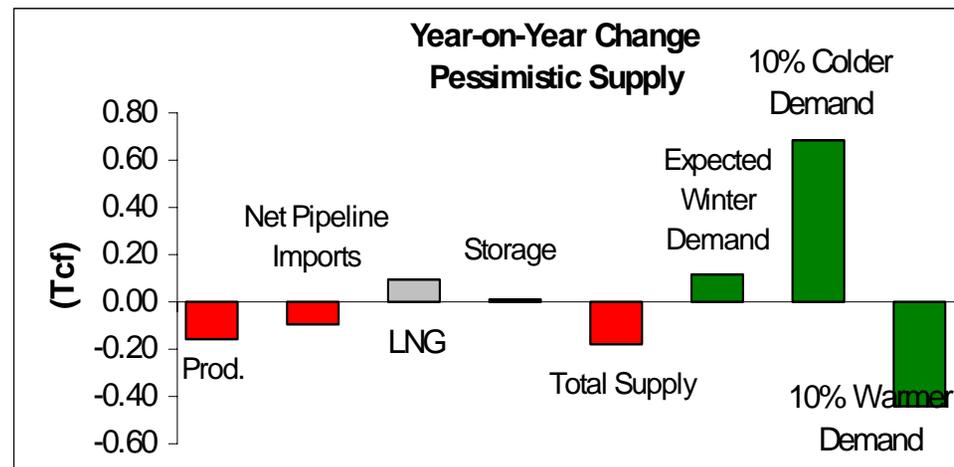
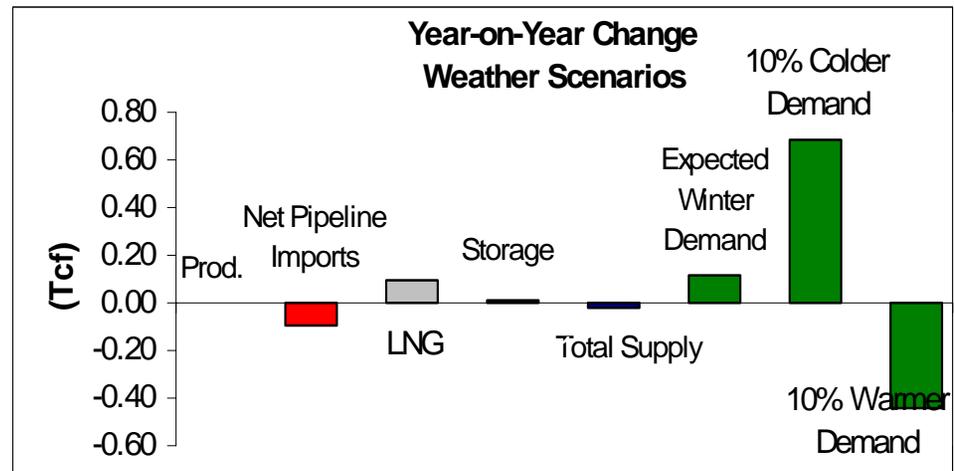
- The economy is growing and continues to drive demand.
- Despite drilling increases, experts estimate flat to declining year-on-year domestic production:
 - EIA: 0%
 - Lehman Brothers -2%
 - CERA -5%
- Uncertainty about production appears to be overcoming the beneficial effects of record storage levels.



Sources: Platts, NYMEX, EIA *Short-Term Energy Outlook*, October, 2004, CERA *North American Natural Gas Monthly Briefing*, October 18, 2004, Lehman Brothers *Oil & Gas Industry Update*, October 13, 2004.

How has the supply and demand balance changed since last winter? Weather is key.

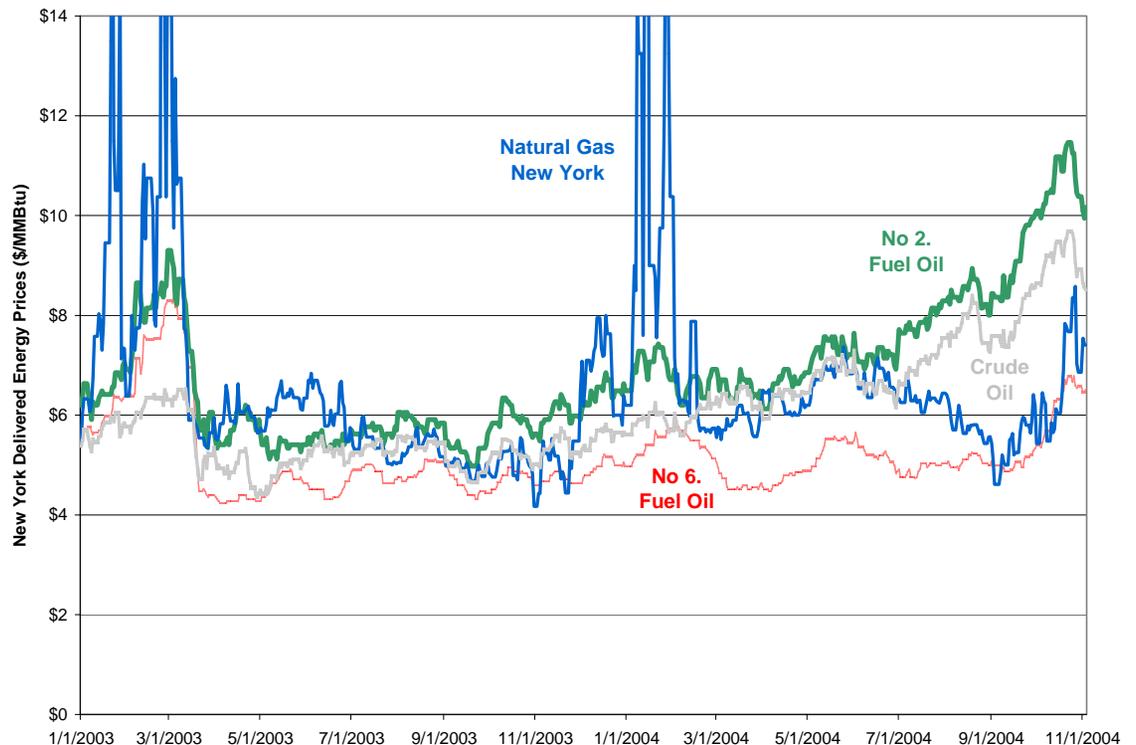
- Increased residential and commercial demand and gas-fired generation.
- Most optimistic supply outlook has production flat with last winter.
- Demand higher than supply signals likely higher prices.
- Some surveys based on reported production have shown significant production declines.
- Tighter supply would increase pressure on prices.



Sources: OMOI analysis of 4th qtr. 2004 and 1st qtr. 2005 compared to 4th qtr. 2003 and 1st qtr. 2004 from EIA *Short-Term Energy Outlook*, October 2004. Pessimistic supply extrapolated by OMOI from Lehman Brothers *Q3'04 Natural Gas Production and Supply Estimate*.

Alternative fuel prices have moved farther and faster than natural gas

- Oil price increases in the summer were not matched by gas – but fall movement upward was.
- Gas has traded between distillate and resid for several years, and recently has remained near the lower end of the price range.
- Recent weakness in oil prices has been matched by gas.
- These prices suggest that gas is facing common concerns and issues with other fuels.



Sources: OMOI analysis of data from Bloomberg and Platts.

Speculative trading appears less significant to price behavior than are supply and demand conditions

- Given its relative size and significance, speculative trading appears to be having an effect on short-term prices:
 - Volatility
 - Level -- perhaps
- Speculative trading (as measured by non-commercial futures positions) does not appear to be sufficient to have caused much of the recent price movement.
- Non-commercial positions are more balanced between long and short compared to the start of last winter.



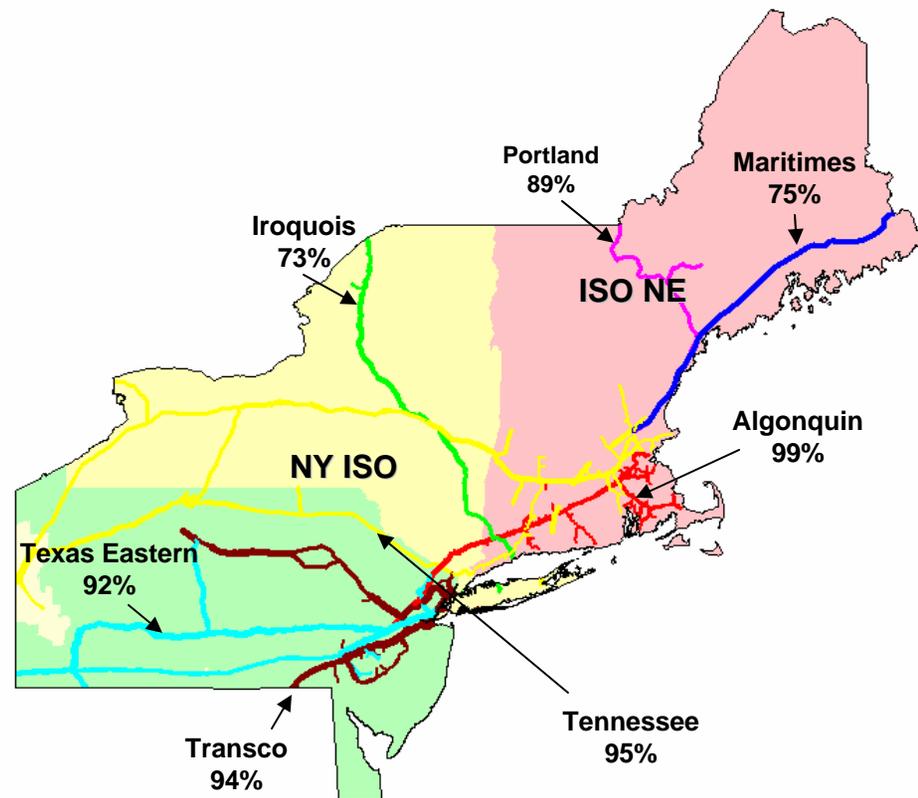
Source: Derived from *Commitment of Trader's* report, www.cftc.gov.



Regional markets, especially the NE, could see price increases with severe weather

- Forward market shows potential congestion into the Northeast this winter.
- 2004-5 winter demand is expected to increase .6 Bcf/d.
- Infrastructure proved just adequate for extreme cold in New England last year.
- So far, 3 additional projects have been completed adding 0.5 Bcf/d to Northeast capacity.
- Paying premium spot prices for brief periods often costs less than adding year-round capacity.

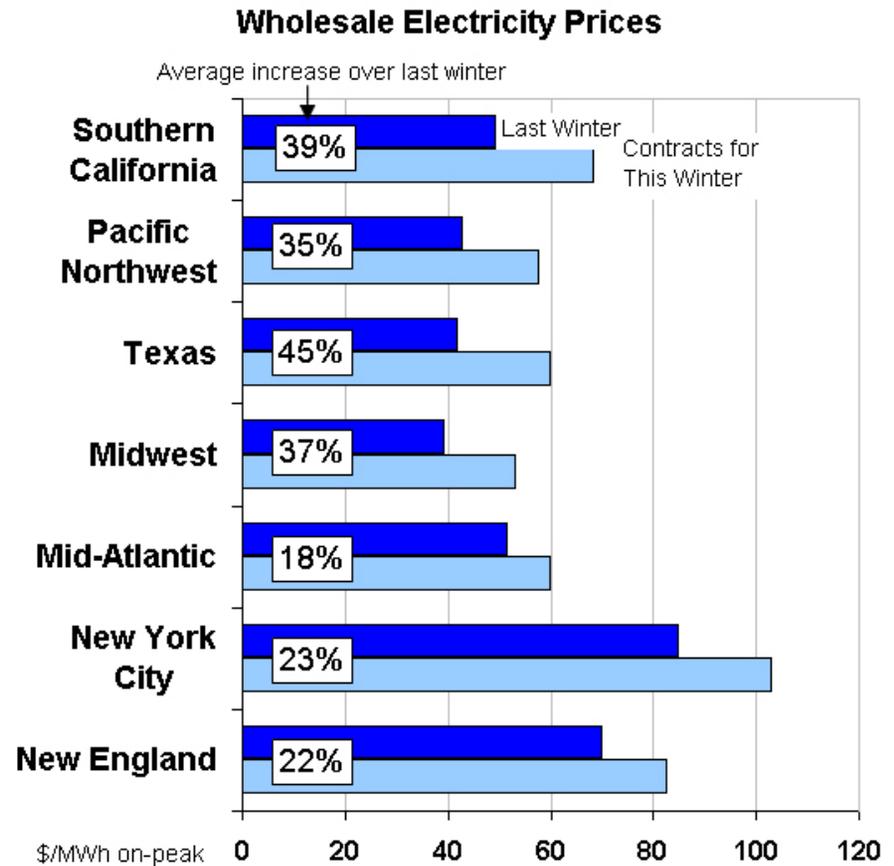
**Pipeline Capacity Use during Peak Conditions on January 14, 2004
Reflected a Variety of System Factors**



Sources: OMOI analysis of pipeline flow data, EIA U.S. *Natural Gas Pipeline and Underground Storage Expansions in 2003*, September 2004, FERC *Northeast Energy Infrastructure Conference Report*, June 2004, and FERC Office of Energy Projects database, October 2004.

Electricity prices are rising in response to fuel cost increases

- Electricity prices are rising with fuel cost increases.
- Scarcity of gas is possible under extreme weather conditions in New England and Texas because they rely heavily on gas for electric generation.
- Reliability issues from gas scarcity may be lessened by operational and market changes made in reaction to last winter.
- Expansion of PJM and new market software in NYISO should enhance markets but is not yet proven in operations.



Sources: OMOI analysis of Platts' data, reports from ISO-NE, NYISO, PJM, ERCOT, NERC. Prices as of November 15.



FERC's OMOI will continue to monitor market drivers closely this winter

- Work with public utility commissions to help them protect customers as prices flow from the wholesale to the retail markets
- Monitor gas market activity including pipeline capacity utilization and regional prices
- Assess status, quality of and market reaction to natural gas storage data
- Monitor winter electric market behavior:
 - Price effects
 - Market design
 - Reliability effects
 - Behavior
- Pay particular attention to unexplained price movements and market activity around extreme weather



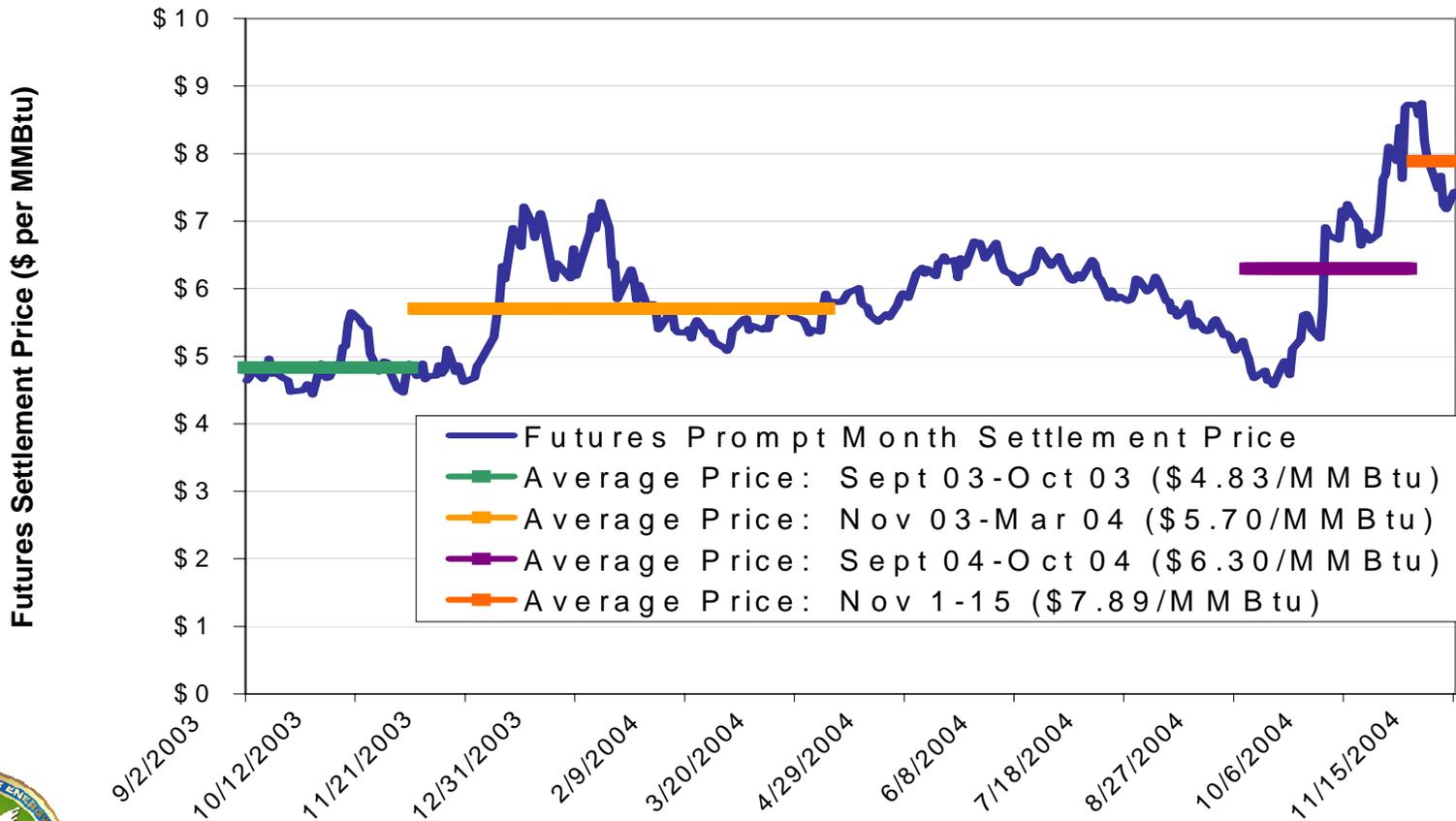
Appendix A

Supply Adequacy



Natural gas prompt-month futures prices reflect supply concerns

Natural Gas Prompt-Month Futures Prices Higher Going into Winter 2004/05

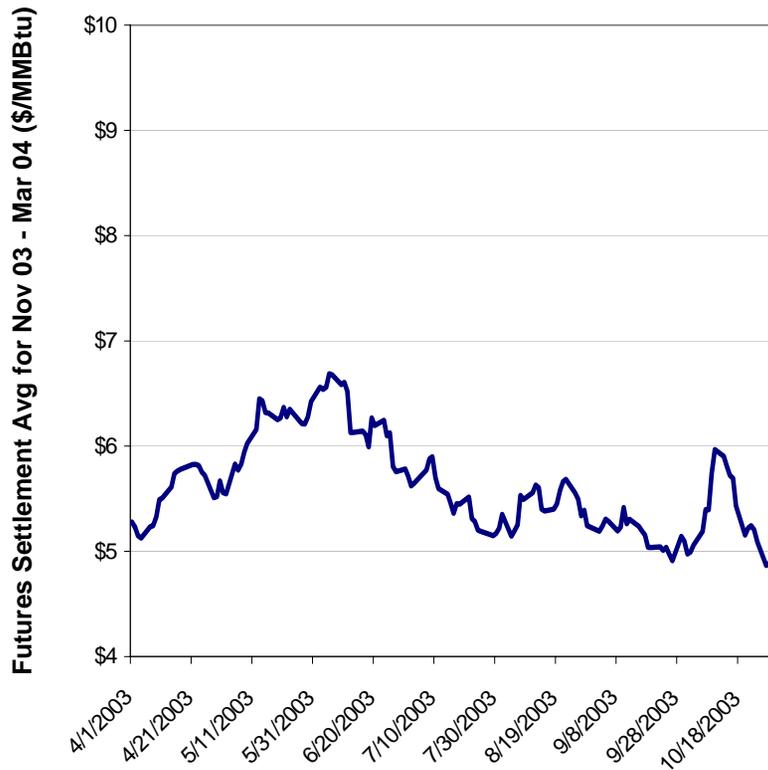


Source: OMOI analysis derived from Platts Gas Daily.



Natural gas futures price average for the winter period, November through March, is 80% higher than last year

Winter Futures average for 2003/04 ends below \$5.00



Winter Futures average for 2004/05 ends above \$8.75



Source: Derived from Bloomberg.

Note: Winter average is the average November through March settlement price.

Futures markets indicate expectations that recent high coal and oil prices may continue this winter

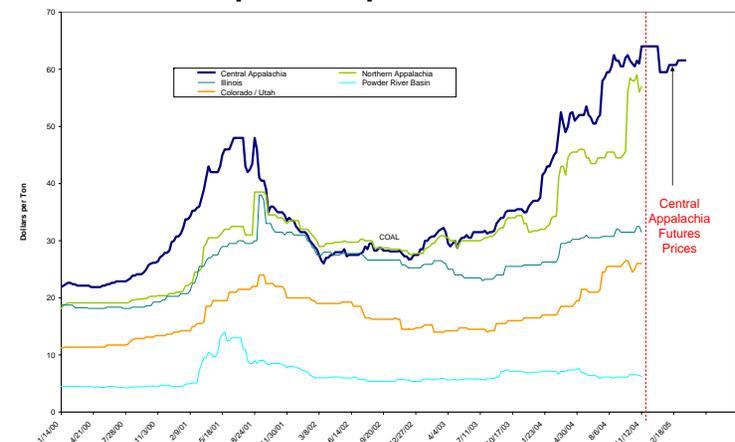
COAL

- NYMEX coal futures prices indicate that current \$60/ton spot prices for Central Appalachian coal may persist through the winter.
- High coal price expectations attributable to fundamental factors such as:
 - Depleted resources in eastern U.S. supply areas and shortages of low sulfur bituminous coal.
 - Reduced U.S. coal stockpiles - now approximately 29% lower than the 3-year average.
 - High alternative fuel prices (oil and gas).
 - Increased demand for coal (2% growth in U.S. electricity demand between 2003 and 2004).
- Western coal is plentiful and prices are likely to remain stable.

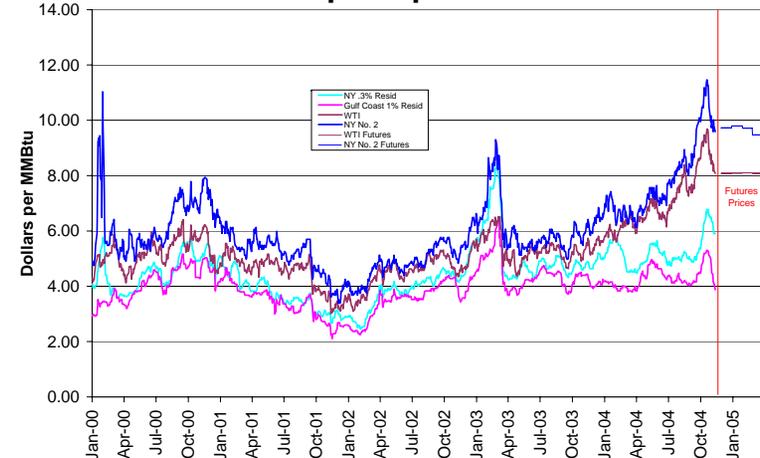
OIL

- WTI and heating oil futures for delivery in January and February are trading at historically high prices (in nominal dollars).
- NYMEX WTI prices have increased 52% since January 2004 and now approximate \$50/bbl throughout the winter.
- Factors influencing expectations for oil prices:
 - Likely tight spare capacity (production, refining, and storage/transportation logistics).
 - Geopolitical uncertainty and fear of supply disruptions.
 - Liquids inventories near the bottom of 5-year average ranges.
 - Global oil demand in the 4th quarter of 2004 anticipated to be 2 million barrels per day higher than in 2003.
- Mitigating Factors:
 - In August 2004, OPEC hit highest production levels since 2000.
 - About 1.5-2.0 million barrels per day of surge capacity still exists.
 - Slow down in Chinese oil demand in the 4th quarter due to conservation, price effects, and growth in non-oil powered generation.

Tight fundamentals sustain recent spot coal price trends



High oil product prices likely but downside price pressure exists

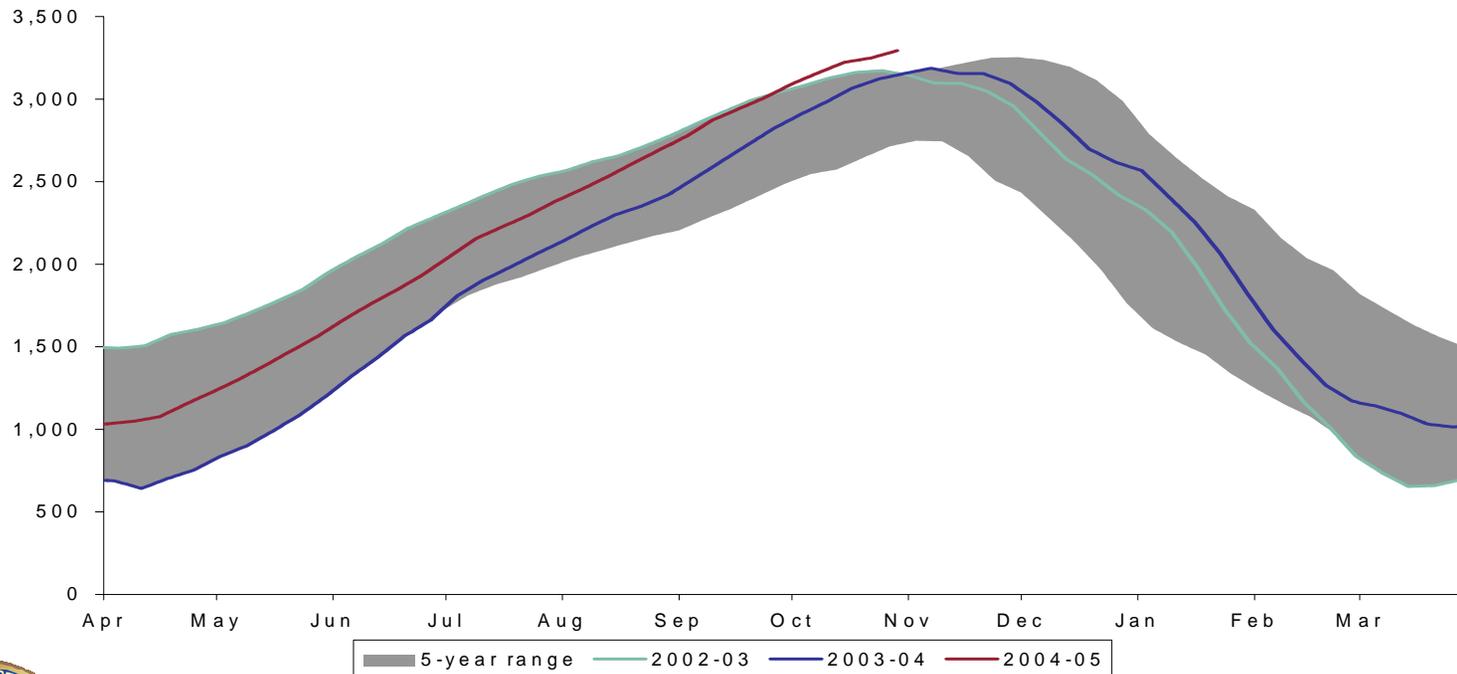


Sources: Bloomberg, EIA and International Energy Agency.



Record natural gas storage levels slightly ease some fundamental concerns for winter 2004/05

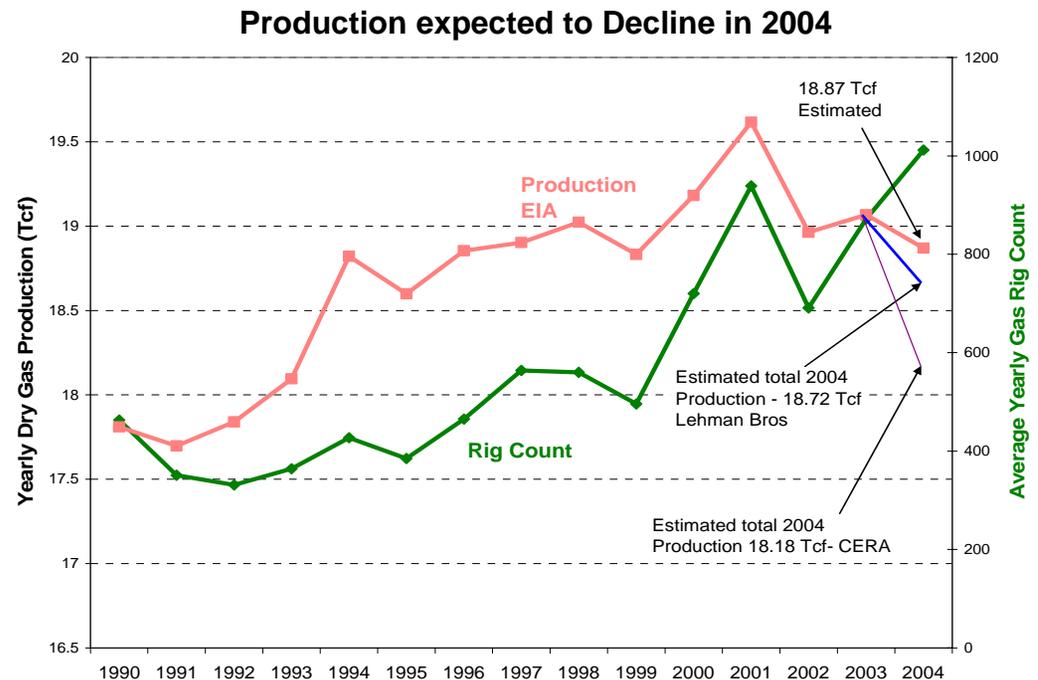
- Upper and lower limits of storage capacity continue to be tested.
- Shut-in production from Hurricane Ivan has cut about 28 Bcf from potential storage injections.



Source: EIA, Form EIA-912, *Weekly Underground Natural Gas Storage Report*, data through week ending November 5, 2004; and Stephen Smith Energy Associates, from NGI's *Daily Gas Price Index*, October 26, 2004.

Gas rig counts are not translating into increased production

- Many analysts are estimating a decline in domestic production for 2004 and 2005. (CERA estimates almost 5% and Lehman Brothers about 1.8%, while EIA estimates 2004 production as essentially flat to 2003)
- Declining production and an expected decline in LNG imports this winter will make overall supplies tight.
- Exports to Mexico are expected to increase about 0.2 Bcf/d to 1.1 Bcf/d in 2004 and to 1.3 Bcf/d in 2005.
- Canadian imports can no longer be counted on to fill the gap due to increased demand in eastern Canada and flat production.

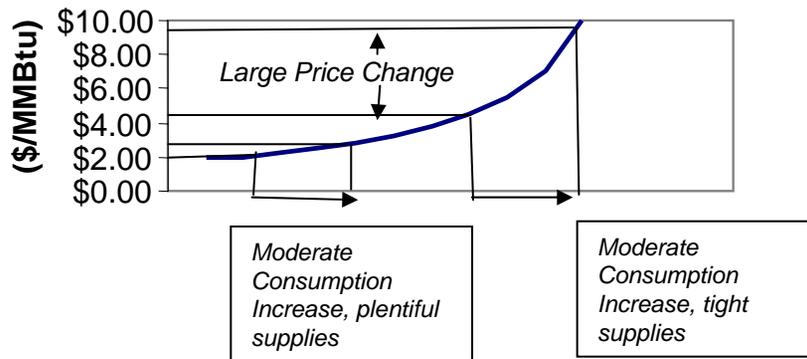


Sources: EIA *Short-Term Energy Outlook*, October, 2004, CERA, *North American Natural Gas Monthly Briefing*, October 18, 2004; Lehman Brothers *Oil & Gas Industry Update*, October 13, 2004.



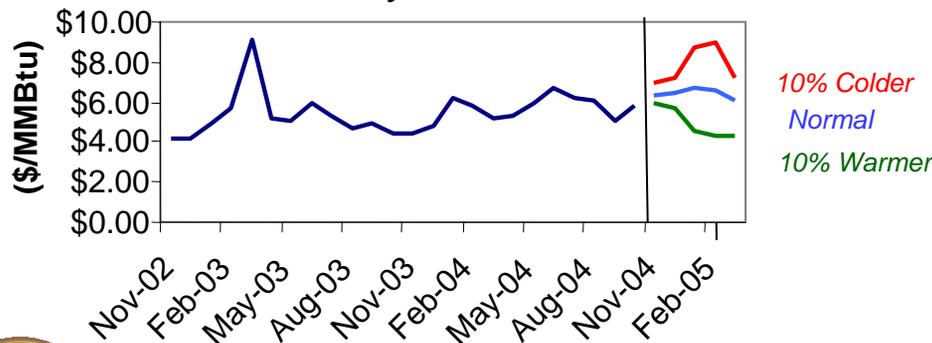
When supplies are tight, changes in consumption or production magnify price effects

Tight Supplies Exaggerate Price Response to Consumption Changes



- In a market with tight supplies, small supply losses or consumption increases can mean large price swings.
- The easiest means to accommodate supply and consumption changes have already been done.

Henry Hub



- Natural gas bills are expected to increase due to higher prices. For a typical Midwestern household, natural gas expenditures will change as follows:
 - Normal winter: +15%
 - 10% colder: +35%
 - 10% warmer: -2%

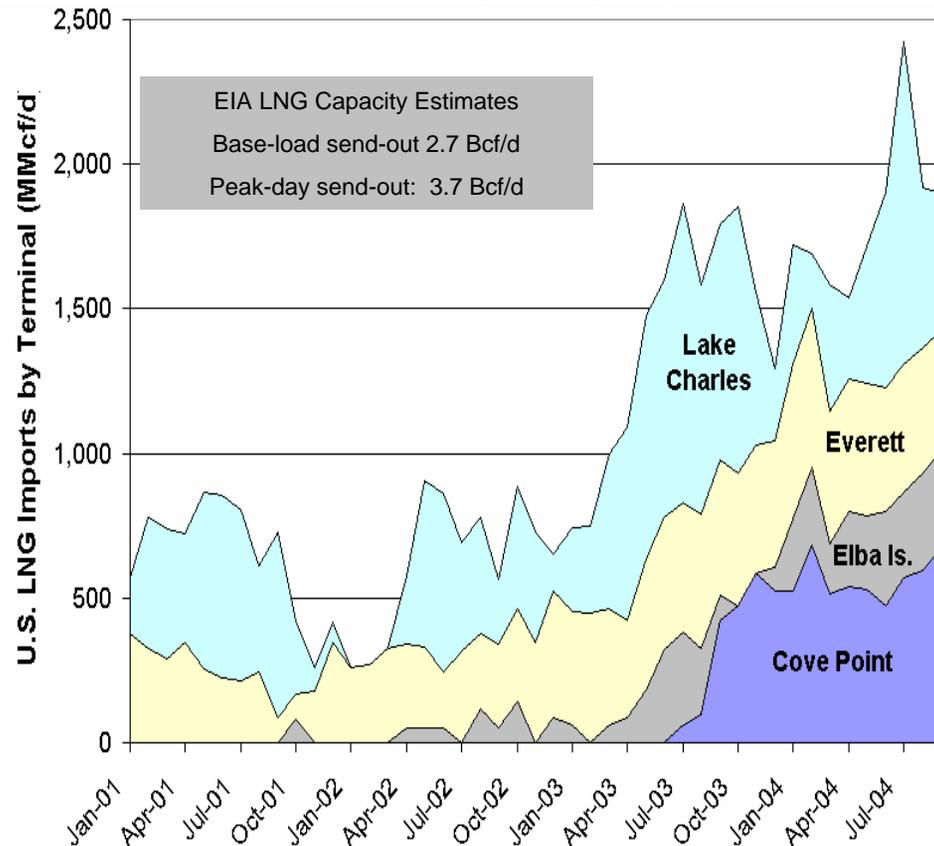


Sources: OMI derivation from CERA North American Natural Gas Watch: *The Worst Is Yet to Come: Diverging Fundamentals Challenge the North American, Gas Market*, GasDaily and the Energy Information Agency October 2004 Short term Energy Outlook

Contracting practices and infrastructure availability may constrain LNG winter deliveries

- U.S. LNG imports grew 38% or from 0.36 Tcf to 0.50 Tcf through the 3rd quarter of 2004 compared to the same period in 2003. Winter 2004/2005 estimates of LNG imports vary from 1.5 – 2.0 Bcf/d.
- Rising LNG imports have moderated U.S. natural gas price increases.
- Several factors could limit U.S. LNG terminal send-out this winter:
 - Lack of spare global liquefaction capacity (especially that meets U.S. pipeline quality fuel specifications).
 - Continued reliance on spot contracts for LNG.
 - Reduced opportunities to divert cargoes to the U.S. because of normal weather (or worse) in Asia and Europe.
 - Inadequate economic incentives to divert LNG spot cargoes to U.S. terminals because of sustained, high crude oil prices.
- Increases in global liquefaction capability underway, but unlikely to materially improve LNG supplies available to the U.S. this winter.

Total U.S. LNG imports have grown steadily since 2002, but spare capacity exists



Source: Lippman Consulting Inc., *Short-Term Energy Outlook*, EIA, "Monthly Gas Briefing: Enough Supply for Winter: Fundamentals Do Not Support Futures," CERA, October 19, 2004, "U.S. LNG Markets and Uses," EIA, June 2004, Q3'04 Nat Gas Prod'n/Supply Survey, Lehman Brothers., November 8, 2004.



Appendix B

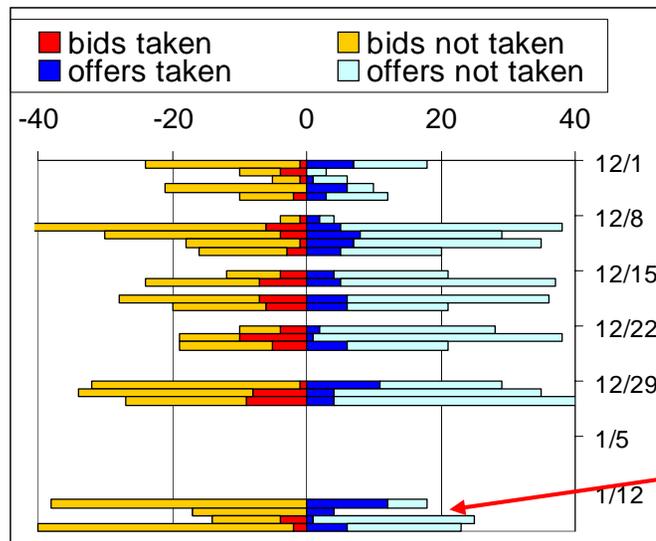
Status of Trading



Trading market liquidity and depth matter. Peak demand in New England last year illustrated a lack of buyer options with limited spot gas.

- When demand exceeds limited gas supplies, spot prices increased, reflecting buyers competing for supply, often to avoid imbalance penalties and the draining of peak shaving inventory.
- In New England last winter, under peak demand conditions, a large range of bids and offers were made, but trades only occurred at the upper end of the price range.
- These conditions are typical of a functioning market during scarcity.

On January 14, Algonquin City Gate trading on ICE saw few offers, all successful, no matter the price.



Algonquin City Gate was a sellers market

(Lines show range of bids/offers, boxes show range of trades)



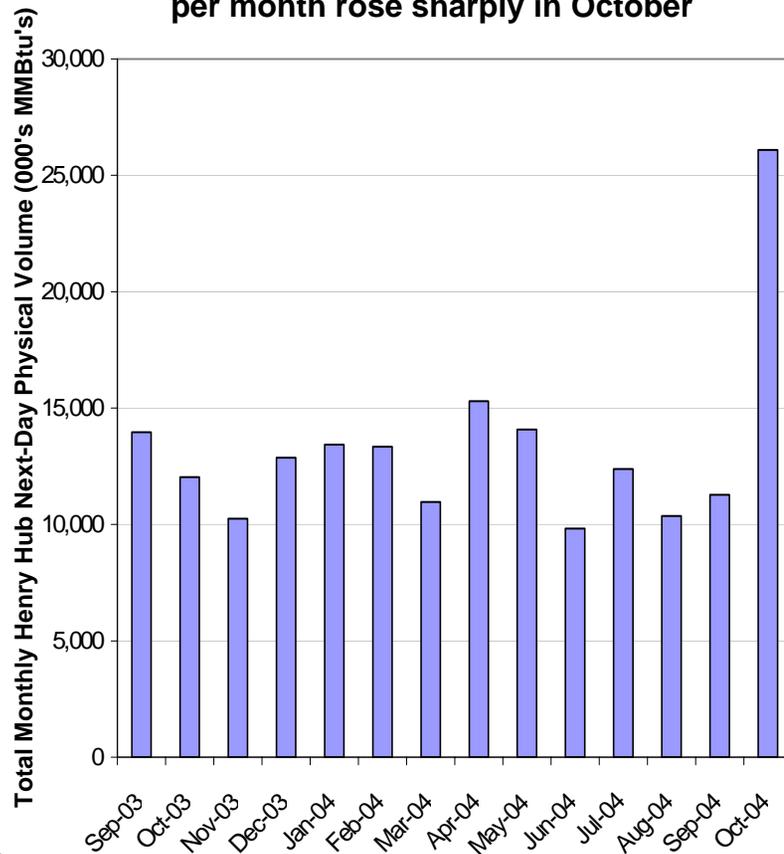
1/14/2004

Source: OMOI analysis of ICE data

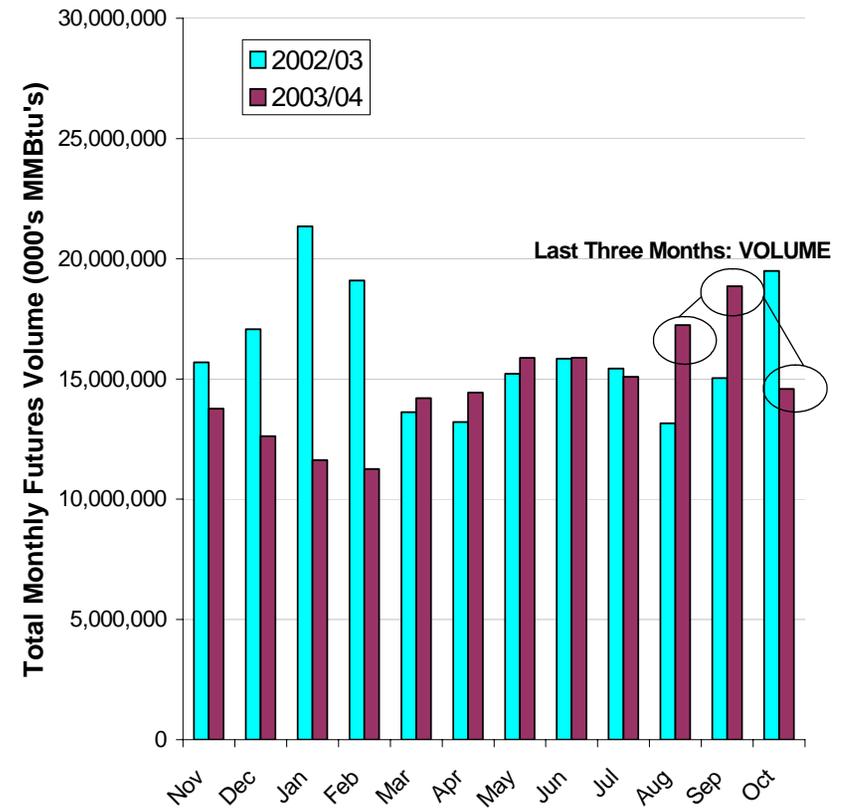


Natural gas physical and futures trading volumes display volatility approaching this winter, coinciding with higher prices & wider price ranges

ICE Henry Hub physical next-day total VOLUME per month rose sharply in October



Futures VOLUME increased in last summer/early fall with decline in October

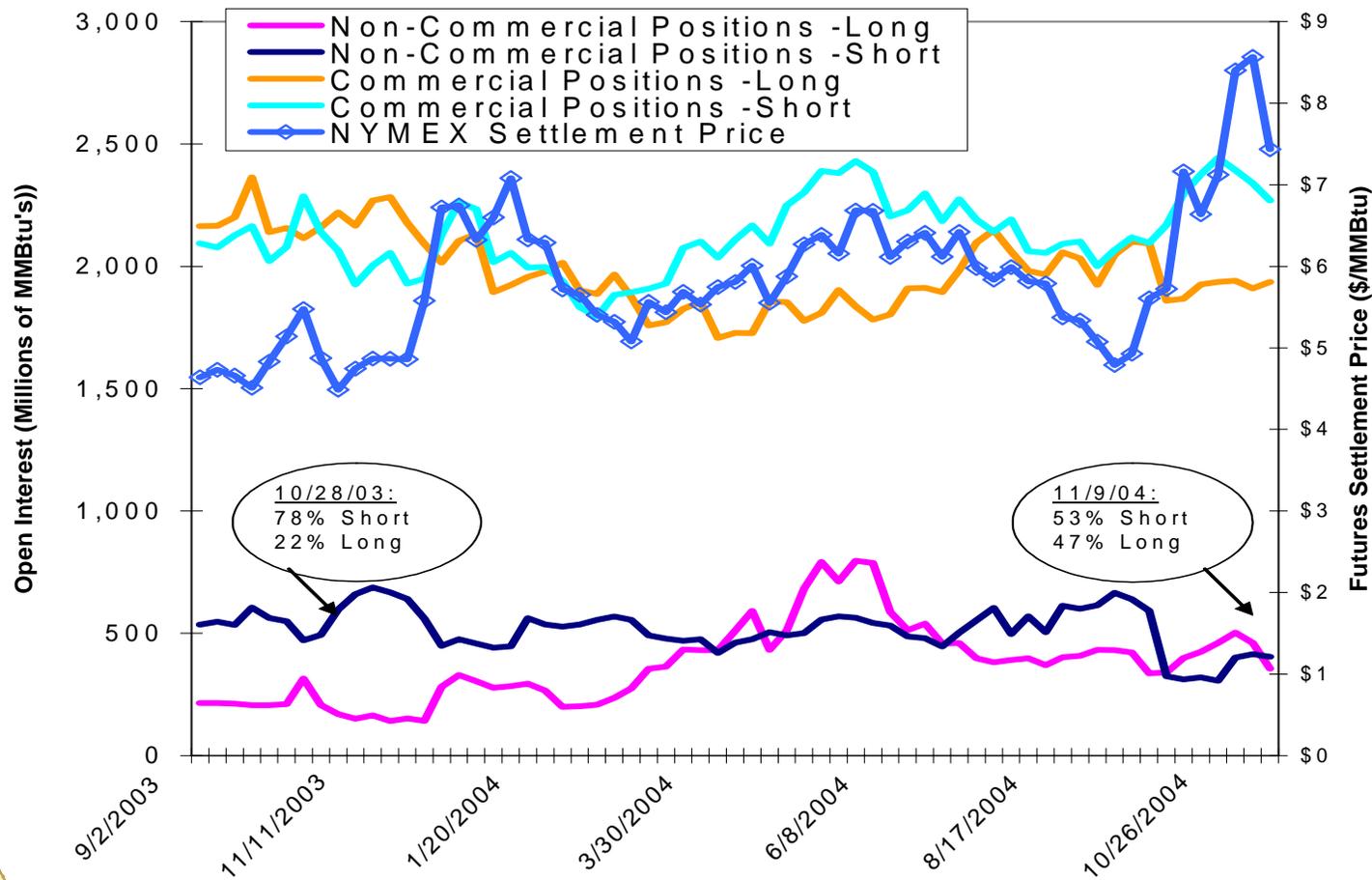


Note: Volume is sell-side only

Source: Derived from ICE, www.theice.com.

Source: Derived from NYMEX, www.NYMEX.com.

While prices are higher, the commercial and non-commercial sectors have different futures positions compared to last winter



Source: Derived from *Commitment of Traders Report*, www.CFTC.gov.



In addition to wide price ranges, physical and futures volumes have also been volatile

- The higher volume likely reflects existing market participants and new participants trading more actively due to the price levels and volatility.
- New participants include hedge funds, replacing some of the speculation by merchant energy companies.
- Not all of the activity growth this fall can be attributed to hedge funds because many were previously in the market.
- On ICE, the average number of counterparties for next-day Henry Hub physical:
 - 11/03 to 3/04: 29
 - 9/04 -10/04: 31
- On NYMEX, the number of companies with reportable open interest:
 - October 28, 2003: 193
 - October 26, 2004: 202
 - For the past year, the maximum number was 225, which occurred in August, 2004.



Sources: Derived from ICE, www.theice.com and NYMEX, www.NYMEX.com.

Greater number of clearing and trading products seen in 2004

- Assisting in credit risk mitigation this winter is the growth in volume and number of clearing products on NYMEX and Intercontinental Exchange (ICE).

Volume Growth:

- From the start of clearing on ICE through September 2004, ICE cleared 420 million megawatt-hours of electricity and 42 quadrillion Btu's of natural gas.
- From the start of clearing on NYMEX through September 15, 2004, NYMEX cleared 310 million megawatt-hours of electricity and 31 quadrillion Btu's of natural gas.

Product Growth in 2004:

- ICE began clearing financially settled electricity trades via the London Clearing House at the following locations: PJM, NYISO, NEPool, Cinergy, Palo Verde, Mid-Columbia, SP-15, and NP-15.
- NYMEX introduced the following natural gas and electricity products via its Clearport system: cleared-only natural gas options, monthly natural gas index futures contracts, daily natural gas swing futures contracts, penultimate natural gas swap futures contract, Dow Jones western electricity futures contracts, and ISO New England internal Hub peak LMP swap futures.



Sources: www.theice.com "Intercontinental Exchange sets new records in September," 10/04/04, www.nymex.com "Exchange sets record for clearing off-exchange transactions," 9/15/04, and various NYMEX press releases.

Appendix C

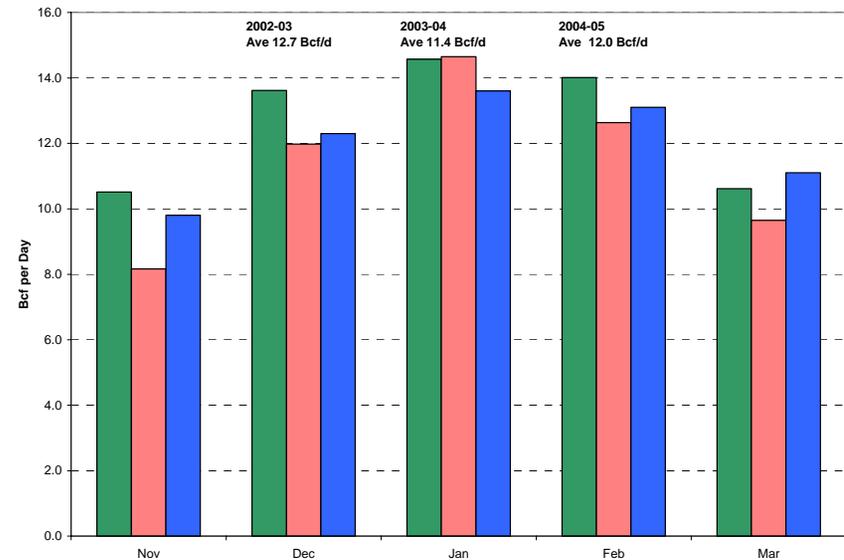
Infrastructure



Increased gas demand for power generation could test the infrastructure during severe weather

- During January 12-16, 2004 cold weather, Northeast pipelines were at high utilization and operated under reduced tolerances.
- Estimates are that Northeast winter gas consumption fell from 12.7 Bcf/d in 2002-03 to 11.4 Bcf/d during winter 2003-04, about 10 percent. 2004-5 winter demand is expected to reach 12.0 Bcf/d, an increase of 5 percent over the previous winter.
- Total U.S. 2004-05 winter gas demand is expected to rise about 2.7 Bcf/d or 0.6 percent from the winter of 2003-04.
- Gas-fired generation capacity in the Northeast increased 17 percent from January 2003 to October 2004.

Northeast Winter Gas Demand



Gas-Fired Capacity in Megawatts

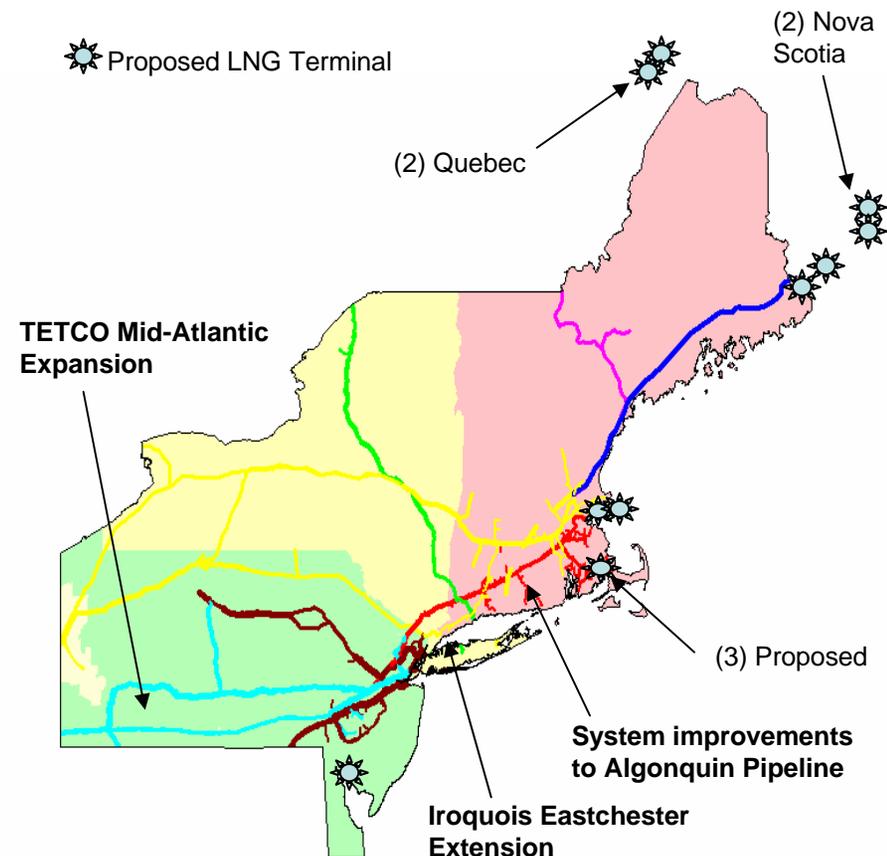
	Jan. 2003	Jan. 2004	Oct. 2004	% Increase
NEPOOL	10,311	12,901	12,998	26.1%
NYISO	13,160	13,210	14,473	10.0%
Total NPCC	23,471	26,111	27,471	17.0%



Sources: FERC Staff report on January 2004 Price Run-up; CERA *Eastern North America Energy Monthly Briefing*, September 9, 2004; CERA *North American Natural Gas Monthly Briefing*, October 18, 2004; Platts *PowerDat*, October 2004.

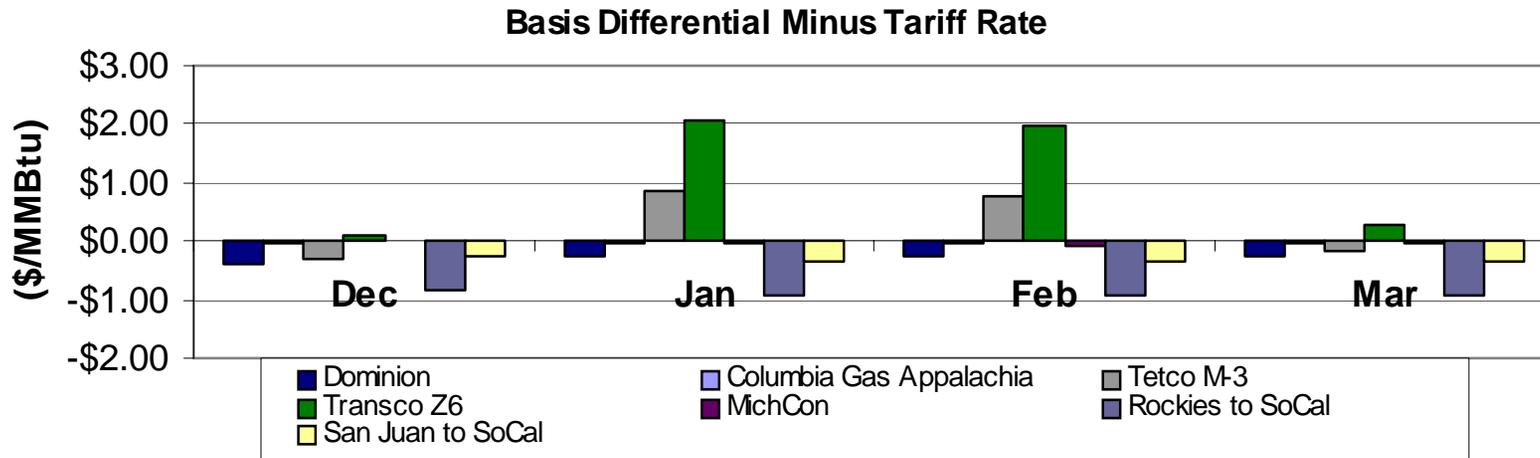
Infrastructure capacity additions estimated to decrease in 2004 as three projects are put on hold

- In September, EIA estimated 8 projects would be placed into service with a capacity of 0.9 Bcf/d. (Five are approved or under construction: Eastern Shore Expansion, Algonquin System Upgrade, Columbia Delaware Valley Expansion, and 2 Iroquois Gas Transmission projects.)
- The remaining three: Islander East (0.25 Bcf/d), a Connecticut expansion of Algonquin (0.28 Bcf/d) dependent on Islander East, and Millennium (0.7 Bcf/d) delayed.
- At this point, 3 projects have been completed in 2004 adding 0.5 Bcf/d to Northeast capacity.



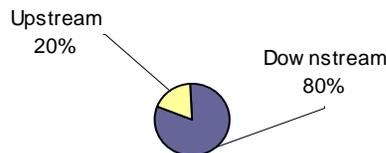
Sources: EIA *U.S. Natural Gas Pipeline and Underground Storage Expansions in 2003*, September 2004; FERC *Northeast Energy Infrastructure Conference Report*, June 2004; and FERC Office of Energy Projects database, October 2004.

Financial markets anticipate transportation bottlenecks in the Northeast and minimal congestion elsewhere



Forward basis anticipates congestion at Tetco M-3 (Mid-Atlantic) and Transco Zone 6 (New York City) compared to minimal constraints in the Midwest and West. Tight capacity is typical of the Northeast. Cold weather could cause restricted pipeline flexibility.

Basis Value Relative to Storage



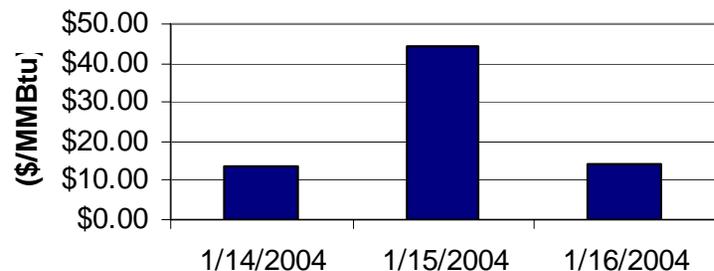
The majority of basis value is downstream of market area storage.



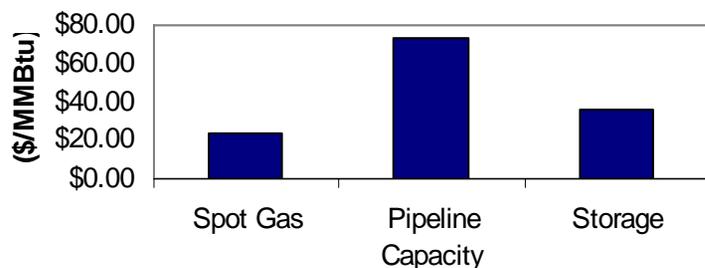
Sources: OMI derivation from NYMEX Clearport settlements as of 11/05/04 and pipeline informational postings.

Economics of high prices for brief periods versus investment in infrastructure tend to favor brief high prices

New England Basis Differential to Henry Hub



Comparison to Unit Costs



- Paying premium spot prices for brief periods often costs less than year-round capacity.
- For instance, during last year's price increases in New England, very high, daily basis differentials occurred on January 14 to January 16. Assuming spot gas purchased evenly over the three days, the additional cost would have been approximately:
 - \$24/MMBtu relative to Gulf purchases.
 - Reserving annual pipeline capacity would have cost more than \$70/MMBtu.
 - Reserving storage and downstream pipeline capacity would have cost more than \$35/MMBtu.
- The economics of new construction around load growth continue to be a challenge.



Sources: OMOI analysis of *GasDaily* data for Tennessee Zone 6 and representative tariff rates; fuel costs excluded. Storage costs assume 55 day service.

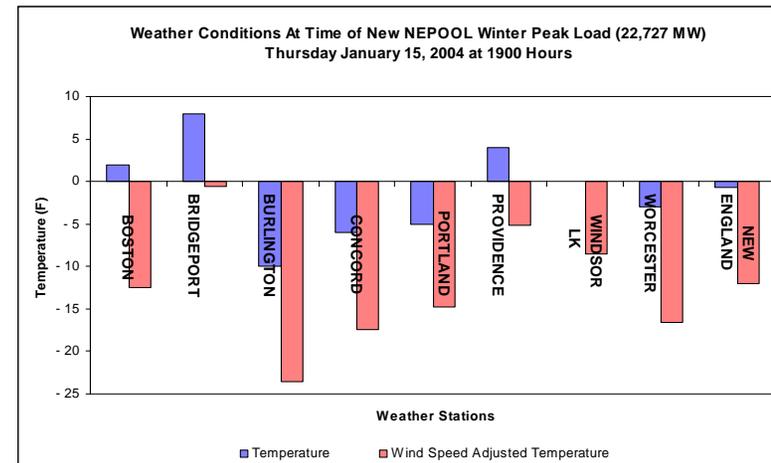
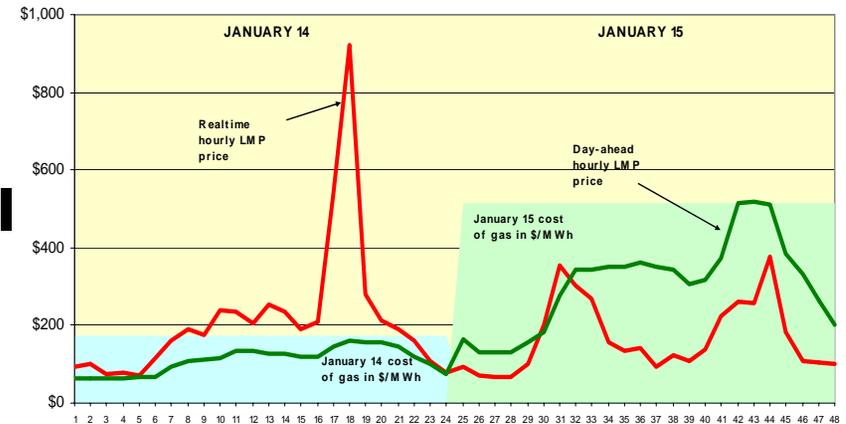
Appendix D

Electric Markets



Last winter, severe weather caused generator outages and fuel scarcity in New England

- Record cold in New England and Eastern Canada last January included average daily temperatures of 0 F° with a minus 15 F° wind-chill.
- Record heating demand for gas coincided with record electricity demand.
- 50% of New England generating capacity is gas-only or gas-dual fueled.
- Large number of generator outages:
 - Fuel and weather-related outages accounted for 4,399 of 8,927 MW of outages.
 - Cold weather-related equipment failures accounted for 1,181 MW, or 21% of mechanical outages.
 - Of the fuel related outages of 3,181 MW, an estimated 48% sold firm gas in the spot market.
 - At the peak on January 14th 47% of available gas-fired generation ran (6,291 of 13,364 MW).
 - MW associated with gas sales represent 17% of outages (1,515 MW of 8,927MW).
- Electricity prices increased on tight supply/demand conditions.



Sources: OMOI analysis of Platts and ISO-NE data.



Could weather and fuel outages hit New England or other areas this winter?

- New England is at greatest risk for weather related outages and fuel scarcity:
 - Heavily reliant on gas-fired generation
 - At the end of gas supply lines from the Gulf of Mexico
 - Regional cold can reduce supplies from Canada
 - Has less dual-fueled capacity than New York
 - Has significant winter load

- ERCOT also depends heavily on gas-fired capacity.



Sources: ISO-NE, ERCOT and OMOI staff .

New procedures will reduce the risk of winter problems in New England and elsewhere

■ New England

- During cold snaps ISO-NE will alter bidding schedules so generators know their power commitment before gas trading and pipeline scheduling deadlines.
- ISO-NE and states clarified emissions rules and made them more flexible.
- Increased power imports from operational and equipment improvements.
- Restrictions on economic outages during cold snaps.
- Unit commitment and forecasting processes now consider fuel and pipeline data.
- Generator improvements to reduce cold-weather forced outages.

■ New York

- NYISO will monitor pipeline and distribution restrictions (OFOs).
- NYISO's new real-time market system has improved bidding, dispatch, and forecasting (but start-up in December could encounter shake-out problems).

■ Texas

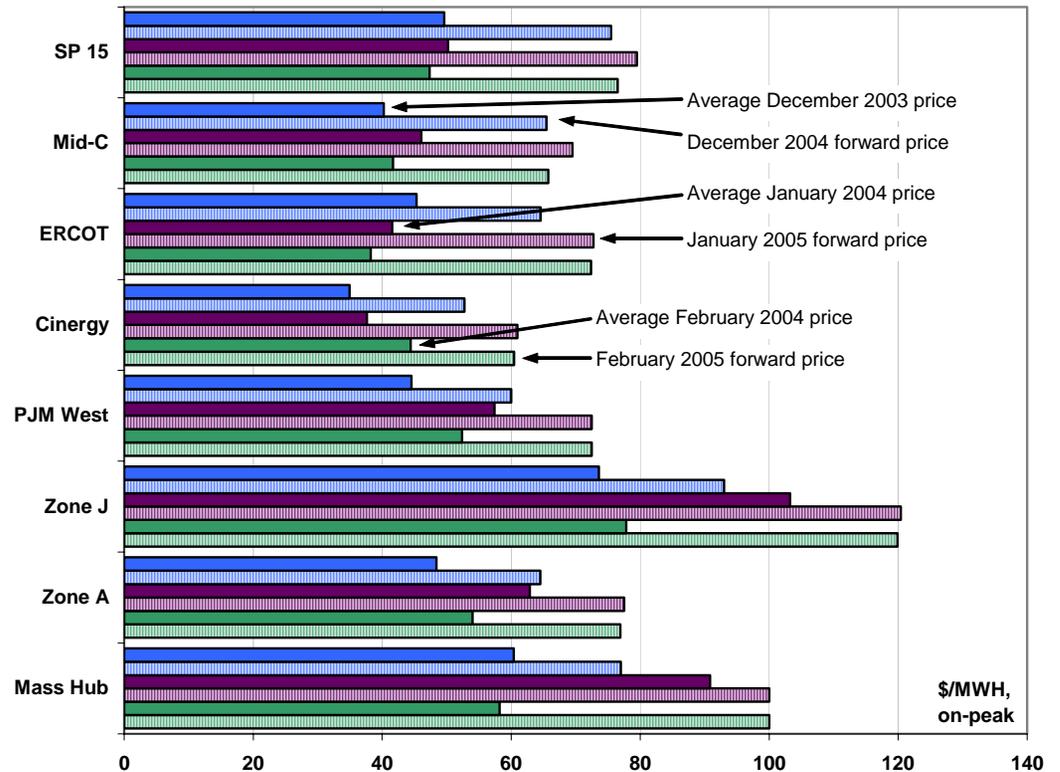
- ERCOT attempting an inventory of dual-fuel capability (but is encountering concerns about proprietary information).



Sources: ISO-NE Management Report, OMOI staff discussions with NYISO and ERCOT

Fuel prices will push up the cost of wholesale electricity

- All primary fossil fuels--natural gas, coal, and oil--will cost more this winter.
- Forward contracts for this winter are higher than last winter's actual prices (chart).
- Nuclear generation has little spare capacity and cannot cushion prices.
- Gas and oil may take turns setting prices in the Northeast and Florida.
- Effects vary with regional fuel mix:
 - New England and ERCOT most sensitive to gas.
 - New York sensitive to gas and oil.
 - PJM and MISO sensitive to coal.



Sources: OMOI analysis of Platts' data, reports from ISO-NE, NYISO, PJM, ERCOT, NERC.



Winter issues in California

- Upgrades and construction should not effect service this winter.
 - Pacific DC Intertie work scheduled to be completed in December. Returns intertie to full 3,100 MW capacity. Substation upgrades will make the connection between Southern California and the Pacific Northwest more robust.
 - Miguel transformer bank work will provide San Diego with greater import capacity.

- California markets need to take action this winter to avoid likelihood of market imbalances in the Summer of 2005.
 - The supply-demand balance in southern California was tight during the peak load hours of summer 2004.
 - CAISO and CEC warned of possible firm load interruptions in summer 2005 if there are generator retirements, together with high heat-driven loads.
 - In October 2004, SCE and PG&E issued RFOs for call options and capacity, some starting in April 2005.



Sources: CALISO, CEC, OMOI staff analysis.

RTOs expand, MISO and PJM work on coordination issues

- PJM's inclusion of ComEd, AEP and Dayton expands its market and transmission system to areas served by different gas markets. This increased complexity is offset somewhat by increased diversity of fuel supply.
- MISO expands to include Illinois Power and prepares for market operations in March of 2005.
- Operations on one side of the PJM-MISO border affect operations on the other side. The two RTOs will operate this winter in the first level--the market-to-non-market level--of the Joint Operating Agreement.



Sources: PJM, OMOI staff analysis.

Contributors

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