Natural Gas Price Impact on the Coal Market

Why natural gas, why right now, and what happens next?

September 20th, 2012
BENSTEK Energy Market Information

Agenda:

- Why is natural gas so cheap?
- Evolution of Natural Gas Production – the Unconventional Revolution.
- Demand Response from the Power Sector.
- Producer Response and Future View on Price.
1990-1998: Fuel Price Competition

Total Installed Capacity (MW)

Fuel Cost of Generation ($/MWh)

Source: BENTEK GENCast, Platts Gas Daily, Coal Trader
1999-2004: Gas Gen Capacity is Overbuilt

Source: BENTEK GENCast, Platts Gas Daily, Coal Trader
2005-2008: High Gas Prices Beget Unconventional Technology

Source: BENTEK GENCast, Platts Gas Daily, Coal Trader
2009-Present: Fuel Price Competition and Shift to Natural Gas

Fuel Cost of Generation ($/MWh)

Total Installed Capacity (MW)

Source: BENTEK GENCast, Platts Gas Daily, Coal Trader
U.S. Gas Production Steady Through 2012

- 2010 Avg. = 57.1 Bcf/d
- 2011 Avg. = 61.5 Bcf/d
- 2012 YTD Avg. = 63.6 Bcf/d

Source: BENTEK Supply and Demand Report, Dry Production
Southwestern Energy’s Rig Productivity Gains

Fayetteville Shale

Source: Southwestern Energy Financials

- Drill Time (Days) - Wells Per Yr. Per Rig - Avg. Lateral Length (Feet) - 30 Day Ave. Prod Rate (Mcf/d) - IP Additions Per Rig Per Yr. (Mcf/d) - Drill & Complete Costs ($MM)

1st Quarter 2007: 20, 18, 2,104, 1,006, 18,360, $2.6
1st Quarter 2008: 18, 50, 4,703, 2,606, 130,300, $2.6
1st Quarter 2010: 7, 50, 2,104, 1,006, 18,360, $2.6
4th Quarter 2011: 7, 50, 4,703, 2,606, 130,300, $2.8

% Changes:
- Drill Time: -64%
- Wells Per Yr.: +174%
- Avg. Lateral Length: +124%
- 30 Day Ave. Prod Rate: +159%
- IP Additions Per Rig Per Yr.: +610%
- Drill & Complete Costs: +8%
Commodity Prices Influence Producer Decisions

Value Gap ~16:1
Plays With High Returns Attract Drilling Rigs

Source: BENTEK, September 2012

Rig Increases Dry Gas Focused Areas
Rig Increases Liquids-Rich/Oil Focused Areas
Rig Declines

Active rig count: September 7, 2012 / Change in rig count from Jan. 6, 2012
U.S. Gas Processing Capacity Set to Increase by 22% Thru 2015

*As of 7/30/2012

www.BentekEnergy.com
U.S. NGL Production to Increase 49% over the next Five Years

1.1 Million Barrel per day Change in Raw Mix Supply
Rates of Return Dictate Drilling Pattern and Pace Gas Production

Price Assumptions:
- Gas = 12 month forward average curve for each regional pricing point (price range $3.26-$3.49/Mcf)
- Oil = 6 month WTI +/- differential (price range $74.98-$98.85/barrel)
- NGLs = weighted average $/barrel, based on current Mt. Belvieu prices and the typical composition in each region (range $27.78-$51.92/barrel)

Source: BENTEK
Northeast Production Could Add 7.5 Bcf/d 2017 vs. 2012

Incremental 7.5 to 9.7 Bcf/d by 2017!
U.S. Dry Gas Production Forecast to Grow 12.8 Bcf/d from 2011 to 2017

+2.3 Bcf/d Per Year

Flat!

+2.1 Bcf/d Per Year

www.BentekEnergy.com
In May, U.S. was nearly 5 Bcf/d long year over year.
Storage Surplus Starts Injection Season at Over 900 Bcf

Inventories Vs. Rolling Five Year Average (Bcf)

- Inventory Surplus
- Forecast

Source: EIA, ICE
Gas Demand from Power Up 5 Bcf/d (24%) in 2012

Highest weekly avg. burns ever!
Power Burn Up Significantly in 2012 but Hotter Temps Suppress YOY Increase

U.S. Power Burn Per Degree (Bcf/d)

- 6 Bcf
- 3 Bcf

- 2009-11
- 2012
New World Order in US Power Markets

Source: EIA 923
Imbalance Forced onto Coal Market Winter 10/11 – Winter 11/12

Supply: -7 MMST

Demand: -58 MMST

Source: BENTEK EIA
Imbalance Forced onto Coal Market Summer 11 - Summer 12

Supply: -58 MMST

Demand: -33 MMST

-71.8

Source: BENTEK EIA
Barrage of EPA Regs Hit Power Sector

Significant EPA regulations affecting the power industry include:

1. **Mercury Air Toxics Standards (MATS)**
   b) Affects about 396 GW of Coal and Oil Power Plants

2. **Greenhouse Gas Rule (GHG)**
   a) Proposed this March
   b) Caps CO2 at 1,000 lbs per MWh (typical coal plant emits 1,800 lbs)
   c) Doesn’t Apply to Existing Plants
   d) Phases in over 30 Years

3. **Cross State Air Pollution Rule (CSAPR)**
   a) Stayed by the U.S. Court of Appeals in Dec. 2011.
   b) Imposes SO2 and NOX emissions caps in 27 states east of the Rockies
   c) States nearly achieved required reductions in 2011 because of Clean Air Interstate Rule requirements in 2005 and low gas prices.
Environmental Benefits of Switching

PJM Switching Q1 2011 VS 2012

1.3 Bcf/d

Pounds of Air Pollutants per Btu of Energy

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Natural Gas</th>
<th>Oil</th>
<th>Coal</th>
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<tr>
<td>Carbon Dioxide</td>
<td>117,000</td>
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<td>208,000</td>
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<tr>
<td>Nitrogen Oxides</td>
<td>92</td>
<td>448</td>
<td>457</td>
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<tr>
<td>Sulfur Dioxide</td>
<td>0.6</td>
<td>1,122</td>
<td>2,591</td>
</tr>
</tbody>
</table>

*EIA Natural Gas Issues and Trends

Pollutant Natural Gas Oil Coal
Carbon Dioxide 117,000 164,000 208,000
Nitrogen Oxides 92 448 457
Sulfur Dioxide 0.6 1,122 2,591

Source: BENTEK Power Burn Report, GENCast
YTD Change in Power Burn by Pipeline, 2007 VS 2012

Eastern Pipes: +82%
Transco, TX Eastern, Tenn: +35%

Midcon Pipes: +13%

Source: BENTEK
Majority of Power Growth Along Eastern Seaboard

- **5.4 Bcf/d in Pipeline Expansions by 2017**
  - SONAT South System III: 375 MMcf/d, June 2012
  - Transco Mid-South: 225 MMcf/d by July 2013
  - Gulf South Southeast Market: 450 MMcf/d, Q4 2014
  - Elba Express: 255 MMcf/d by December 2014
  - Transco Atlantic Access: 1.8 Bcf/d by late 2014

- **All targeting power demand growth**
- **Most designed to takeaway Marcellus supply**

Source: BENTEK Southeast/Gulf Observer Expansions, Demand Analytics
U.S. Gas Demand Forecast Up 12.6 Bcf/d from 2011 to 2017

+1.2 Bcf/d Per Year

+2.0 Bcf/d Per Year

70 Bcf of Demand in 2013 for Prod to Show in 2014
NYMEX Forward Curve Expectations

NYMEX – September 19, 2011

NYMEX – September 19, 2012

BENTEK Forecast – September 2012
Conclusions and Takeaways

- Natural Gas demand push has eroded storage overhang this summer, but need weather to show up in winter to balance market.

- Natural Gas production to slow then resume growth as higher oil prices, uncompleted wells, technological and efficiency gains allow E&Ps to respond to market conditions.

- Liquids production growth dependent on pipeline capacity expansions, demand growth and exports of purity products.

- U.S. storage glut = low price environment = high power demand

BENETEK is an energy market analytics company focused on the natural gas, liquids, crude oil and power sectors.

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