Upstream/Midstream Issues
CEE 2011 Annual Meeting and Forum

Estimated share of shale, 17% of U.S. total

* CBM and other U.S. shales estimated based on industry and government data
Historical Eras

- Henry Hub Monthly Average Spot Price ($/MMBtu)
  - Avg Feb 89-Feb 92 ($1.61)
  - Avg Mar 92-Dec 98 ($2.11)
  - Avg Jan 99-Dec 01 ($3.46)
  - Avg Jan 02-Sep 09 ($6.32)
  - Avg Oct 09-Aug 11 ($4.32)

GOM Hurricane Events

Key transactions for horizontal technology:
- First Barnett Shale well, 1981
- Horizontal drilling applied in Barnett, 2003
Oil & Gas Technology is Slow

Average duration of the four phases in different industries

Cost Management?

“We want to push costs below $3 rather than wait for nat gas prices to catch up”

Supply Curves:
- All reviewed average $5+ to 6
- LNG is incremental supply
- Shales are higher cost
Closer Look

What’s left for growth?

- U.S. Price Delivered to Residential
- NY Price Delivered to Residential
- NJ Price Delivered to Residential
- FL Price Delivered to Residential
- CA Price Delivered to Residential
## Review of Pipes

### Marcellus

<table>
<thead>
<tr>
<th></th>
<th>MMCF/D</th>
<th>Current Del.</th>
<th>Peak Del.</th>
</tr>
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<tbody>
<tr>
<td>Interstate in Service</td>
<td>850</td>
<td></td>
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<tr>
<td>Interstate Under Cons/FERC Application w/FT</td>
<td>2506</td>
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<tr>
<td>Intrastate In Service</td>
<td>375</td>
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<tr>
<td><strong>Sub-Total</strong></td>
<td>3731</td>
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<tr>
<td>Interstate Filed Firm Contracts</td>
<td>950</td>
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<tr>
<td><strong>Sub-Total</strong></td>
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<tr>
<td>Interstate Pending, Prefiled, Announced</td>
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<tr>
<td><strong>Total</strong></td>
<td>6518</td>
<td>3300</td>
<td>12000</td>
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### Fayetteville

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<td><strong>Total</strong></td>
<td>2000</td>
<td>2600</td>
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### Haynesville

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<td>Intrastate in Service</td>
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<tr>
<td>Interstate Under Cons/FERC App w/FT</td>
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<tr>
<td>Intrastate Under Construction</td>
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<td><strong>Total</strong></td>
<td>5260</td>
<td>7000</td>
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### Eagle Ford

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<tbody>
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<td>Intrastate in Service</td>
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<tr>
<td><strong>Total</strong></td>
<td>350</td>
<td>1200</td>
<td>5000</td>
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Trends: Marcellus Case

- Of the 850 mmcf/d of interstate in service, all are FT with producers
- Of the approved/under construction interstates (1525 MMCF/D) 1187 is with producers and 388 is with customers
- Of the interstates with firm contracts, all FT is with producers
- Supply push?

And Now A Message from the Sponsor

“The biggest point to punctuate the year with is that Kinder ‘bought the game’…positioned to move gas around the NA market by displacement.”

“Other fear we have is that people have ‘drunk the Kool-Aid’ on gas supply abundance and will forget the basics that you make in your point… This was espoused at the last Potential Gas Committee BOD meeting. Supply must still be nurtured and shielded from an overreaching federal government.”
### Storage: East

- **Bearish:** Actual above average
- **Bullish:** Actual below average

- **East Consuming**
- **HH Spot**

### Storage: West

- **Bearish:** Actual above average
- **Bullish:** Actual below average

- **West Consuming**
- **HH Spot**
“A ‘fair’ price for gas would be at par with that of oil, Qatar’s Energy Minister Mohammed Al-Sada said.”
- November 15, 2011, Bloomberg
Discussion

Eeekonomics…

- Lots of similar thinking
- Gas is not used as much as during regulated low price 60s
- Struggled as a business to get back to roughly 24%
  - Volatility, slower increase power demand
- Caution against 30 TCF market views
Eeekonomics…

- “Fuel is poised for success”
  - Cannot get to 30% until 2026; “inching along”
- Varying viewpoints on gas/coal
  - Only about 5 BCFD for coal retirements
- So, how to get organic growth???
- Shift in power devt dispatch to political realm

Eeekonomics…

- Will gas take its role??? Much more political question
- Signs of producer discipline – industry very good at capital destruction
- Exuberant capital is not there; fast money is gone
- Lack of discipline; affects lots of sectors
Eeekonomics…

• MLP “hot money” is only source
  – Relatively high sales prices for storage, upstream assets (higher than should be)
• Gas rig count down to 700 by 2012
• Marcellus wells look good
  – No below ground problems
  – General agreement that about 5-6 BCFD can be delivered at current prices

Eeekonomics…

• Question really is what to do with supply
• General agreement that regional delivery (forward displacement) is offsetting forward hauls
  – Back up to HH
• Huge price correlations across the continent
  – HH is an island – every location discounted to HH except Florida and far Northeast
Eeekonomics…

• With “flat basis nationwide, we now have a ‘U.S. hub’
  – What is the impact of lack of basis differentials???

• Yr 11 issues – expiration of 10-yr contracts (but financing was available for 70-80% volumes out of Barnett, Haynesville on 7 yr contracts)
  – What next when best gas (sweet spots) has been produced?

Eeekonomics…

• Upshot: consolidation era is on the way
  – Era of “third ownership” for pipelines

• Is MLP financing over???

• Pipelines will have to be created
  – Liquids transportation – pipes can only blend to handle liquids for so long
  – Will displacement business model discourage investment?

• Will Mexico take more gas?
  – Helped to pop the bubble in 1990s
  – Allows PEMEX to focus on oil