

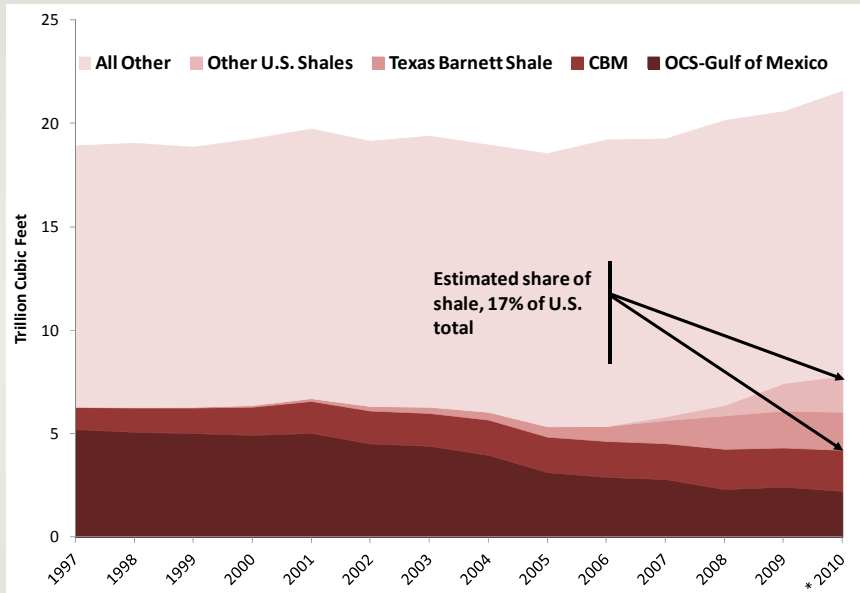


Bureau of Economic Geology, The University of Texas at Austin



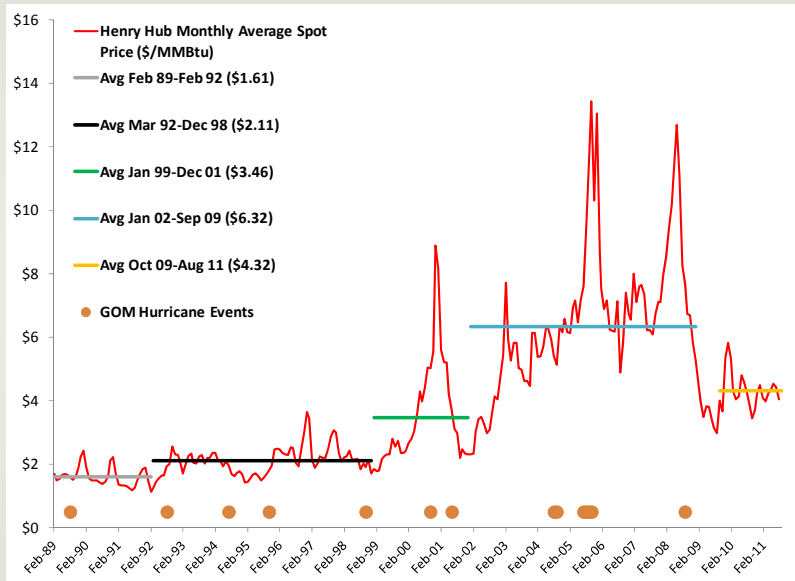
Upstream/Midstream Issues

CEE 2011 Annual Meeting and Forum

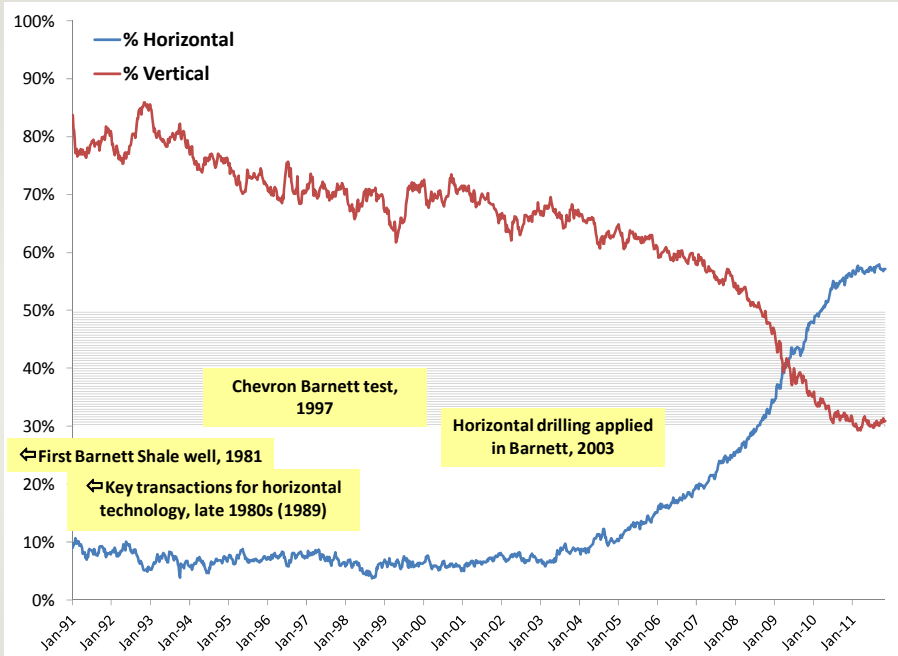


* CBM and other U.S. shales estimated based on industry and government data

Historical Eras



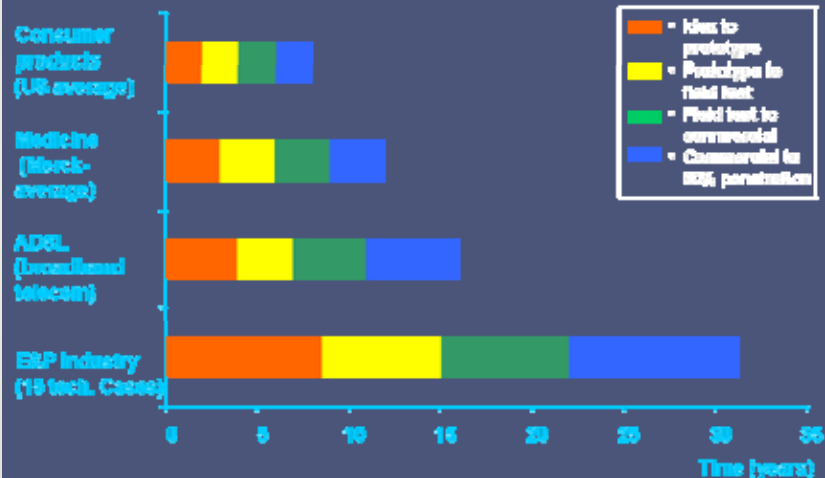
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Oil & Gas Technology is Slow

Average duration of the four phases in different industries

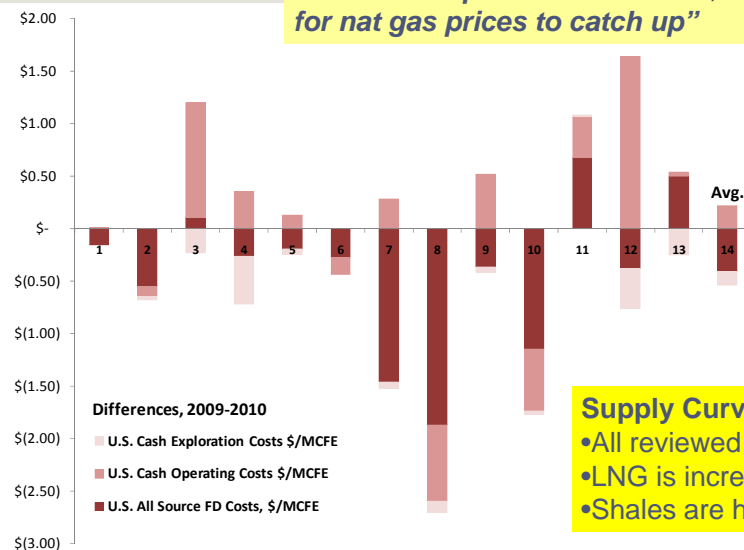


McKinsey & Company for Shell, 2001 NPC Study

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Cost Management?

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



Supply Curves:

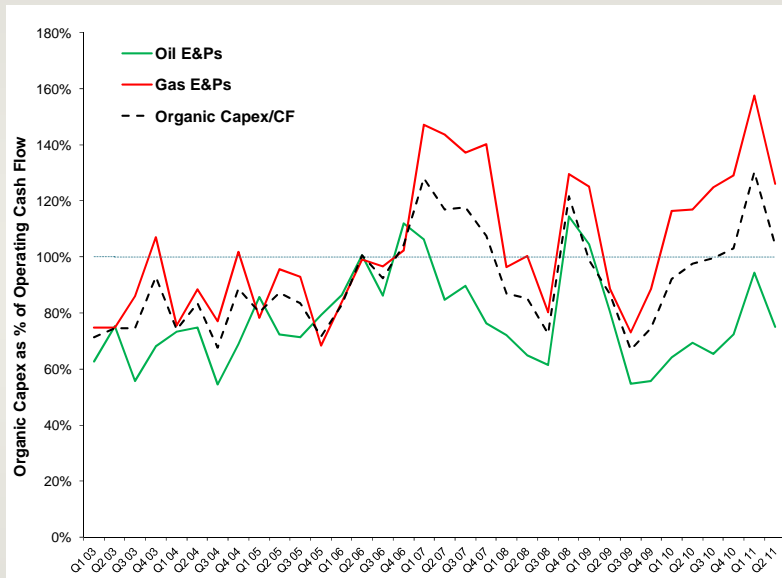
- All reviewed average \$5+ to 6
- LNG is incremental supply
- Shales are higher cost



Industry financials, CEE analysis

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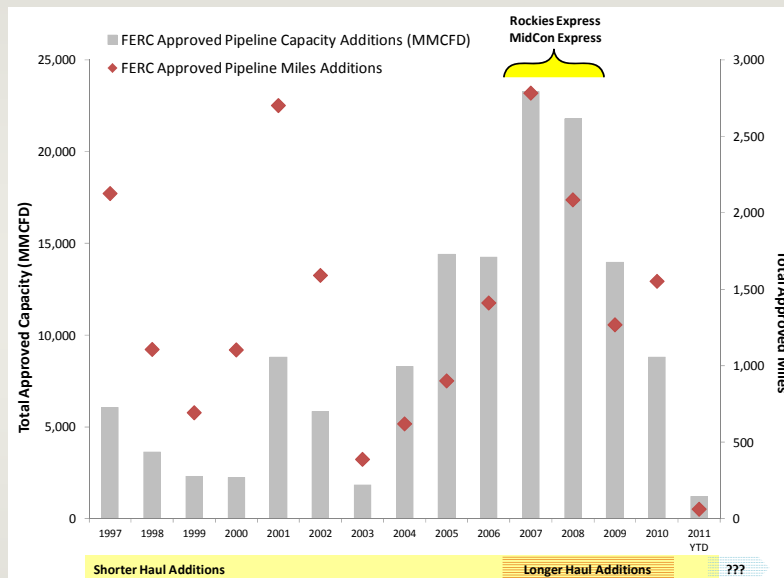
Sustainability?



Bernstein Research, used with permission

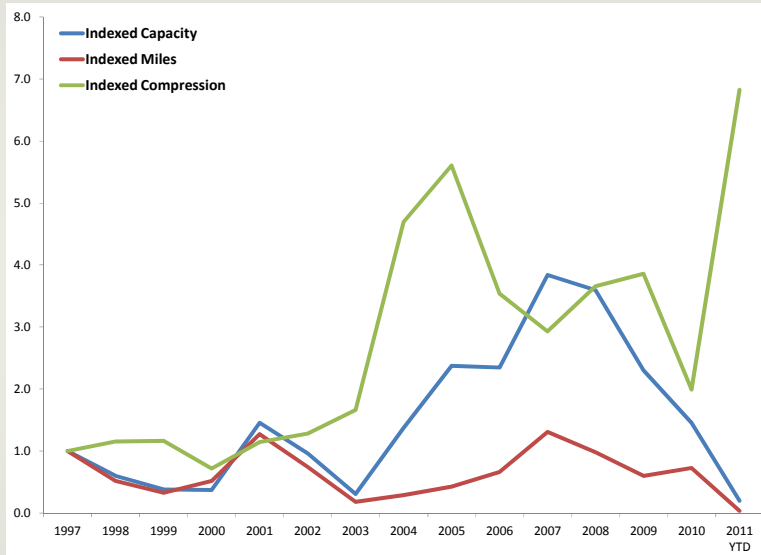
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Pipe Additions

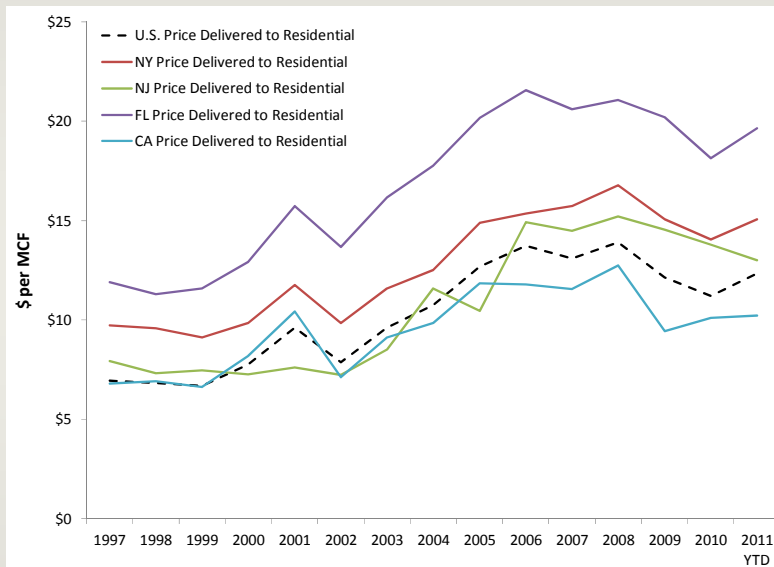


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Closer Look



What's left for growth?



Review of Pipes

Marcellus	MMCF/D	Current Del.	Peak Del.
Interstate in Service	850		
Interstate Under Cons/FERC Application w/FT	2506		
Intrastate In Service	375		
<i>Sub-Total</i>	<i>3731</i>		
Interstate Filed Firm Contracts	950		
<i>Sub-Total</i>	<i>4868</i>		
Interstate Pending, Prefiled, Announced	1650		
Total	6518	3300	12000



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Review of Pipes

Fayetteville	MMCF/D	Current Del.	Peak Del.
Interstate Under Cons/FERC App w/FT	2000		
Total	2000	2600	3500
Haynesville			
Intrastate in Service	3060		
Interstate Under Cons/FERC App w/FT	400		
Intrastate Under Construction	1800		
Total	5260	7000	12000
Eagle Ford			
Intrastate in Service	350		
Total	350	1200	5000



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Trends: Marcellus Case

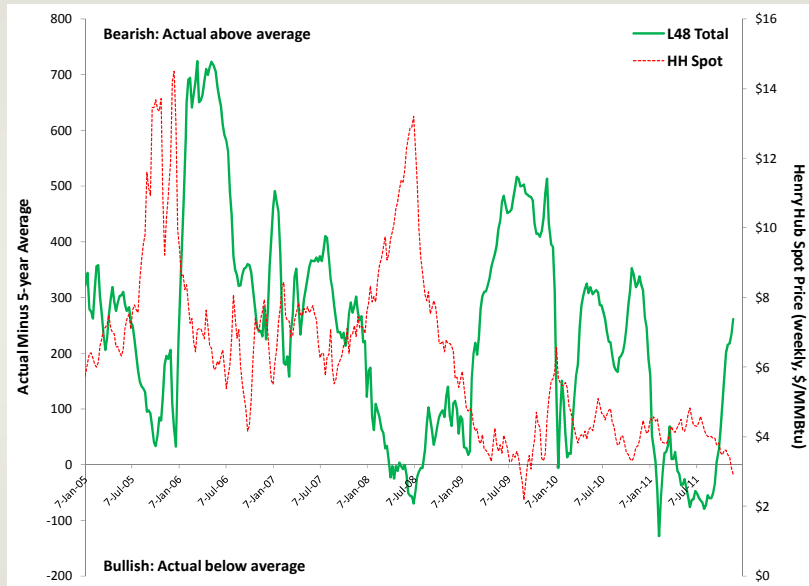
- Of the 850 mmcf/d of interstate in service, all are FT with producers
- Of the approved/under construction interstates (1525 MMCF/D) 1187 is with producers and 388 is with customers
- Of the interstates with firm contracts, all FT is with producers
- ***Supply push?***

And Now A Message from the Sponsor

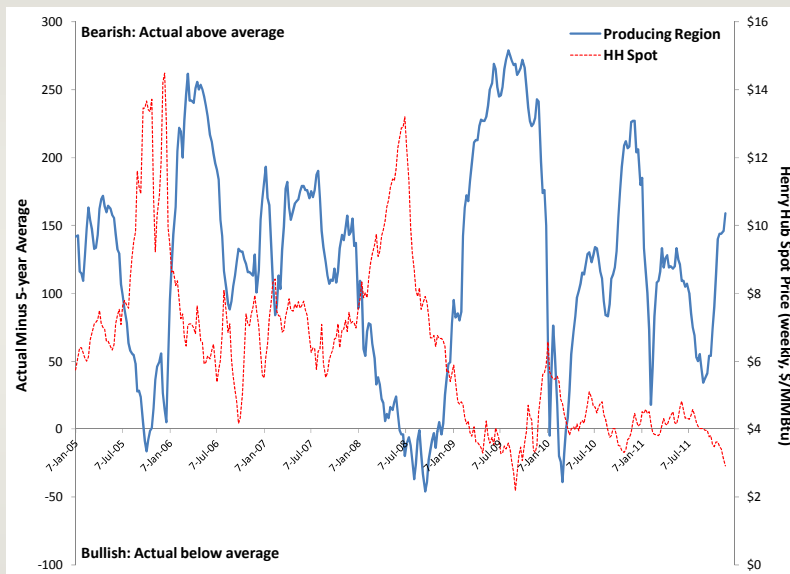
“The biggest point to punctuate the year with is that Kinder ‘bought the game’...positioned to move gas around the NA market by displacement.”

“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.”

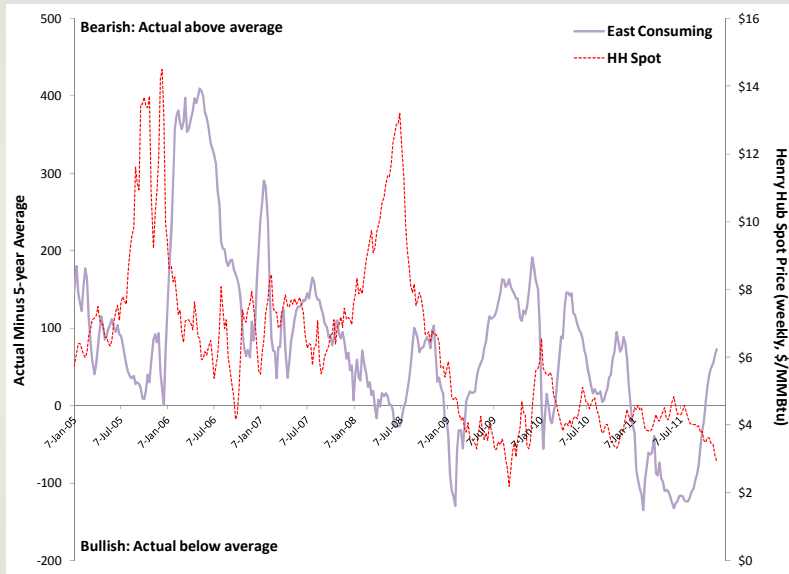
Storage: L48



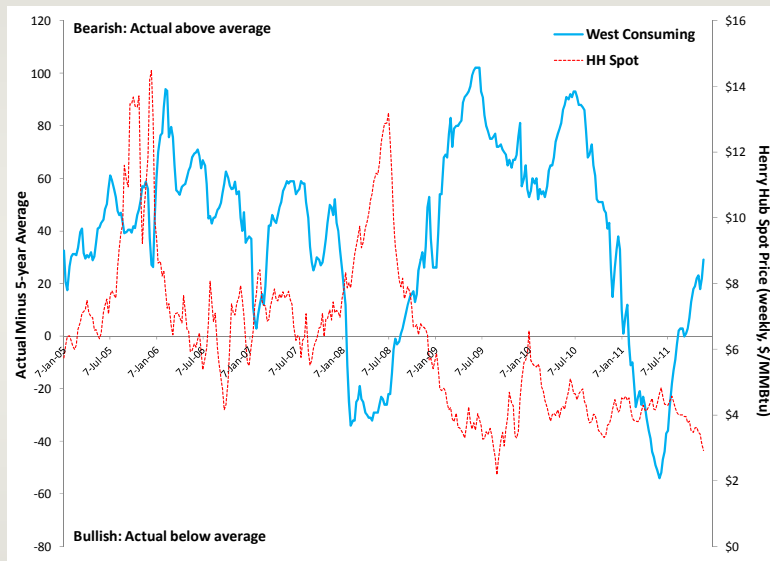
Storage: Producing

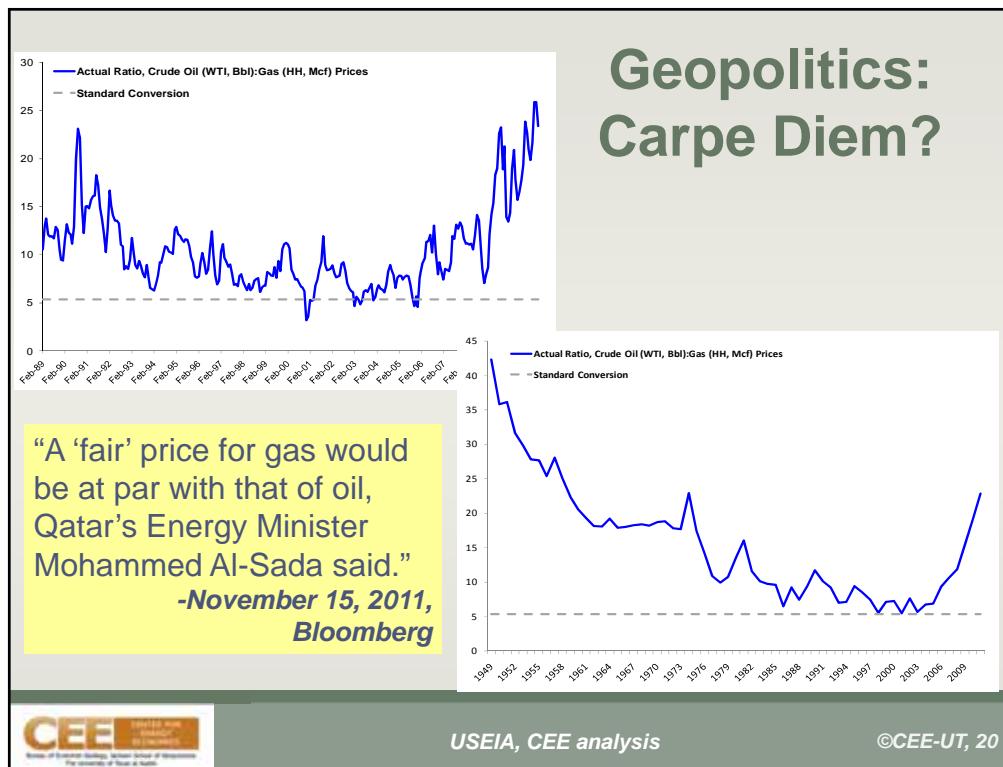
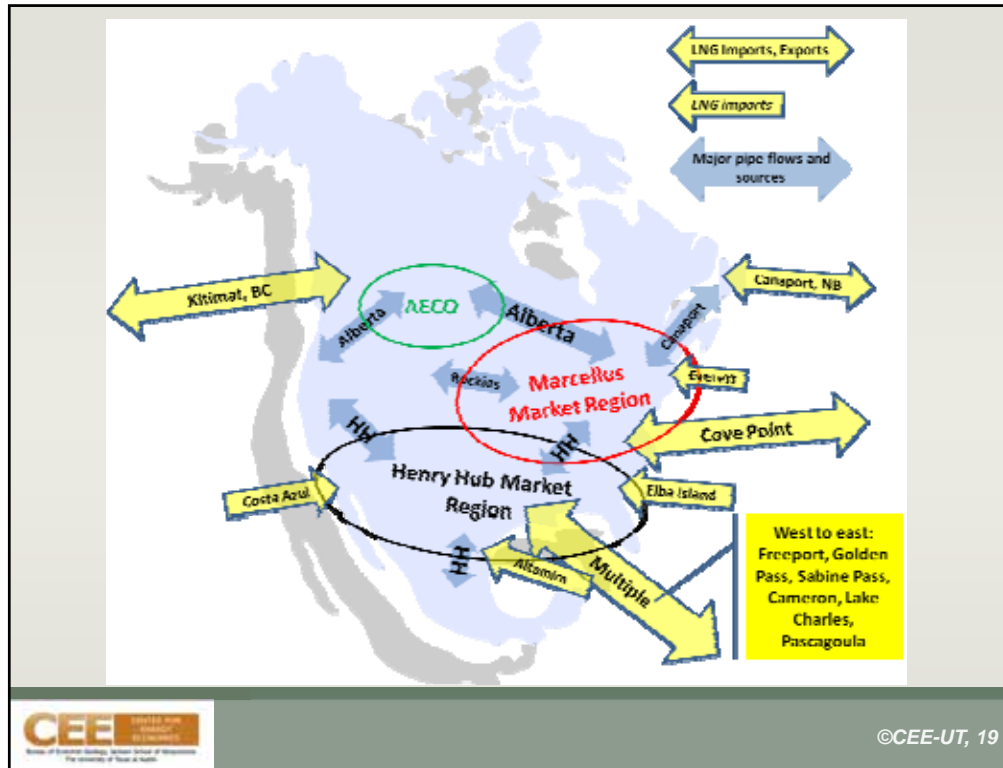


Storage: East



Storage: West





Discussion

Eekonomics...

- 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...

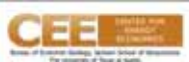
- With “flat basis nationwide, we now have a ‘U.S. hub’
 - What is the impact of lack of basis differentials???
- Yr 11 issues – expiration of 10-yr contracts (but financing was available for 70-80% volumes out of Barnett, Haynesville on 7 yr contracts)
 - What next when best gas (sweet spots) has been produced?



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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



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