

# The Alaska Pipeline – It's Not Dead Yet

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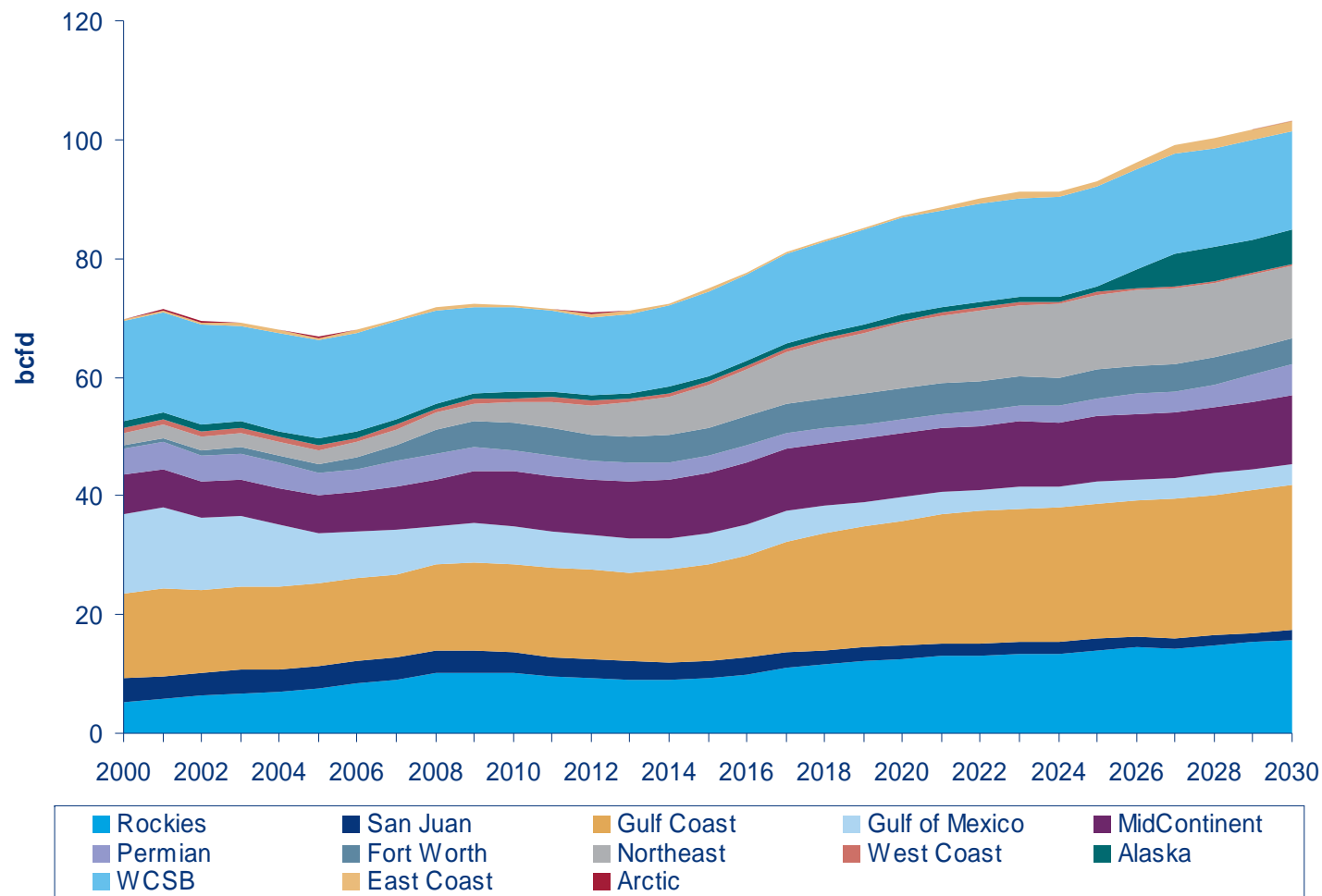
With apologies to Monty Python

consulting  
business environment



## Longer term, US and Canadian shale gas production is set to grow steeply

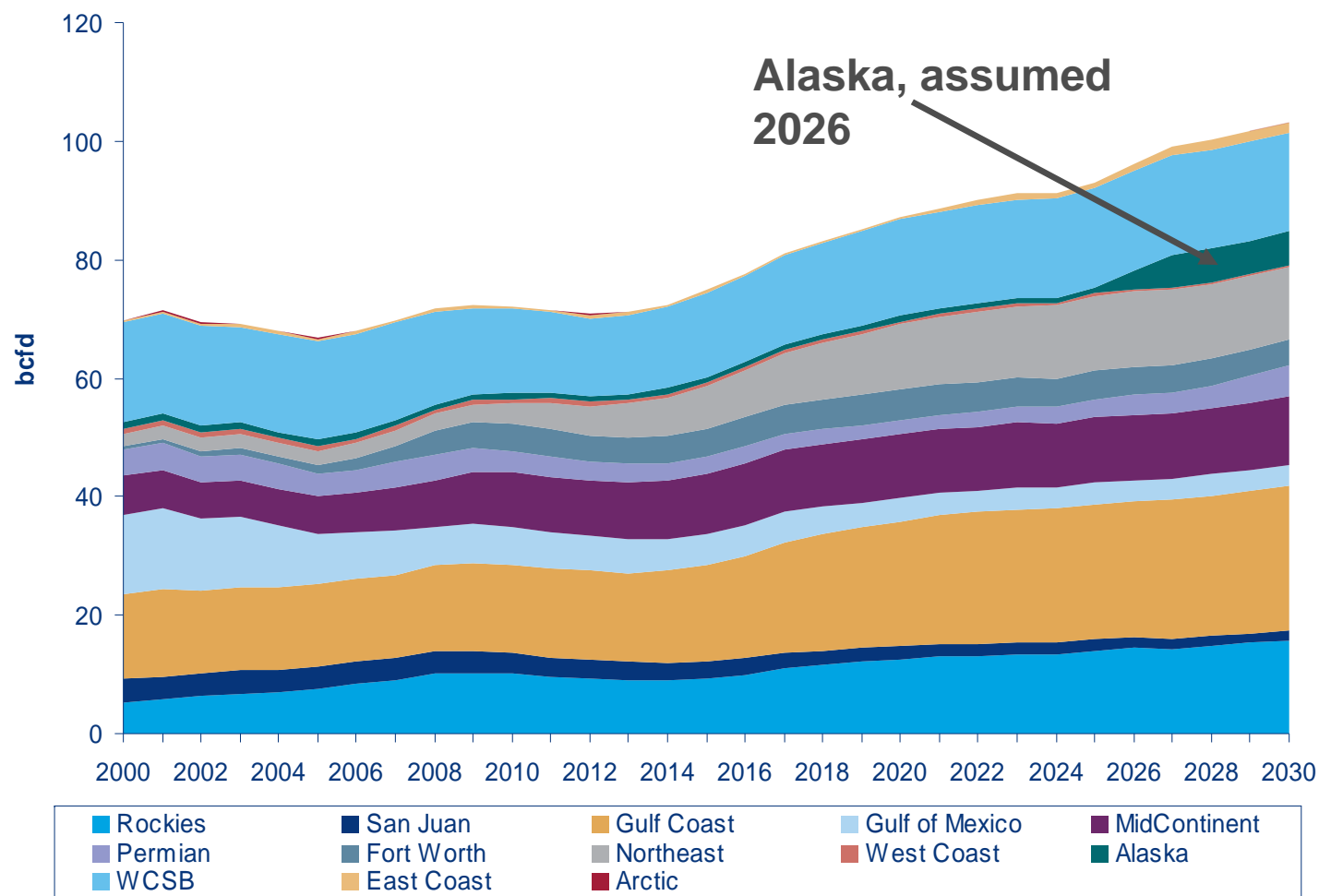
- › With near term weakness, US production plateaus at 56.0 - 56.5 Bcfd until 2013-14.
- › Growth in the Northeast and Gulf Coast lead the way.
- › Rockies production rebounds, at the expected \$6 - \$7.50 price level.
- › Canadian production is stabilized by BC shales, other unconventional supplies.
- › Marcellus set to see growth as gathering infrastructure improves.



Source: Wood Mackenzie NAGS and Upstream Service

## But, Alaskan Supplies Are Not Necessarily Shut Out of the US Supply Mix

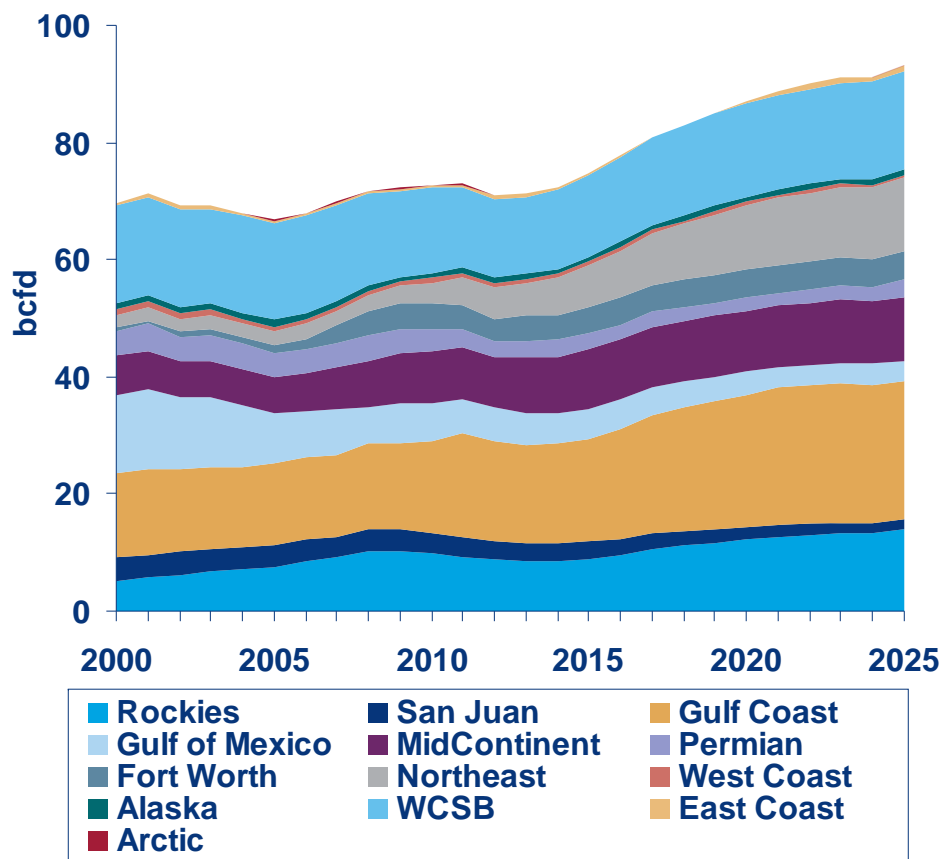
- › The near-term surplus is *not* indicative of the long-term cost or developing shale resources.
- › *Especially so*, in the context of likely demand growth.
- › At a price level of around \$6.50 or above, Alaskan supplies may enter the supply mix.
- › The LNG option is intriguing, but a pipeline is more likely.
- › Other LNG supplies outcompete AK in the Pacific basin.



Source: Wood Mackenzie NAGS and Upstream Service

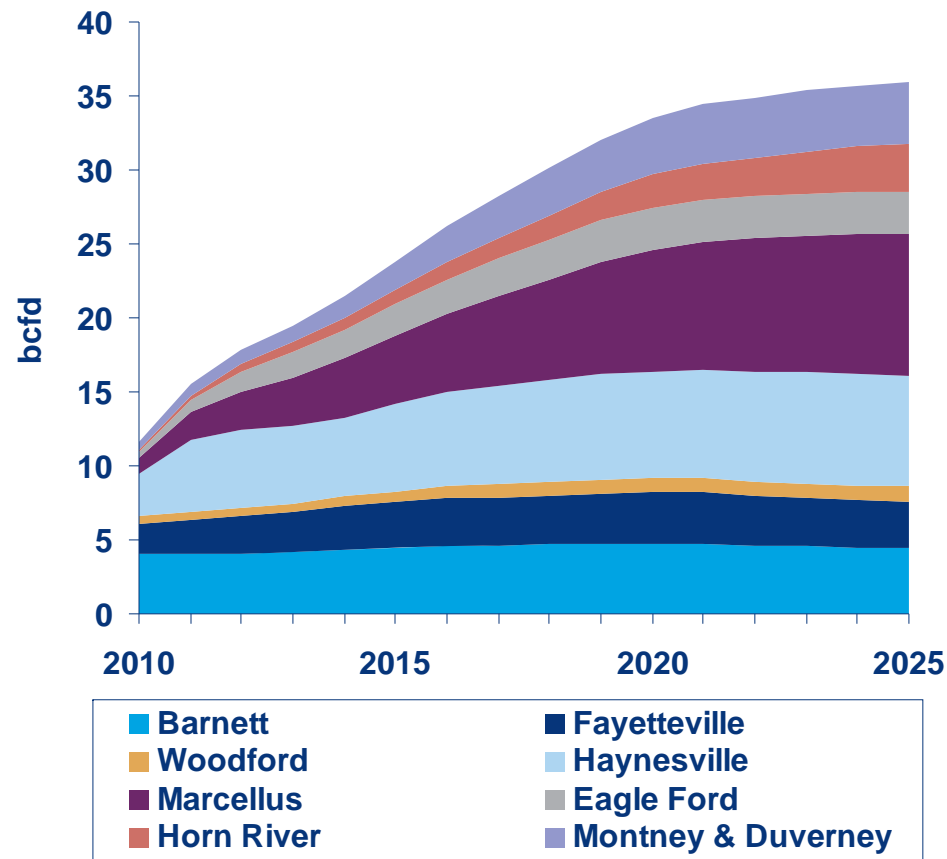
# Just the *Known* Shales Could Reach 35-40% of Overall US/Canadian Production

## US and Canadian production



Source: Wood Mackenzie

## Major shales



Source: Wood Mackenzie

## But the Major Uncertainties are: the Cost of *Future Shale Developments*, and the Market Size

- › In Wood Mackenzie's Current Base Case – approximately 10 Bcfd of production from currently undeveloped shales is needed, by 2030.
- › The possibilities are widespread – a partial list in which *some* test wells have been drilled:
  - Bossier – overlies Haynesville; significant upside given some really good well results.
  - Collingwood – strong leasing, but only 1 horizontal well test; results mixed
  - Utica in the US (PA and OH) - Utica acreage was mentioned in some recent deals involving the majors; highly prospective with 2-3 well tests
  - Pearsall – west Texas; a few dry gas wells, not economic as yet There is 3D seismic being shot that may aid in well selection.
  - Chattanooga – some minor drilling now; mixed results from CNX, Range, Chesapeake
  - Avalon – New Mexico; some drilling by EOG, Chesapeake; liquids rich
  - Anadarko Woodford – smaller sub-basin play in southern Oklahoma; a few smaller players, rich gas
- › All of these remain speculative, and there are others (Rockies, noncore areas of current developments). Based on current trends only Bossier and West Texas shales cumulatively appear likely to approach the volumes of a Barnett or Haynesville.

## The New Big Picture—North American Gas Market Overview

**Gas is Available in Any Feasible Quantity at a Moderate Price ...But It's *Not* \$4.00.**

### › Short-Term: Through early 2012

- Weighted by sluggish economic recovery and supply strength; coal displacement continues to influence the gas market

### › Mid-Term: Late 2012 - 2016

- With an increasing call on production as demand growth resumes, there is potential for growing pains as the market transitions from retrenchment to expansion; prices rise to the \$5.55 - \$6.50 range.

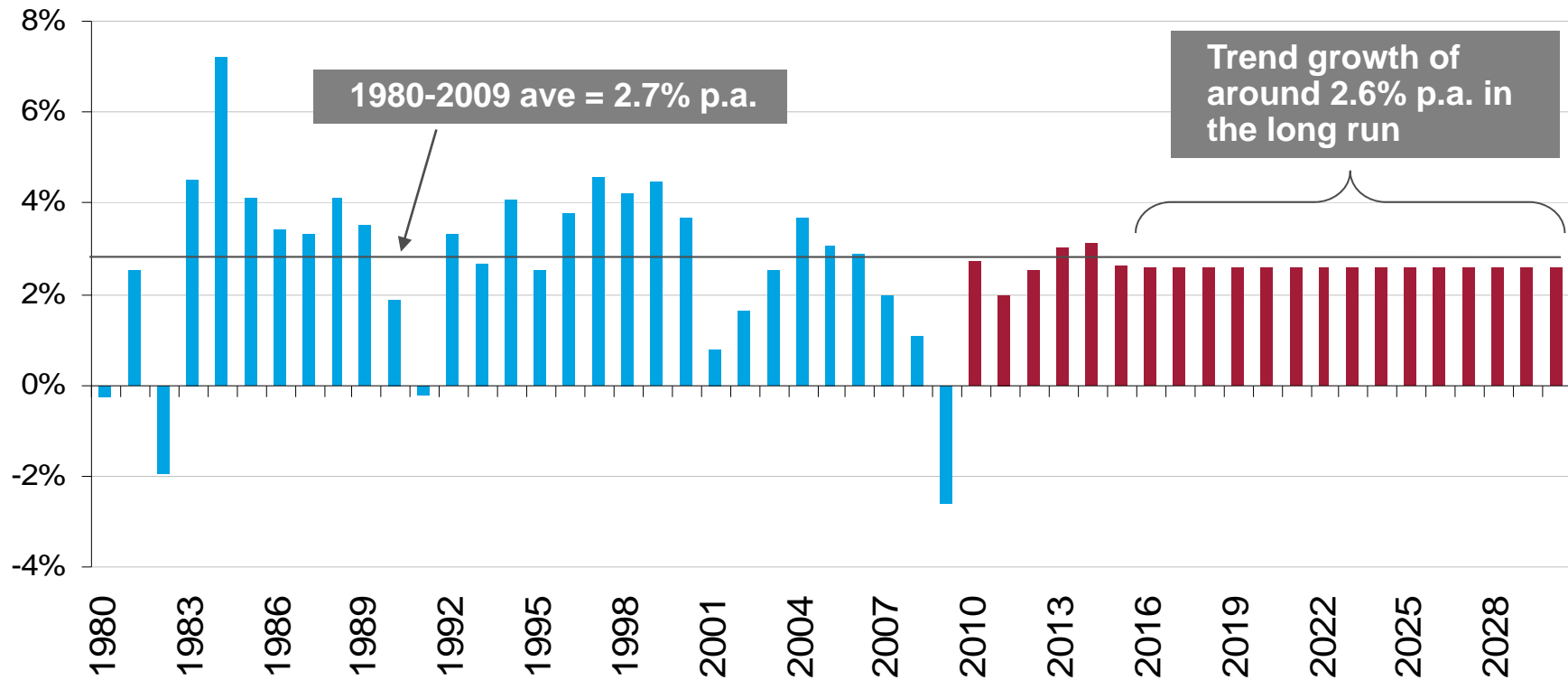
### › Long-Term: 2016 and Beyond

- Consistent demand growth appears likely, with the pace of growth shaped by coal retirements, potential carbon legislation and long-term US domestic resource strength.
- With the rebuilding of the upstream, pricing remains moderate: \$6.00 - \$7.00

**Within this Base Case view of the North American market, policy and politics will become increasingly influential, and can shift the fundamentals**

## But Even with a Relatively Weak Economic Growth Outlook...

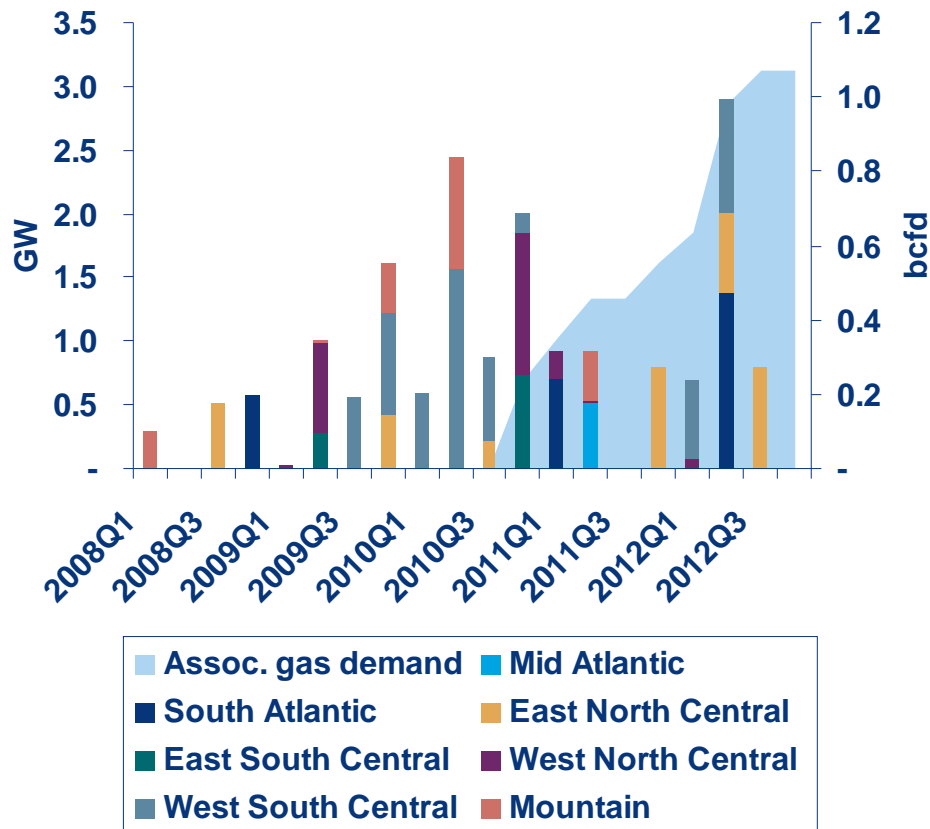
### US annual real GDP growth



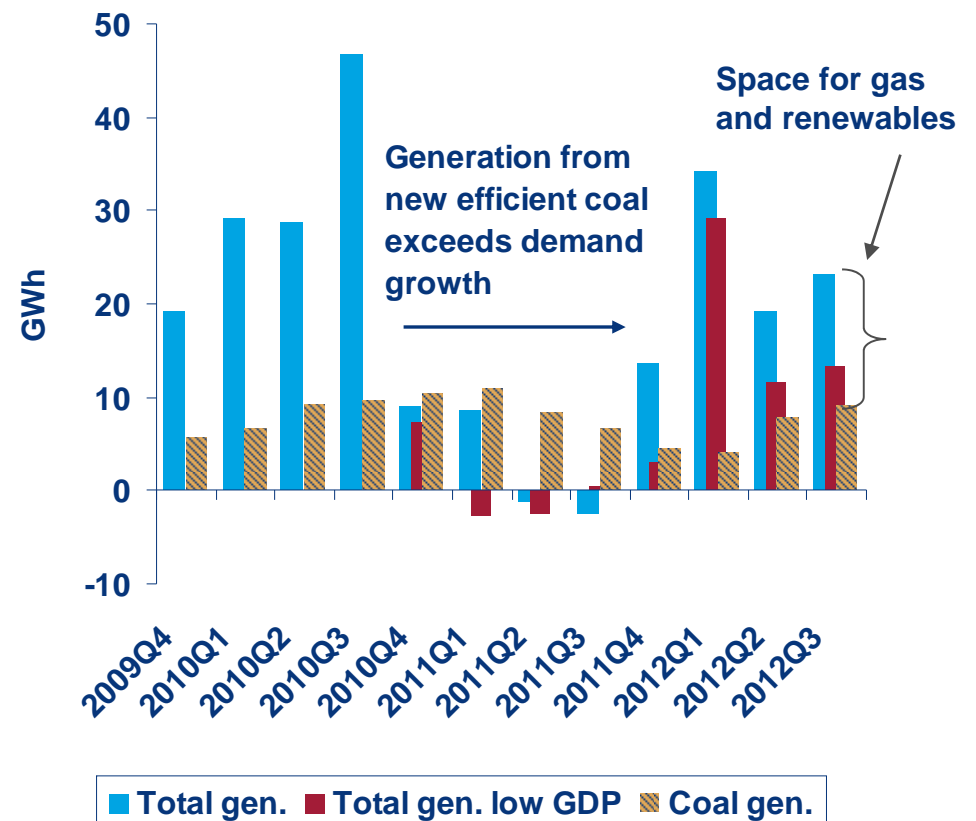
Source: US BEA, Wood Mackenzie projections

# The Current Weak Demand Context Shifts, and Growth Resumes once Recent New Coal Plants are Absorbed into the Power Market

New coal capacity



Year-over-year generation growth



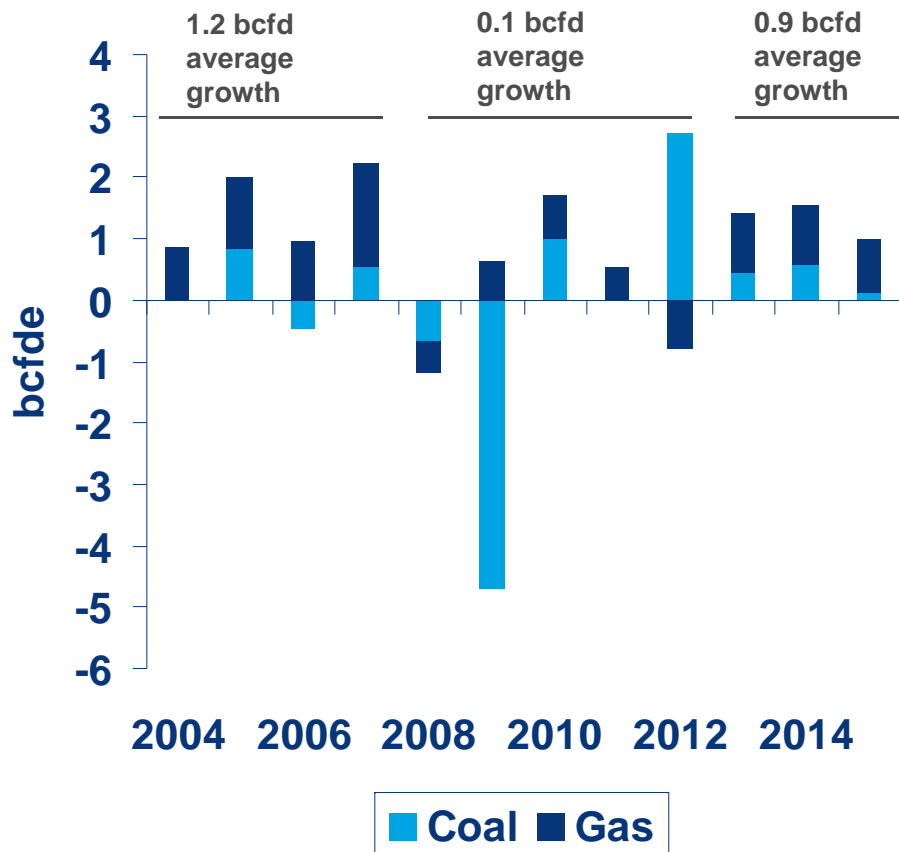
Source: Wood Mackenzie North America Power Service

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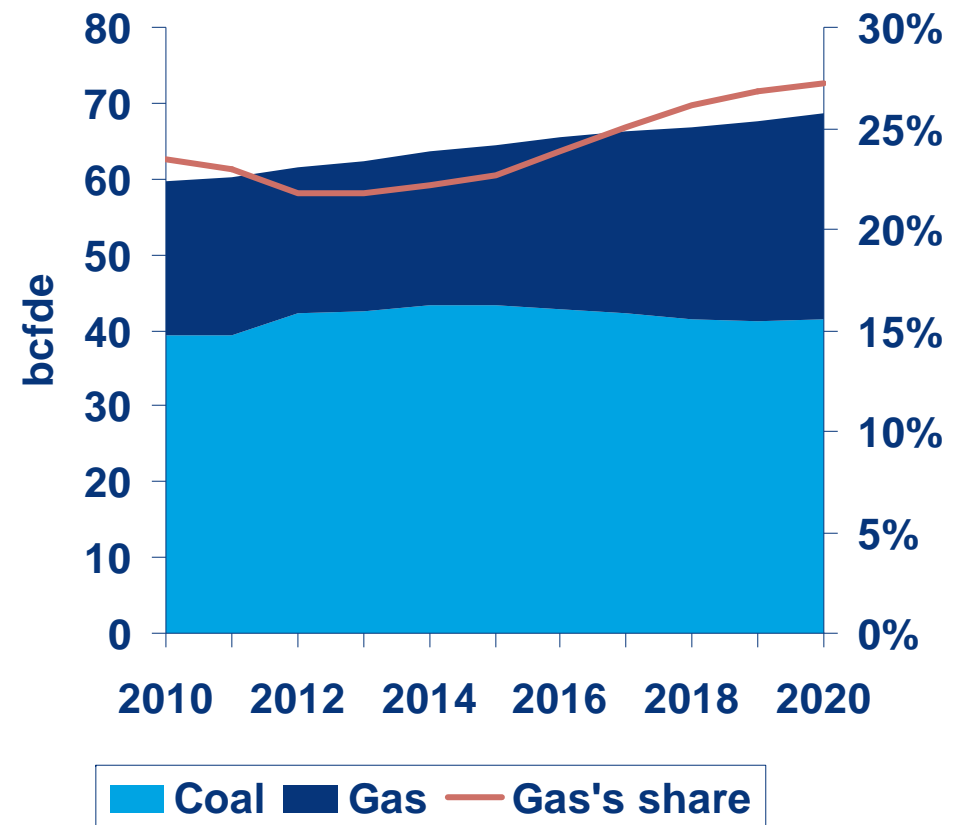


# By late 2012, demand growth begins to affect the gas market, and accelerates once coal retirements outpace new coal plant construction

### Gas and Coal Demand Growth in Power Sector



### Power Sector Trends

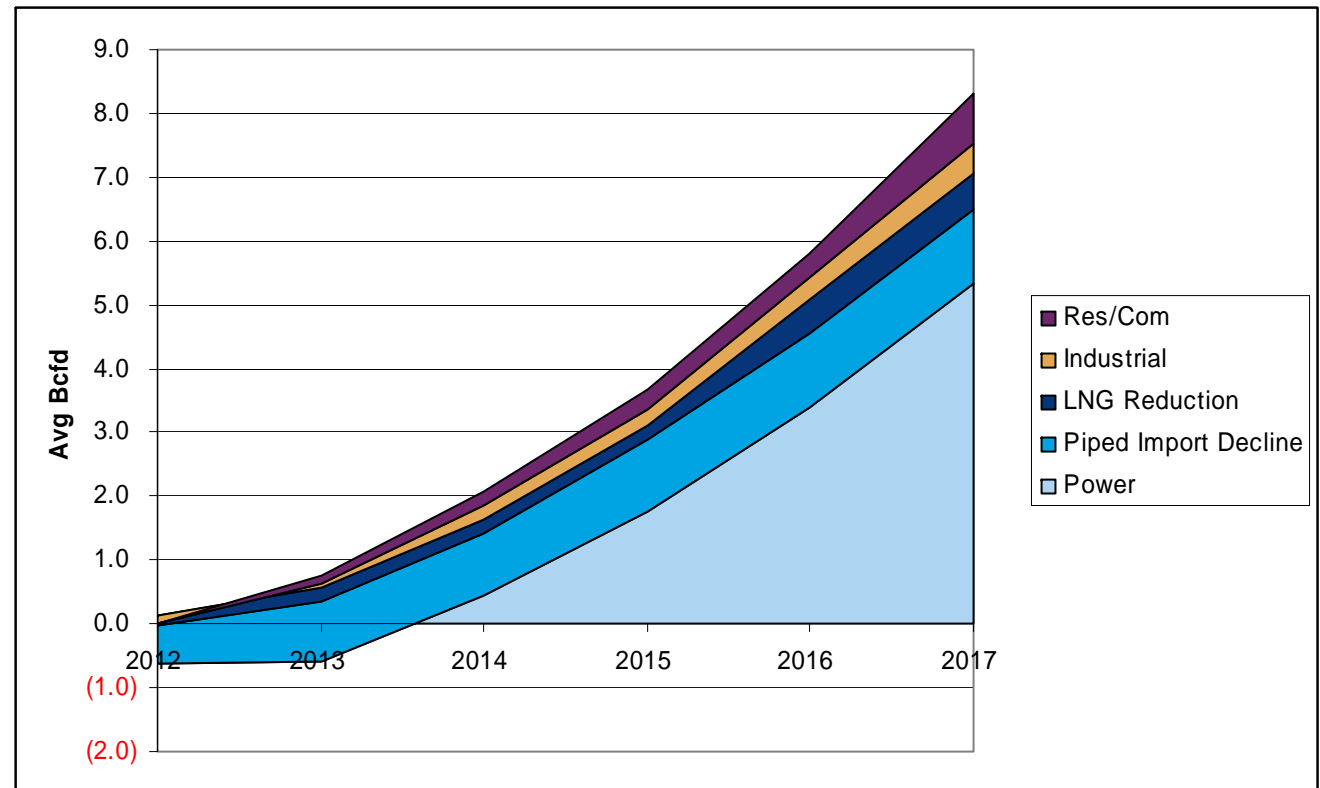


Source: Wood Mackenzie

## Longer Term, Strength in Power Demand and Declining Piped Imports Increase the Call on US Domestic Supply: 2012-17 compared to 2011

- › Power demand uplift is 2/3 of overall growth
- › Pipes imports decline, including an increase in exports to Mexico.
- › Canadian supply declines continue, but exports stabilize once shales/tight gas grow.
- › This higher pace of development and competition with oil for resources increases costs

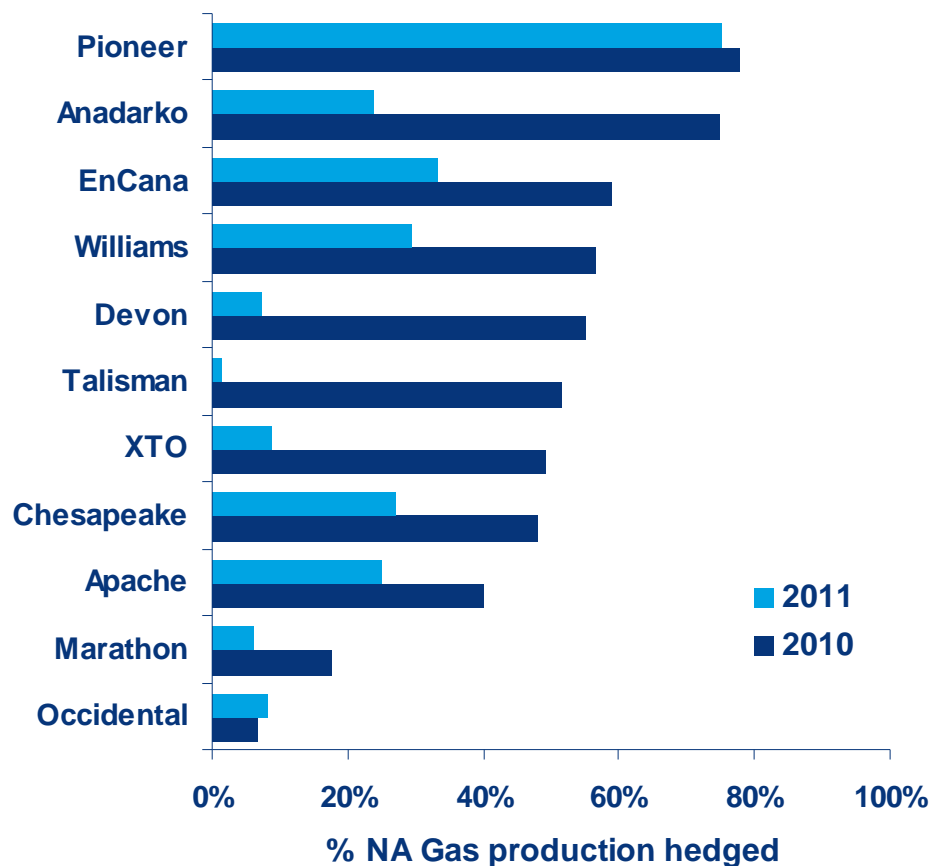
### Increasing Call on US Production



Source: Wood Mackenzie

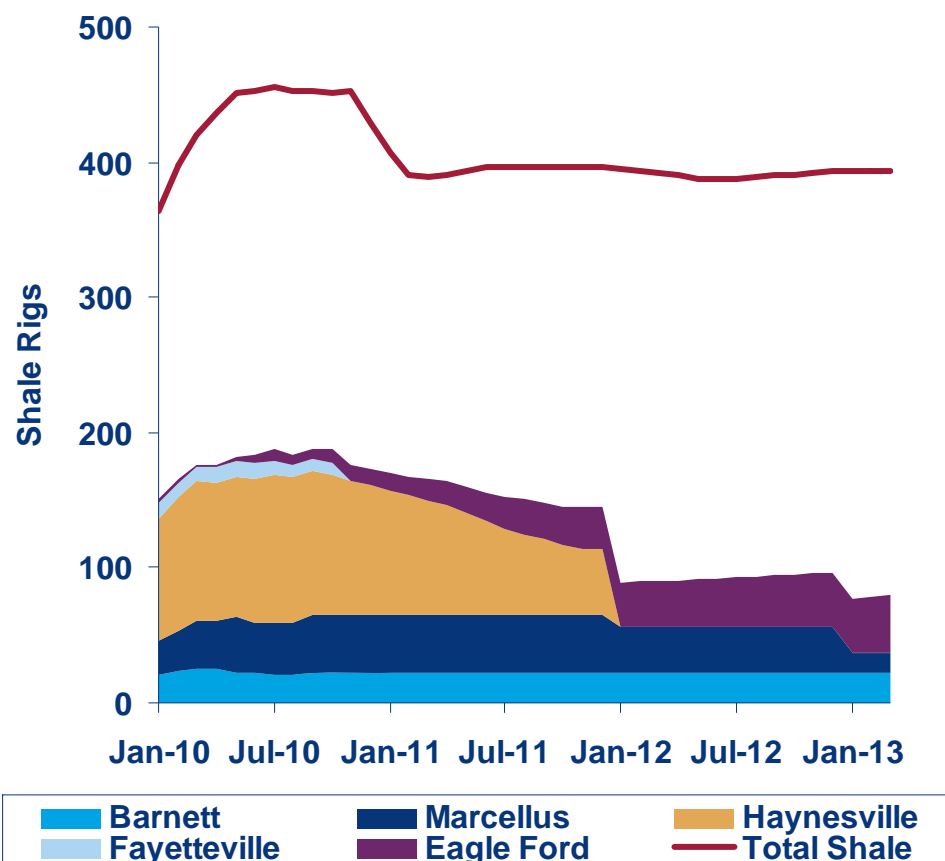
**On the Supply Side, with the loss of hedge support, cost carries, an easing of hold-by-production clauses, and competition with oil, drilling activity is expected to drop in 2011.**

**% of NA production hedged by top operators**



Source: Company filings

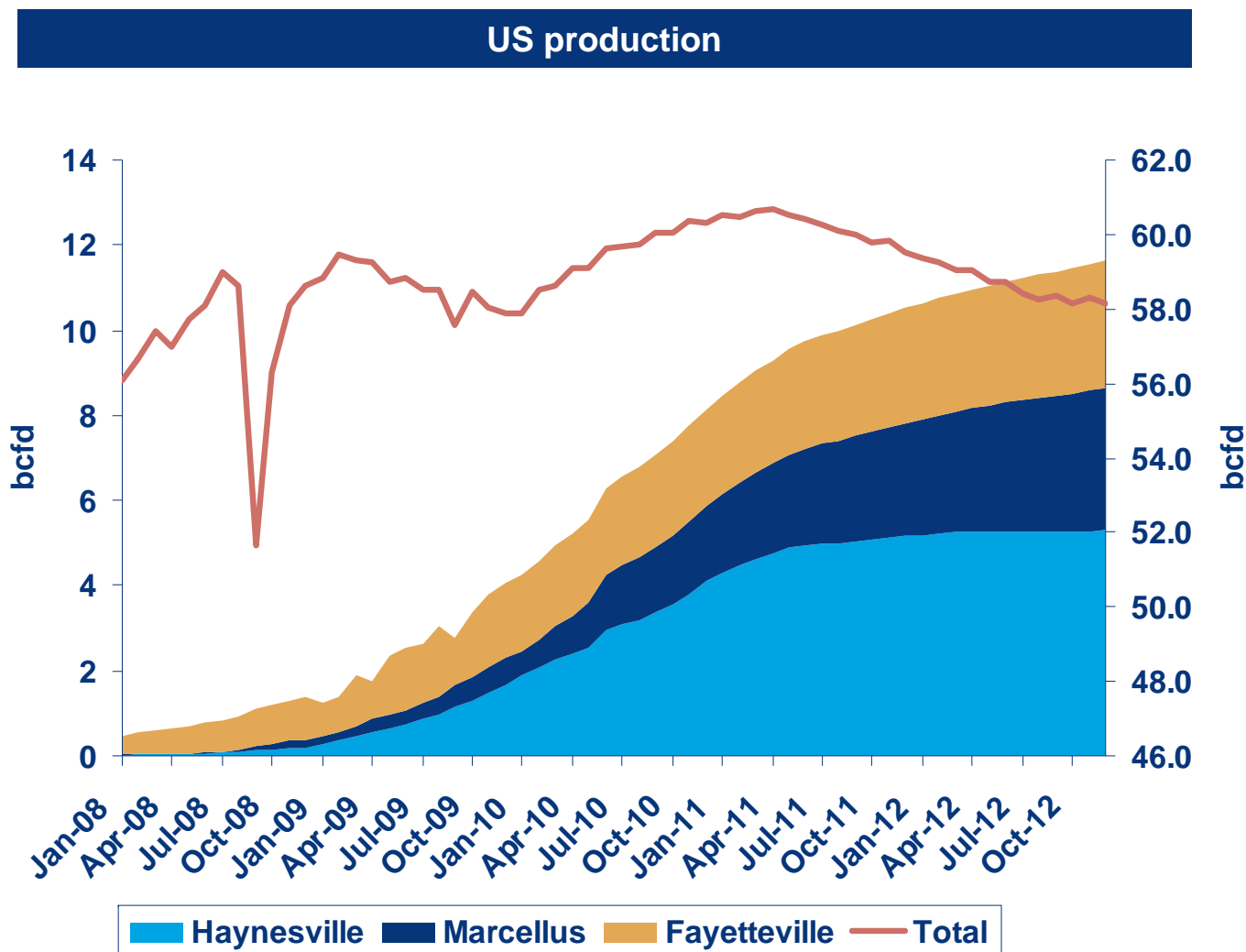
**Rigs under cost carries and HBPs**



Source: Wood Mackenzie

# Nevertheless, Key Shales Support Overall US Supply Growth Through Mid 2011

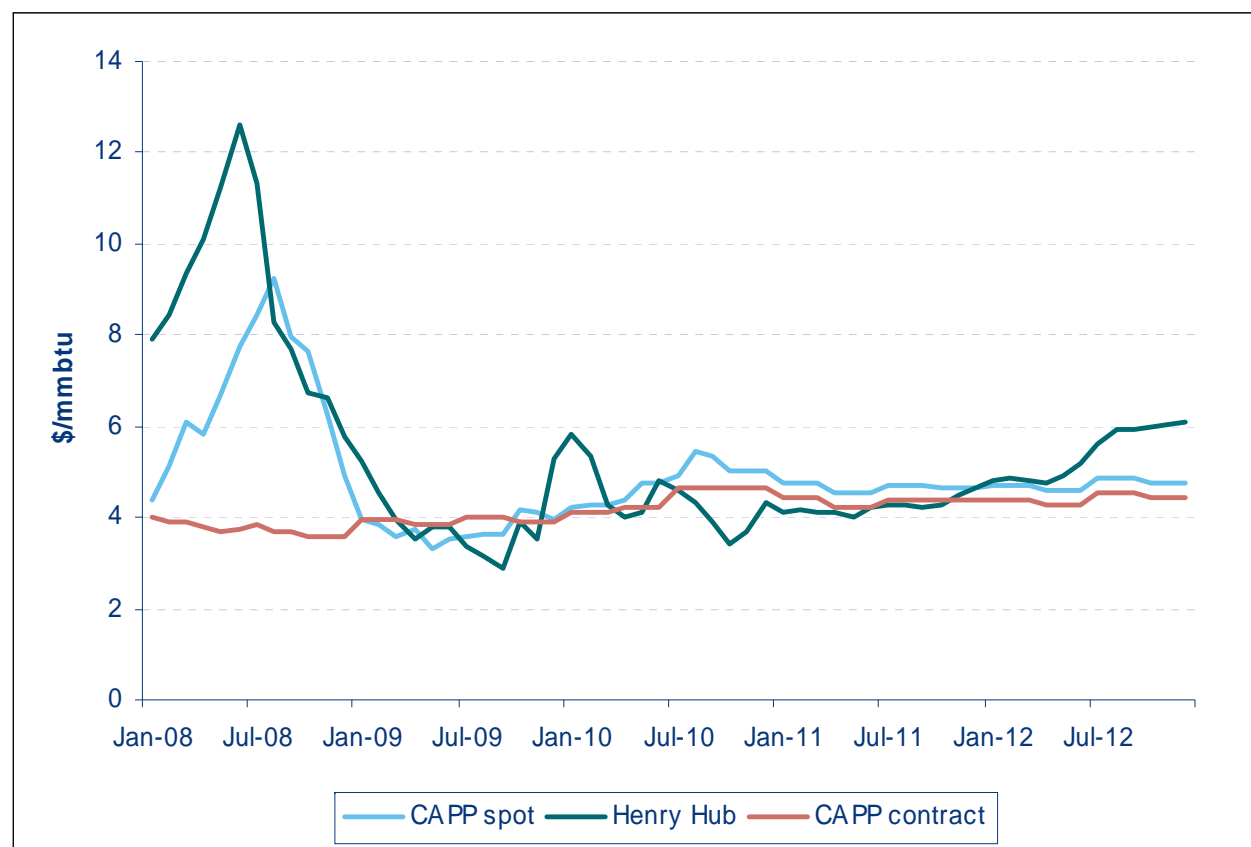
› Over the last six months, Haynesville, Fayetteville, and Marcellus production has climbed by 1.5 bcf/d.



## For Price: Near Term Weakness, but a Break Beyond Coal Competition next Year

- › High storage, a looser global market, and non-economic drilling through '10 precludes a large winter boost
- › Flat supply, firmer global markets, and power demand supports price rebound from current lows
  - Prices below \$4.00/mmbtu are likely short-lived (end mid 2011)
- › For 2011, prices remain in the low \$4.00s (\$4.23 nom) as the market remains well-supplied
  - Drilling levels look vulnerable late in year
  - Market support develops by winter 2011/2012 (\$5.41 2012 price)
- › \$5.50 - \$6.00 by late 2012

### Short-Term Price Outlook



Source: Wood Mackenzie

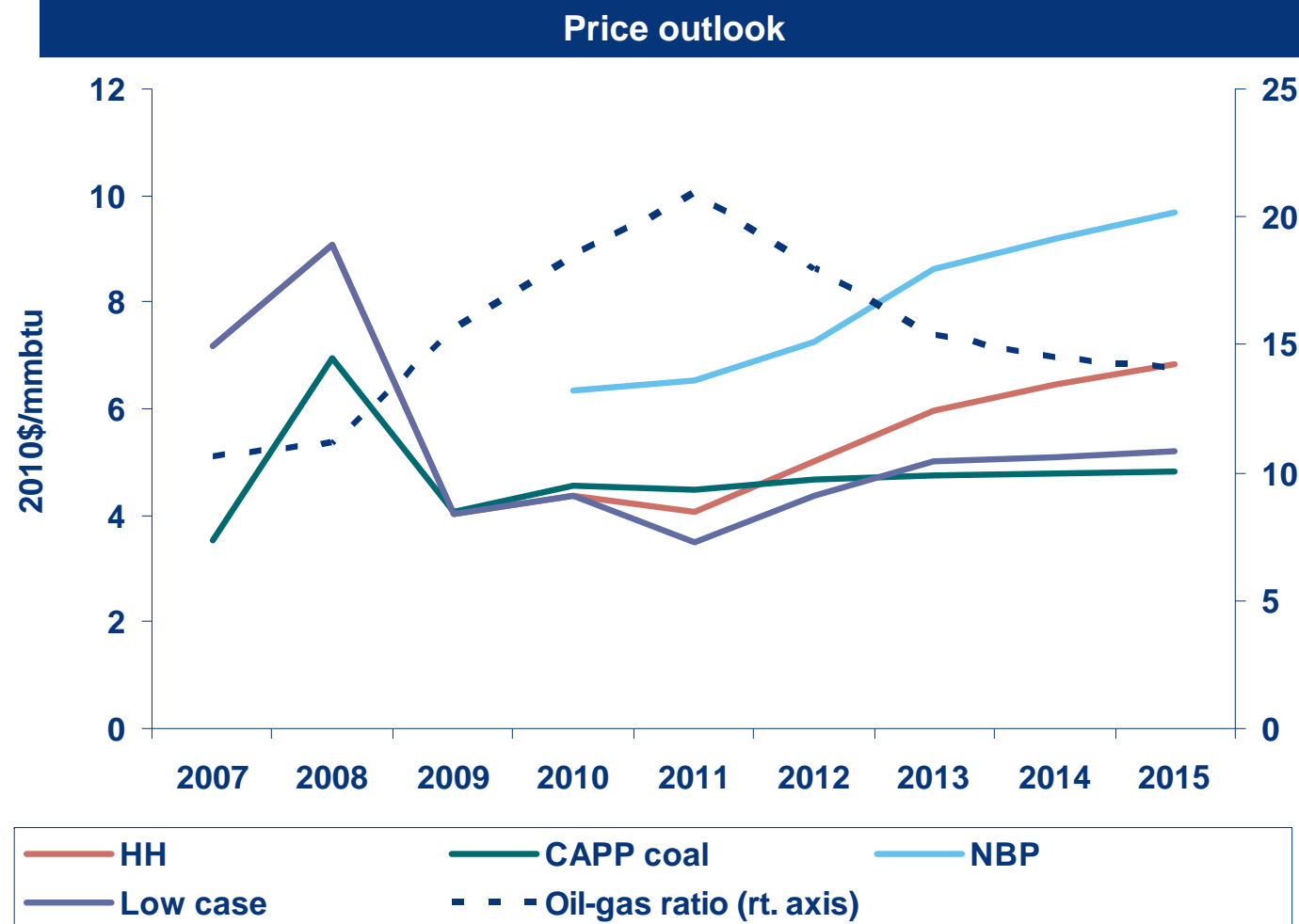
## But with Demand Growth, Higher Drilling Levels are Required, and Price Must Support it. Therefore, Price Expectations Rise Through 2015

### > Mid-term uncertainties

- Coal retirements
- Global market?
- Demand risks
  - La Nina
  - GDP

### > Drill baby drill

- Pace of tech. change
- Haynesville as bellwether



Source: Wood Mackenzie Coal Markets Service, NAGS, EGAPS, and Macro Oils

## **By Contrast – World Oil Markets face Demand Pressures, which are Attracting Upstream Investments**

- › **World oil demand increases by an average of 1.5 million barrels per day annually**
- › **Initially, non-OPEC/unconventional supplies can offset part of this demand increase.**
- › **2013-2015 and beyond, OPEC spare capacity comes under pressure**
- › **Prices increase steadily, even assuming conservative economic growth, and increasing consumption efficiency in the developed world**

## So In Relative Terms Gas Remains Cheap—Oil and Gas Stay Apart

› Average price WTI:

- 2010-15: \$89.46
- 2016-20: \$92.21

› 2021-30: \$105.26

› *Plentiful exploration risk, and reservoir performance risk in this oil outlook, in contrast to US gas.*

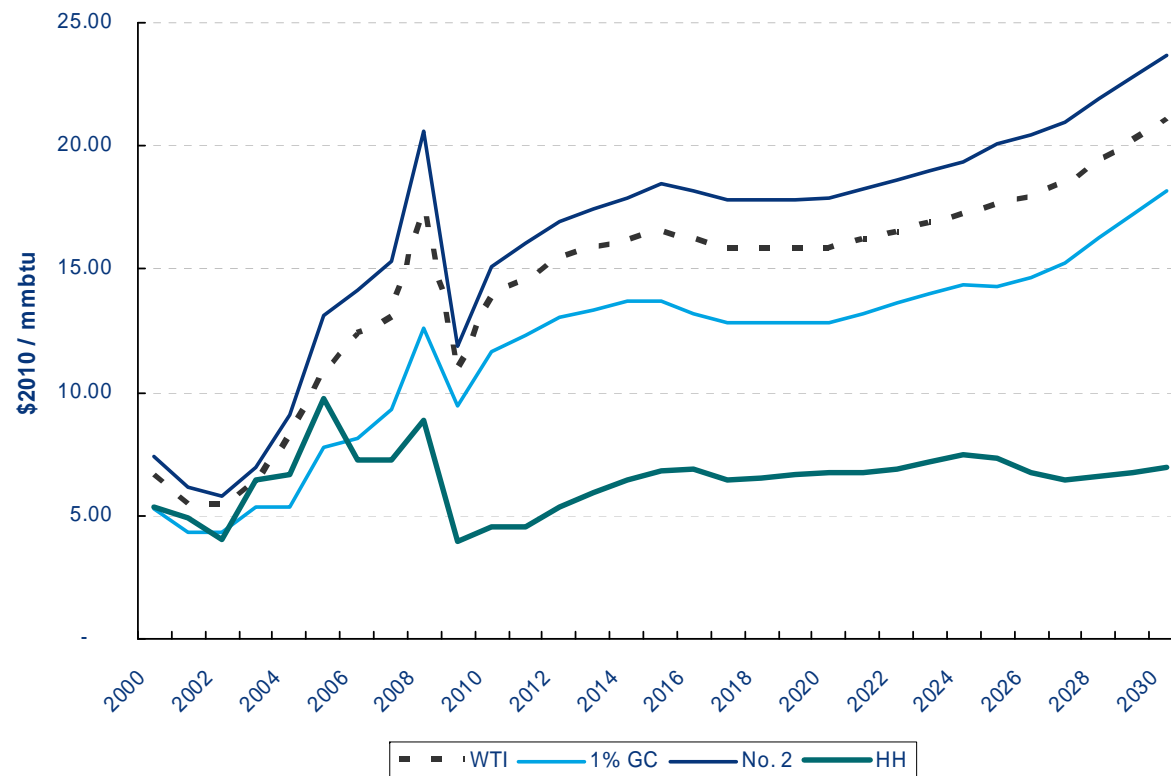
› Average price Henry Hub (real):

- 2010: \$4.35
- 2011-15: \$5.67
- 2016-20: \$6.65
- 2021-30: \$6.91

### Average WTI to Henry Hub Differential

	\$2010/mmbtu
2000-2008	2.83
2009	6.88
2010-2020	9.55
2021-2030	11.24

### Oil and Gas Commodity Price Forecasts





## The Long-term Risks and Uncertainties in the Natural Gas Market are Many

### Resource Base is vast, but production levels and cost remain uncertain

#### › Ultimate shale/unconventional production performance

- By 2013-2014, we will know much more about how shale wells perform longer term, and will have a much better idea of ultimate recoveries and production potential for a given well

#### › Environmental resistance – hydraulic fracturing regulations, for example.

- Environmental resistance, and political attention, is building
- Regulatory costs and permitting delays could slow development considerably

#### › Competition with oil for upstream dollars and services

- As companies move toward oil, gas shale plays must compete for horizontal rigs and crews
- A booming opportunity in oil could raise target IRRs on gas plays as producers seek the best margins

### Demand opportunities require major capital commitment or policy help

#### › Carbon and environmental policy

- Wide range of possibilities w. carbon depending on the targets, timing, price and investment focus
- EPA regulation and pressure on older coal units—how many retire?

#### › New (or renewed) markets for gas

- Gas-intensive industries represent an opportunity, but depend on liquids and global dynamics
- NGVs? Difficult competition from plug-in hybrids for passenger cars and energy density issues for long haul heavy duty vehicles

# **But With Two or More new Highly Productive Shales...**

**The Need for the Alaska Gas Pipeline is More Questionable, as**

**The Overall Cost of Supplying Reasonable Demand Potential  
Could Decline into the \$5.50 - \$6.50 Range**

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