

Energy Trends: Dealing With Unintended Consequences



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Down the Rabbit Hole...

To the Wonderland of the Energy Markets

- *Major longer-term trends*
- *Crude oil and natural gas markets*
- *Credit and bank issues*
- *NGL market*
- *Transportation outlook*
- *Utica/Marcellus issues*

And many other scary things



“Faster! Faster!” cried the Red Queen

They seemed to skim through the air, until, exhausted, Alice, stopped and found herself on the ground.



The Queen propped her up by a tree.

Alice looked around in surprise. “I do believe we've been under this tree the whole time! Everything's just as it was!”

“Of course it is,” said the Queen, ‘what would you have it?’”

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- *When you're right, never let them forget it.*



Primary Trend Theses

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Perception: Climate Change needs action



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Hydrocarbons (BTU) will \$ converge



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- *Hydrocarbons (BTU basis) will converge*

Governments will get more rent from energy



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- *Slowing economies put pressure on to change*



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Regulation will get worse, maybe much worse

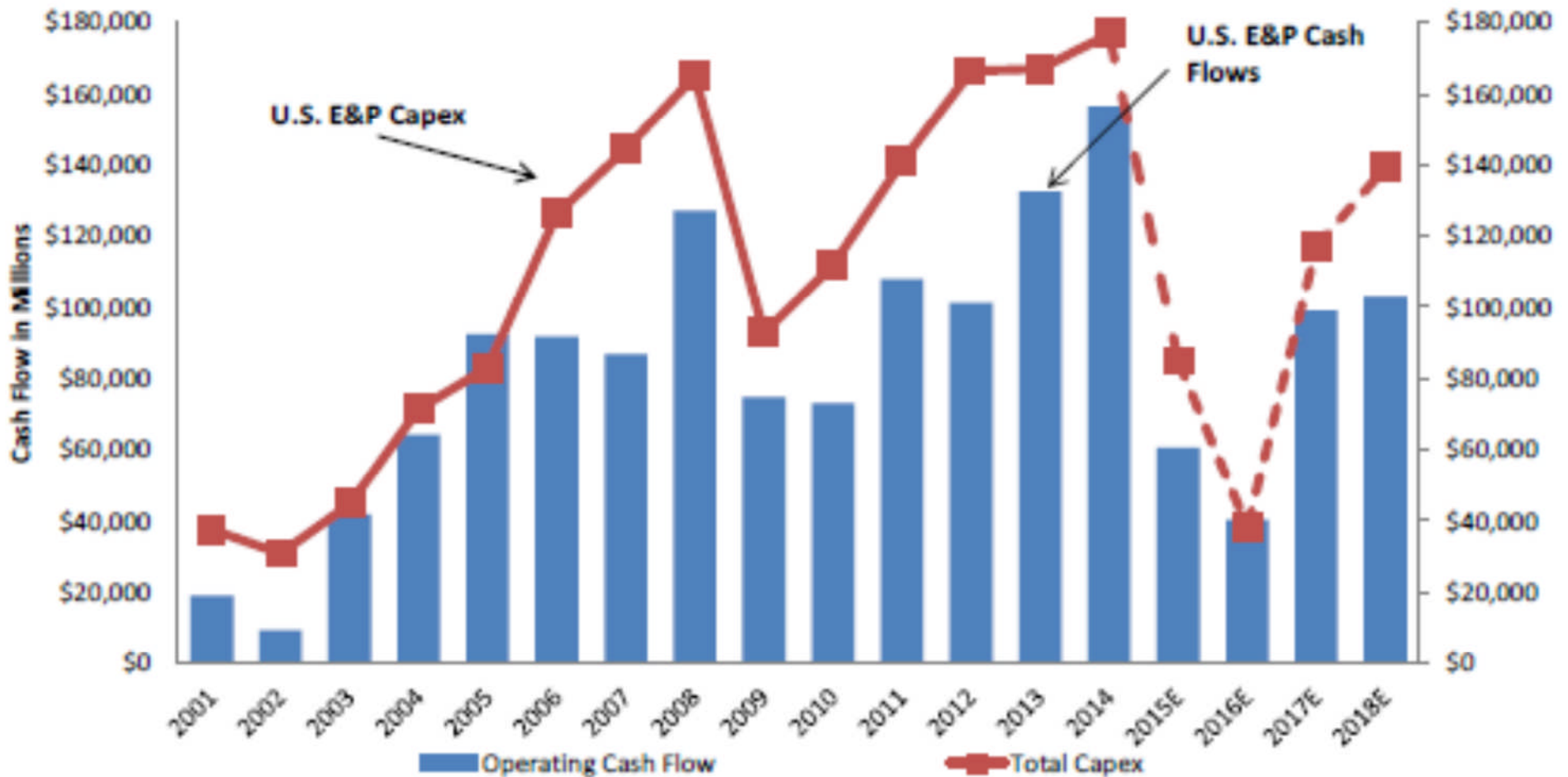
The most expensive words in the English language:

"This time it's different."- Sir John Templeton



E&Ps: Serial Destroyers of Capital

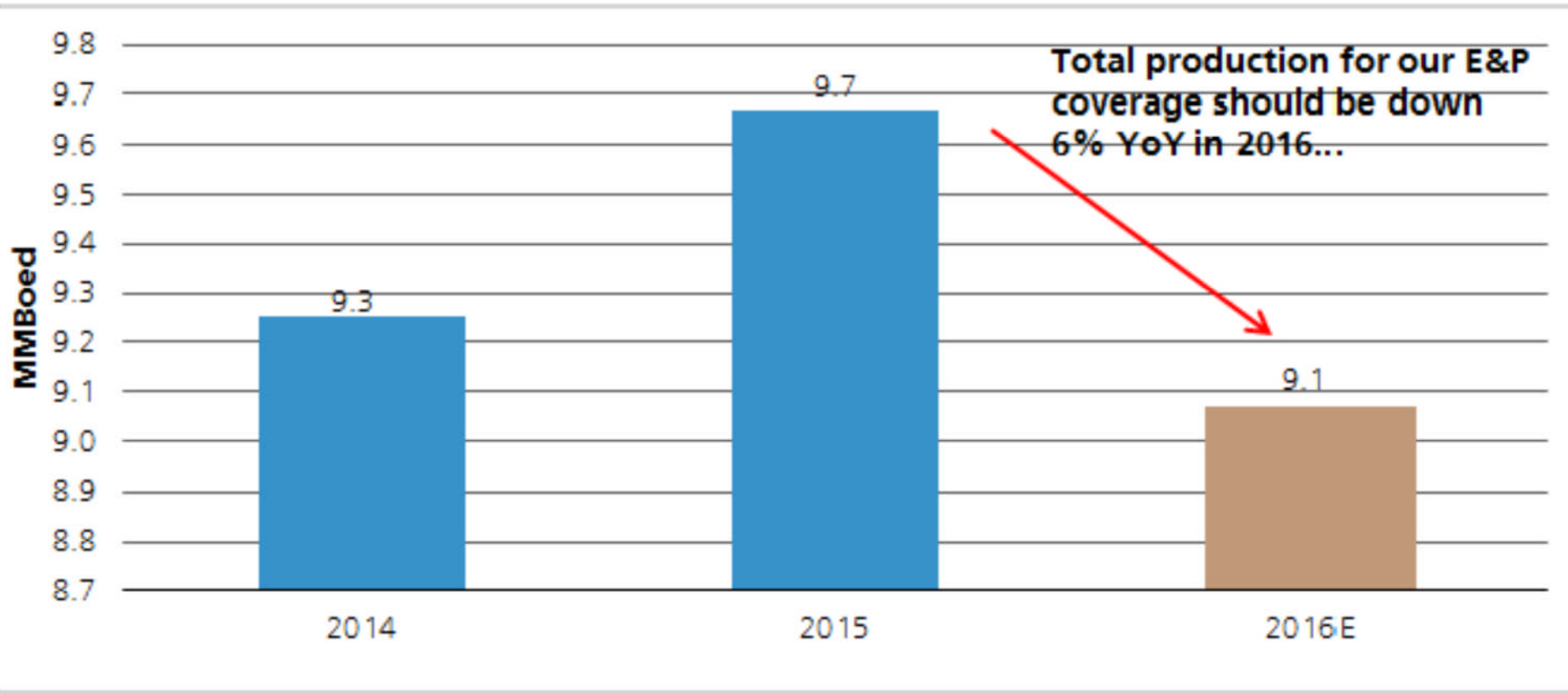
U.S. Oilfield Cash Flow and Capex



Source: Raymond James Research; Spears & Associates; EIA; Company Reports; Bloomberg

Incentivized by shale; enabled by cheap money

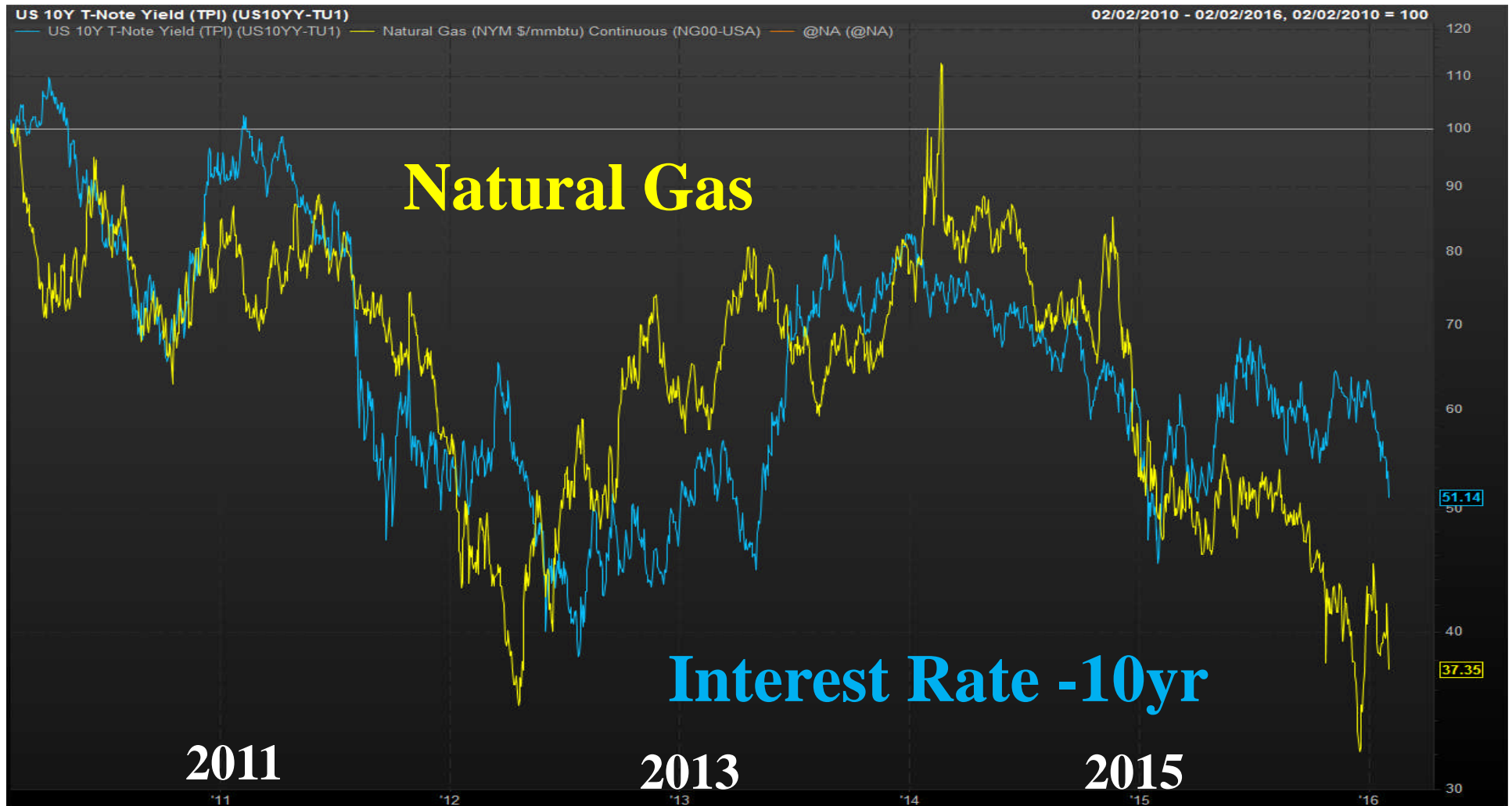
Global O&G Production S/B Down 6%



Source: Company documents and UBS estimates

Run rate decline at Y/E 2016 could be ~8%

Low Interest Rates Push Shale Drilling



Too much cheap capital chasing marginal projects

Increasing Importance of Credit Markets

- *Forecast for extended slow economy, weak prices*
- *Fed concerned about bank capitalization*
- *Also: Seek to avoid voluminous foreclosures*
- *Credit agencies (Moody's) helping the process*
- *Closing debt markets, pushing equity*
- *Austerity may leave only the biggest standing*
- *Implicit time frame: 2-3 years, minimum*
- *Nobody too big to avoid some pain*

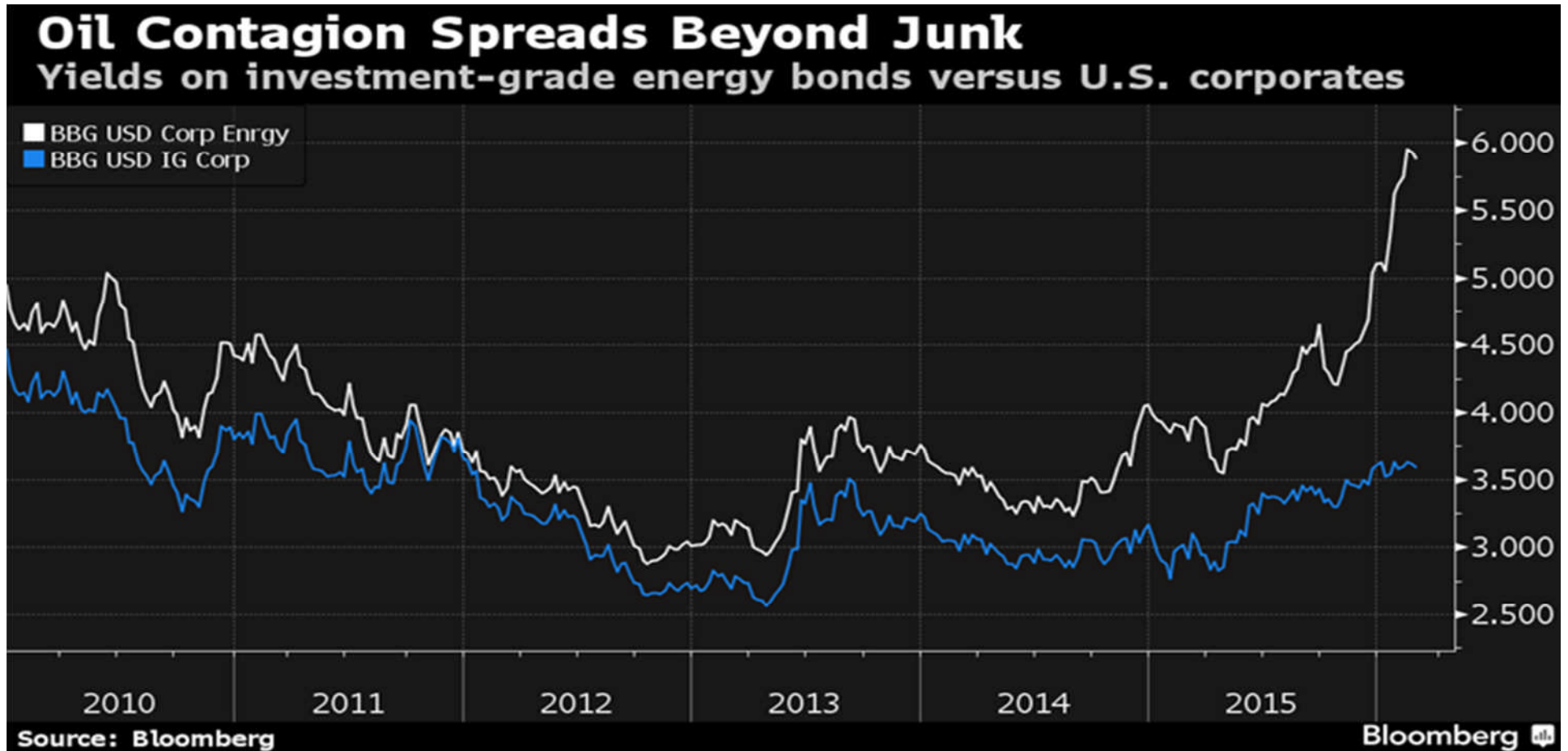
Leverage Soars at U.S. Oil Producers

Net debt/Ebitda for S&P 500 versus energy companies



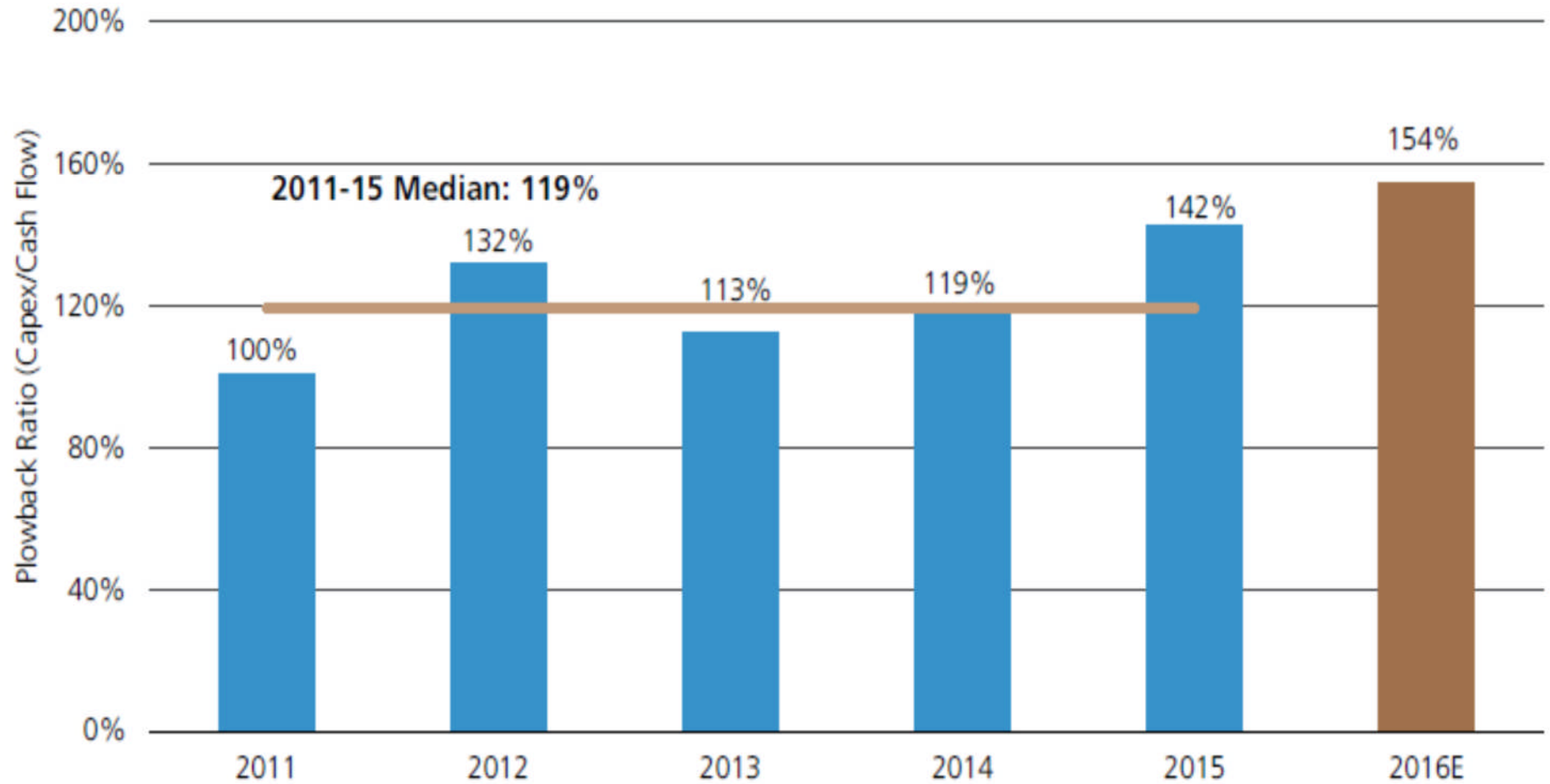
Reason for Fed's concern about banks

Rates for Energy Names Higher Than Implied



Exxon (AAA) had 2016 debt priced like A rate

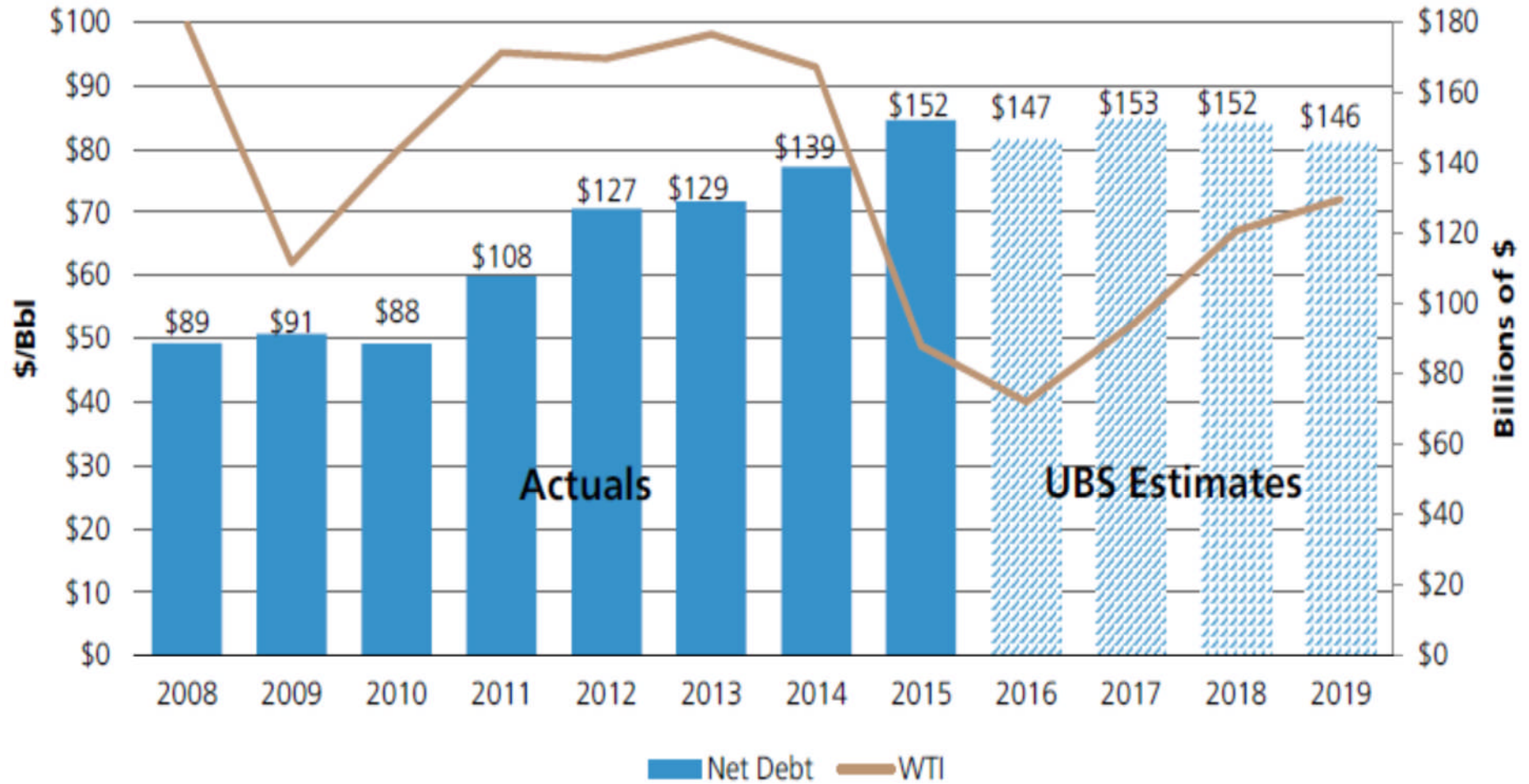
Capex Plowback Still High in 2016



Source: Company documents and UBS Estimates

Prices have come down faster than spending

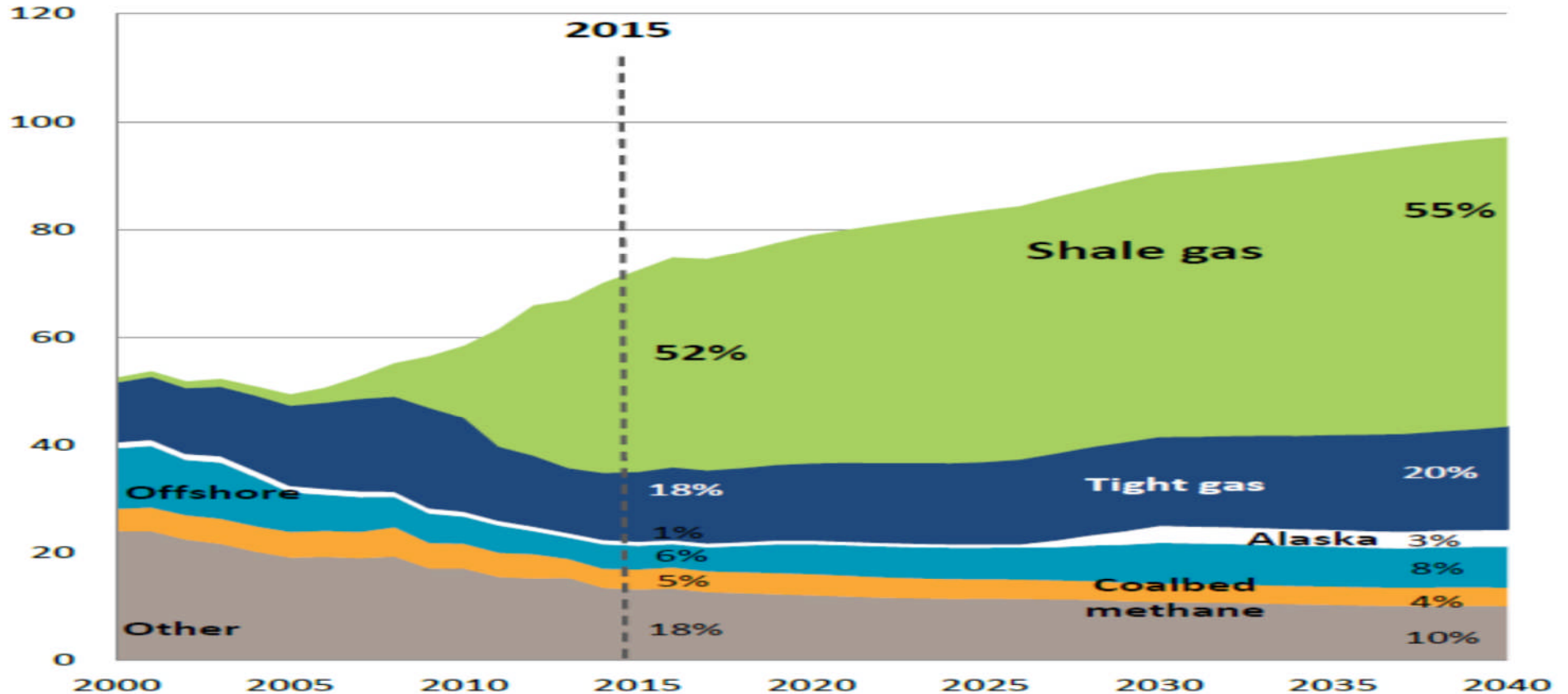
E&P Debt Will Take Years to Bring Down



Even if prices recover, the debt hangover will remain

NatGas Perception Illustrated

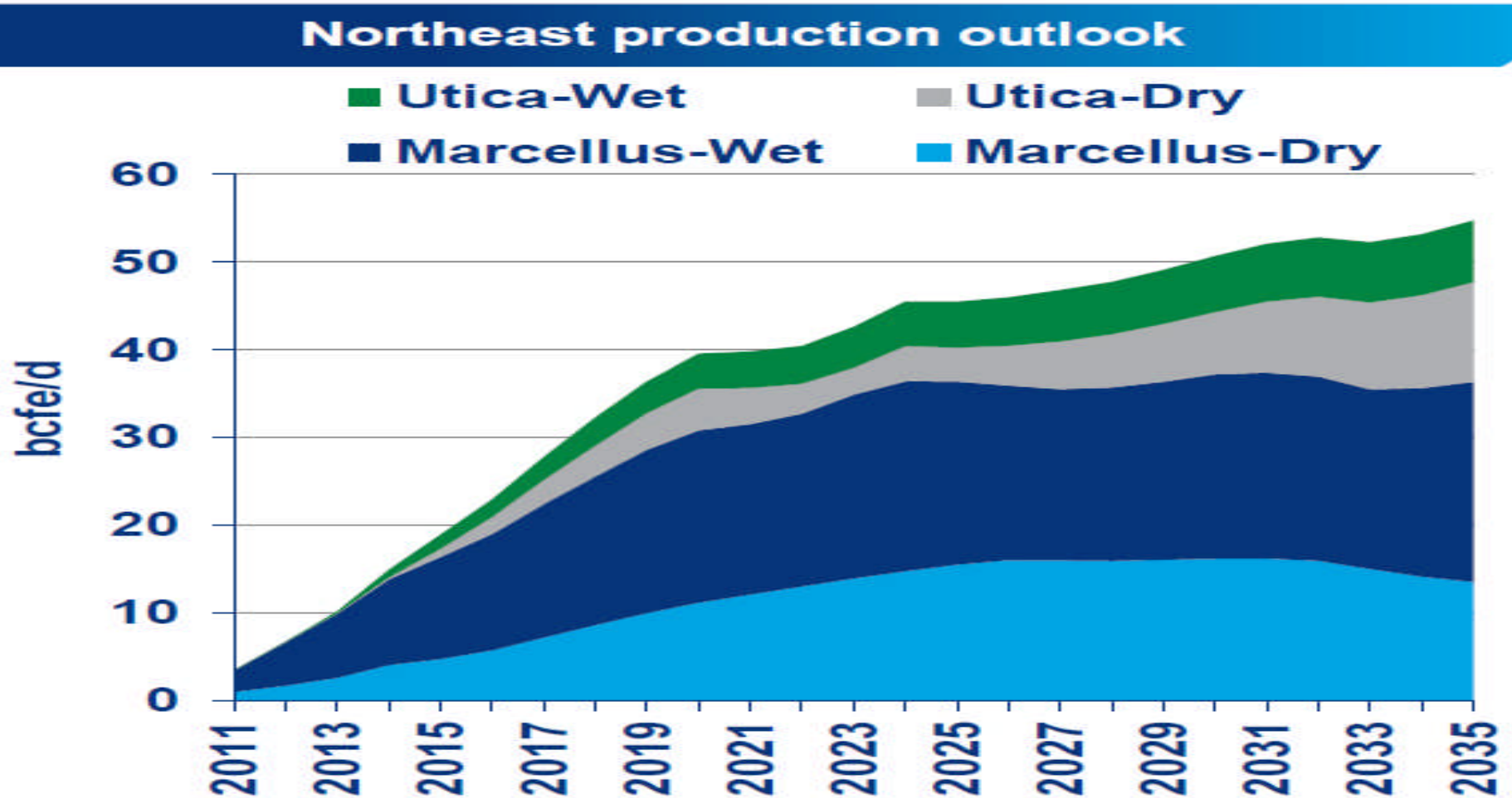
U.S. Dry Natural Gas Production (billion cubic feet per day)



Source: U.S. Energy Information Administration, *Annual Energy Outlook 2015*

This implicitly assumes costs and prices of dry natural gas will not increase over future years.

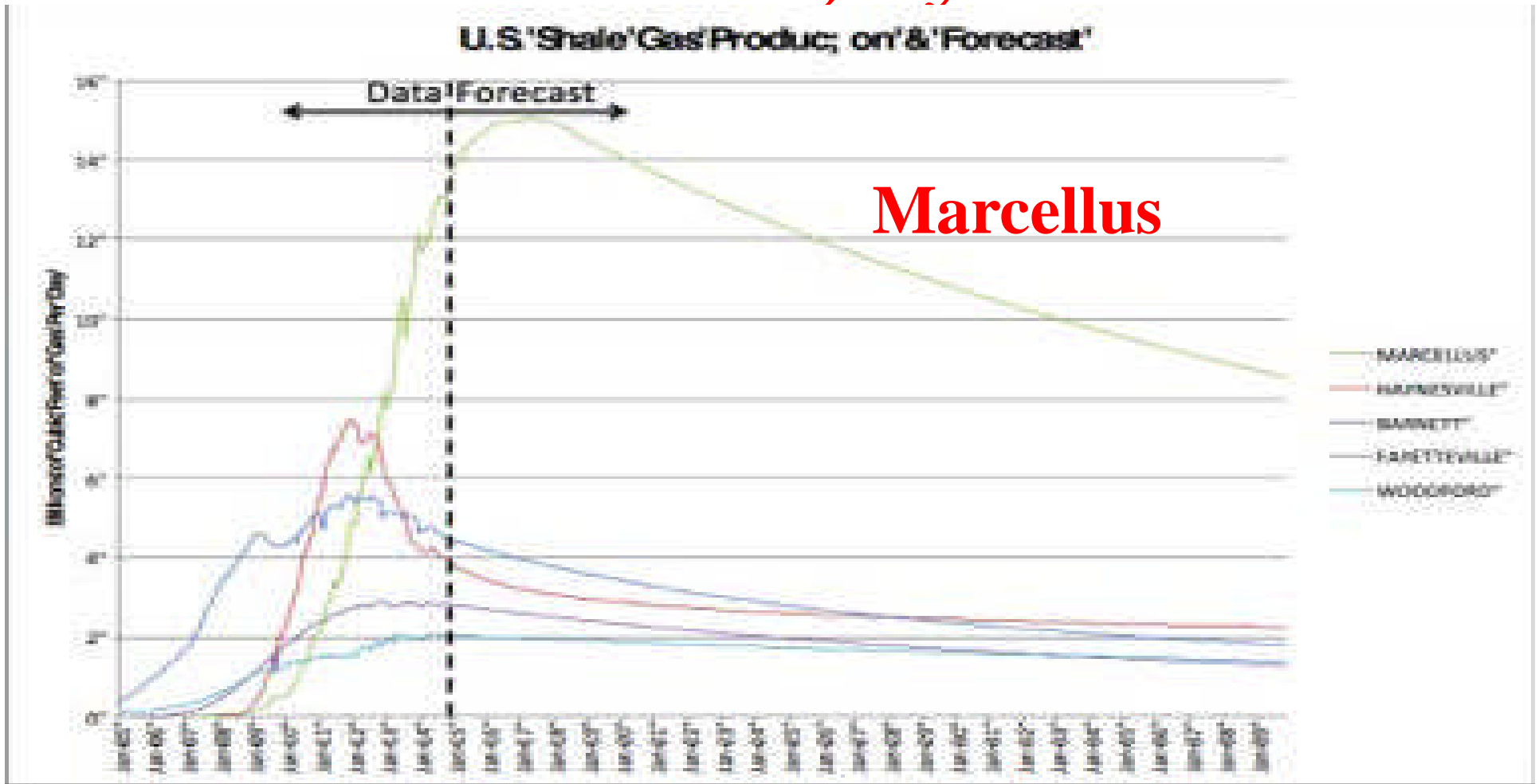
Utica Source of Long-term Growth



Source: Wood Mackenzie

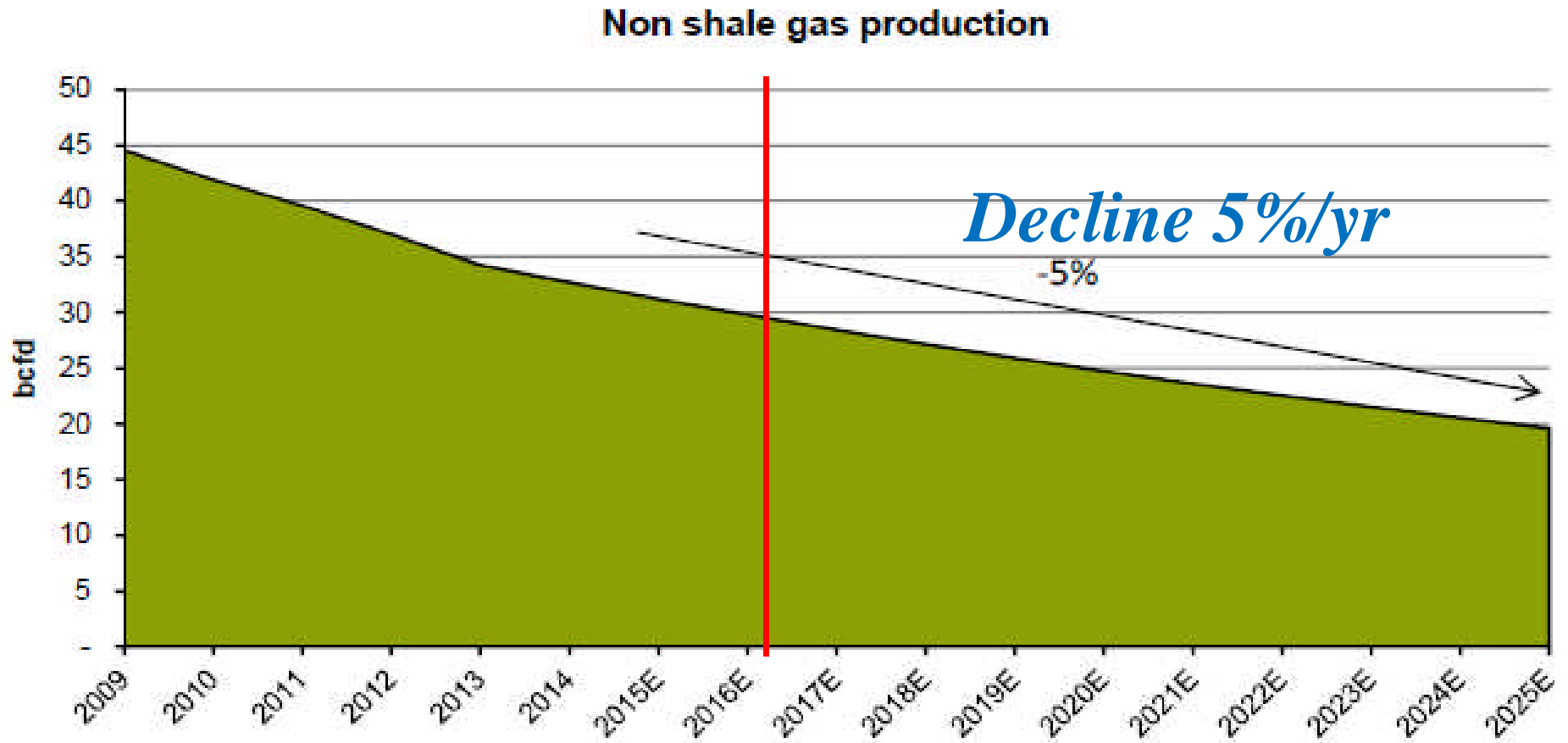
More constrained than Marcellus by offtake

Natural Gas Peaks, By Shale Field



All dry shale gas plays except Utica, Marcellus in decline already. They should be in decline by 2020, if not earlier.

Conventional Gas In Long-term Decline



*Economics not supporting shallow drilling.
Likely cut by 40% over next decade.*

Shale Gas as Disruptive Innovation

- *Perceived bonanza for economy, energy supply*
 - *Expand power, chemical, transportation*
 - *Touted as 100-year supply*
- *Priced artificially below \$3/Mcf (33% of oil BTU)*
- *Poised for LNG export (some), GTL (never)*
- *Disrupts planning for nuclear, coal, renewables*
- *Path to HUGE fuel imbalance*
- *Increases volatility and disruption*
- *Spillover affecting banks, credit markets (perhaps economy?)*

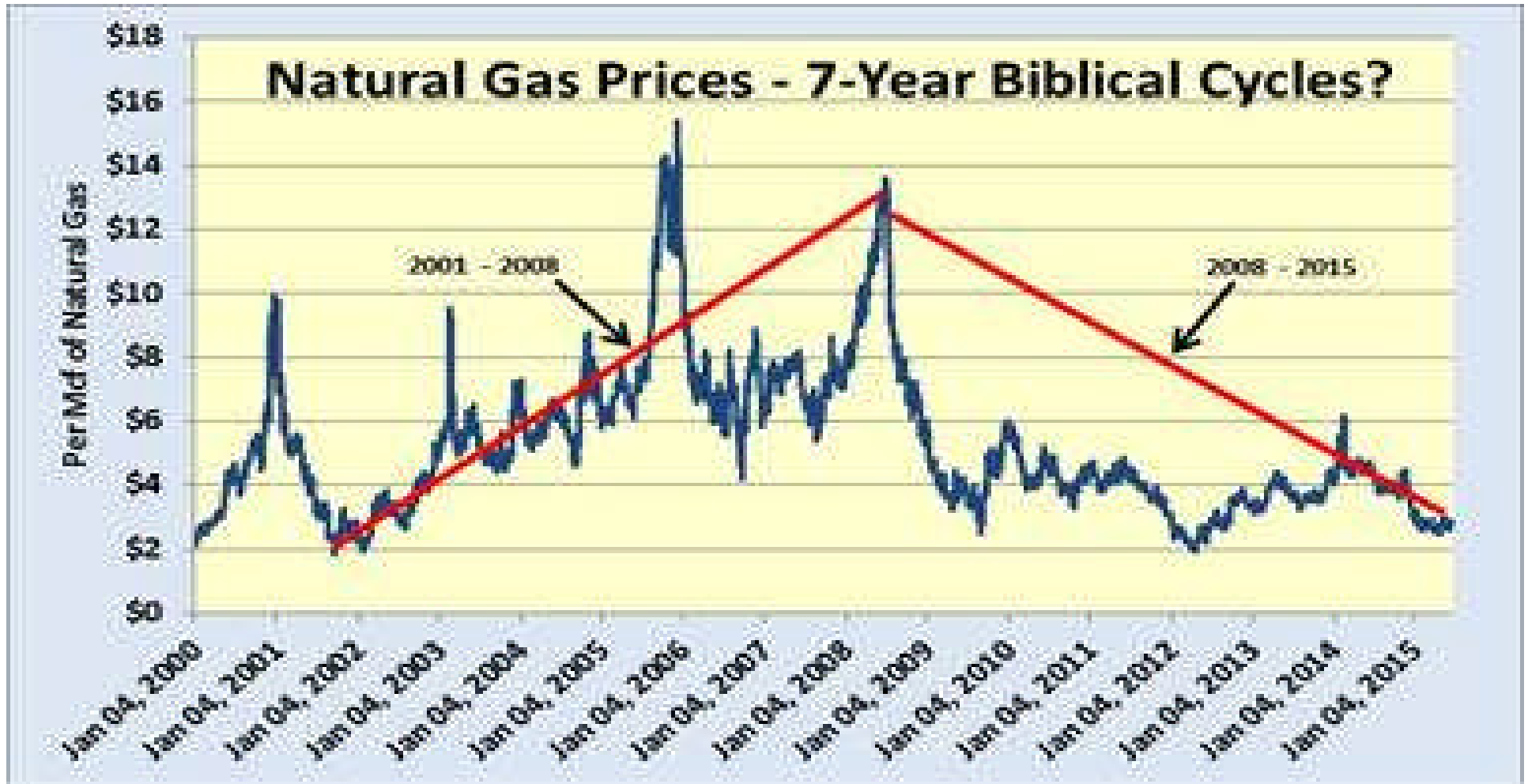


“Trends” Run In Cycles (7-10 Years)

- *1999 – Crude oil at \$10, forecast to stay there*
- *2002– Power deregulation, favors nukes & merchants*
- *2005 – Plans for 38 LNG import terminals*
- *2006 - Natural gas hits \$14/Mcf*
- *2007 –Crude climbs to \$140, rise of cellulosic ethanol*
- *2011 – Nukes, merchants, coal plants being shuttered*
- *2013 – 100-year supply of cheap (\$3) natural gas*
- *2014 – Plans for 30+ LNG export terminals*
- *2015 - Crude oil drops from \$100 to \$30*



Natural Gas Seven Years Up and Down



It could be a LONG next seven years for gas.

Intermediate Energy Trends

- *Majors cutting back on big projects*
- *MLPs ready for infrastructure roll-ups*
- *Oil service: Huge pressure to lower costs*
- *PE capital inflow to debt or assets, not equity*
- *Focus on upstream exports for all hydrocarbons*
- *Access to capital becoming problematic*
- *OPEC no longer supporting oil price*
- *Longer completion times vs. plans*
- *2016-20 is Era of Infrastructure*



Crude Oil Macro View

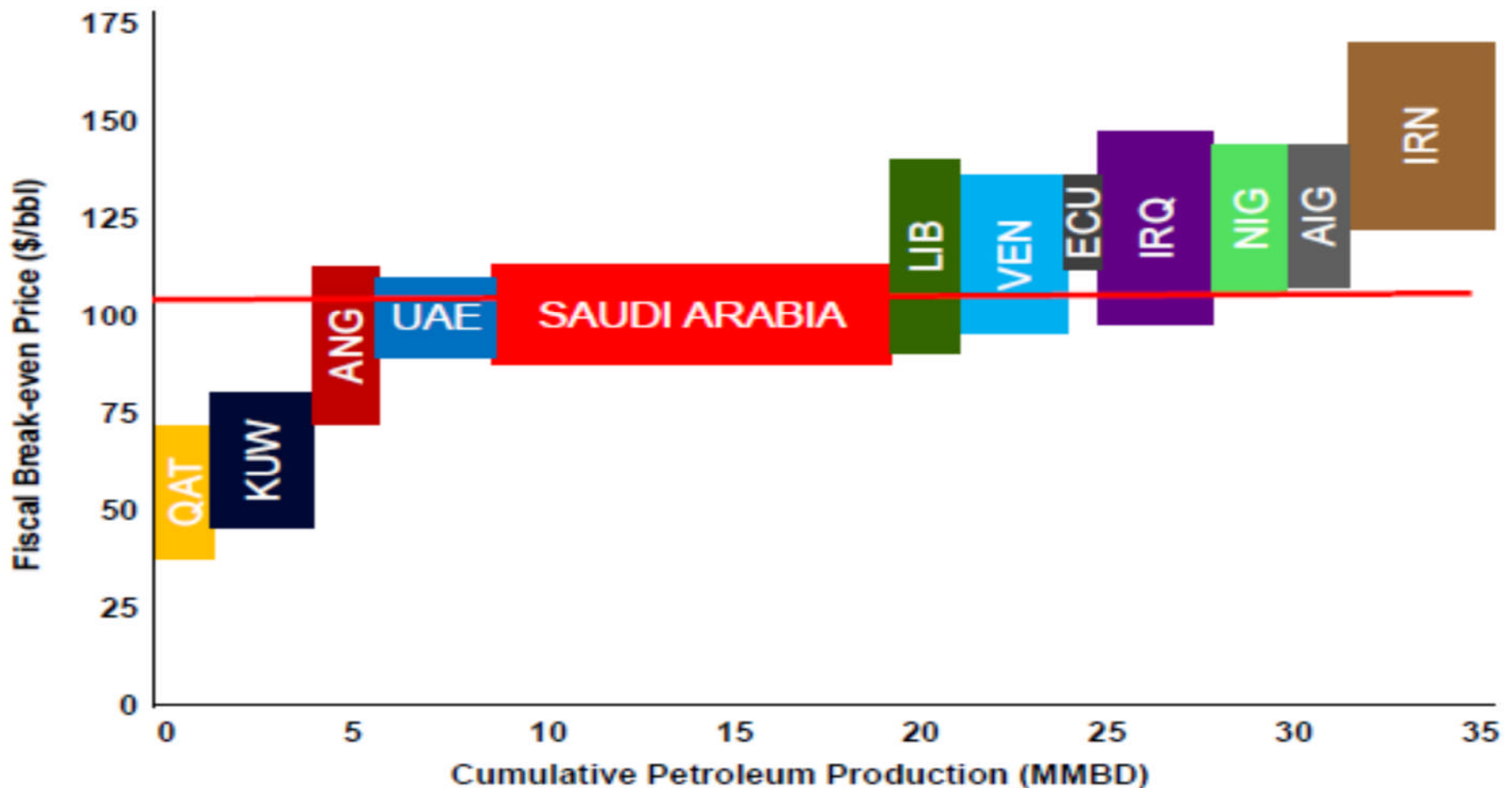
- *Drivers: supply, demand, global central bankers*
- *Primary Oil Major driver: Avoid political risk*
- *Energy demand correlated to global GDP*
- *Critical supply elements:*
 - *Saudis only OPEC swing producer, rest at maximum*
 - *OECD supply growth centered on US shale*
 - *Saudi Arabia no longer supporting price targets*
- *Shale introduces faster S/D response, more volatility*
 - *Major projects getting pushed off (bullish)*
 - *Capacity delayed, lumpy when it arrives*

Effect of Dollar, OPEC on Crude Oil



November 2014 – Saudis decide to not cut production

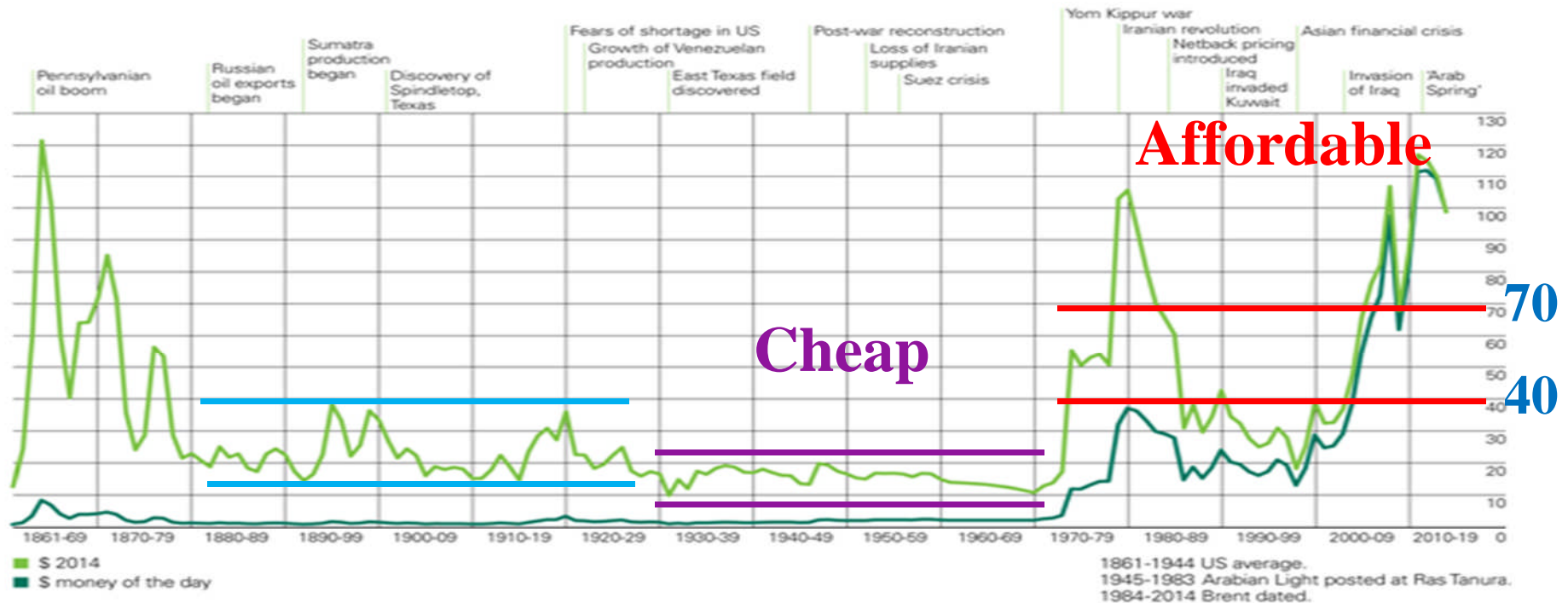
Fiscal Breakeven For OPEC Countries



Increased chance for heightened political risk

Historical Oil Price, In Current Dollars

Crude oil prices 1861-2014
US dollars per barrel, world events



*Move from “cheap” to “affordable” crude oil.
Large increase in volatility, new “normal”.*

Natural Gas – Macro View

- *Production less subject to “subsurface risk”*
 - *Transition : “hunters” to “gatherers” to “farmers”*
 - *Highly technical process/logistics*
- *Stressful pricing while awaiting infrastructure*
- *Mediocre results away from “sweet spots”*
- *Will Asia drive marginal U.S. natgas price?*
- *US natgas pricing a victim of its own success*
 - *Capital tightening (another round?)*
 - *Too many players, now and sidelines*
 - *Capital needs market pricing*



Natural Gas Demand Growth

Power/heat: Displace coal – 4Bs/day by 2020



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Chemicals: Ethylene, other –3Bs/day by 2017



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Industrial/Economy- 3Bs/day by 2020



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- Export Canada/Mexico – 3Bs/day by 2017*



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- *Vehicle Transportation- ???*

Added 20+Bs/day (30%) by 2020

(But economy may cut estimates by 40%)



Hurdles To LNG Export Story

- *Many foreign LNG entrants, Gazprom*
- *Other sources (e.g. Japan nuclear fleet)*
- *Link to oil price unraveling*
- *Low European gas prices*
- *Worker shortage to construct*
- *Distance from prime markets*
- *Reliance on current gas price*

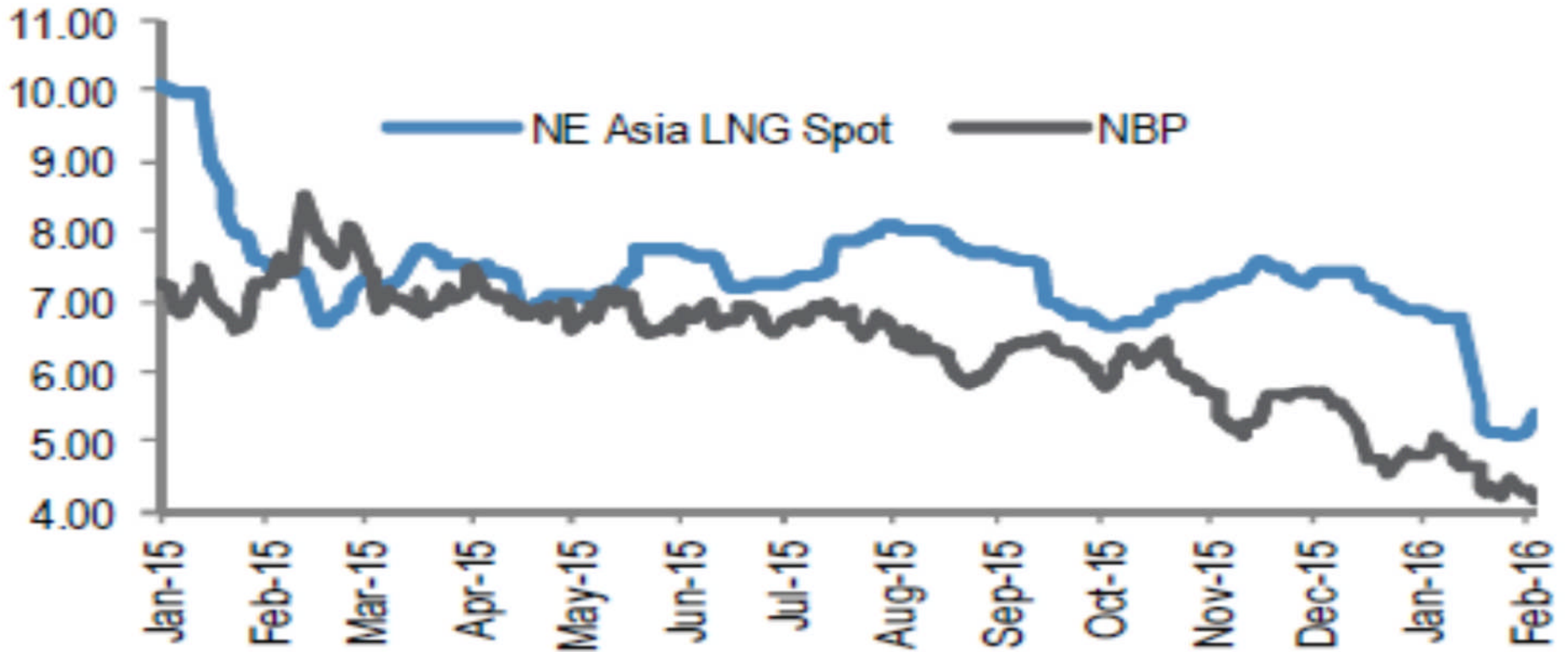
Crucial to gas price recovery



Global LNG Price Anticipating Supply

Exhibit 7: NE Asia spot LNG price vs NBP

\$/MMBtu



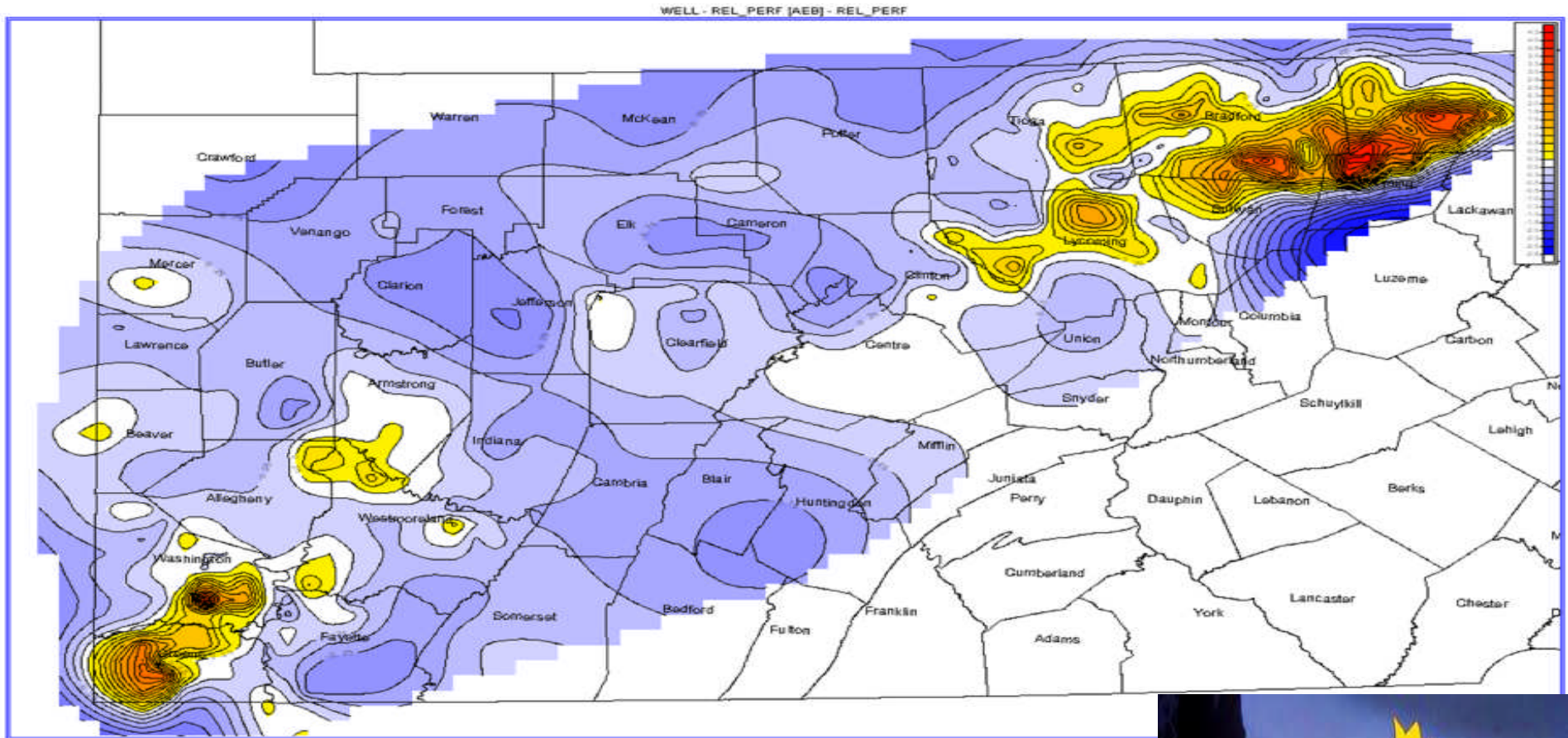
Source: Bloomberg, JPMorgan Natural Gas Strategy

Supply likely to exceed demand for many years

Issues Affecting Utica/Marcellus

- *Environmental issues*
- *Proposed severance tax(es)*
- *Infrastructure build-out*
 - *Time frame (2020 treadmill?)*
 - *Negative basis/cash flow*
- *Lack of “major players”*
- *Cloudy cycle (7-10 yr.) economics*
- *Closing of capital markets*

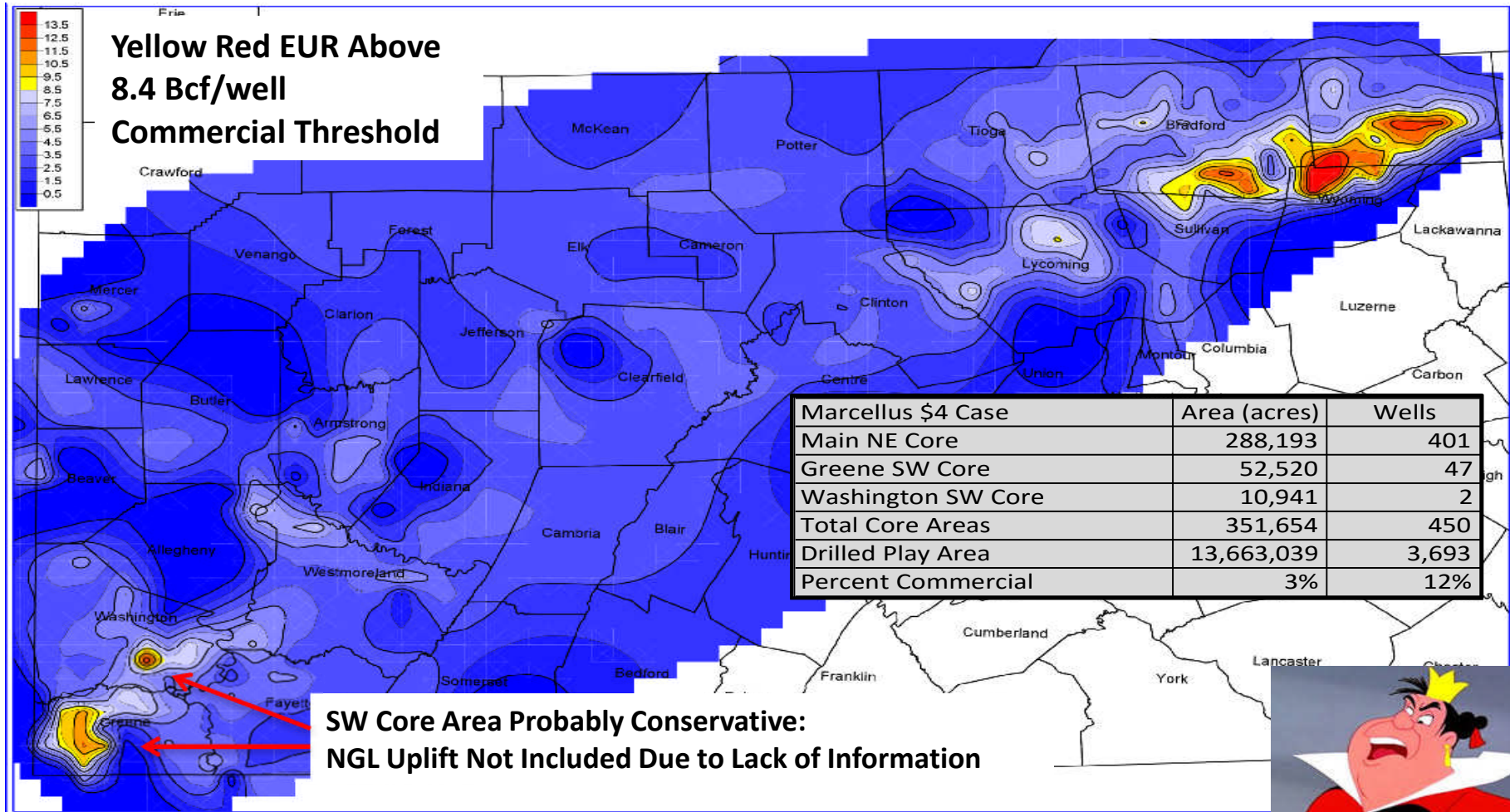
The Good Acreage Gets Developed First



*Two large Marcellus sweet spots
Wet in southwest, dry in northeast*



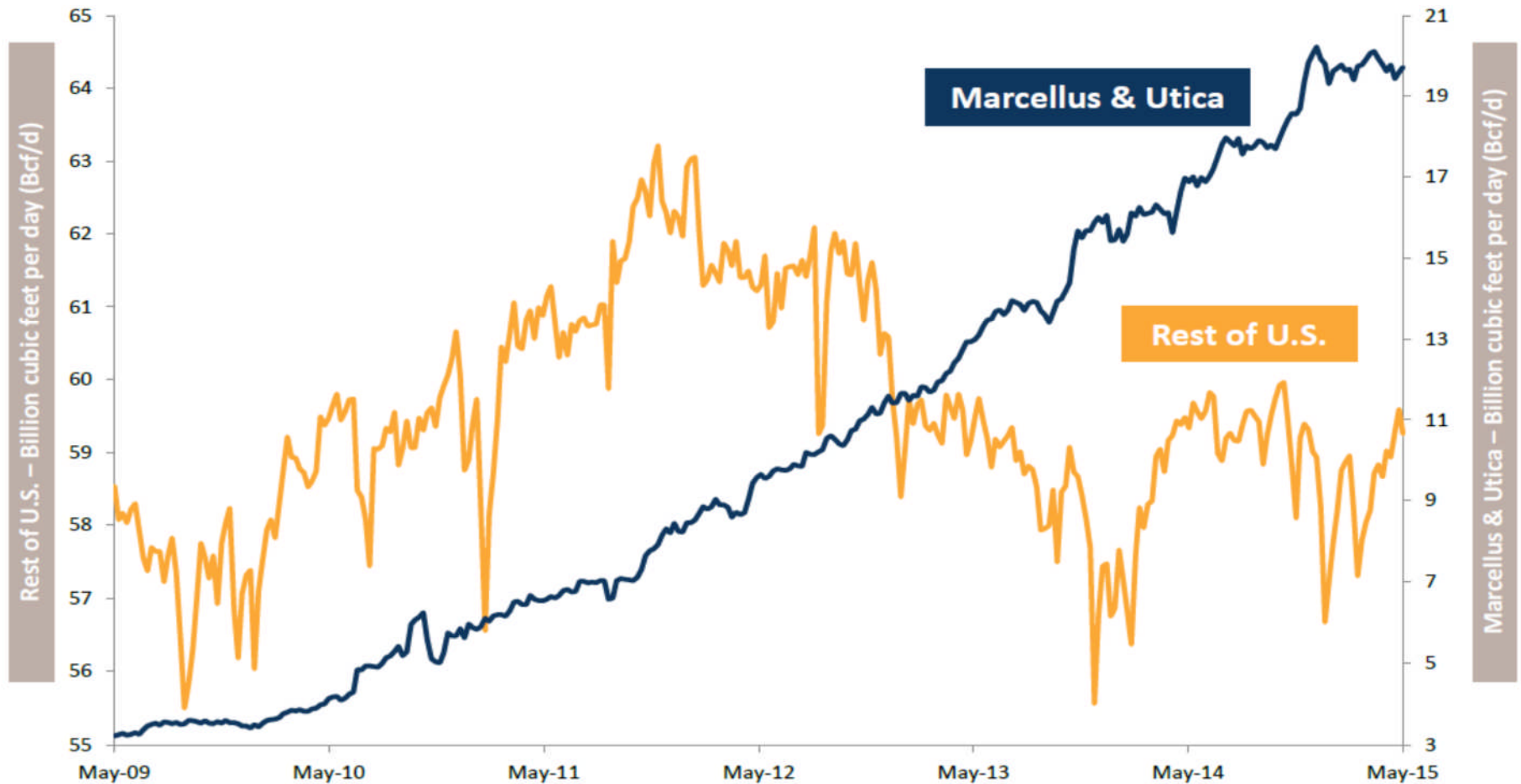
Limited Acreage Profitable at \$3/Mcf



Core profitable-at-\$3 areas are smaller than sweet spots

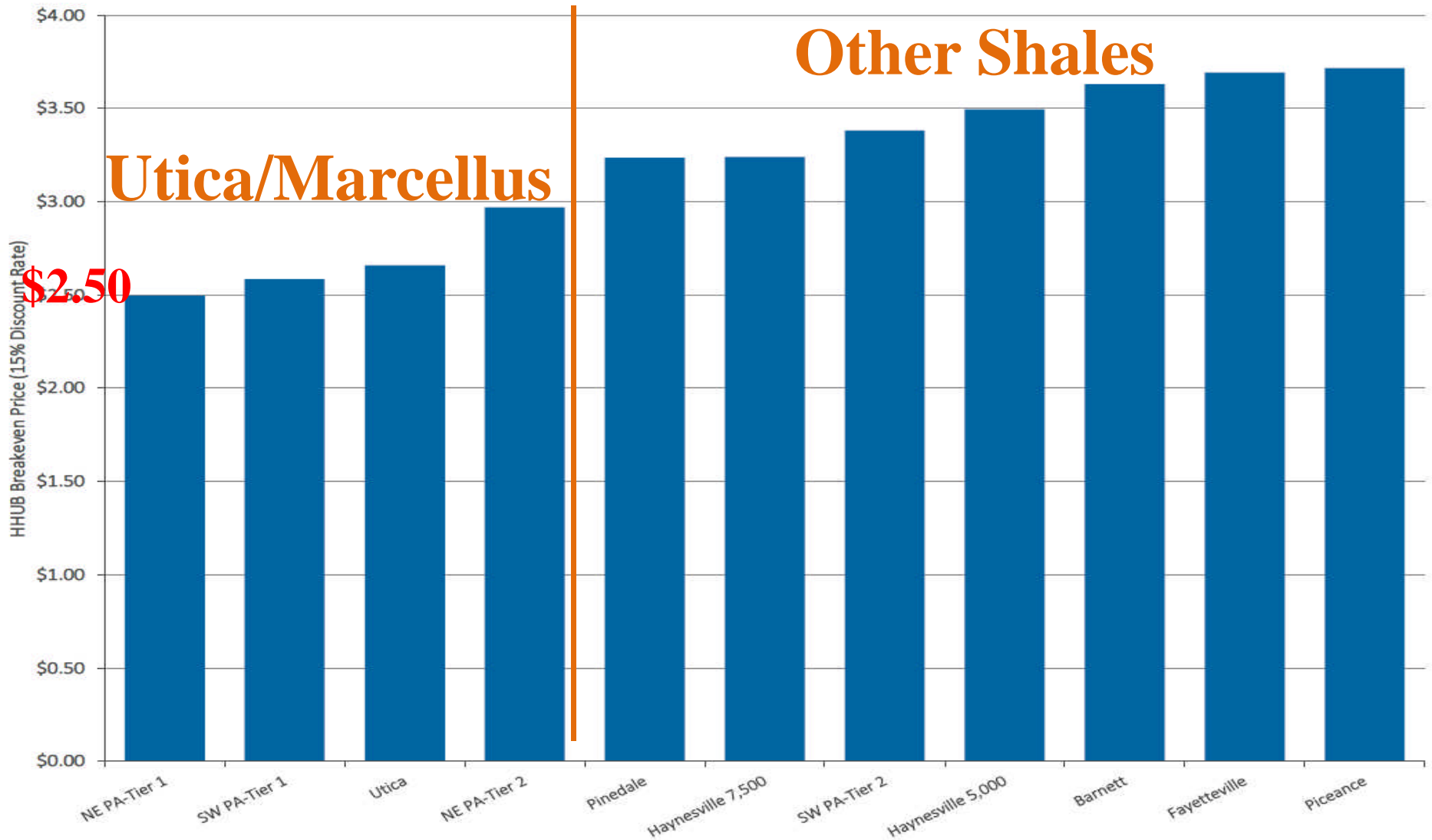


All US Supply Growth From U/M



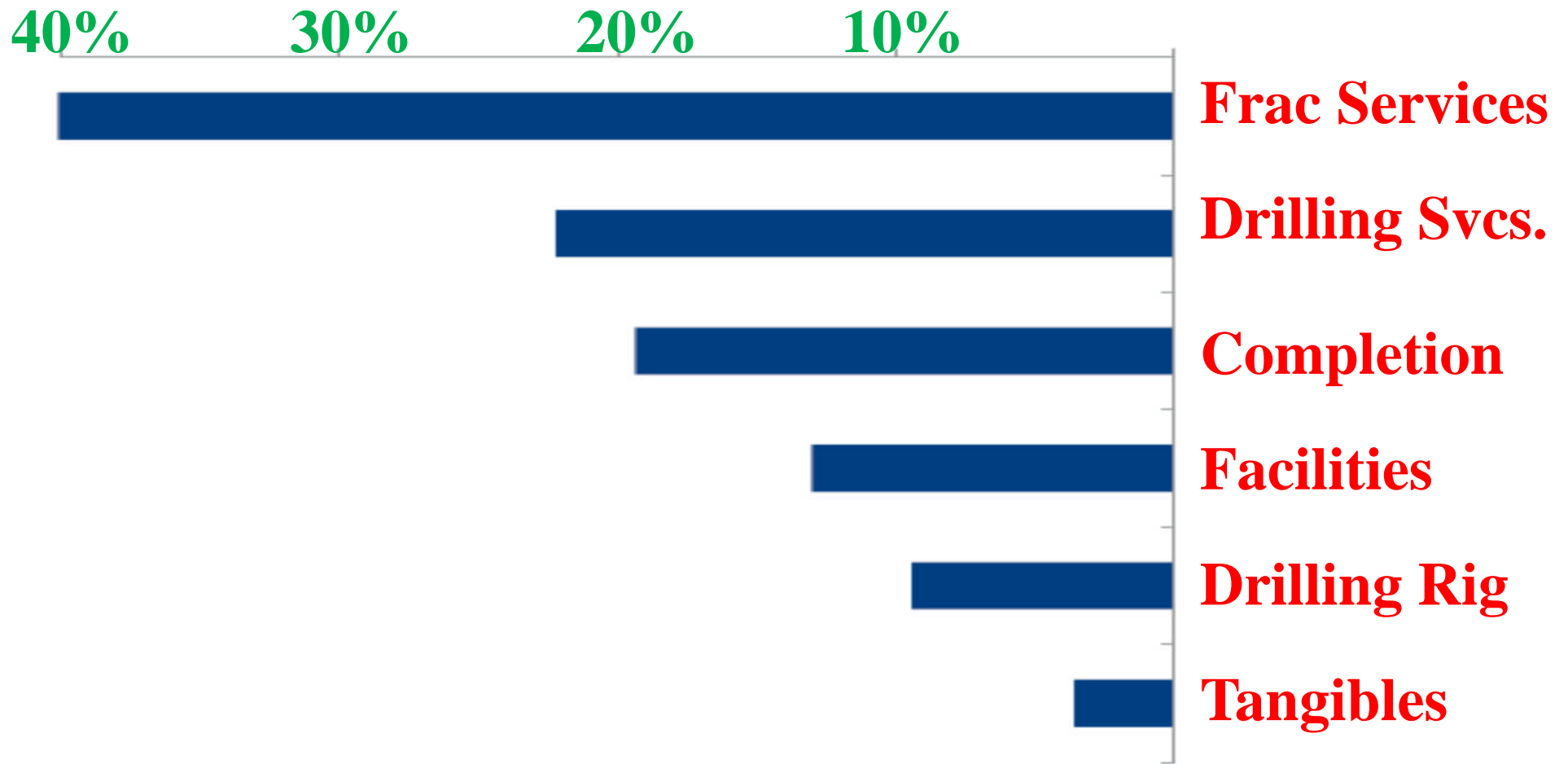
Region has more than 2500 drilled nonoperating wells with at least 10 Bcf/day initial production.

Utica/Marcellus Lowest Cost Shale Gas



Infrastructure, markets still huge hurdles

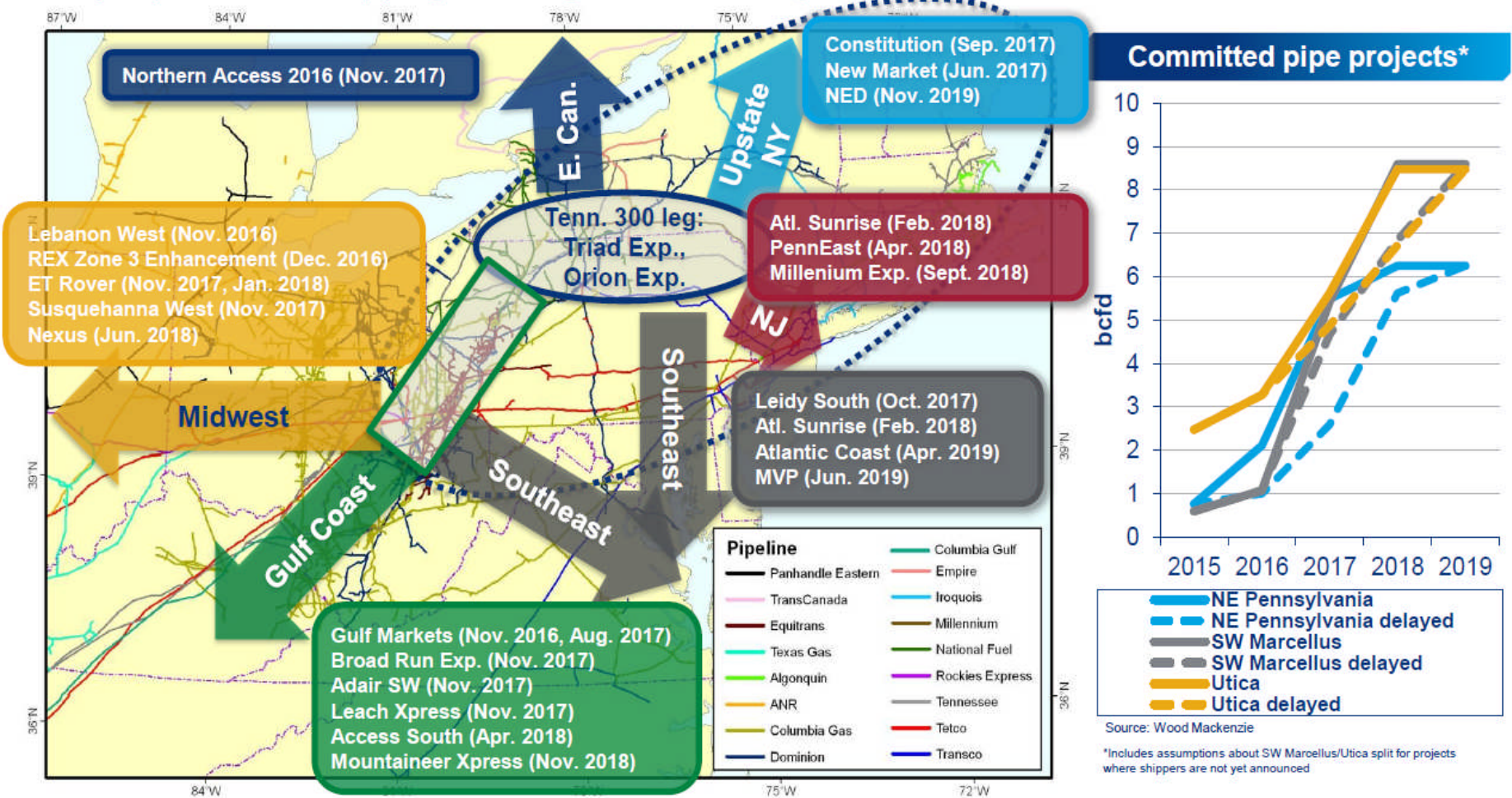
2016 Marcellus Well Cost Savings



Gas is cost “beneficiary” of oil price decline

Offtake Like Flying Through O'Hare

Major (>100 mmcf/d) projects target several major destination markets



Longer than planned & unforeseen problems

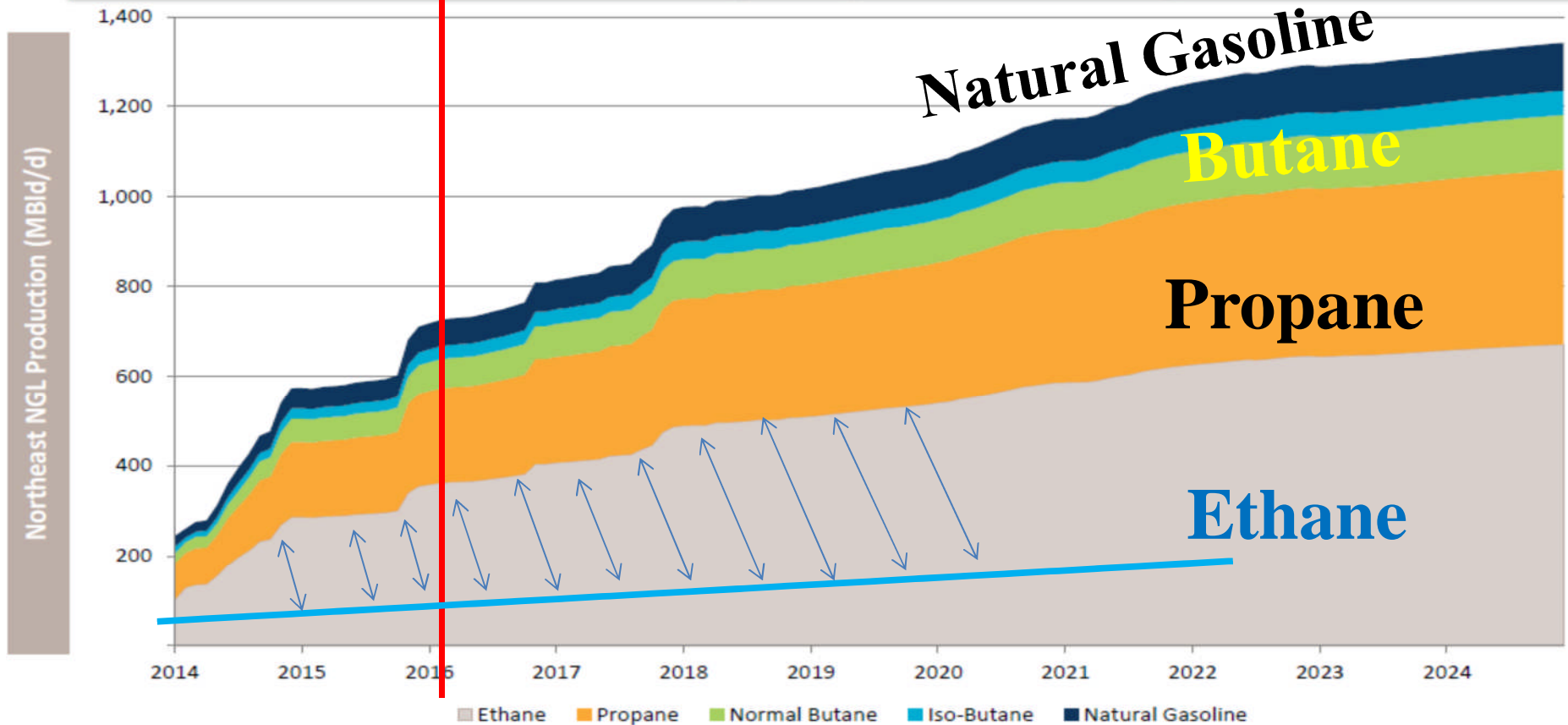
NGL Overview

- *Supply growing faster than demand*
- *Midstream, fractionation: Little resistance*
- *End-use infrastructure taking longer*
- *Take/Pay contracts forcing production*
- *Weak gas price hurting ethane rejection*
- *Slim export capacity growth short-term*
- *Crude oil drop, instability major hurdles*



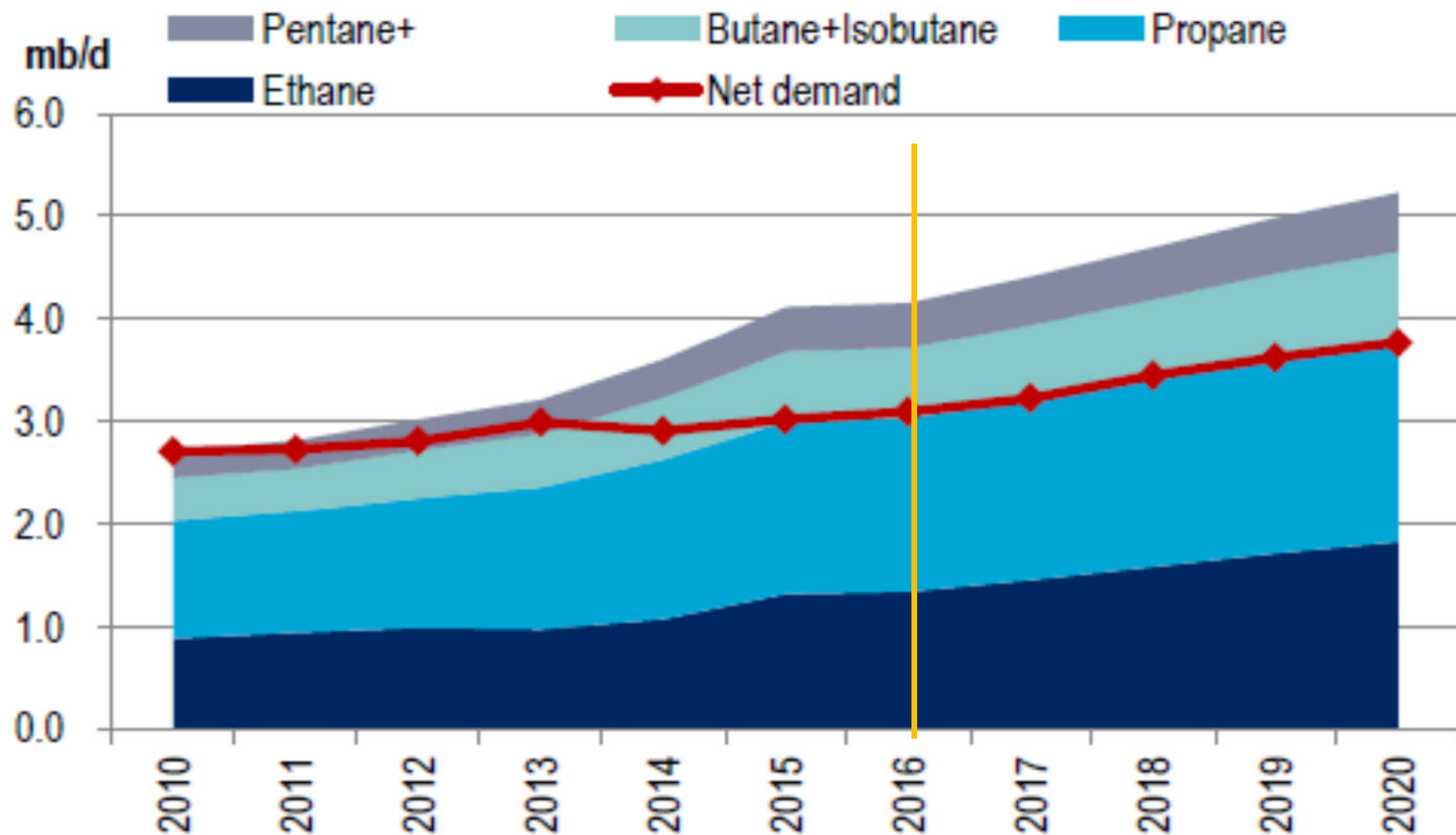
Marcellus/Utica NGL Production

Northeast NGL production is forecasted to exceed 13 million barrels per day over the next 10 years



The ethane above blue line is “rejected”, left in methane stream to sell as natural gas. Leads to propane oversupply.

Domestic NGL Demand Will Lag Supply



Exports need pipelines, facilities, markets

How Does Oil Drive Natural Gas Price?

- *Global LNG chases oil-based pricing*
- *Crude oil and NGL drilling brings “associated gas” production*
- *NGLs also priced off crude oil*
- *Ethane (NGL) “rejected” as feedstock, crowds dry natural gas supply*



Commodities are priced at the margin

Less Spending ! More Production?

**Exxon Mobil cutting spending, but
could boost output 250M barrels/ day**

**Antero Resources scales back on 2016 spending
by 36 percent**

Continental slashes 2016 budget by 40%

Halliburton cut 22,000 jobs in last year

**Conoco Slashes Capex by 40% and
Reduces Dividend 66%**

*Most 2016 spending cuts will come out of lowered Oil
Service costs. Focus to be on best wells, for cash flow*

Key Take Away Thoughts

- *Natural gas infrastructure will take at least three years, lagging supply*



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- *Cheap capital, global monetary policy, high dollar, slowing economies have oversized effect on supply/demand*



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- *Decline rates, volatility, regulation & tax trends are bullish for crude oil*



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- *Growing price interaction among hydrocarbon commodities*
- *Utica/Marcellus are key to future for natural gas and NGL markets*

The key is not to predict the future, but to be prepared for it. - Pericles



“Well, in OUR country”, said Alice...

still panting a little, “you'd generally get to somewhere else—if you ran very fast for a long time, as we've been doing.”



*“A slow sort of country!” said the Queen.
'Now, HERE, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!”*

*Thank you.
Any questions?*

