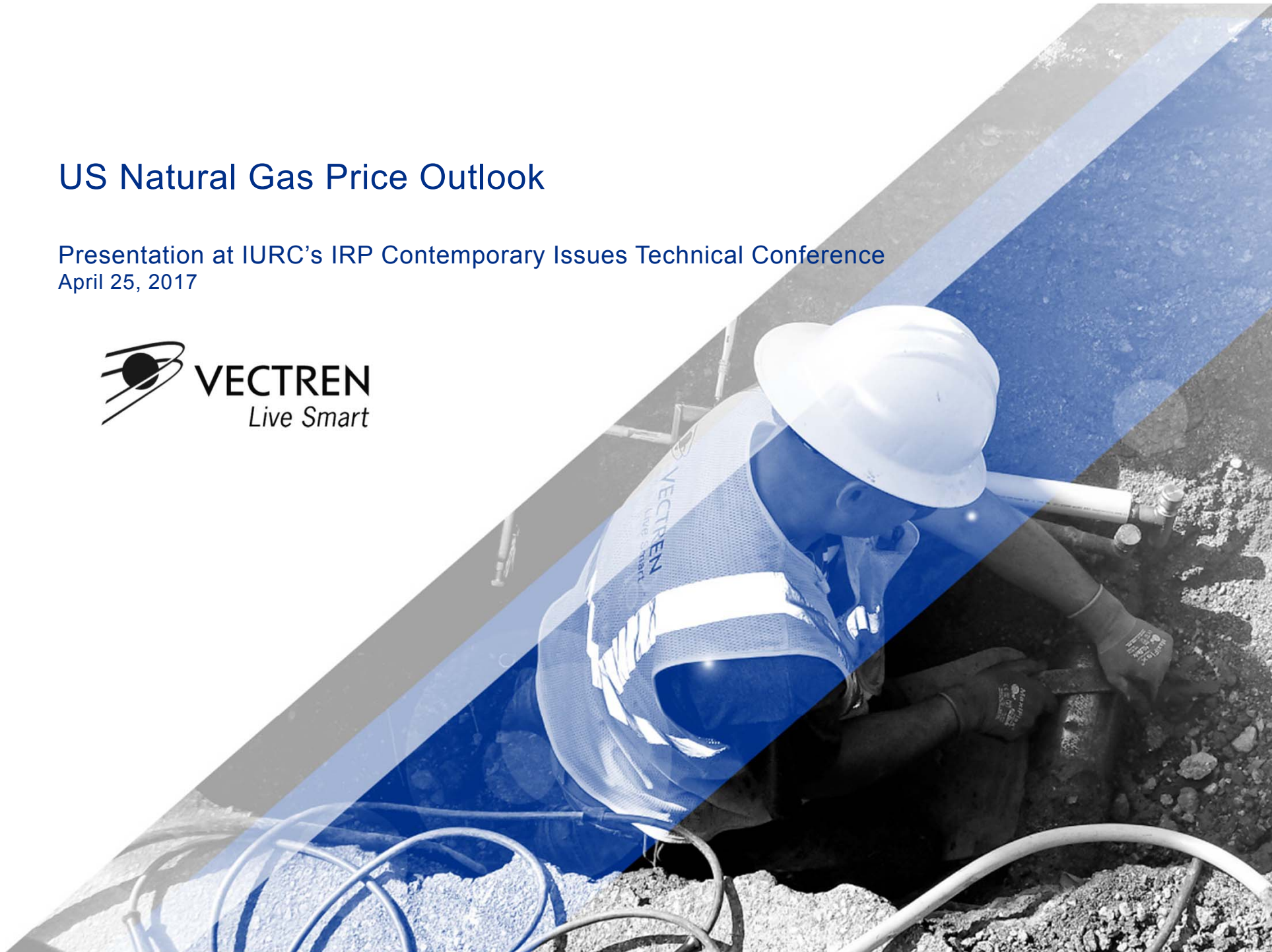


US Natural Gas Price Outlook

Presentation at IURC's IRP Contemporary Issues Technical Conference
April 25, 2017



Introduction and Key takeaways

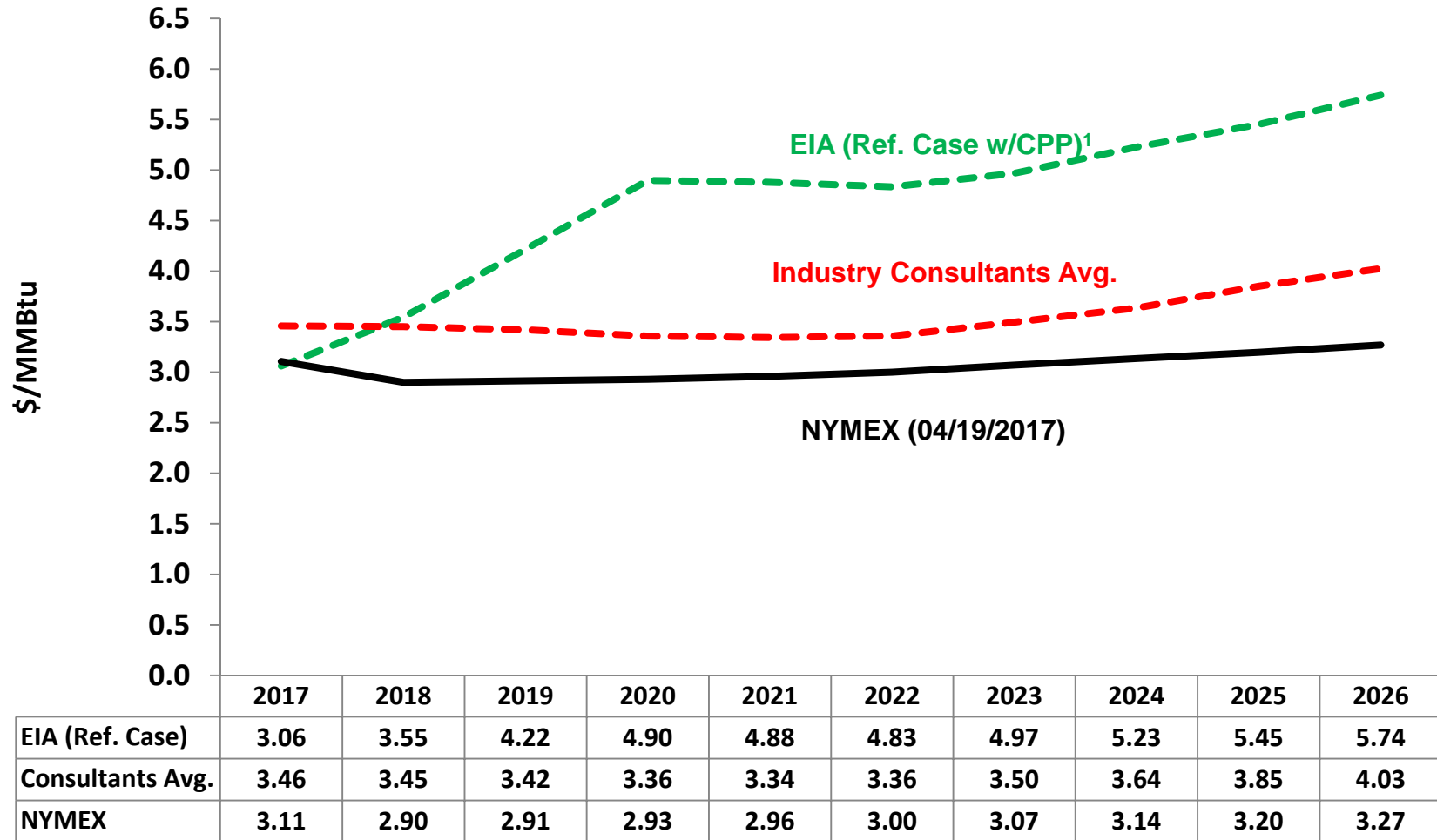
- **Major market intelligence service providers have “cautiously” forecasted slight increases in prices in the near future**
- **Continued developments in the Marcellus and the Utica will continue to drive growth in total natural gas production in the US**
 - Pipeline takeaway capacity is needed to move the gas from the Northeast
- **Demand is now the swing fundamental factor in determining prices**
- **The ensuing summer will be a test for the adequacy of production to refill storage**
- **Current low oil price calls for increased natural gas price to incentivize gas drilling investments**
- **For coal, the current theme is more gas and less coal, but unpredictable events could disrupt the trend**

Outline

- **Natural gas price (Henry Hub) forecasts by industry consultants**
- **Natural gas production, demand and storage**
- **Regional Pipeline Takeaway Capacities, emphasis on the Northeast**
- **Coal vs Natural Gas fuel costs**

The major market intelligence service providers have “cautiously” forecasted for slight increases in prices in the near future

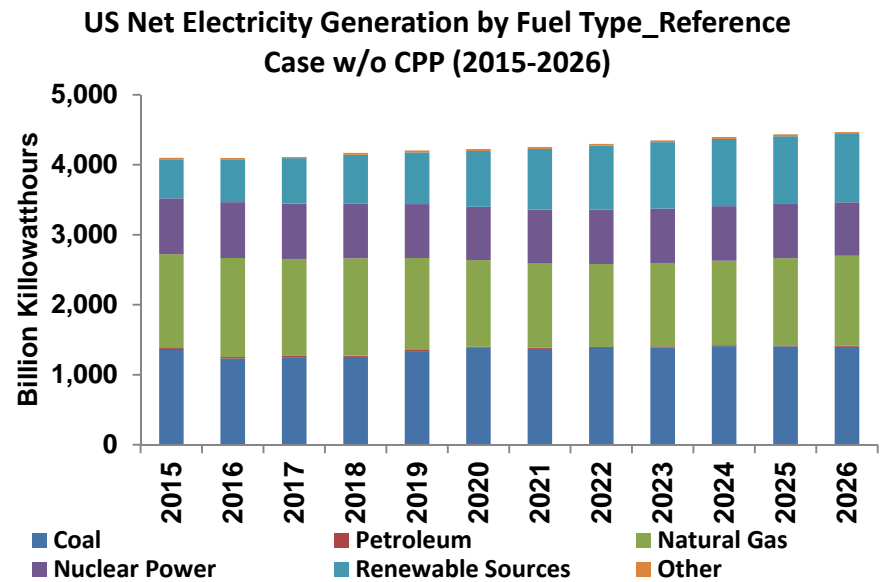
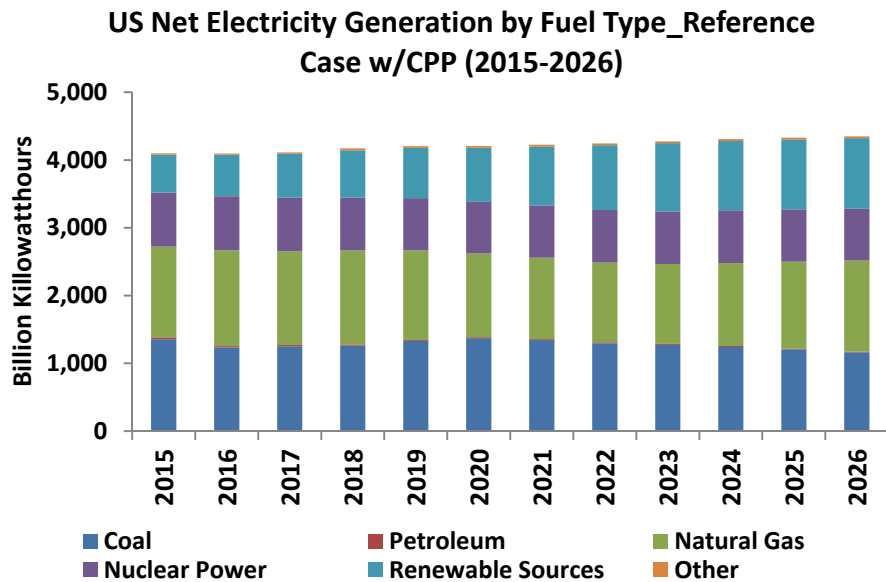
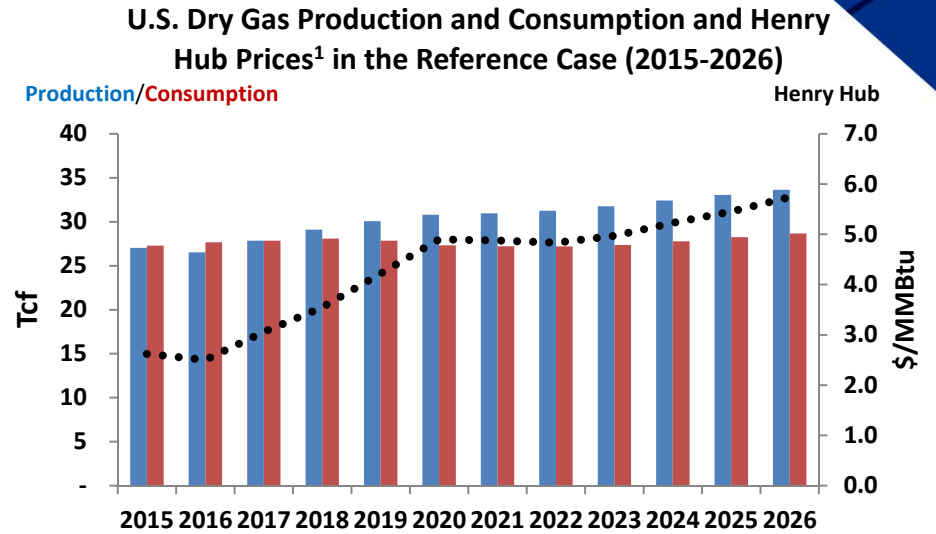
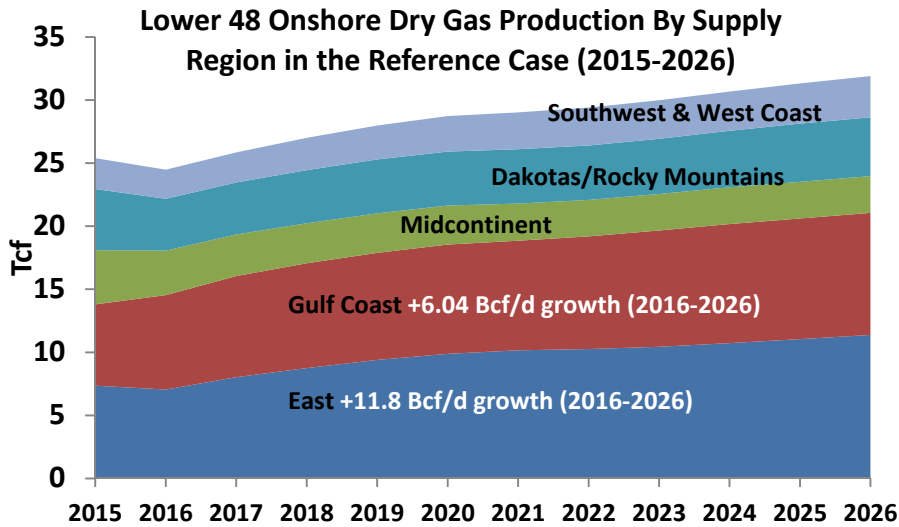
Natural Gas Price Forecasts, Henry Hub (2017-2026)



¹Note: The EIA has several other scenarios with different price forecasts

Source: Drillinginfo, PIRA, EIA, Wood Mackenzie, & SNL

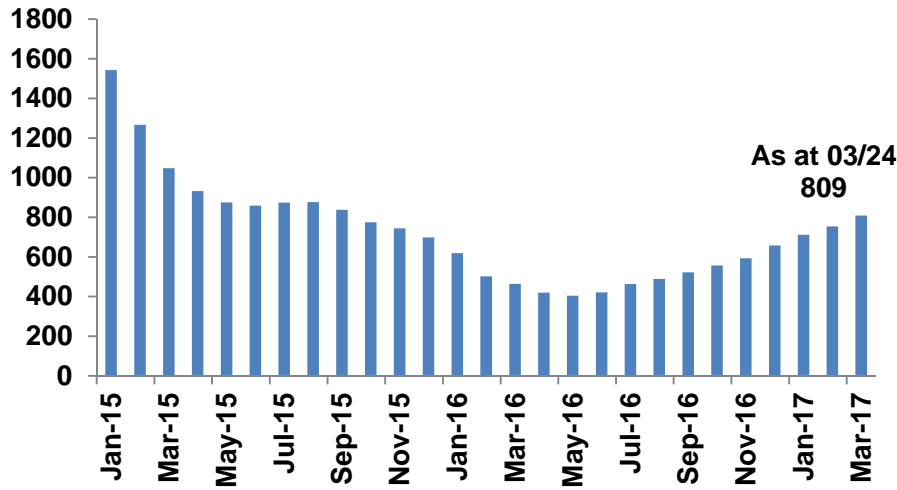
Marcellus and the Utica will continue to drive US domestic production, gas power burn is expected to grow slightly



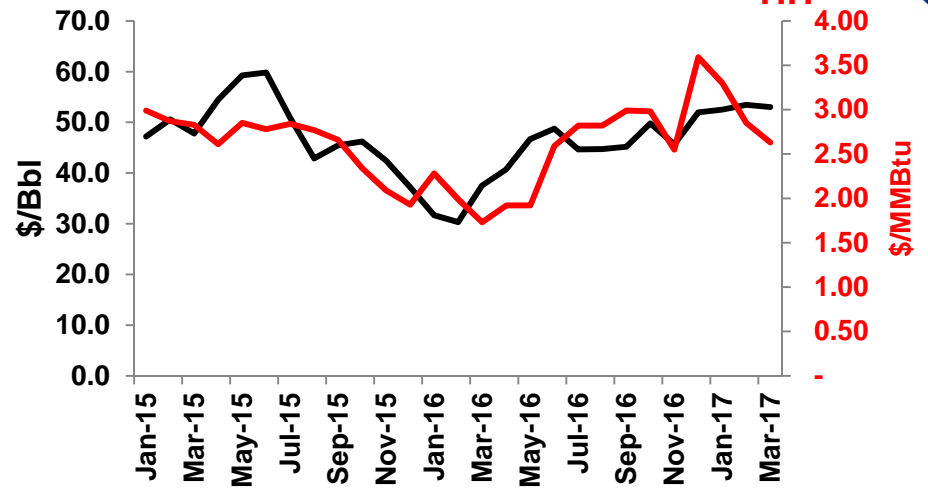
¹Note: This is EIA Reference case w/CPP, see slide 4 for a comparison with average price forecasts from industry consultants

Despite increasing rig count, the ensuing injection season will test the adequacy of production to refill gas storage in the summer

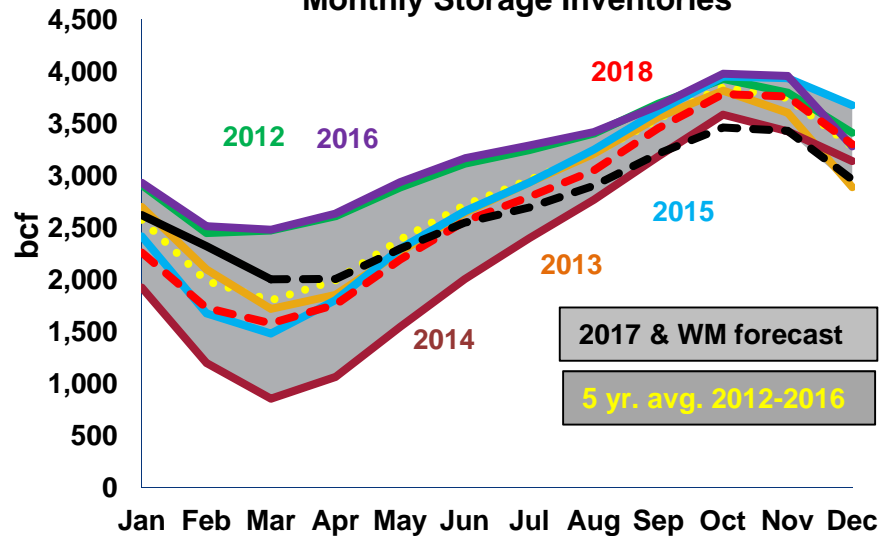
US Rig Counts (Crude Oil and Dry Gas)



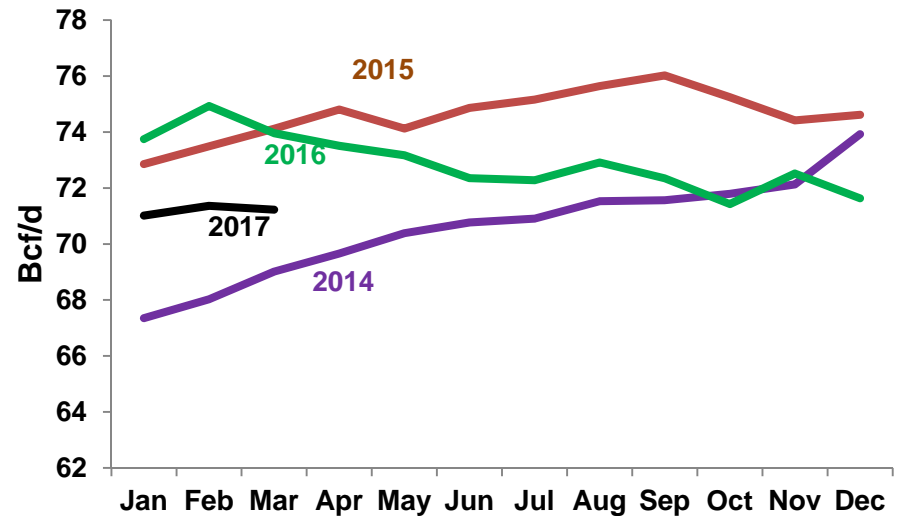
WTI¹ Monthly Prices



Monthly Storage Inventories



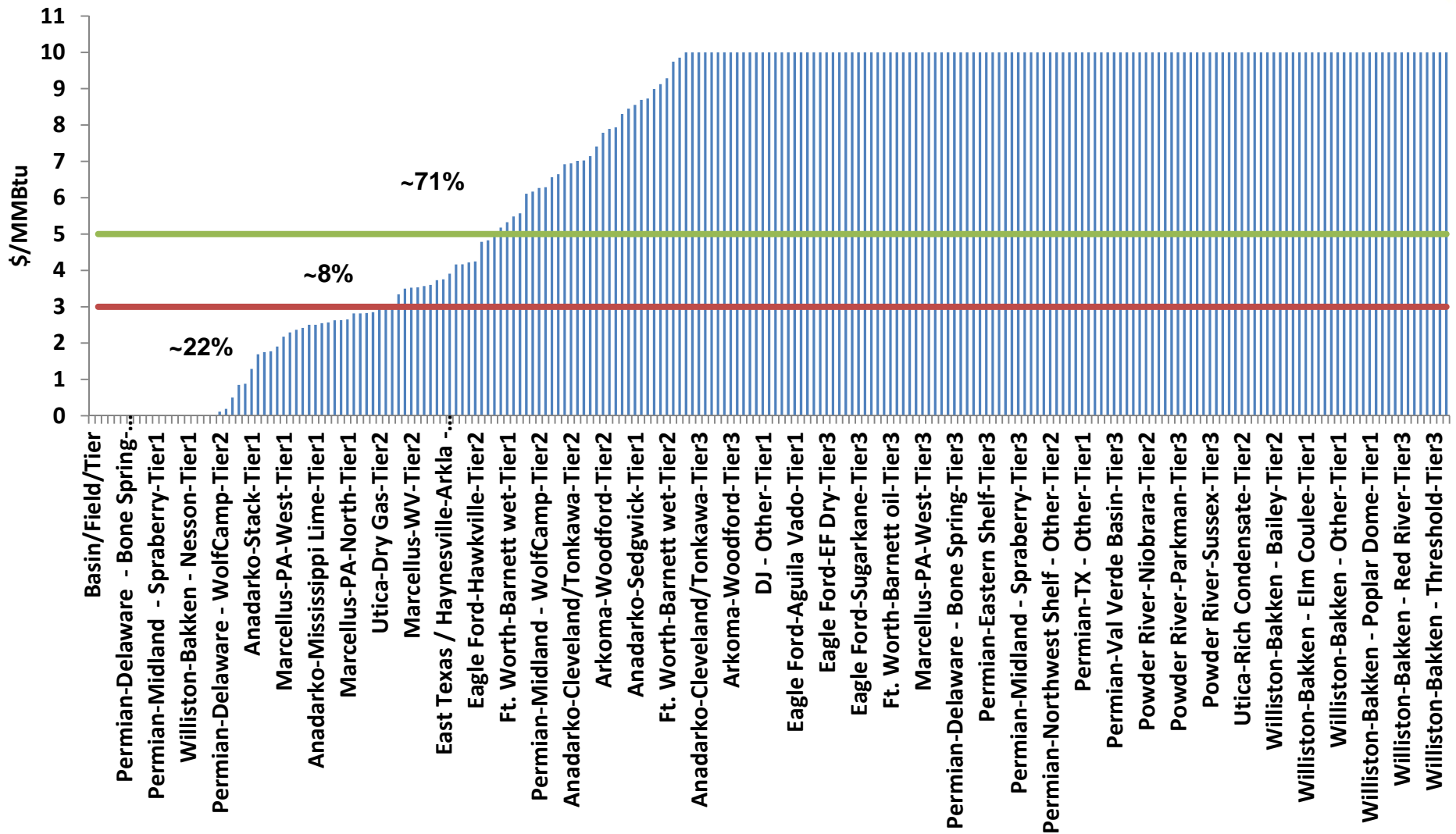
US Monthly Dry Gas Production



¹Note: WTI is West Texas Intermediate, a benchmark price for crude oil. HH is Henry Hub, a benchmark price for natural gas

The current low oil price calls for increased natural gas prices to incentivize gas drilling investments

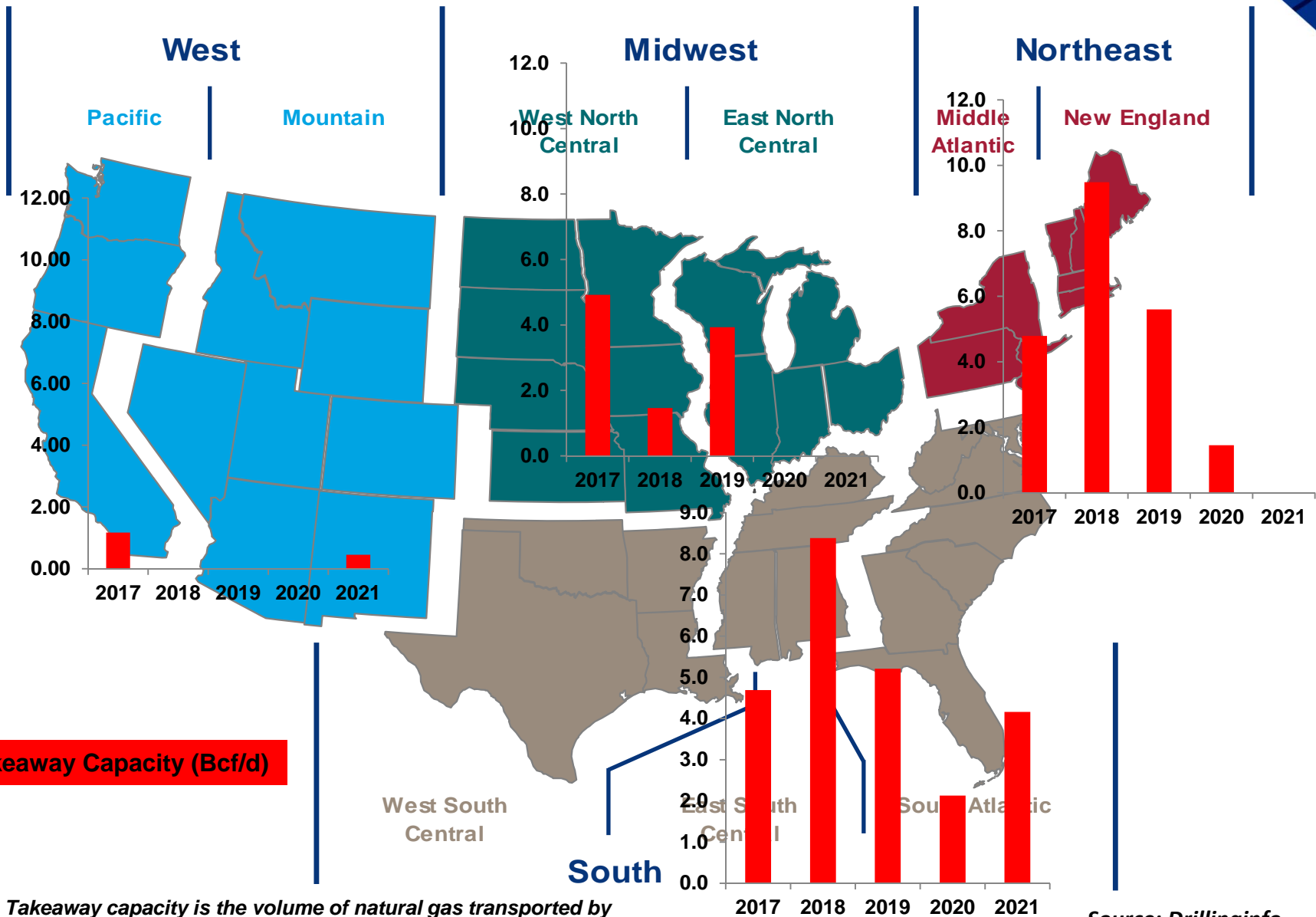
HH Breakeven @ \$52/Bbl for WTI & 20% MARR¹



¹MARR: Minimum acceptable rate of return

Source: Drillinginfo

With the increased production expected from the Northeast and the South, most of the takeaway capacity¹ will come from these regions



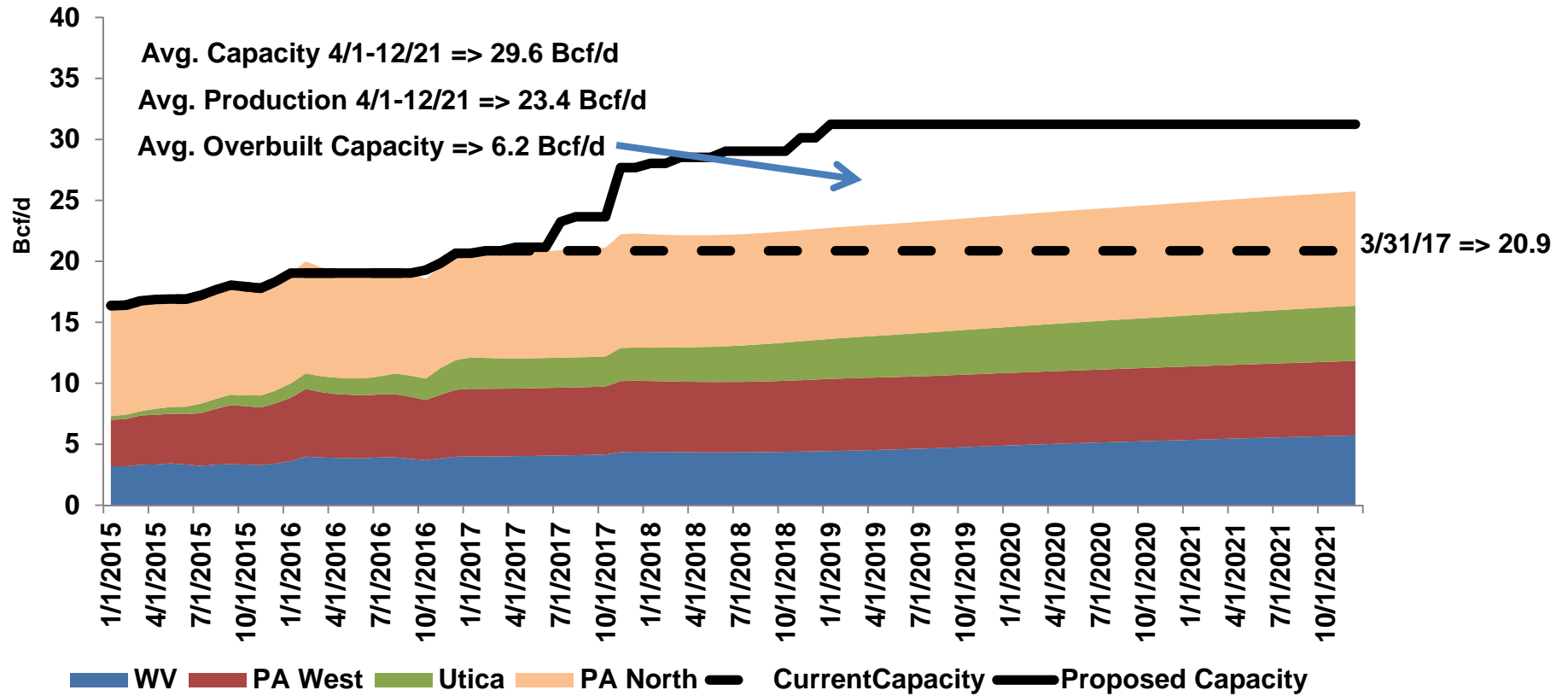
Note: Takeaway capacity is the volume of natural gas transported by natural gas pipelines from a producing area to a demand area

Source: Drillinginfo

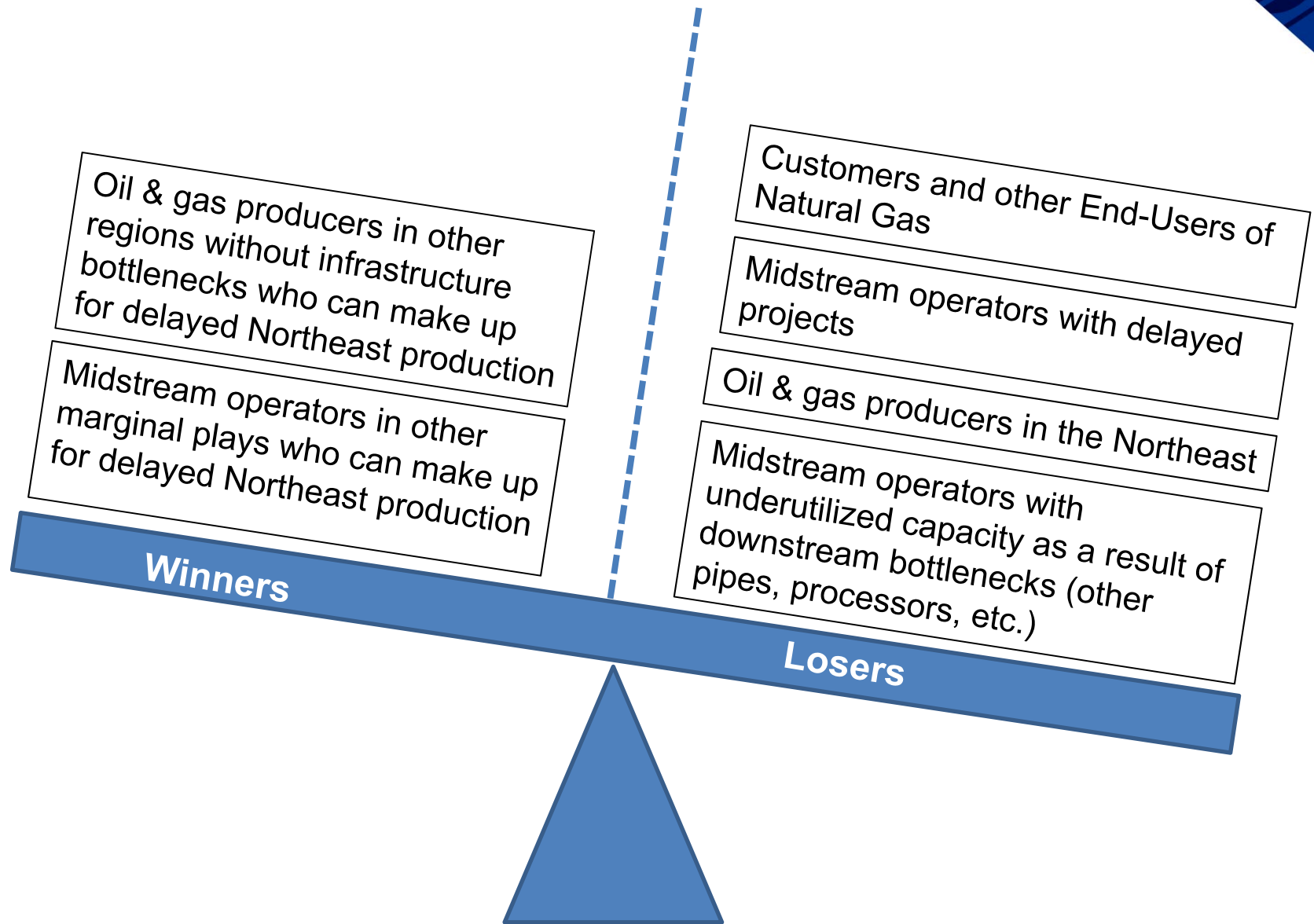
If production grows more than currently anticipated, new infrastructure would be needed to move volumes out of the region



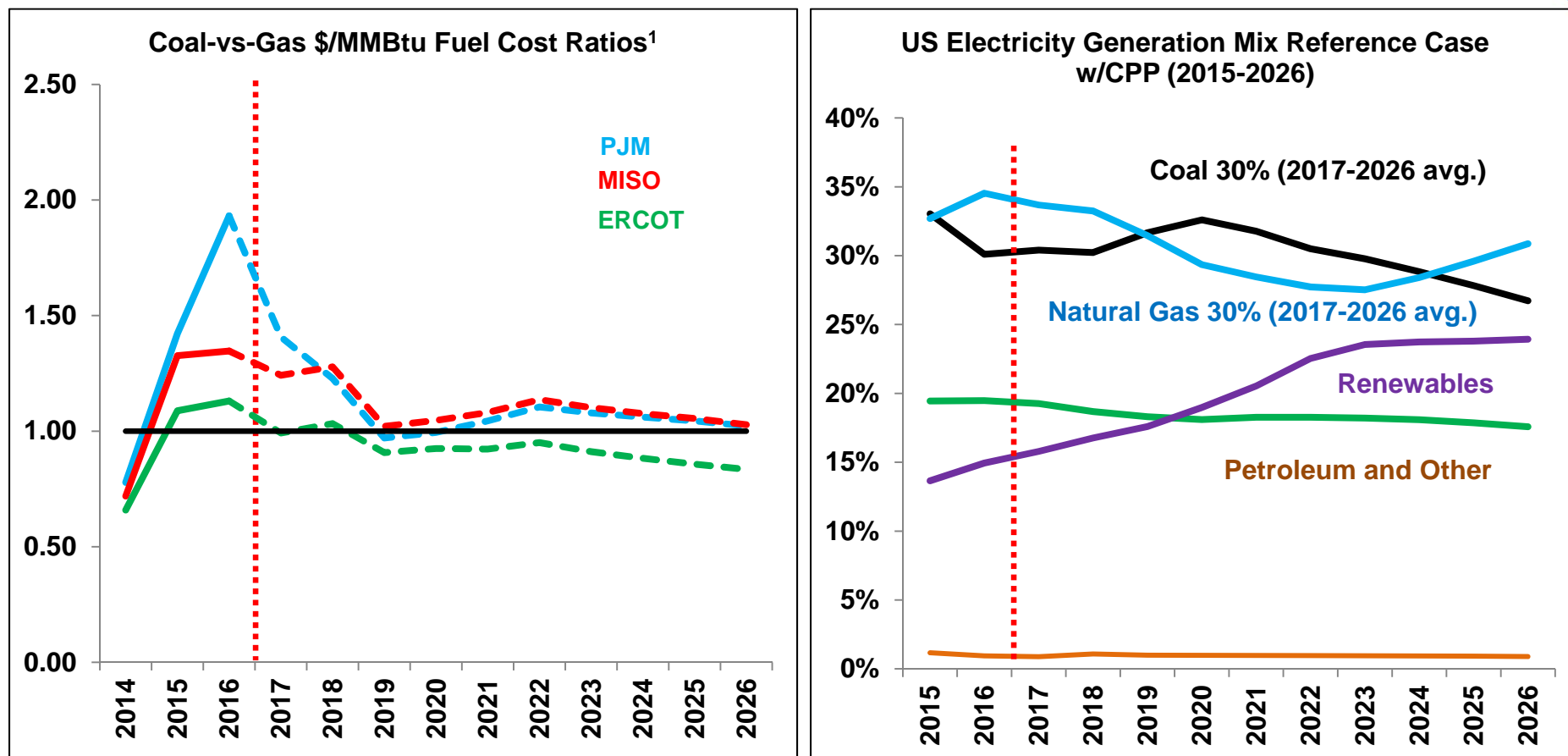
Northeast Capacity and Production (2015-2021)



Delayed Pipeline Projects and Capacity constraints; more losers, including consumers



Coal vs Gas, coal is still with us



¹This is a simplistic analysis and assumes a ratio of 1.4 for the heat rates of an average coal steam unit and average combined cycle gas unit. It does not account for the cost of emissions.

Conclusions

- **A \$3+ gas price in the near future is easily justifiable**
- **Demand not supply, is the likely swing fundamental factor in determining prices and the more we are able to understand these drivers, the better our forecasts will be**
- **Given the current trajectory of storage and production, should demand increase, prices will increase**
- **The current low levels of crude oil prices call for an increase in natural gas prices to incentivize gas drilling investments**
- **Coal vs. natural gas switching is driven primarily by economics and coal is still with us**





THANK YOU

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