

Energy Prices and the Outlook for the Tuscaloosa Marine Shale

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Understanding Recent Changes

- Recent fall in crude oil prices should not come as a “big” surprise. However, speed and magnitude of the decrease is stunning.
- Factors destined to shift the market:
 - (1) End of easy monetary policy (quantitative easing).
 - (2) Markets are re-assessing crude oil demand outlook
 - Continued U.S. structural change (increased efficiency/transportation fuel switching).
 - Japanese/European economic contraction.
 - “BRIC” (Brazil, Russia, India, China) slow-down/contraction.
 - (3) Trader realization/rationalization of stability and continuity of U.S. unconventional supplies.
 - (4) Saudi unwillingness to “catch the falling knife.”

Near Term/Longer Term TMS Impacts

TMS showing good success and moving a long way towards “de-risking” the emerging play.

TMS was seeing considerable efficiency improvements likely to also go along way in making the play more economic.
(faster drilling, higher initial production rates, longer laterals)

Unfortunate timing: TMS is considered one of the highest cost unconventional plays and could be a likely early victim of low prices.

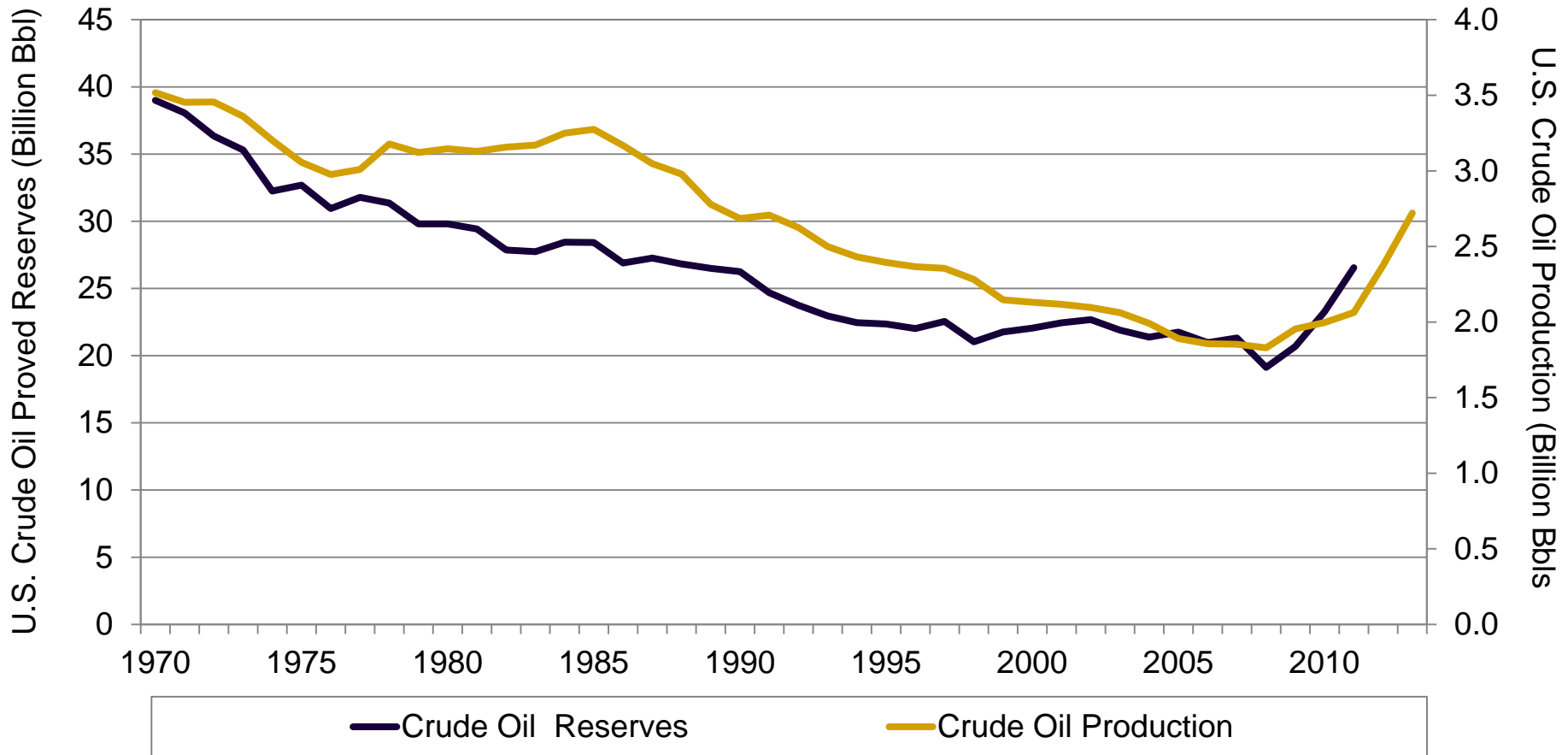
However, the genie is out of the bottle, higher prices will re-emerge and support future activity –

Challenge: can current operators in these marginal areas hang in there until prices recover?

**Unconventional Crude Oil
Development**

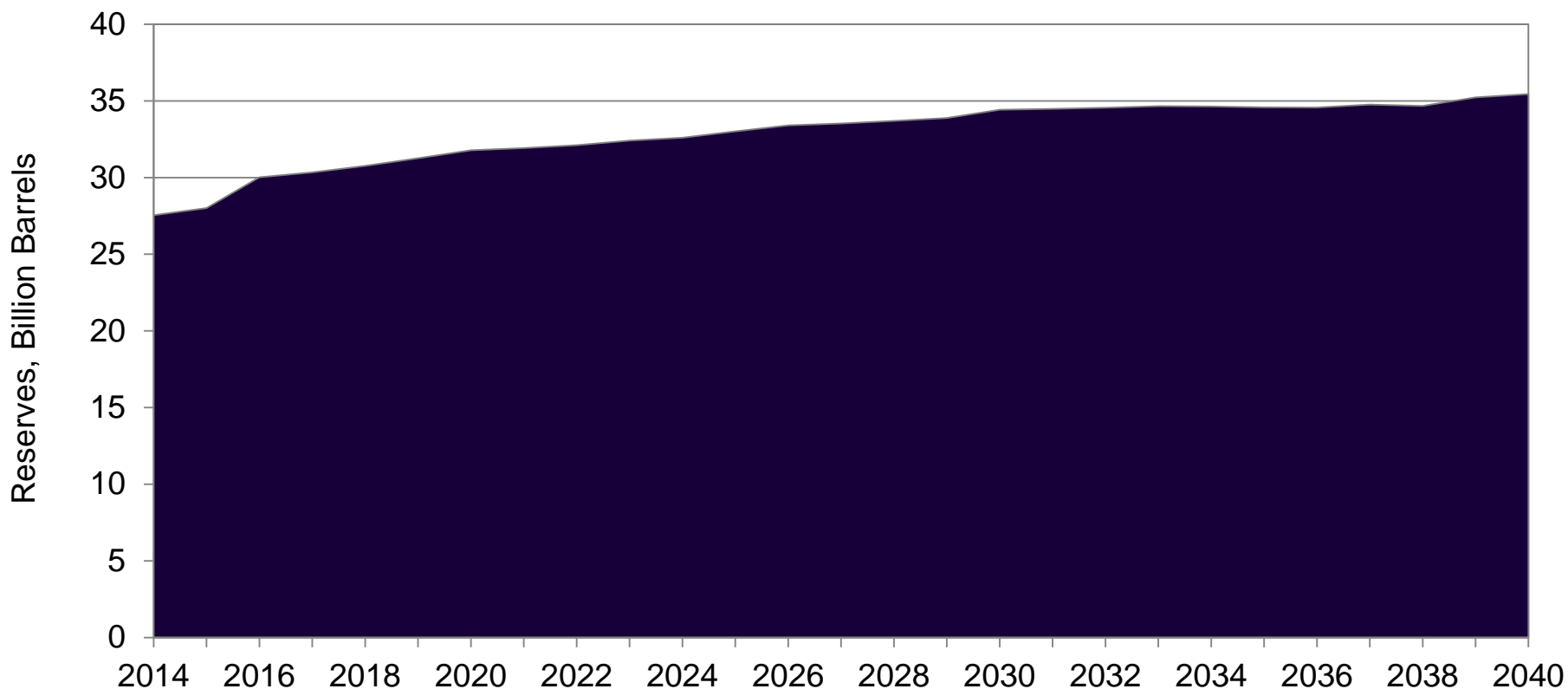
Changes in Crude Oil Reserves and Production

Crude oil production and reserves are climbing back to levels not seen since the 1980s.



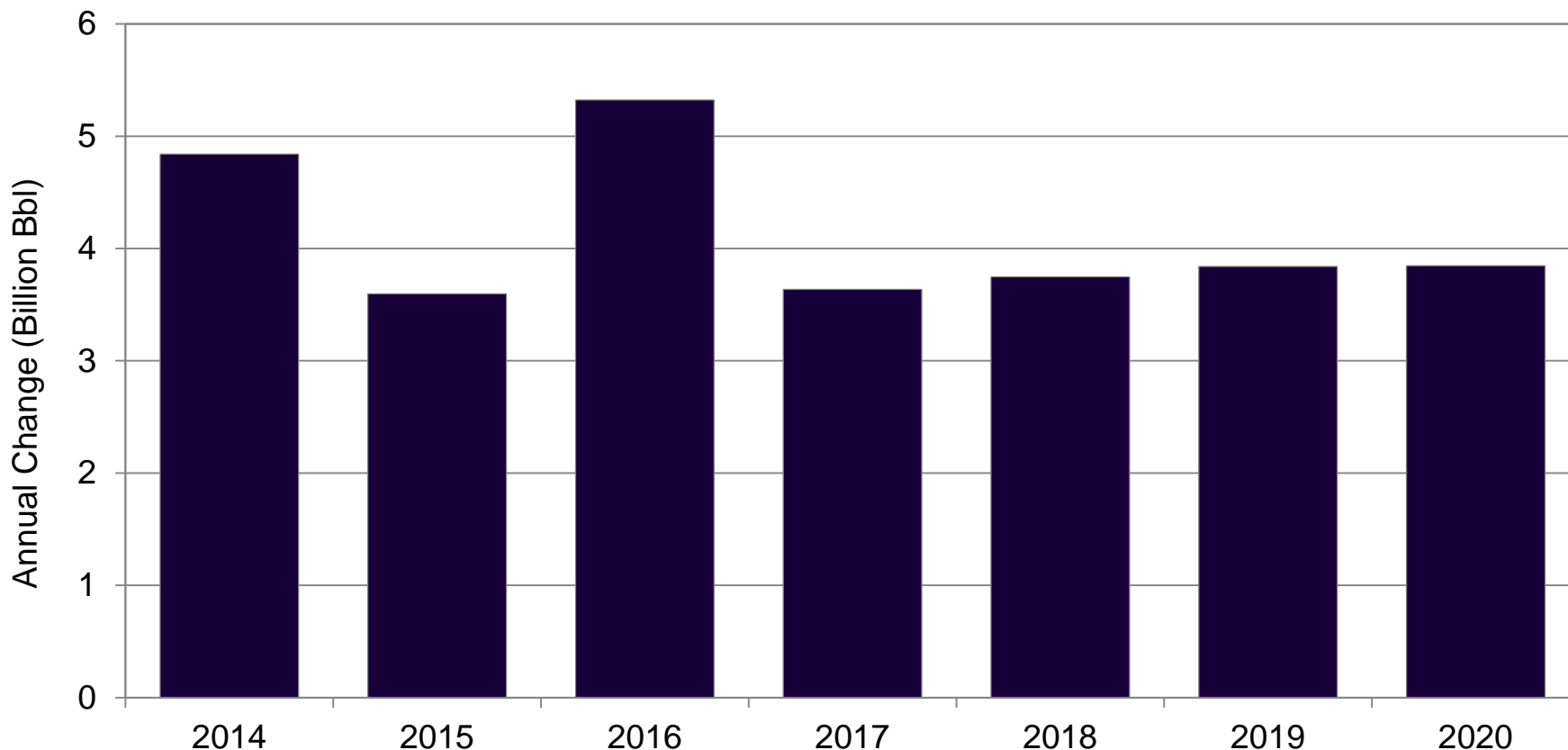
Annual Energy Outlook, Crude Oil Reserves

Crude oil reserves are expected to increase 15 percent by 2020. percent by 2016 and then gradually increase by another 12 percent another to 2040.



Annual Changes in U.S. Crude Oil Proved Reserves (Shale and Other)

Crude reserve revisions (shale and other) are showing similar trends to natural gas (positive and growing).



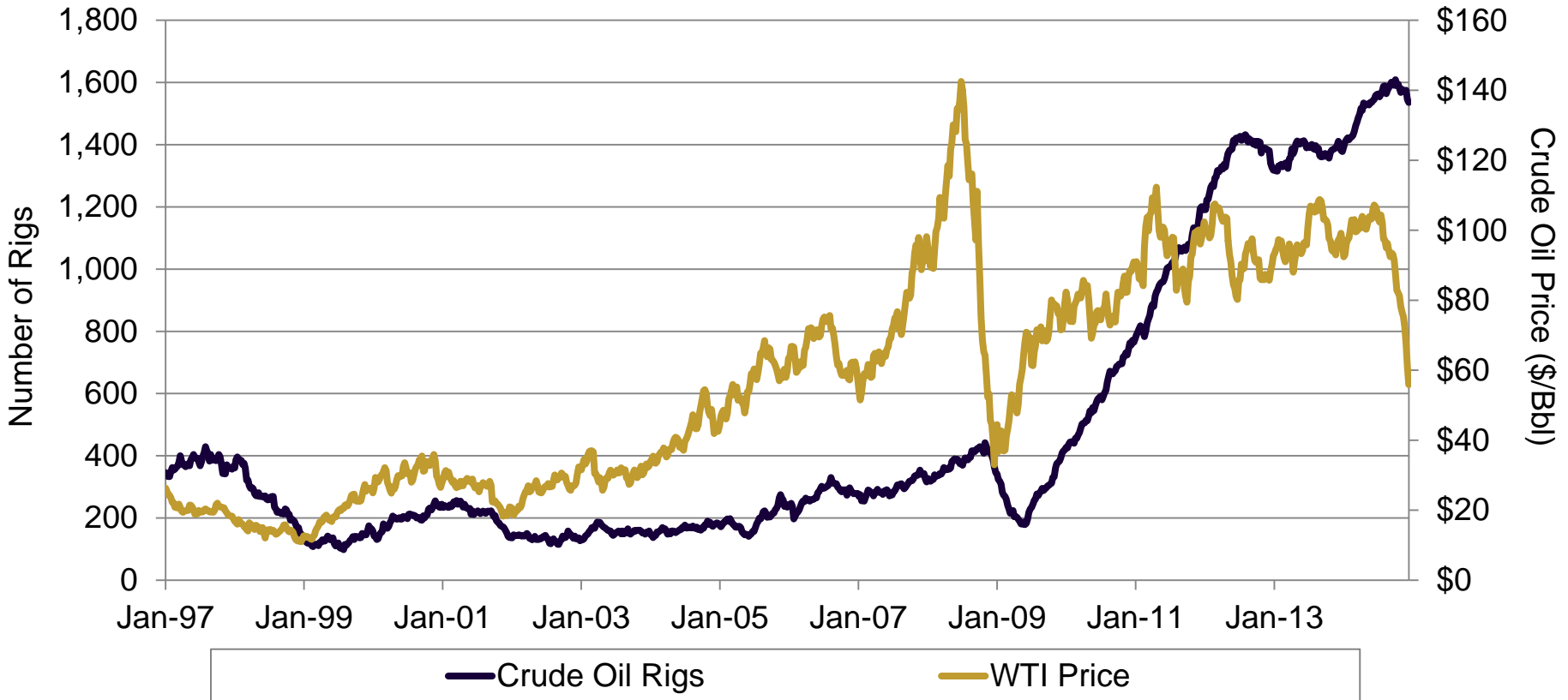
Note: Includes crude oil and lease condensate.

Source: Energy Information Administration, U.S. Department of Energy.

Recent Market Changes

U.S. Crude Oil Rig Count and Spot Price

Crude oil rigs have moved considerably faster to price run-ups post recession. Crude oil rigs starting to react to decreases in crude oil prices.



Understanding Recent Changes

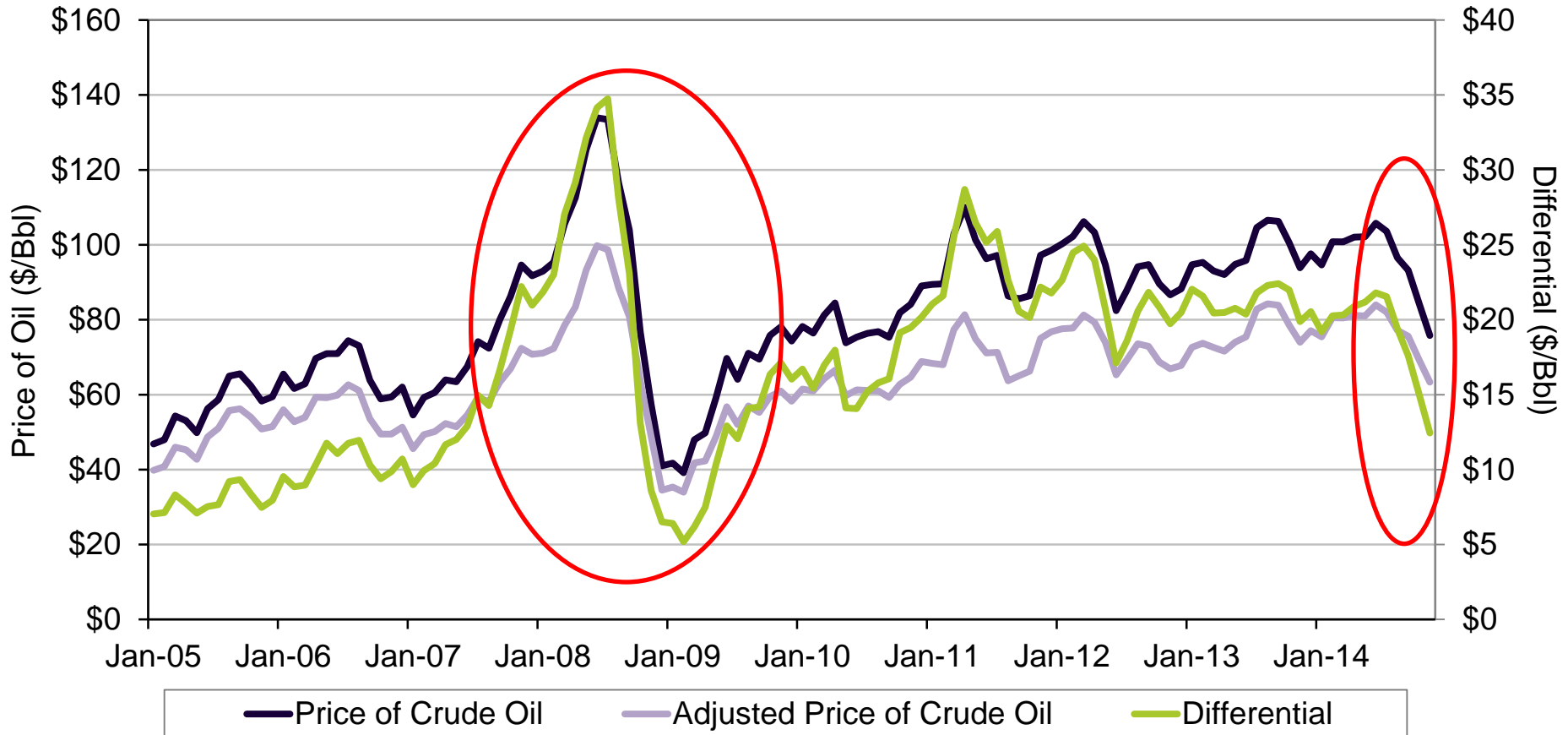
Recent market changes not entirely unexpected:

- Changes in dollar valuations due to the anticipated end of U.S. monetary easing.
- Increasingly apparent global economic contraction, particularly in China.
- Increases in non-OPEC production, including U.S. unconventional activity.



Dollar Value and Oil Prices

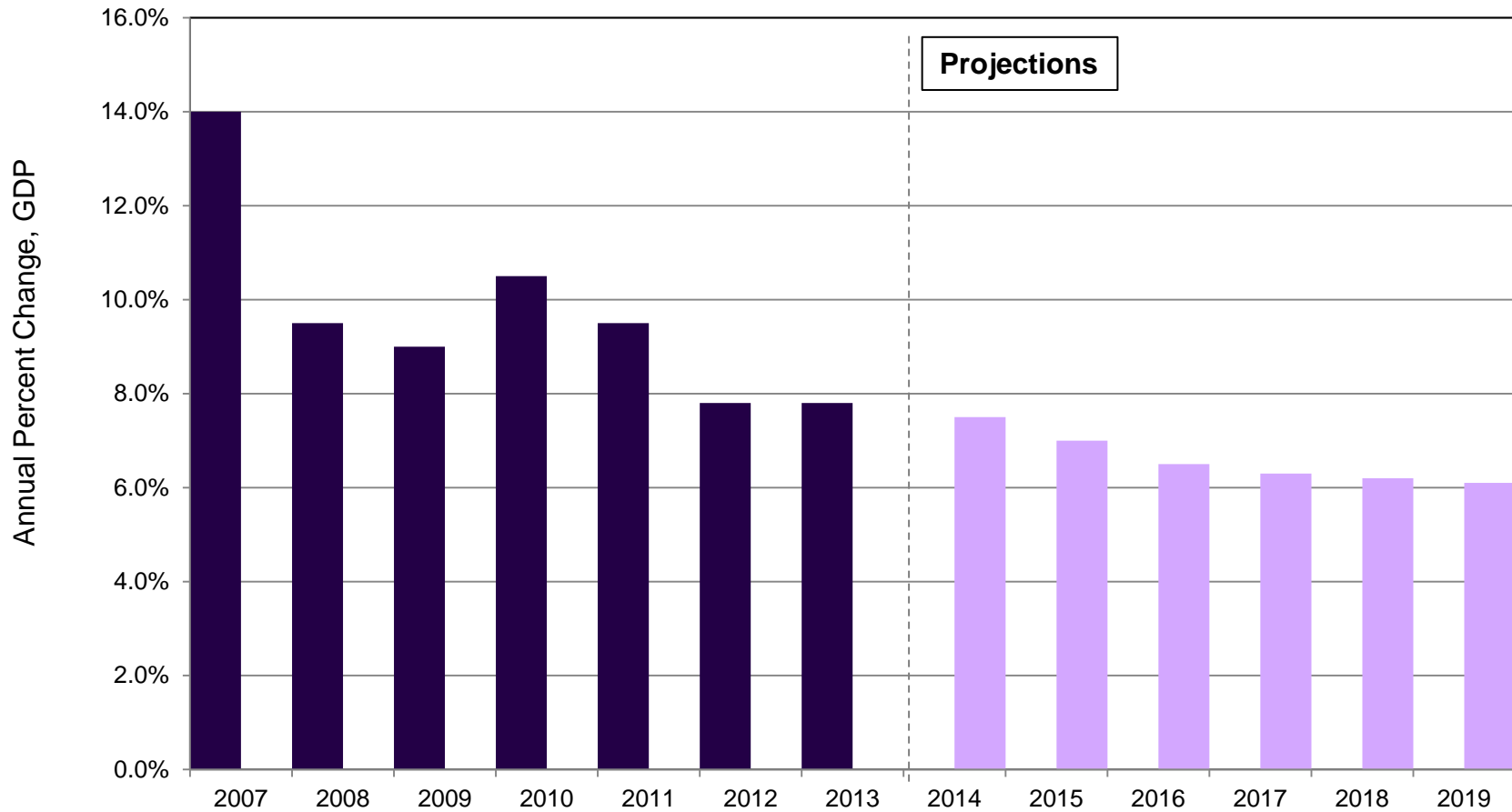
Exchange rate adjusted value of crude oil starting to fall back to levels not seen since the financial crisis of 2008-2009.



Note: The adjusted price of crude oil is the nominal WTI adjusted by the Federal Reserve Bank's Broad Index. The Broad Index is a weighted average of the foreign exchange values of the U.S. dollar against the currencies of a large group of major U.S. trading partners. Base year is 2002.

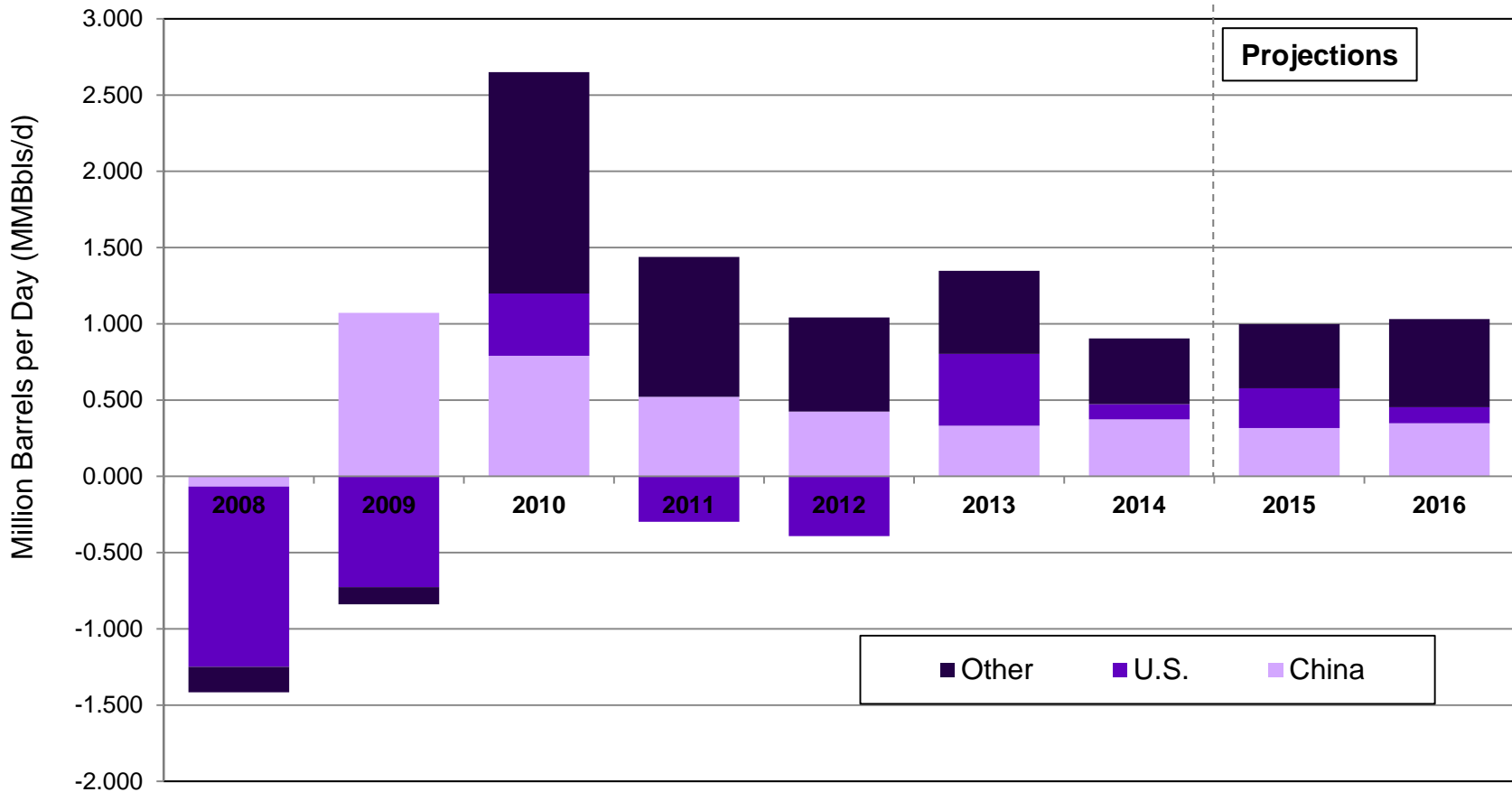
Changes in Chinese GDP

Chinese economic growth slowing considerably from 2007 peaks.



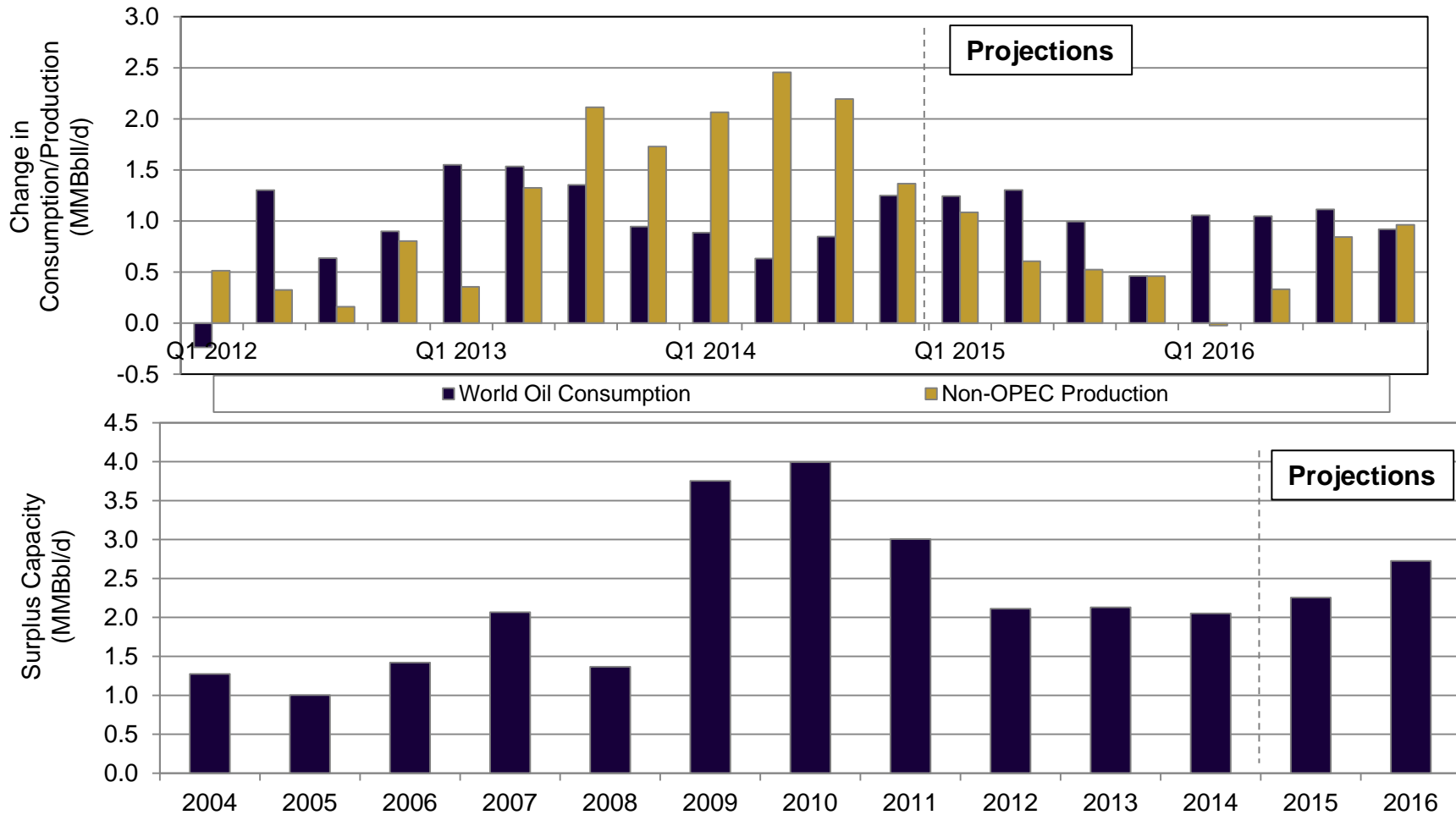
Global Liquids Fuels Demand Contraction

Change in liquids fuel growth slowing considerably, particularly since 2010.



Increased Excess Production Capacity

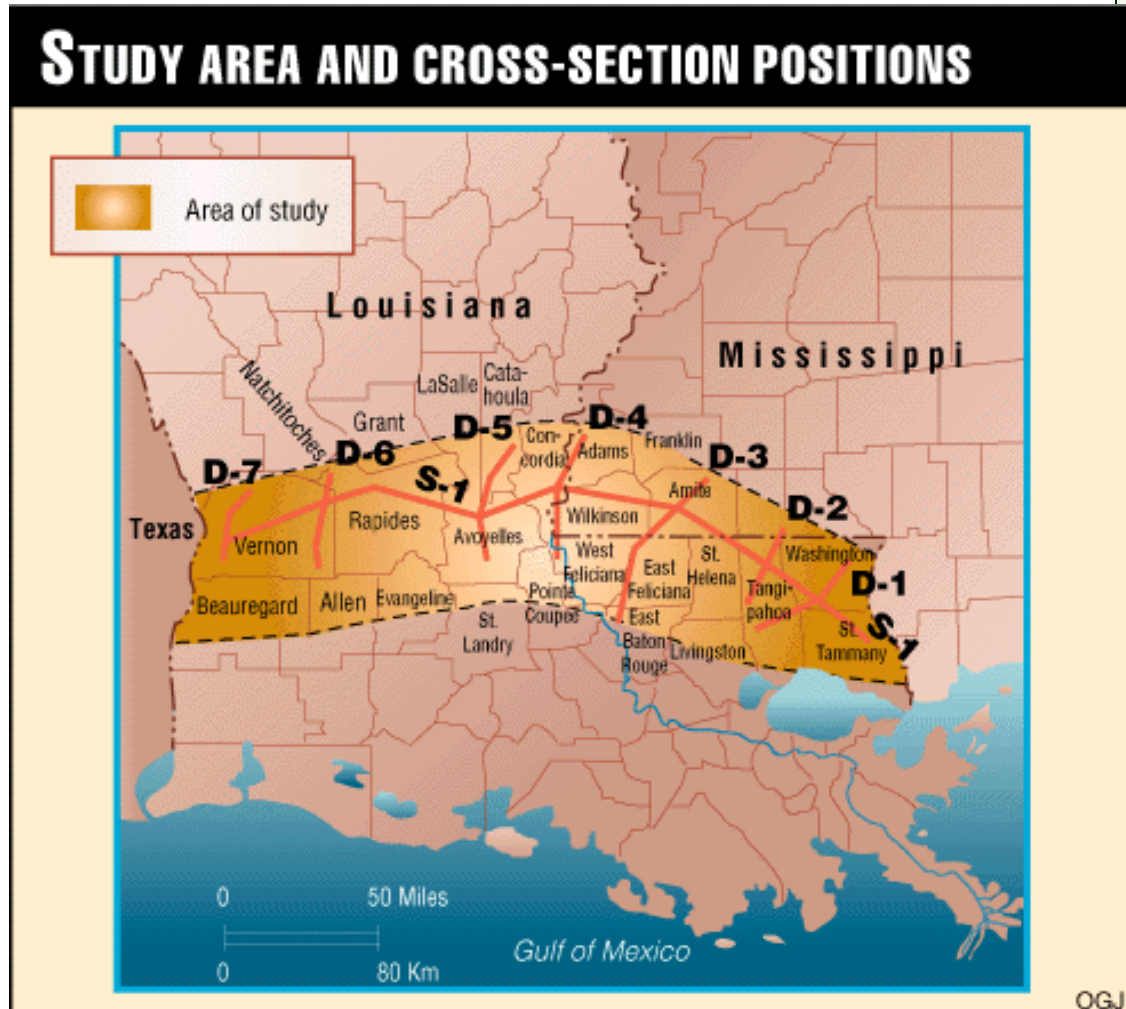
Most media and market pundits suggesting growing excess capacity responsible for the big crude oil price contraction.



Tuscaloosa Marine Shale (TMS)

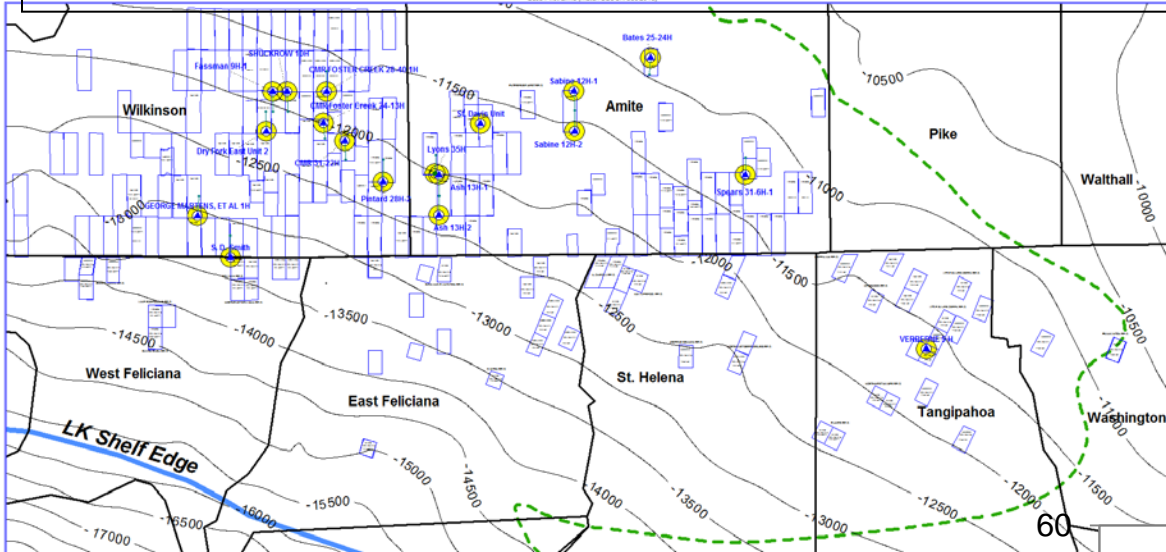
Upstream Opportunities in the Tuscaloosa Marine Shale

- **1998 LGS Study** primary publicly-available source of information on the formation.
- Lies between sands of the upper and lower Tuscaloosa.
- Approximately **2.7 MM acres**.
- Varies in thickness from **500 feet (MS) to around 800 feet (LA)**.
- -Shallowest opportunity around 10,000 feet – mostly between **11,000 to 12,000** – some areas as deep as 16,000 (EBR).
- Estimated potential resource of **7 BBbls (LGS)**.
- Other estimates (Amelia Resources) have Original oil in place estimated at **153 BBbls, potential at 9 BBbls**.



TMS Development Statistics

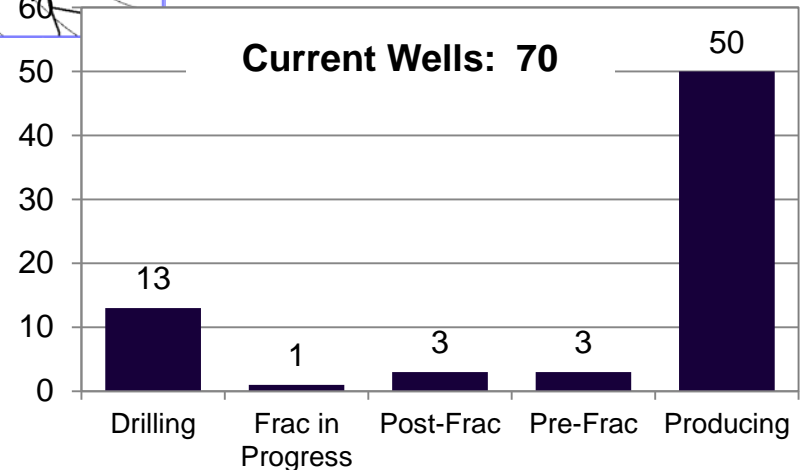
TMS activity, while growing, is still relatively small, and concentrated in the more shallow depths in southwestern Mississippi.



**MS well depths around 11,500-12,000 feet.
LA wells around 13,000 to 15,000**

Acreage Holdings

- Halcon: 307,000
- Goodrich: 300,000
- Encana: 200,000
- EOG: 180,000
- Sanchez: 80,000
- Comstock: 80,000
- Helis: 55,000
- Contango: 45,000



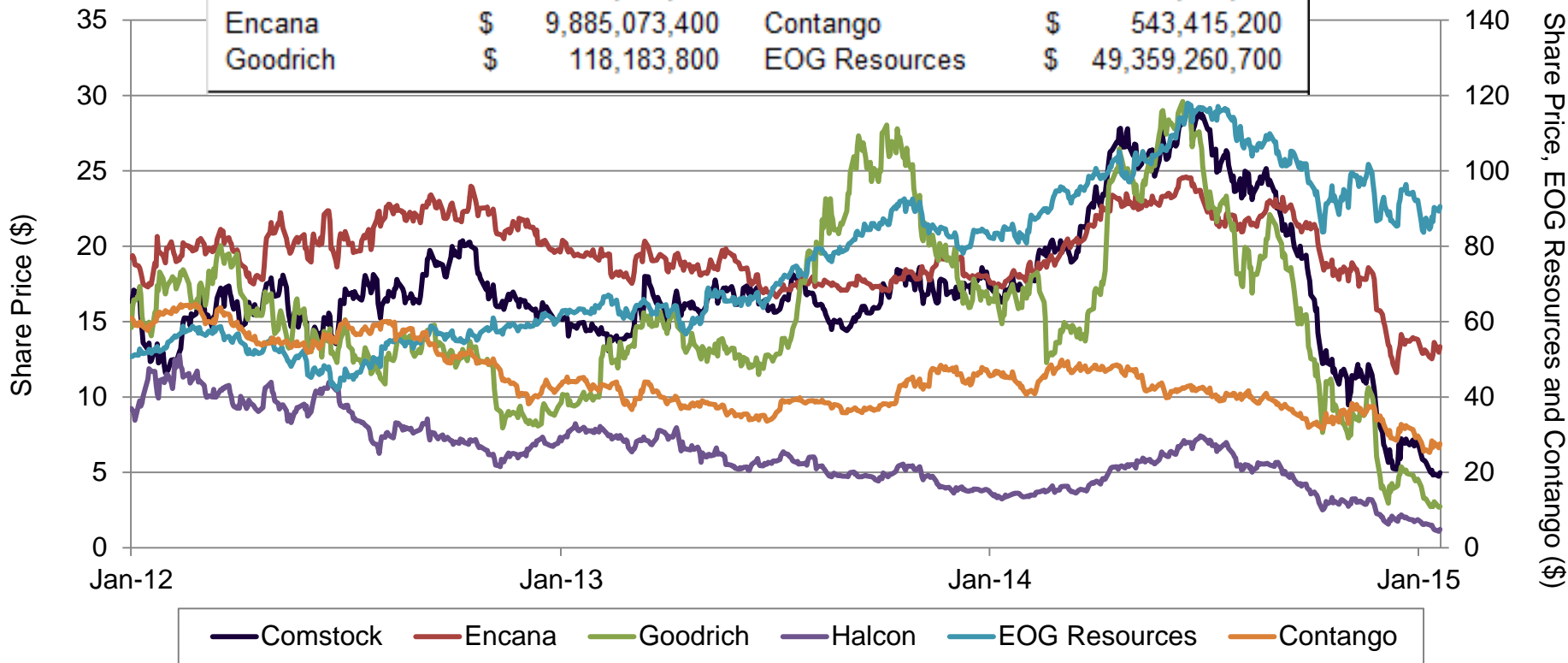
Current Wells: 70

50

TMS Developer Share Price Changes

Share prices for publicly traded TMS operators have fallen considerably.

Company	Market Capitalization	Company	Market Capitalization
Comstock	\$ 234,035,400	Halcon	\$ 595,640,400
Encana	\$ 9,885,073,400	Contango	\$ 543,415,200
Goodrich	\$ 118,183,800	EOG Resources	\$ 49,359,260,700



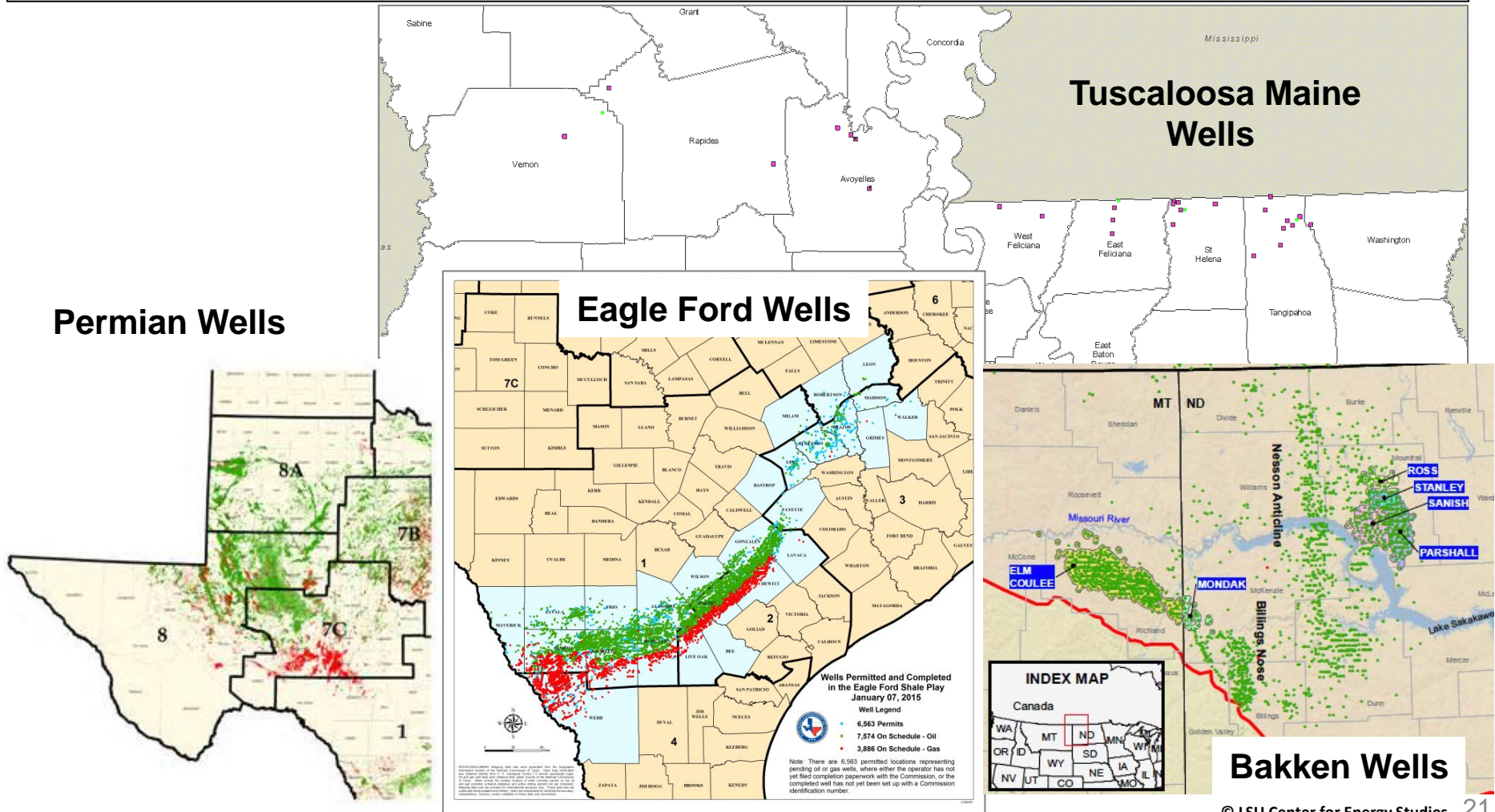
TMS Efficiency Improvements

There have been numerous impressive developments in the play over the past several years that bode well for the future.

- 50 completions to date still producing.
- Increasing lateral lengths: originally around 4,500 feet, now increasing, on average, to 6,000 feet; maximum around 8,900 feet.
- Reduced drilling time from 42 days to 27 days.
- Increasing frac stages from 22 to max of 32
- Increasing initial production rates from around 800/bpd to over 1,000 bpd. Range now 1,000 bpd to 1,540 bpd

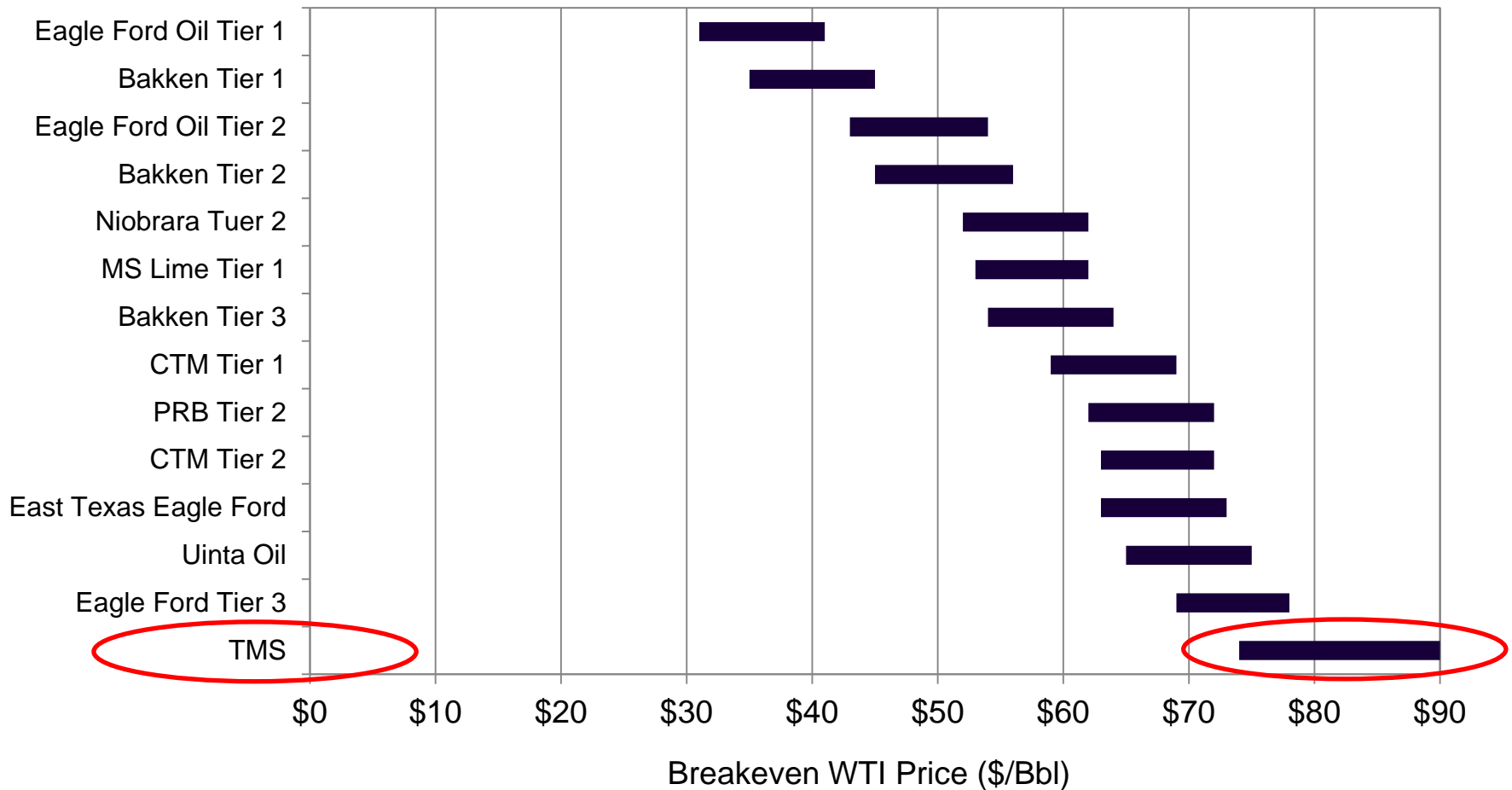
Unconventional Drilling by Major Basin

TMS drilling activity is still in its infancy relative to other maturing unconventional crude oil basins.



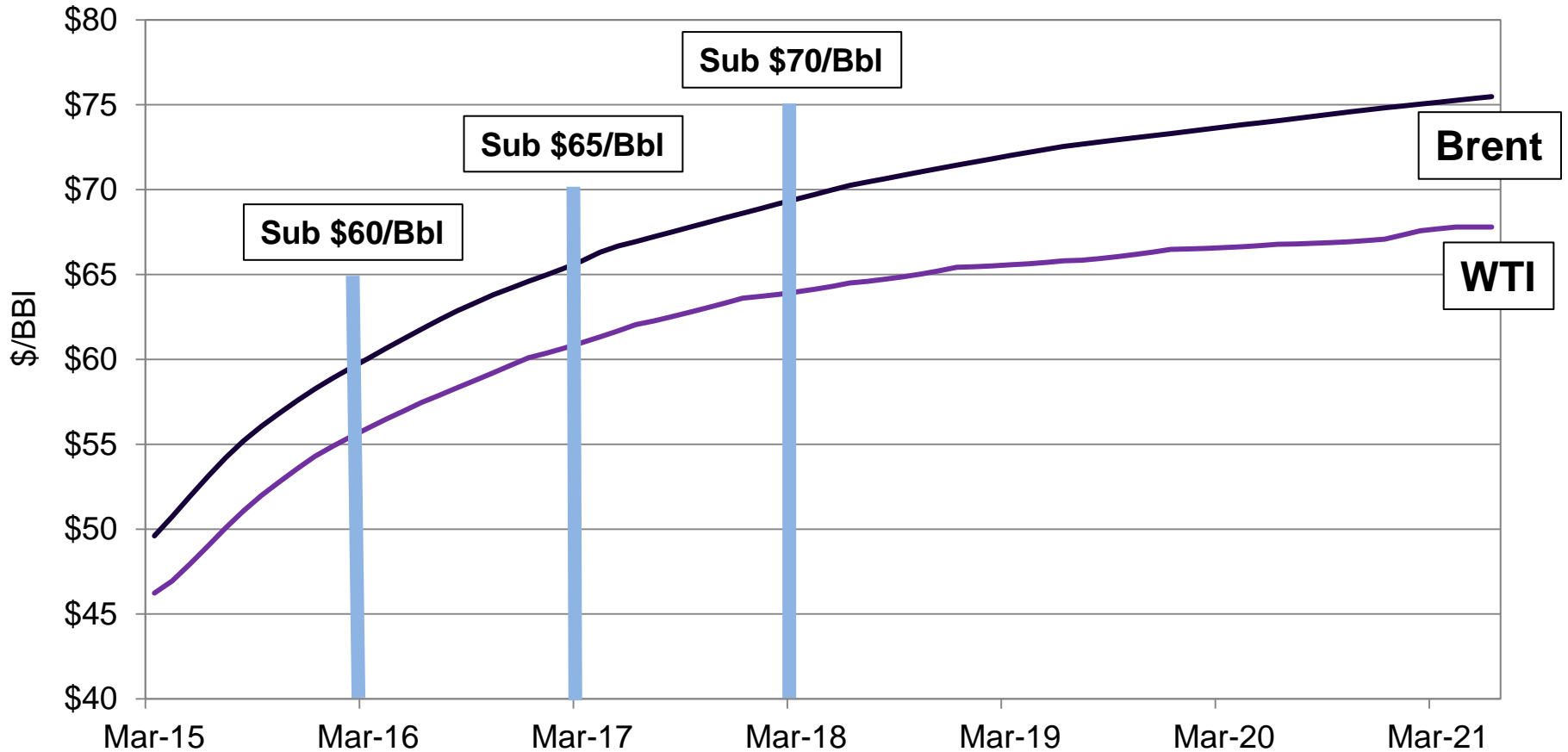
U.S. Unconventional Production Costs by Basin

TMS is estimated to have the highest development costs of the major unconventional basins.



Crude Oil Futures Settlements (January 27, 2015)

Market outlook for prices is continued sub-\$100/Bbl well into next decade.



Conclusions

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- Crude oil price correction likely to last throughout 2015. Some analysts arguing for even longer recovery period.
- Current prices are very low and likely too low to sustain new activity in emerging unconventional crude oil basins like TMS.
- Some TMS developers have seen impressive successes and efficiencies improvements and there may be some opportunities for continued activity, however, that activity is likely to be very restricted, assuming it can be sustained.
- TMS has been proven up in many ways and has promising opportunities provided enough price support materializes.



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