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The Shale Oil Revolution

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ITS UCDAVIS
INSTITUTE OF TRANSPORTATION STUDIES

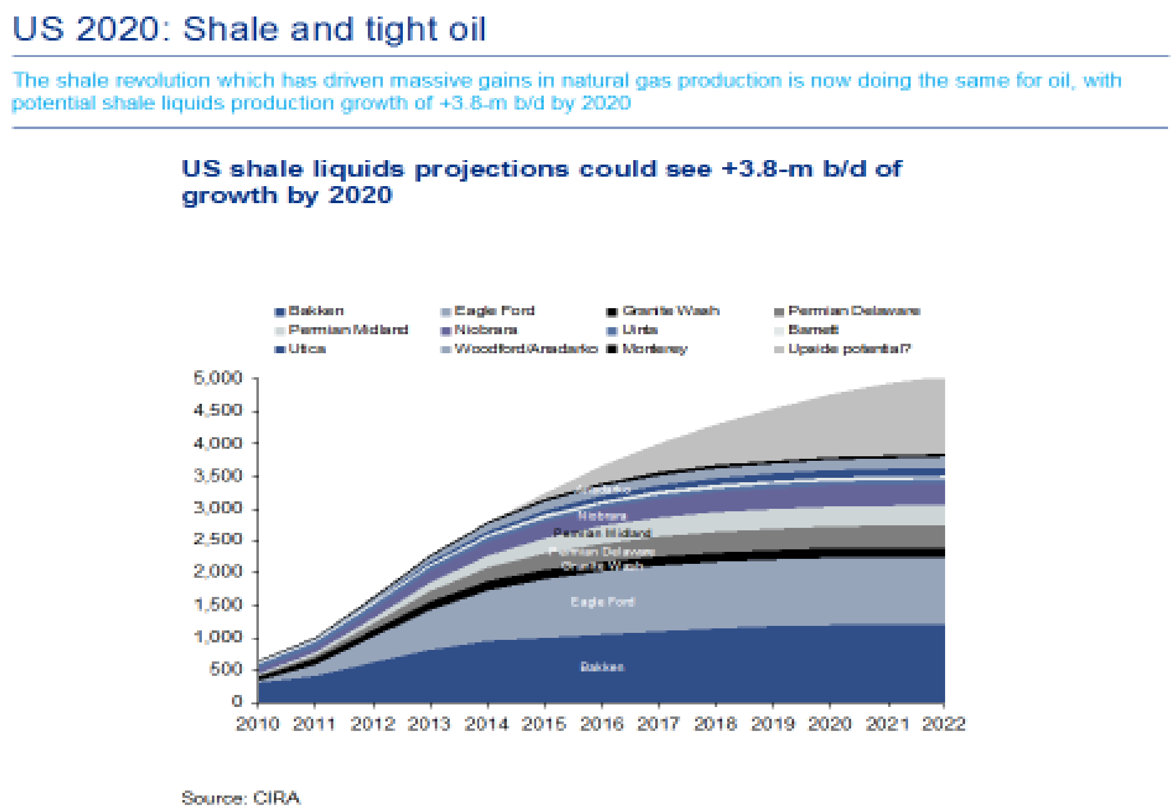
The Shale Revolution is Real

- *Investment in Tight Oil Prospects in North America Has Quadrupled Since 2010; Expected to Reach $80 Billion by 2015*
- *Producing from source rock is a new game changing paradigm*
- *Forecasts vary*

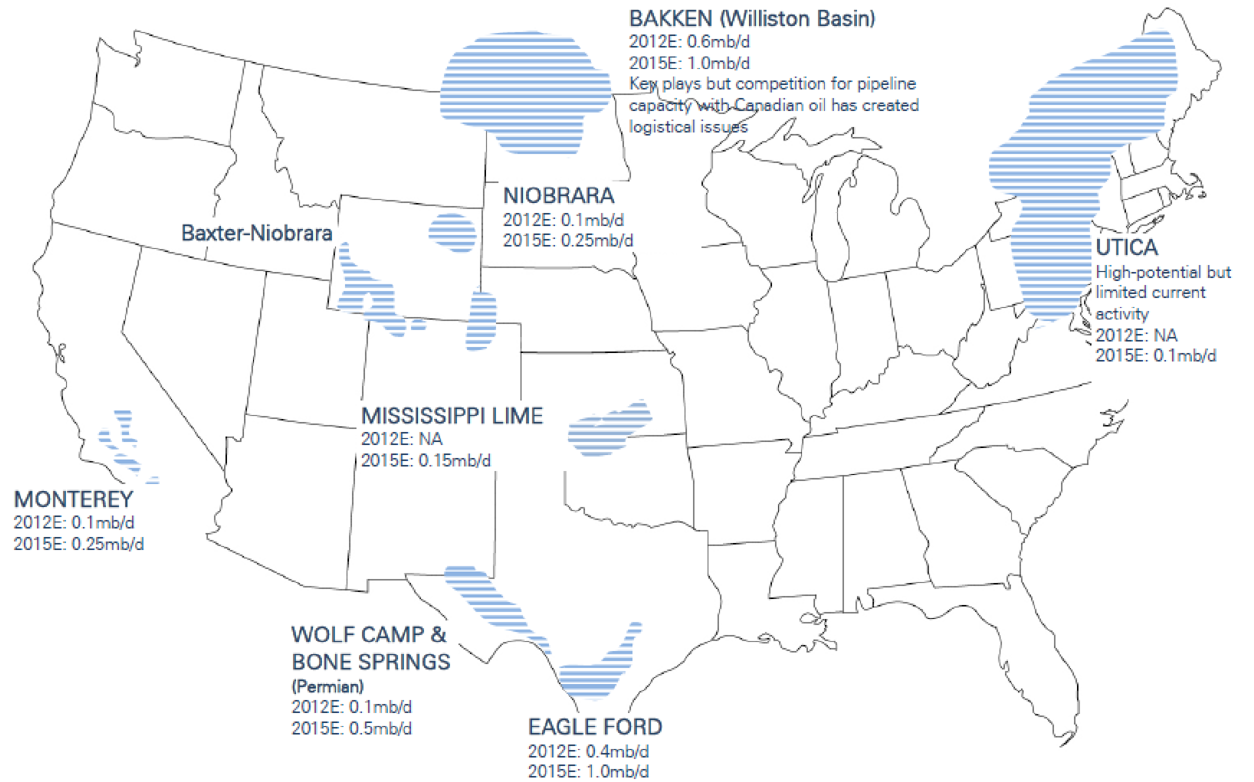
but mainly on

size of supply

bubble



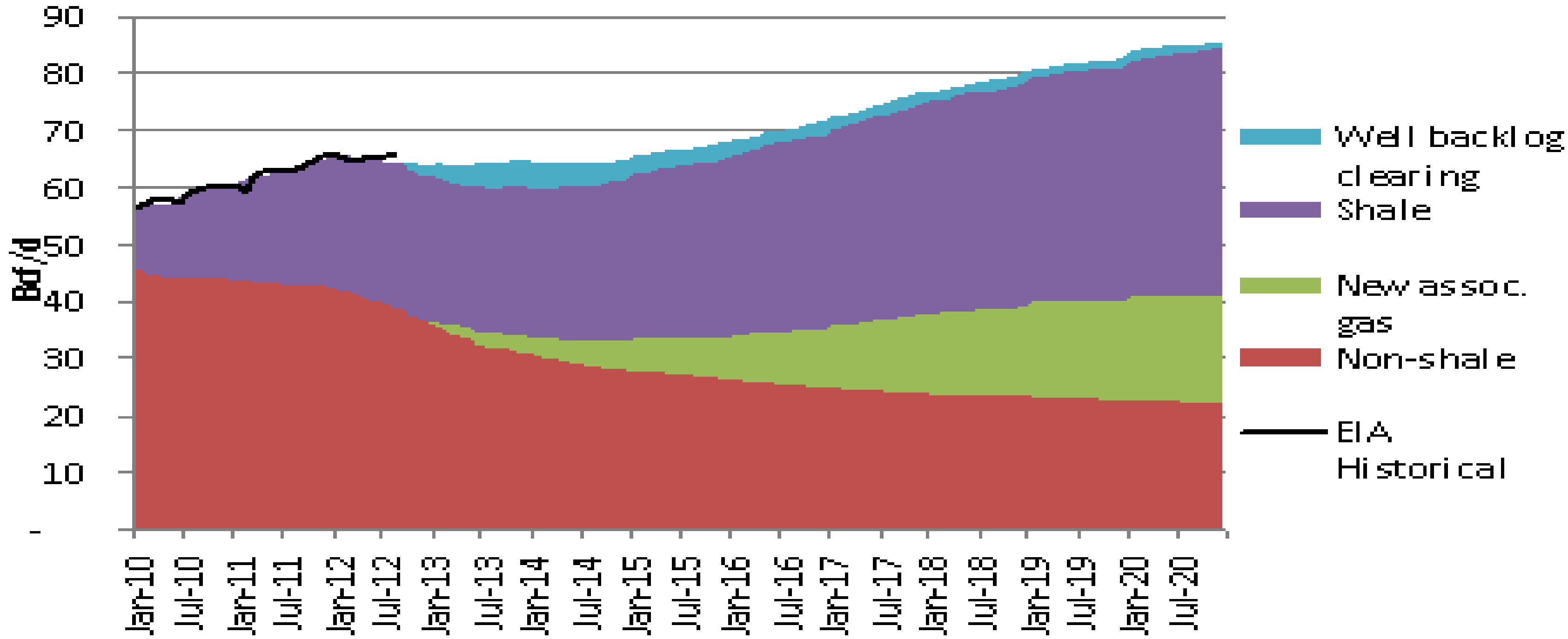
Over ten U.S. shale plays have high liquids potential



Source: Deutsche Bank, Integrated Oils: Oil & Gas for Beginners

- U.S. shale oil and gas potential is widely distributed geographically
- Technical and cost challenges rapidly being overcome through experience and innovation; Production increases can be expected for the next several years

U.S. Natural Gas Production Profile Remains Robust through 2020 and beyond

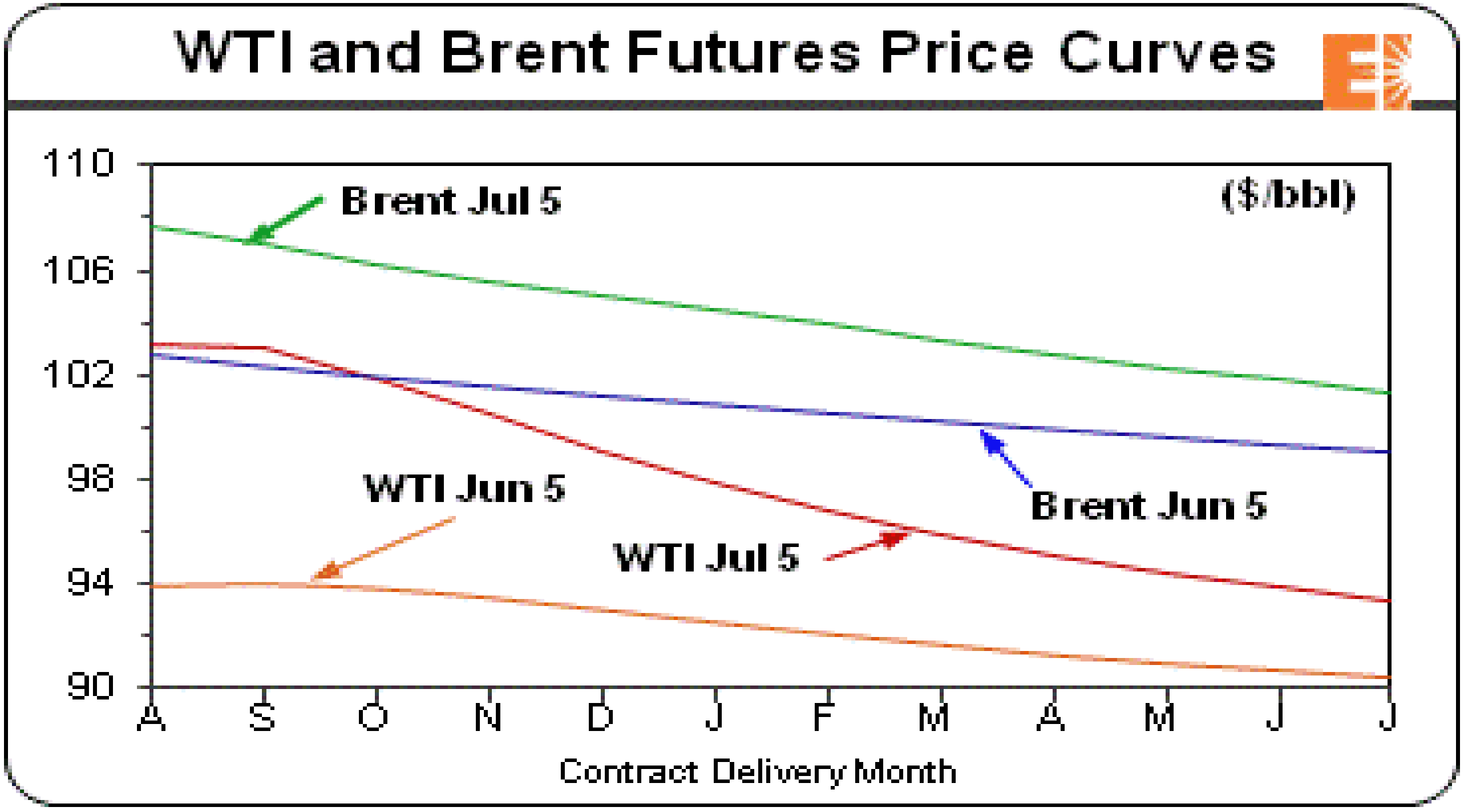


Source: Citi

- Large resources available at breakeven costs between $2 per mcf to $3.50 per mcf in 2013-2014 time frame given a backlog of drilled wells and rising Marcellus output
- Longer term, modeling simulations indicate U.S. domestic supplies can keep up with rising demand and limited US LNG exports without pulling prices out of the $4 to $6 range, drawing on higher cost dry gas reserves

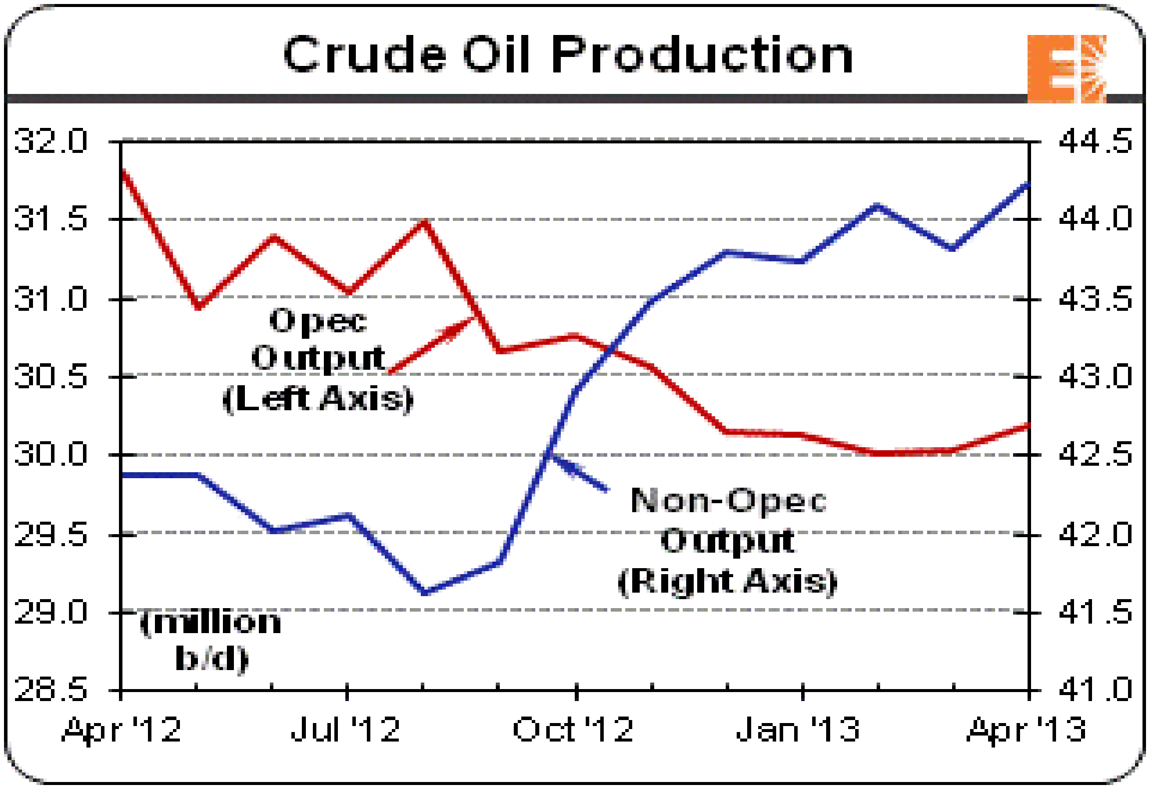
Geopolitics, not long term supply fundamentals, are holding up the price of oil

Oil futures seeing discounts in forward months



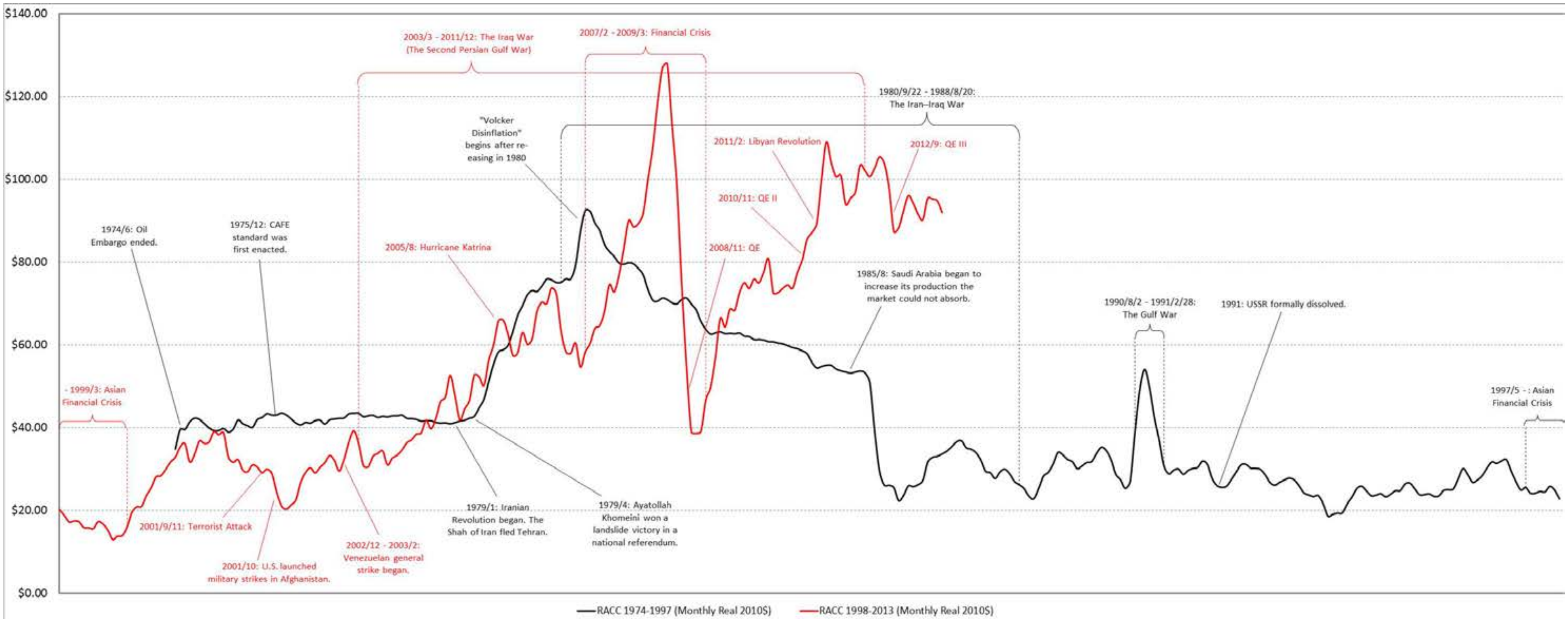
Optimism about “long” oil price is fading.

Non-OPEC gaining market share reminiscent of early 1980s



Tight oil is the new North Sea. OPEC will be under new pressure to defend either prices or marketshare. Chances are OPEC can do neither.

Repeating Boom and Bust Cycles Characterize Oil.



Source: Medlock, K.B., Amy Jaffe, "The price of crude oil: deja vu all over again?" (2013), EIA

- High oil prices usher in demand destruction through conservation, efficiency gains, and substitution
- High oil prices stimulate drilling innovations, which over time can lead to supply bubbles.

C0nclusions

- Oil scarcity will not be the force driving a shift to alternative energy
- Climate and energy policy initiatives will have to take into consideration the possibility of oil and gas surpluses and lower fossil fuel prices