Tight Oil - Possibilities, Challenges, and Policy

Economic, Political and Environmental Issues

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Energy Policy Research Foundation, Inc. (EPRINC)
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Projected Imports of LNG vs. Actual (or why forecasters should have humility)

Source: EIA data and forecasts
NPC Findings

Note: The oil supply bars for 2035 represent the range of potential supply from each of the individual supply sources and types considered in this study. The specific factors that may constrain or enable development and production can be different for each supply type, but include such factors as whether access is enabled, infrastructure is developed, appropriate technology research and development is sustained, an appropriate regulatory framework is in place, and environmental performance is maintained.

Source: Historical data from Energy Information Administration and National Energy Board of Canada.
Oil and Gas Permits in Past 90 Days

As of Feb 13th

As of March 16th

Source: HPDI March 16, 2012
Rig Count and Permits

Source: Photo Baker Hughes Interactive Rig Count Jan 25, 2012
Technology Progression, ND and MT

Daily Oil Production (Bopd)

- 350,000
- 300,000
- 250,000
- 200,000
- 150,000
- 100,000
- 50,000
- 0


Wells

- 7,000
- 6,000
- 5,000
- 4,000
- 3,000
- 2,000
- 1,000

~350 MBO
~2,700 WELLS

HZ wells
No frac

Single Leg HZ Liner / Multi-stage Frac

Multi Leg HZ Open hole Frac

Estimated Ultimate Recovery

Source: Brigham Exploration via World Oil
Williston Basin Production

North Dakota accounts for almost 10% of US Production

Almost all new production is from the Bakken/Three Forks

Source: NDIC
Trend Area Daily Average Production

Source: HPDI March 21, 2012

Barrels Per Day vs. mcft/day

LIQ vs. GAS
Eagle Ford Production

Source: HPDI March 21, 2012
Unconventionals Production and Forecast
(Crude oil, no NGLs)

Source: HDPI data, EPRINC estimates
Resources for the Future on the Keystone XL Pipeline*

...from a national perspective, whether the pipeline is approved or not is relatively unimportant. Instead, we should focus on reducing our contribution to the global carbon footprint and improving the efficiency of our carbon-based fuel use.

Putting Politics Aside: The Consequences of the Keystone XL Rejection
RFF Feature, By Joel Darmstadter and Alan J. Krupnick, January 24, 2012

* Did they miss something?
North American Crude Oil Pipelines

North American Pipes
Choke Points

Source: Savage, Presentation Bakken Product Markets and Take-Away Denver Jan 31-Feb 1 2012 *with EPRINC Additions*
North Dakota Crude Oil Transport

October Estimates, 2011
- Pipeline Export: 67%
- Tesoro Refinery: 18%
- Truck Exports: 10%
- Rail: 5%

January Estimates, 2012
- Pipeline Export: 58%
- Tesoro Refinery: 10%
- Truck to Canadian Pipelines: 25%
- Estimated Rail: 7%

December Estimates, 2011
- Pipeline Export: 61%
- Tesoro Refinery: 10%
- Truck Exports: 23%
- Estimated Rail: 6%

Source: North Dakota Pipeline Authority
Bakken Prices at Clearbrook

Source: Bloomberg, Mar 16, 2012
Final Observations

Major new pipeline infrastructure will deliver sustained and large scale benefits. Keystone decision has created uncertainty on whether those benefits will be realized.

U.S. is now poised for major economic renaissance from the both oil sands and unconventional natural gas and liquids. Net present value of $1 to $2 trillion if appropriate policies put into place.

Paradigm shift and large scale economic benefits are possible, but not without new approach to government regulations (and permitting) of both midstream and downstream facilities --- refinery expansions and modifications, natural gas processing, petrochemicals, LNG.

U.S. now poised to be a major export platform for value added oil and gas processing.

Major expansion of domestic manufacturing --transformation of national economy now in the cards.