Keeping Our Options Open: Markets for Canadian Crude and the Pipeline Dilemma

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Who is EPRINC?

EPRINC stands for *Energy Policy Research Foundation, Inc.* Non-profit research group that does economic and policy analysis on the petroleum industry

Founded in 1944 in New York. Established as a group to explain markets and fundamentals

Previously the Petroleum Industry Research Foundation, Inc (PIRINC) until we moved to Washington in 2007

Grew largely into a downstream organization, but have since moved extensively into upstream and midstream

Extensive work on ethanol, refining, U.S. shale plays, Keystone XL

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Main Discussion Points

1) In the past ten years Canadian imports into the US have steadily rose along with a surge in US production
2) Not all of the natural markets for Canadian crude in the U.S. have been tapped as planned and now there are multiple existing bottlenecks in the US, putting pricing pressure on Bakken and Canadian crude
3) Canadian crude, along with US stranded crude, must now search for alternative routes, markets, and transportation in order to capture a higher value
4) US crude is now moving by rail...will more Canadian crude begin to seek this option...?
Markets for Canadian Crude

• The current markets for Canadian crude are the Rockies (PADD 4) and the Midwest (PADD 2)

• The potential exists in Asia and the Gulf Coast...substantially knocking out heavy Mexican and Venezuelan imports in the US Gulf Coast

• But due to regulatory and environmental hurdles, PADD III access has been postponed and thereby tightness has been created – and too much light sweet in the market, no need for SCO in the U.S.
Canadian Crude Flows

Source: Canadian Pipeline Transportation System, NEB, July 2009
So what’s the big deal? It this a renaissance or something?
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.

5 mbd of tight oil or shale oil
Some Recent Forecasts

“projected 3,100 Mb/d increase (36%) in U.S. and Canadian oil production and....900 Mb/d increase in Canadian oil exports to the U.S. between 2011 and 2016” (BENTEK)

“U.S. oil imports (excluding imports from Canada) are projected to drop 41%, or 2,800 Mb/d, to an average of 3,900 Mb/d in 2016.” (BENTEK)

“We’re now forecasting that U.S. oil production (excluding NGLs) will grow from 5.6 MMBpd in 2010 to a whopping 9.1 MMBpd in 2015. Including natural gas liquids, total U.S. petroleum liquid production grows 60% from 7.7 MMBpd in 2010 to 12.2 MMBpd in 2015.” (RAYMOND JAMES)
Total Canadian Oil Production (NEB Reference Case)


Additional 1 mbd in three years = tightness

Maybe some upside in tight oil
Canadian Consumption to Remain Flat...

....Every incremental barrel must be exported

Source: EIA
**U.S. Production Increases**

Additional 2-3 mbd by 2016 = tightness

Source: EIA and EPRINC estimates from NDPA and HPDI
U.S. Rig Count

Source: HPDI April 20th, 2012
U.S. Shale/Tight Oil and Conventional Plays

Source: EPRINC, not to scale
U.S. and North Dakota Rig Count

Source: Baker Hughes Oct 4 2011. All but 50 rigs nationwide are onshore.
Williston Basin Production

North Dakota accounts for almost 10% of US Production

Almost all new production is from the Bakken/Three Forks

Source: NDIC
Eagle Ford Production

Source: HPDI
April 20, 2012
What’s happening to prices?

Source: AFPM Map, Mar 1 2012 Bloomberg Brent and WTI Prices; Flint Hills and estimates, Canadian assumptions
Brent, WTI, and Bakken Markets

Source: AFPM Map, April 20, 2012 Bloomberg Brent and WTI Prices; Flint Hills and estimates, Canadian assumptions
Bakken Prices at Clearbrook

Source: Bloomberg, April 20th, 2012
North Dakota Discounts

Canadian discounts even steeper

Source: Flint Hills, EIA, and estimates
Why?

Source: AFPM Map; Mar 1 2012 Bloomberg Brent and WTI Prices; Flint Hills and estimates, Canadian assumptions
Choke Points

Source: Savage background map of pipelines and refineries, Presentation Bakken Product Markets and Take-Away Denver Jan 31-Feb 1 2012 with EPRINC analytical Additions
U.S. Imports of Canadian Crude

Source: EIA
Where heavy (blended bitumen) needs to go...

Source: AFPM map, EIA data for graph
Canadian Crude Imports into PADD II

Source: EIA
Only Imports to the Rockies are Canadian

Source: EIA
Canadian Crude Imports into PADD III...Almost Zero

Source: EIA
Canadian Crude Imports into PADD I

Source: EIA
Canadian Crude Imports into PADD V

Source: EIA
Canadian Pipeline Export Options

- **Kinder Morgan’s** Transmountain line off BC coast - currently 300,000 b/d capacity - recent announcements to expand up to 800,000 b/d (early 2017)
- **Platte line to Wood River** 280,000 b/d-full
- **Enbridge mainline system** currently transporting over 1.5 mbd with potential capacity around 2.5 mbd
- **TransCanada’s Keystone** 581,000 b/d-full

Source: Canadian Energy Pipeline Association with EPRINC additions
PADD II will be importing more HEAVY...

....pushing out light

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<tr>
<td>Total</td>
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Source: Enbridge presentation April 2012, Denver, Platts Rockies Oil and Gas Conference
Canadian Imports and Potential Markets

Crude Disposition by Region 2010 (MB/D)

US Supply
Non-Canadian Foreign Imports
Canadian Imports

Source: EPRINC rendition from Enbridge. Enbridge, EIA and NEB Data and Enbridge Estimates (with some averages)
U.S. Imports by API Gravity

Source: EIA
Your options in the short to medium term...
Shale Oil Plays and Existing Oil Pipeline Network

Source: Savage, Presentation Bakken Product Markets and Take-Away Denver Jan 31-Feb 1 2012
North American Rail Map

- New markets
- Diversification
- Neat Barrels
- Nimble - Quickly adjustable

Source: Watco Companies LLC, Presentation Bakken Product Markets and Take-Away Denver Jan 31-Feb 1 2012
Average weekly U.S. railcar loads of crude oil and petroleum products


Note: Data are weekly average originations for each month, are not seasonally adjusted, and exclude U.S. operations of Canadian National Railways and Canadian Pacific Railway; one carload holds 30,000 gallons.
North Dakota Crude Oil Transport

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

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

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

Source: North Dakota Pipeline Authority
ND Pipeline and Rail Take-Away Capacity

Source: North Dakota Pipeline Authority, Included Planned Projects
Value of Rail vs. Pipeline

- Volume flexibility (ups and downs in production)
- Access new and high value markets (St. James LLS prices)
- Neat Barrels
- Competitive for every incremental barrel (a lot of new barrels coming on)
- Long-term stability, reliability
- Low cost transport to traditional and liquid markets
- Competes with rail and local refineries for incremental barrels

Source: Hess, Presentation Bakken Product Markets and Take-Away Denver Jan 31-Feb 1 2012
Conclusions

• US and Canadian production surging
• Pipelines are being built, but right now their exists tightness—need Gateway, XL, and Costal options for US and Canadian crude
• Rail is a serious option for US producers distanced from refining centers
• Rail could be an alternative shipping method for oil sands producers as they look to diversify their options and secure stable prices—markets exist where pipeline doesn’t (especially with XL delay and Gateway uncertainty)
• Blended bitumen needs to get to the Gulf and potentially PADD V
• Bakken light sweet needs to get to East Coast PADD I....only so much light sweet can be sent to Cushing and down into Gulf