“Canada’s Competitive Barrel: Can Canadian Heavy Barrels Compete in the US Gulf?”

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Agenda

• The “Why”
• Canadian Exports to the US
• Transportation Network
• US Gulf Imports
• Potential Netbacks for Canadian WCS
The “Why”

Source: ARC Financial Corp.
Canadian Heavy Crude Exports to the US (2014-2015)

Source: National Energy Board
Pipeline Network

Existing and Future Western Canadian Pipeline Export Capacity

Source: Canadian Energy Pipeline Association

Source: Canadian Association of Petroleum Producers
Rail Network

Existing and Future Western Canadian Rail Export Capacity

Source: Canadian Association of Petroleum Producers
US Gulf Coast Refining Capacity

Source: US Energy Information Agency
Crude Prices

**Maya and WCS Houston: Discounts to LLS**

*July:* Enbridge expands Line 67 of Mainline system to 800,000 b/d. Texas receipts of heavy Canadian hit record levels.

*July:* Sunoco’s Permian Express 2 starts up. WTI Midland and WTS pushed higher as a result.

Source: Argus Media
Crude Oil Quality

Source: BP, EIA, Genesis Capital, Oil & Gas Journal, Pemex, Statoil
US Gulf Coast Heavy Crude Imports

Canadian Net Available Heavy Crude Exports

Source: CERI, “Heavy barrel competition in the US Gulf Coast: Can Canadian producers compete?”, 2016
Potential Heavy Crude Exports to the US Gulf Coast

Source: CERI, “Heavy barrel competition in the US Gulf Coast: Can Canadian producers compete?”, 2016
Potential Netbacks for Canadian Heavy Barrel Producers

- Western Canadian Select @ Hardisty
- Median Heavy Sour Crude landed @ USGC
- USGC Heavy Sour Crude Quality Adjustment @ USGC
- WCS Price Uplift @ USGC (excluding transportation costs)
- Pipeline
- (10-year committed toll)
- Pipeline (uncommitted tolls)
- Rail
- Pipeline + Barge
- Energy East + Tanker
- TMX + Tanker

All values are 2015 average US$
Source: CERI, “Heavy barrel competition in the US Gulf Coast: Can Canadian producers compete?”, 2016
## Netbacks for WCS – Existing Pipeline

<table>
<thead>
<tr>
<th>Netbacks for WCS Transported by Existing Pipeline (Committed Tolls) from Hardisty, AB to the US Gulf Coast</th>
<th>Netbacks for WCS Transported by Existing Pipeline (Uncommitted Tolls) from Hardisty, AB to the US Gulf Coast</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pipeline toll Hardisty to Texas Gulf Coast (10-year committed toll) US$/bbl</strong> $7.79</td>
<td><strong>Pipeline fee Hardisty to Texas Gulf Coast (uncommitted toll) US$/bbl</strong> $11.03</td>
</tr>
<tr>
<td><strong>Pipeline load terminal fee US$/bbl</strong> $1.00</td>
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</tr>
<tr>
<td><strong>Total Pipeline Transportation Cost – Hardisty to Houston / bbl</strong> $8.79</td>
<td><strong>Total Pipeline Transportation Cost – Hardisty to Houston / bbl (uncommitted tolls)</strong> $12.03</td>
</tr>
<tr>
<td><strong>Western Canadian Select @ Hardisty</strong> $30.43</td>
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</tr>
<tr>
<td><strong>Median USGC Heavy Sour Crude landed</strong> $45.95</td>
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</tr>
<tr>
<td><strong>USGC Heavy Sour Crude - Dilbit Quality Adjustment</strong> $2.5</td>
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</tr>
<tr>
<td><strong>Estimated WCS Price Uplift @USGC</strong> $13.02</td>
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</tr>
<tr>
<td><strong>Netback for Canadian producers at the USGC</strong> $4.23</td>
<td><strong>Netback for Canadian producers at the USGC</strong> $0.99</td>
</tr>
</tbody>
</table>

All values are 2015 average US$
Source: CERI, 2016
# Netbacks for WCS – Existing Rail

Netbacks for WCS Transported by Rail from Hardisty, AB to the US Gulf Coast

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rail Tank Car (bbl)</td>
<td>600</td>
</tr>
<tr>
<td>Rail Freight Hardisty to Texas Gulf Coast (Heavy Crude) US$/bbl Unit Train</td>
<td>12.00</td>
</tr>
<tr>
<td>Rail Tank Car Lease / bbl ($600/month, 2 turns)</td>
<td>0.50</td>
</tr>
<tr>
<td>Rail Car Load and Unload Terminal Fee / bbl ($1.50 each)</td>
<td>3.00</td>
</tr>
<tr>
<td><strong>Total Rail Transportation Cost – Hardisty to Houston / bbl</strong></td>
<td>15.50</td>
</tr>
<tr>
<td>Western Canadian Select @ Hardisty</td>
<td>30.43</td>
</tr>
<tr>
<td>Median USGC Heavy Sour Crude landed</td>
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<tr>
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<td>13.02</td>
</tr>
<tr>
<td><strong>Netback for Canadian producers at the USGC</strong></td>
<td><strong>(-2.48)</strong></td>
</tr>
</tbody>
</table>

All values are 2015 average US$

Source: CERI, 2016
Conclusions

• Canadian heavy crude oil production is expected to grow from 2.6 MMbpd in 2015 to 4.7 MMbpd in 2035, more than a 2 MMbpd increase over the next twenty years.

• Canadian domestic demand for heavy crude oil is expected to increase by approximately 50% and reach over 800,000 bpd by 2035.

• Net heavy Canadian available exports are expected to grow to volumes larger than 3.5 MMbpd over the next decade.

• Heavy crude imports from Mexico and Venezuela have decreased by over 1 MMbpd over the last 10 years.

• If Canadian heavies could displace most of the Mexican and Venezuelan imports, the opportunity for bitumen blends and heavy oil would be about 1.5 MMbpd.
Conclusions

• If exports are to increase to the Gulf to displace other exporters, additional pipeline capacity needs be developed.
• Under current market conditions, rail access to the USGC prices Canadian producers out of the market.
• By allocating heavy production to other markets such as Asia and Europe, Canadian producers are able to reduce their overland dependence on the US market, reduce their supply to that market, and overcome pipeline constraint issues on the US Gulf Coast.
• As Western Canadian crude oil production continues to grow, the leverage of these resources for economic benefits to the nation will depend on the ability to connect this growing supply with demand.
Thank you!

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