North American Condensate Production & Export Potential
Challenges & Opportunities

The 18th Annual Condensate & Naphtha Forum
November 3-4, 2014
DOHA

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About EPRINC

• Founded in 1944
• Not-for-profit organization that studies intersection of petroleum economics and public policy
• Provides independent and technical analyses for distribution to the public
• Funded largely by the private sector, foundations and U.S. government
• Currently Supporting DOE effort on QER for Crude Infrastructure
• www.eprinc.org
EPRINC Embassy Series

• Engagement with Washington’s energy policy community

• Collaboration among the diplomatic community to provide both an interesting venue and constructive policy discussion

• The series offers an opportunity to gain a greater understanding of U.S. energy policy in an era of expanding U.S. supplies of oil and gas
Understanding the Potential (and Uncertainties) for US Condensate Exports

• **U.S. Production Potential**

• **Export Potential**

• **Politics and Regulatory Risks, i.e.,**
  understanding uncertainties in future volumes of condensate export from U.S.
U.S. PRODUCTION POTENTIAL
WESTERN INTERIOR SEAWAY

Williston Basin

Powder River Basin

Uinta Basin

DJ Basin (Niobrara Reservoir)

Anadarko Basin
(Mississippian, Granite Wash, Mississippi Lime and other stacked plays)

Permian Basin

Eagle Ford Reservoir

Utica Basin

Source: HPDI Sept 2014, Past 90 Days
U.S. and Canadian Crude and Natural Gas Liquids Production, (millions of barrels/day)

Source: Canadian Association of Petroleum Producers, EIA
EPRINC Outlook: Total US Production by API Gravity

Source: Joint Study EPRINC-Ponderosa Model Results
FULL-CYCLE BREAK-EVEN COSTS IN 2013, INCLUDING 9% AFTER-TAX RETURN

WTI OIL PRICE, US$ PER BARREL

**EXISTING**  **NEW PROJECTS**

<table>
<thead>
<tr>
<th>Region</th>
<th>Cost (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bakken (Sask.)</td>
<td>$44.30</td>
</tr>
<tr>
<td>Shaunavon (Sask.)</td>
<td>$57.67</td>
</tr>
<tr>
<td>Lloyd Heavy (Alta.)</td>
<td>$57.90</td>
</tr>
<tr>
<td>In-situ Bitumen (Alta.)</td>
<td>$63.50</td>
</tr>
<tr>
<td>Conv. Light (Alta.)</td>
<td>$63.50</td>
</tr>
<tr>
<td>Eagle Ford (Tex.)</td>
<td>$63.57</td>
</tr>
<tr>
<td>Niobrara (U.S. midwest)</td>
<td>$65.41</td>
</tr>
<tr>
<td>Dodsland Viking, light (Sask.)</td>
<td>$65.95</td>
</tr>
<tr>
<td>U.S. Bakken range**</td>
<td>$69.00</td>
</tr>
<tr>
<td>Permian (Tex.)</td>
<td>$81.00</td>
</tr>
<tr>
<td>Oil sands mining &amp; upgrading</td>
<td>$100.00</td>
</tr>
</tbody>
</table>

**Source:** Scotiabank
MOVEMENT TO LTO PRODUCTION ALREADY UNDERWAY

LTO: Light Tight Oil

Source: EIA, DrillingInfo, Colorado DNR, Texas RRC.
EXPORTS

Source: IEA, EPRINC Calculations
Exports to Canada Already Underway

(millions of barrels/day)

Nearly all U.S. crude exports are to Canada

Of 900,000 bbl/day of Petroleum Exports in July 2014, approximately 500,000 were refined products

Source: EIA
Total Imports, Production, Canadian Imports

Source: EIA

Canadian Imports
2.7 mbd or 38%
EXPOSURES BY API GRAVITY

EPRINC PRODUCTION FORECAST -- NO EXPORT BAN

Source: EPRINC/Ponderosa – EPRINC/Ponderosa Production study for US DOE QER
Imports and Exports, No Export Ban
EPRINC PRODUCTION CASE – Crude & Condensate

Source: EPRINC/Ponderosa – EPRINC/Ponderosa Production
Politics and Regulatory Risks

These risks come in two categories:

1. Some refiners (and American shipping companies & Seafaring Unions) who correctly view that removing export constraints as harming their bottom line.

2. Politicians and supporters who are stuck in 1970s views of Energy Security

Source: IEA, OMR
JONES ACT: WHY LIFTING THE EXPORT BAN IS NOT SO EASY

Foreign refiners can get access to U.S. crude at a lower price than some domestic refiners.
What Makes Condensate an Exportable Product?
(and how much will be heading to the world market?)

Source: Drillinginfo.com
U.S. PETROLEUM EXPORT POLICY FOR DUMMIES

IF ..........................................

CRUDE OIL and Lease Condensates ................................................................. STOP

Plant Condensates (e.g., nat gasoline, naphtha, etc) .......................... GO

All Refined Products ................................................................................ GO

CRUDE OIL from Alaskan North Slope and Some California Heavy...... GO

Lease Condensates----plus stabilization & distillation + .................. GO

To date 5-6 cargos by ETP at $5-10/bbl. above WTI, both to Asia and Europe
THIS IS A STABILIZER
Even if Crude Export Ban Persists – Condensate Exports Will Continue to Grow

1. Economics favor Existing Splitters – but only one in operation and two under construction. Policy and economics will limit number of new splitters.

2. Adjustments inside refinery gate are reaching their economic limits (for > 50 API).

3. Canadians will have ample access to plant condensates for diluent

4. US condensate exports likely to exceed 1 mmb/d by 2020. Precedent has been set- no going back !!