North American Crude Oil Market Overview

Prepared for:
CCQTA / COQA Joint Meeting
Kananaskis, Alberta
June 19, 2012

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Managing Director
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  - Global presence with offices in Houston, Calgary, London, Singapore, Dubai, and Moscow
  - Consulting staff of Chemical Engineers/MBAs
  - Possess combination of technical and commercial experience
  - Global company populated with global colleagues

- IHS acquired Purvin & Gertz in November 2011
  - IHS is 5,400+ people, in 30 countries, speaking 50 languages
  - Serving businesses and all levels of governments worldwide
  - Provide comprehensive content, software and expert analysis and forecasts
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IHS is the leading information company with comprehensive content, insight and expert analysis in key areas shaping today’s global business landscape, including:

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- Design & Supply Chain
- Defense, Risk & Security
- EHS & Sustainability
- Country & Industry Forecasting
- Commodities, Pricing & Cost

Advancing Decisions that Advance the World
North American Crude Oil Market Outlook

• Product demand trends and refinery rationalization
• Crude market outlook
• Pipelines and politics
• Crude oil pricing
US product demand growth net-negative in near term...

**Demand Growth Year-to-Year (MBPD)**

- Other Products
- Residual Fuel
- Distillate
- Jet/Kero
- Gasoline
- Refinery Utilization (%)

Refinery Utilization (%)


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U.S. product trade shifts to exports...

**Million Barrels per Day**

- **Net Imports**
- **Net Exports**

- **Decline in EU gasoline imports**
- **Distillate exports to Latin / Europe**
- **Mostly petcoke and declining petchem naphtha imports**

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US distillate export trade was a record in 2011
USGC refining margins bit stronger entering summer, but weak overall...

**Full Cost Margin, $/Bbl**

- Maya Coking
- LLS Cracking

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Substantial US Refinery Rationalization...

- PADD I refining landscape continues to undergo major changes
- Nearly 0.5 MMBD of PADD I capacity has been taken offline since 2009
- An additional 0.70 MMBD, or ~43% of remaining USEC capacity, is currently idled or for sale

**Million Barrels per Day**

- **Shutdown**
  - Hovensa USVI
  - Sunoco Marcus Hook
  - COP Trainer
  - Big West Bakersfield
  - Western Bloomfield
  - Shell St. Rose
  - Somerset Energy
  - Western Yorktown
  - Sunoco Westville
  - Chevron Perth Amboy

- **Idled**

- **For Sale**

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A different story in the US Midwest... but at the expense of crude producers
North America becoming less dependent on foreign imports, but not entirely...
Western Canada production outlook...
Tight oil a potential wild card going forward

- Total Western Canadian oil supply is forecast to continue increasing
  - 3 million BPD by 2015, an increase of 700 kBPD
- Shale oil developments in Canada have potential to moderate the conventional crude decline
Tight Oil and Shale Gas plays are causing a fundamental shift in the market...

Source: IHS CERA.
Tight Oil development growth rates have been impressive... What’s in store globally?

Source: US Energy Information Administration, IHS CERA
Gulf Coast/East Texas to Midwest corridor flows illustrate the degree of change...

Mid-Valley + Capline Total Capacity ~ 1.4 Million BPD

Increasing Canadian + Bakken crude runs will reduce dependence on PADD III sourced barrels

Higher US Tight Oil or Canadian production outlook applies more pressure
The latest wave of U.S. Coker expansion projects nearly completion....

<table>
<thead>
<tr>
<th>Start-up Timing</th>
<th>Company</th>
<th>Location</th>
<th>Net Coker Addition (MBD)</th>
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<tbody>
<tr>
<td>Mar 2010</td>
<td>Marathon</td>
<td>Garyville</td>
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<tr>
<td>Dec 2010</td>
<td>Hunt</td>
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<tr>
<td>Mar 2011</td>
<td>Total</td>
<td>Port Arthur</td>
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<tr>
<td>4Q 2011</td>
<td>WRB</td>
<td>Wood River</td>
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<td>2012</td>
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<tr>
<td>2012</td>
<td>Motiva</td>
<td>Port Arthur</td>
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<tr>
<td>2013</td>
<td>BP</td>
<td>Whiting</td>
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Canadian heavy crude runs in U.S. Midwest expected to increase >250,000 B/D by 2015 as a result of projected investments
Pipelines and Politics....

• Recent decisions have caused greater uncertainty for pipeline growth....

• The facts remain:
  • North America will remain dependent on foreign imports
  • Canadian and US crude oil supply growth dependent on pipelines
  • Diversification of Canadian exports an option to provide alternatives
Proposed Pipeline / Rail Projects will shift the North American crude balance...

- Over 1 million BPD of Cushing outbound pipeline capacity potential as projects
- West coast projects add up to another 1 million BPD outbound capacity

Existing Midwest Inbound pipeline capacity
~ 5.3 million BPD compared to 200,000 BPD of existing outbound capacity
Seaway reversal provides relief from Cushing, but only temporarily....

Cushing Takeaway Capacity, Million B/D

- Truck or Barge to Gulf Coast
- Cushing MarketLink P/L to Gulf
- Keystone XL P/L to Gulf Coast
- Seaway P/L Reversal to Gulf Coast
- Centurion South P/L
- BP No. 1 P/L to Whiting
- COP Line U to Borger
- Ozark P/L to Wood River
- Net Refinery Consumption

Incoming Flows

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US rail shipments of crude are soaring...

Average Weekly US Rail Car Loads of Crude Oil & Petroleum Products

Source: Association of American Railroads and US Energy Information Administration.

2011

2012

2008-10 Range

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WTI begins to recover on anticipated pipeline projects, but not quite yet...

WTI - LLS ($/Bbl)

<table>
<thead>
<tr>
<th>Year</th>
<th>Pipeline</th>
<th>Rail/Barge</th>
<th>Trucking</th>
<th>Seaway Sale Announced</th>
<th>Full Seaway S/U</th>
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<tr>
<td>2006</td>
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Crude Price Outlook....

CRUDE OUTLOOK
• Economic outlook resulting in downward pressure on crude price
  • Eurozone issues
• US tight oil / Non-OPEC production outperforming forecasts
• US Export politics potentially results in a North American discount
• “Fear/Security” premiums being tempered (at the moment)

CANADIAN LIGHT / HEAVY
• Start-up of BP Whiting and Marathon Detroit cokers expected to put pressure on light/heavy differential
• USGC access also will increase pressure on light / heavy as supply moves south
• Tight oil potentially impacts light sours, but not heavy sours
• Long-term Canadian heavy crude expected to be at the USGC parity
Shifting Paradigms...
US Domestic Sweet discount to sweet imports

$ / barrel

Ref. Value less Market Price
LLS - Dated Brent (Refining Value)
LLS - Dated Brent (Market Price)
Light / heavy spread has been wide on pipeline and WTI issues, but still forecast to tighten.
In Summary...

- **North American oil markets in structural transition**
  - Strongest demand prospects for refined products/crude are outside North America
  - Unconventional sources (oil sands and tight oil) are the pillars of supply growth
  - Atlantic Basin refinery rationalization

- **Pipelines needed...**
  - Logistical systems have not kept pace, and strong opposition threatens industry expansion
  - Planned projects from Cushing to USGC will provide necessary outbound capacity in near-term
  - Seaway reversal provides immediate relief; additional capacity required by 2016
  - Growth of the Canadian Oil Sands is utterly dependent on pipeline growth, but which projects will get built?

- **Expansion of tight oil impact on pricing....**
  - Light sour substitution possible with light-crude discounting
  - Long-term global impacts of tight oil developments?
About this Presentation

Production and marketability of Oil Sands bitumen blends and synthetic crude oil, crude price differentials, economics of upgrading and diluent issues are analyzed in PGI’s multi-client service, *Crude Oil & Oil Sands Market Outlook*.

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