Canadian Heavy Oil Industry Update

By: Gerald Bruce – CHOA Executive

Presented to:
Joint COQA/CCQTA Meeting
New Orleans, Louisiana, February 2010
Overview

- Canadian Heavy Oil Association
- What a difference a year makes
  - Change in direction or course correction?
- What has changed
  - Who is changing what and why
- Significant new project announcements
  - SAGD and upgrading
  - Numerous projects “restarting”
- Future outlook
CHOA Mission

• To provide
  ⇒ A technical, educational and social forum for those involved with the heavy oil and oil sands industries
CHOA – at a glance

• Founded in 1984
  ➞ Membership today > 1400
  ➞ Members are “individuals with a interest in Heavy Oil”

• Heavy oil and oil sands industry
  ➞ From reservoir to finished products

• Diverse membership
  ➞ Production, reservoir, drilling, upgrading, business, suppliers, service providers
Key CHOA Events

- **Technical Lunches**
  - Key industry speakers with interesting topics
  - Technical focus

- **Beer and Chat**
  - More “business focus”, presentations, panel discussions
  - Meet, greet, network
  - Petroleum Club venue

- **Conferences / Social**
  - Golf, Curling, Lobster Night
  - Edmonton Chapter Established!!!
Canadian Heavy Oil Association

More information

You too can become a member!!

http://www.choa.ab.ca/
Heavy Oil in Canada

Growth and Development Plans

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Heavy Oil API Gravity < 22.3

- Heavy Oil API Gravity < 22.3
- High viscosity
- Bitumen < 10 API

API = (141.5/sg)-131.5
sg = specific gravity @ 60 F

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Heavy oil and bitumen account for about 70% of total oil resources.
Crude Oil Reserves – billion barrels

Source: Oil & Gas Journal, 2007

Reference: Alberta Oil Sands Strategy
170 billion barrels of proven oil sands reserves remain – 3.6% produced since 1967

- Fort McMurray
- Edmonton
- Calgary

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Bitumen Reserves of 170 billion vs 1.5 billion Conventional Oil

Source: Alberta Energy Resources Conservation Board ST98-2009

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Reserves of heavy oil, bitumen and the rest are significant

- 170.4 billion barrels (economically recoverable with current technology)

Distinctions between:

- Conventional heavy oil
- Bitumen
  - Bitumen Derived
    - Blended bitumen
      - Dilbit and Synbit
    - Upgraded bitumen
- Future material from the carbonates

Security of supply will continue to drive investments
CHANGES TO
THE HEAVY OIL BUSINESS

What a Difference a Year Makes!!
Oil prices ramp to over $US 140/bbl

Multiple significant oil sands project investment plans

Projects “stacking up”
  - Significant competition for people, services, resources
    - “gold rush”

Capital markets accessible
Have We Been Here Before?

WTI Price History - 1986 to present

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The Industry is Changing

New EnCana and Cenovus start trading today

Posted: November 02, 2009, 8:59 AM by Jonathan Ratner
Energy, EnCana, trading, Cenovus

EnCana Corp.'s fast-track to a corporate split means integrated oil company Cenovus Energy Inc. and pure-play natural gas company EnCana Corp. (GasCo) will begin trading on an "as and when issued" basis when the market opens today.

SUNCOR ACQUIRES PETRO-CANADA IN HISTORIC DEAL

‘Super major’ born

THE PLAN
Oil sands operator Suncor Energy expands focus

THE DEAL
Largest Canadian oilpatch takeover valued at $18.4 billion in all-stock deal

THE IMPACT
Layoffs loom as company aims to save $300 million

ENERGY

OIL & GAS
Suncor CEO says merger boosts oil sands projects

Suncor Energy Inc. chief executive officer Rick George says delayed oil sands projects will start up more quickly after its merger with Petro-Canada.

Canadian Heavy Oil Association
## Q1 2009 - Project Announcements

### Summary of Recent Announcements of Oil Sands Project Delays

<table>
<thead>
<tr>
<th>Project</th>
<th>Bitumen Volume (kb/d)</th>
<th>Original Stated In-service</th>
<th>News Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA Upgrader Phase 1 - 3</td>
<td>70 x 3</td>
<td>2009, 2010, 2013</td>
<td>Construction has been halted</td>
</tr>
<tr>
<td>CNRL Horizon</td>
<td></td>
<td></td>
<td>Cutting spending</td>
</tr>
<tr>
<td>Imperial Oil Kearl Phase 1</td>
<td>100</td>
<td>2010</td>
<td>Investment decision in 2009</td>
</tr>
<tr>
<td>Korea National Oil Company (KNOC) Phase 1</td>
<td>10</td>
<td>2010</td>
<td>Delayed for a year</td>
</tr>
<tr>
<td>Laricina Energy Ltd</td>
<td></td>
<td>Q2 2009</td>
<td>Delayed 12-18 months; cap changed to 600 b/d</td>
</tr>
<tr>
<td>Germain Saleski</td>
<td>1.8</td>
<td>Q4 2009</td>
<td>Delayed 6-9 months; cap changed to 1.2 kb/d</td>
</tr>
<tr>
<td>Opti Long Lake Phase 2</td>
<td>72</td>
<td>2013</td>
<td>Sanctioning subject to various factors</td>
</tr>
<tr>
<td>Petro-Canada - Ellis River</td>
<td></td>
<td></td>
<td>Project on hold</td>
</tr>
<tr>
<td>Korea Oil Refining Phase 1</td>
<td>120</td>
<td>Q2 2011</td>
<td>Decision for go-ahead will be deferred until sometime in 2009</td>
</tr>
<tr>
<td>Petro-Canada - Highwood Phase 1</td>
<td>130</td>
<td>2015</td>
<td></td>
</tr>
<tr>
<td>Petro-Canada - Fort Hills Upgrader 2/3</td>
<td>71</td>
<td>2014</td>
<td></td>
</tr>
<tr>
<td>Shell Jackpine 1B</td>
<td>100</td>
<td>2012</td>
<td>Suspending expansions for now</td>
</tr>
<tr>
<td>Shell Carmon Creek (in-situ) Phase 1-2</td>
<td>50 x 2</td>
<td>2008; 2017</td>
<td>Withdrawn application due to potential changes in design changes – more info to be provided in early 2009</td>
</tr>
<tr>
<td>StatoilHydro Upgrader</td>
<td>250</td>
<td>2014</td>
<td>Withdrawing application – project cancelled</td>
</tr>
<tr>
<td>Suncor Voyageur Upgrader Project</td>
<td>300 (orig = 350)</td>
<td>2012</td>
<td>Completion delayed by 1 year</td>
</tr>
<tr>
<td>Suncor Firebag Phase 5</td>
<td>68</td>
<td>Q1 2012</td>
<td>Schedule flexible to mkt conditions</td>
</tr>
<tr>
<td>Suncor Firebag Phase 6</td>
<td>68</td>
<td>Q3 2012</td>
<td>Schedule flexible to mkt conditions</td>
</tr>
<tr>
<td>Syncrude Stage 4 Expansion</td>
<td>140</td>
<td>2015</td>
<td>Re-evaluating plans</td>
</tr>
<tr>
<td>Total Joslyn Mine</td>
<td>100</td>
<td>2013</td>
<td>May ’08 - on-stream date moved to 2014</td>
</tr>
</tbody>
</table>

Source: CAPP

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Some Level of Uncertainty of Future Oil Sands Project. Delays in future project phasing will likely extend the ramp up rate.
Mined Bitumen and SCO Production

Source: EUB ST98-2009

SCO = Synthetic Crude Oil

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• Mining
  ⇨ Esso (Exxon) Kearl Lake
    ◆ 100 kbpd by 2012, additional phases up to 345 kbpd
  ⇨ CNRL Horizon
    ◆ 110 kbpd in operation, next phases up to 250 kbpd
    - Includes upgrading
  ⇨ Total Joslyn Mine/Upgrader
    ◆ 200 kbpd, approvals expected 2011
  ⇨ Shell Athabasca Oil Sands Project (Jackpine)
    ◆ 100 kbpd Phase 1B approved (Jackpine)
    ◆ 115 kbpd expansion (Muskeg River) approved
    ◆ 200 kbpd application (Pierre River)
  ⇨ UTS/Teck Cominco
    ◆ 210 kbpd disclosure (Equinox, Frontier)
Mining withdrawn = Synenco (Total) Northern lights = 115 kBPD

Source: Strategy West – Feb 2010 Update

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**SAGD Announcements**

- **SAGD Production**
  - Suncor Firebag Phase 3
    - 65 kbdp ($1.5 billion)
  - Husky Sunrise
    - 60 kbdp ($2.5 billion)
      - Link to BP
  - CNRL Kirby
    - 45 kbdp ($1.5 billion)
  - ConocoPhillips Surmont Phase 2
    - Currently 27 kbdp
    - Up to 110 kbdp by 2015
  - Cenovus (EnCana) expansions to Christina Lake, Foster Creek
    - Jointly with ConocoPhillips
    - 40 kbdp at Christina Lake ($1 billion) ............... 218 kbdp ultimate
    - 120 kbdp at Foster Creek ............................. 210 kbdp ultimate
Withdrawn/Suspended: Total (Joslyn) = 42 kbdp

Source: Strategy West – Feb 1010 Update

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Key Players – In Situ

- **North Athabasca - Operators**
  - Suncor Firebag
    - 95 kBPD operating with plans for 367 kbpd (6 phases)
  - Suncor MacKay River
    - 33 kBPD operating with plans for 73 kbpd (2 phases)

- **Future**
  - Athabasca Oil Sands, Chevron, CNRL, Cenovus, E-T Energy, Husky
    - Sunrise, Ivanhoe Tamarack, Southern Pacific MacKay, Sunshine, Value
    - Creation

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- **South Athabasca - Operators**
  - **Cenovus (EnCana)**
    - 18 kBPD operating Christina Lake ... 218 kBPD
    - 120 kBPD operating Foster Creek .... 210 kBPD
  - **ConocoPhillips Surmont**
    - 27 kBPD operating with plans for 110 kBPD
  - **Nexen**
    - 72 kBPD Long Lake with plans for 288 kBPD
In-Situ Operators

- South Athabasca – Operators
  - JACOS Hangingstone – 10 kbdp → 45 kBPD
  - Devon Jackfish
    - 35 kBPD with plans for 105 kBPD
  - MEG Energy Corp.
    - 25 kBPD with plans for 260 kBPD
  - Connacher Great Divide
    - 10 kBPD with plans for 44 kBPD with Refining (Montana)
  - PetroBank Whitesands
    - 2 kBPD special production

- Future
  - Athabasca, CNRL, EnerPlus, E-T Energy, Husky, KNOC, Laracina, Statoil, Suncor

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In-Situ Operators

- **Cold Lake**
  - CNRL Primrose/Wolf Lake
    - 120 kBPD with plans for 150 kBPD
  - Husky Tucker
    - 30 kBPD
  - Imperial Oil Cold Lake
    - 150 kBPD with plans for 170 kBPD
  - Shell Orion
    - 10 kBPD, 20 kBPD

- **Future**
  - Husky, Koch Exploration, OSUM, Pengrowth

- **Peace River**
  - Shell is the primary operator, with plans for > 90 kBPD production

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UPGRADING IN ALBERTA
Upgrading in Alberta

- **Currently Operating**
  - Suncor
  - Syncrude
  - Shell
  - CNRL
  - Opti/Nexen

- **Future Plans**
  - Total

- **Merchant Upgrading**
  - NorthWest Upgrading
  - BA Energy

- **Uncertain**
  - Suncor Voyageur, Fort Hills, StatOil, others…
A New Merchant Upgrader

- NorthWest Upgrading
  - Partner with Canadian Natural Resources Limited
  - 50 kBPD bitumen feed (Phase 1)
  - Bitumen to Finished Products (Diesel)
  - Integrated CO2 capture, transport, and EOR use
  - Outlet for government royalty barrels

Oil company buys into oilsands technology

Calgary-based Canadian Natural Resources Ltd. is buying into a proposed technologically advanced plant to upgrade bitumen from the Alberta oilsands and produce low-sulphur diesel fuel.

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# Planned Alberta Investment

**Proceeding Oilsands Projects “on the books” = $62 billion (29 projects)**

<table>
<thead>
<tr>
<th>Project Sector</th>
<th># of Projects</th>
<th>Value of All Projects</th>
<th># On Hold</th>
<th>Value of On-Hold Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture &amp; Related</td>
<td>4</td>
<td>$62.9</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Biofuels</td>
<td>16</td>
<td>$1,872.0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Chemicals &amp; Petrochemicals</td>
<td>2</td>
<td>$50.0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Commercial/Retail</td>
<td>78</td>
<td>$11,129.7</td>
<td>4</td>
<td>$167.2</td>
</tr>
<tr>
<td>Commercial/Retail and Residential</td>
<td>16</td>
<td>$5,315.5</td>
<td>2</td>
<td>$761.8</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>328</td>
<td>$19,982.8</td>
<td>4</td>
<td>$83.4</td>
</tr>
<tr>
<td>Institutional</td>
<td>220</td>
<td>$11,598.8</td>
<td>7</td>
<td>$221.6</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>5</td>
<td>$876.7</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Mining</td>
<td>5</td>
<td>$4,612.0</td>
<td>1</td>
<td>$4,500.0</td>
</tr>
<tr>
<td>Oil &amp; Gas</td>
<td>11</td>
<td>$1,246.5</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Oilsands</strong></td>
<td><strong>43</strong></td>
<td><strong>$137,813.3</strong></td>
<td><strong>14</strong></td>
<td><strong>$76,567.0</strong></td>
</tr>
<tr>
<td>Other Industrial</td>
<td>11</td>
<td>$319.7</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Pipelines</td>
<td>31</td>
<td>$9,338.3</td>
<td>2</td>
<td>$2,018.0</td>
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<tr>
<td>Power</td>
<td>54</td>
<td>$19,235.3</td>
<td>4</td>
<td>$950.0</td>
</tr>
<tr>
<td>Residential</td>
<td>91</td>
<td>$6,501.1</td>
<td>18</td>
<td>$2,804.4</td>
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<tr>
<td>Telecommunications</td>
<td>1</td>
<td>$700.0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Tourism/Recreation</td>
<td>122</td>
<td>$9,358.1</td>
<td>2</td>
<td>$21.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,038</strong></td>
<td><strong>$239,812.7</strong></td>
<td><strong>58</strong></td>
<td><strong>$88,094.4</strong></td>
</tr>
</tbody>
</table>

Source: Alberta Finance and Enterprise – December 2009 Update

Oil Sands > $C138 billion

TOTAL >$C239 billion

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Where is that Production Headed?

Market Demand for Western Canadian Crude Oil – Actual 2008 vs 2015 Potential

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Oil Sands Industry Challenges

- **Realities of the current state**
  - Oil price decline
  - Financial market turmoil – debt & equity
  - Project Costs remain misaligned with current price
    - Project deferral and cancellation

- **Ongoing**
  - Environmental performance
    - Air, water, and land
    - Public perception of industry

- **Balance – energy, environment, economy**
  - Demonstrating real improvements

- **Uncertainty**
• Production forecasts have been adjusted downward
  ➔ Still growing but at a slower pace

• Minimal change in the first five years 2008-2012 period
  ➔ Up to 300,000 barrels per day less in 2012-2017 period

• Deferrals in upgrader projects changes the “mix” of heavy oil to market
  ➔ means more heavy blend and less upgraded light produced

• Deferrals are intended to bridge the current high level of uncertainty
  ➔ financial & credit crunch
  ➔ Cost of new facilities
  ➔ Price of oil
  ➔ Policy (Environmental)
- Slow down of the rate of growth
  - More of sustainability focus

- The “gold rush” is over
  - High cost projects are not viable
  - Adjustment to $40 oil means not all projects will proceed

- The industry is doing a lot of “rethinking”
  - Reducing cost, processing options

- Environmental drivers “Front and Centre”
  - Greenhouse gas, CO2, water, land
    - Impact of best approach to sustainability
Encouragement

- Price of materials are decreasing
  - steel

- Market cooling is freeing up resources
  - Sale on engineering

- Oil Product priced in $ US
  - Exchange now favourable

- Differentials are shrinking

- Natural gas is a “bargain”

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Visit the CHOA website for more information

WWW.CHOA.AB.CA

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