Wood River Refinery Expansion

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In 2030:

- Fossil fuels will still have over 80% market share
- Oil retaining over 30% share
- Natural gas is gaining share, reaching 24% in 2030
The Oil Supply Challenge

Source: Based on IEA World Energy Outlook 2006
World Oil & Gas Reserves: 1960s vs. 2005

Drift Toward Constrained IOC Access

1960’s

- Full IOC Access: 85%
- SOVIET Reserves: 14%
- NOC Reserves (No Equity Access): 1%

2005

- Full IOC Access: 7%
- NOC Reserves (Equity Access): 12%
- Reserves Held by Russian Companies: 65%
- NOC Reserves (No Equity Access): 16%

IOC = International oil company
NOC = National oil company

NOTE: Excludes unconventional crude oil and bitumen reserves
GLOBAL CRUDE OIL RESERVES BY COUNTRY

Canada, with 175 billion barrels in Oil Sands reserves, ranks 2nd only to Saudi Arabia in global oil reserves.

Source: Oil & Gas Journal Dec. 2004
TOP 10 WORLD CRUDE OIL PRODUCERS IN 2004

- Saudia Arabia
- Russia
- USA
- Iran
- China
- Mexico
- Norway
- Venezuela
- Canada 2004
- UAE

Oil sands growth will move Canada from #9 to #5 in the world by 2015

Source: EIA & CAPP
Increasing Cost of New Oil Supplies

Note (1): Includes mitigation costs to make unconventional sources CO2 neutral compared to conventional
Note (2,3): Based on energy equivalent breakeven versus crude including tax incentives (2), excluding tax incentives (3)
Source: Booz Allen Hamilton
Canadian Oil Sands
Oil Sands to Bitumen

Before dilution for pipeline transportation
Extraction Techniques: Mining

- Uses massive shovels and trucks to scoop the sand from the surface and load into trucks.
- Taken to crushers, where hot water is added before sent to extraction plant.
- Bitumen is extracted from oil sand and water is pumped into settling ponds.
- Typically associated with local upgrading to Synthetic Crude Oil.
- Only 20% of oil sands can be mined.
- The land is reclaimed after it is mined.
ConocoPhillips’ Syncrude Project in Canada
Mining Reclamation
Extraction Techniques: SAGD

SAGD = Steam Assisted Gravity Drainage
SAGD development has a similar footprint to conventional oil and gas development with the exception of GHGs, which we’re working to address through technology.
Figure 2.13
Canadian and U.S. crude oil pipelines

- Existing pipeline
- Proposed pipeline
- Extensions to new market
- Petroleum administration district (PADD)
WOOD RIVER REFINERY TODAY

- Built in 1917
- Tenth Largest Refinery in US
- 800+ Employees
- \~30\% Heavy crude processing capability
- 306,000 BPD crude processing
- Main Products Include
  - Gasoline
  - Diesel Fuel
  - Asphalt
  - Jet Fuel
WOOD RIVER’S FUTURE

• CORE Expansion Will:
  • Create More Than 1,500 Construction Jobs Between 2008 and 2011 at Refinery
  • Increase the Refinery’s Employment 5%
  • Increase Canadian Crude Processing Capability to > 50%
  • Meet the Projected Future Demand for Transportation Fuels in the Midwest
  • 356 BPD Crude Processing
  • Products Include
    • Gasoline
    • Diesel Fuel
    • Jet Fuel
    • Asphalt
WOOD RIVER’S FUTURE

• Full Bitumen Expansion

• Continue to Provide Significant Construction Jobs Through 2015 and Further Increase Refinery Employment

• Increase Canadian Crude Processing Capability to 100%

• Expanded Crude Processing

• Products Include
  • Gasoline
  • Diesel Fuel
  • Jet Fuel
  • Asphalt
REFINERY CONFIGURATION – FUTURE

- Gasoline Vapors
- LPG
- Naphtha
- Kerosene
- Diesel Distillate
- Medium Weight Gas Oil
- Heavy Gas Oil
- Residuum
- Distillation Tower
- Cracking Units
- Alkylation Unit
- Reforming
- LPG
- Gasoline
- Jet Fuel
- Diesel Fuel
- LPG
- Gasoline
- Motor Gasoline
- Jet Fuel
- Diesel Fuel
- Industrial Fuel
- Asphalt Base
- End Products
Questions?