Canadian Oil Sands

Energy Innovations for North America

September 2009
Today’s Presentation

• Overview of ConocoPhillips
• COP and Ports to Plains
• Technology Focus
ConocoPhillips Overview
Worldwide Operations


Map excludes LUKOIL Investment and includes Burlington Resources.

*Marketing is located in the following countries: Austria, Germany, Switzerland, United Kingdom, Ireland and the United States.
ConocoPhillips Presence in Member states and Alberta Province

- Approximately $2.8 Billion in royalties and taxes paid to Provincial, State and Local governments
- 82 Million Barrels of Oil Produced Annually
- Almost 1.5 Trillion cubic feet of Natural Gas Production Annually
- 4 Refineries
- 7800 miles of pipeline
- 16,000 employees
US Crude Oil Imports

Sources: EIA, CAPP, internal analysis
Canadian Oil Sands: Huge Resource Base

- There are an estimated 1.7 trillion barrels of oil in the Canadian Oil Sands *(Source: CAPP)*
- Only 20% can be mined – the rest (1.4 trillion barrels) is too deep
- Conventional production methods don’t work for “in-situ” production – the oil won’t flow naturally
ConocoPhillips’ Oil Sands Land Position

Relative Athabasca Land Positions

Note: Figure is for Athabasca region only.

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.
Mining Reclamation
Extraction Techniques: SAGD

SAGD = Steam Assisted Gravity Drainage
SAGD development has a similar footprint to conventional oil and gas development.
Comparative Emissions

Canada’s GHG Emissions by Sector

- Solvent & Waste: 4%
- Buildings: 11%
- Agriculture: 8%
- Transportation: 24%
- Electricity and Heat: 17%
- Other industry: 14%
- Oil & Gas ex OS: 18%
- Oil Sands: 4%

Global Energy-Related Emissions

- United States: 22%
- China: 20%
- Europe: 17%
- Eurasia: 9%
- Japan: 4%
- India: 4%
- Other: 21%
- Canada: 2%
- Australia: 1%

Source: Environment Canada, Canadian Inventory, Large Facility Reports (2005 data)

Source: US Energy Information Administration (2005 data)
Technology Focus - Land

• Disturb less land
  • Smaller facilities and pads
  • Longer wells
  • Low-impact seismic

• Use land more efficiently
  • Increase recovery factor

• Reclaim land faster
  • Faster Forests
Technology Focus - Water

• Use less water
  • SOR reductions
  • Water from combustion

• Recycle more
  • Evaporators/centrifuges

• Use higher salinity water
  • Exploration for water
Technology Focus - GHGs

• Generate fewer GHGs per barrel of oil
  • SOR reductions
  • Vacuum insulated tubing
  • Energy efficiency

• Generate fewer GHGs per barrel of steam
  • Alternate combustion
  • Alternate fuels

• Facilitate CCS
  • Improved amine systems
  • Oxy burn

Data source: CERA, 2009
Technology Focus - Economics

- Less capital/bbl
  - Improved SOR

- Less opex/bbl
  - Improved SOR

- Less fuel cost/bbl
  - Alternate fuels
  - Efficiency

- Less CO2/bbl
  - Lower GHG emissions
Oil Sands Key Points

- The Oil Sands offer strategic energy security for US
  - Massive resource base
  - Stable, friendly country with stringent environmental regulations
  - Offers energy security for >40% of US demand

- GHG emissions from production are high but perspective is needed
  - Oil sands have similar GHG emissions to oil from Mexico or Venezuela, which are about 15% higher than GHG emissions from light oil
  - Canadian oil sands emissions are <0.1% of global GHG emissions
  - Canada has a comprehensive framework to regulate emissions

- Technology is the key to reducing oil price and environmental footprint
  - Project economics are challenged
  - Technology will improve the economics and environmental footprint