

**Canadian Oil Sands**  
***Energy Innovations for***  
***North America***

**September 2009**

# Today's Presentation

- **Overview of ConocoPhillips**
- **COP and Ports to Plains**
- **Technology Focus**



ConocoPhillips

# ConocoPhillips Overview

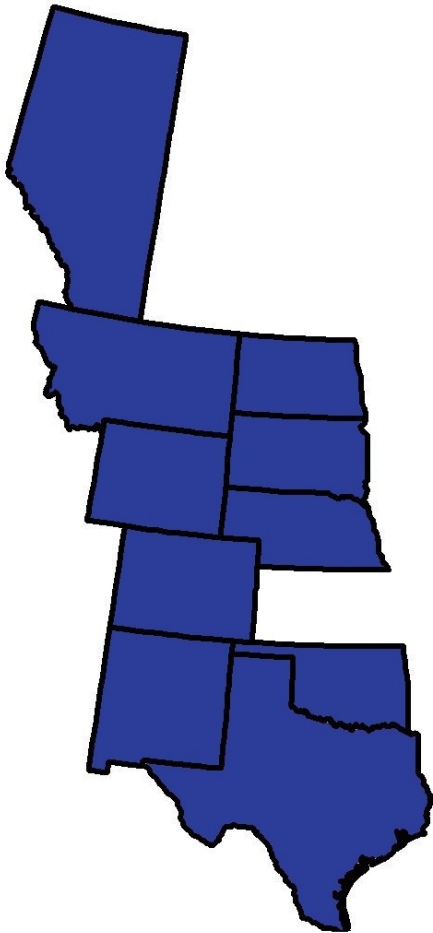
# Worldwide Operations

As of Dec. 31, 2008.



\*Marketing is located in the following countries: Austria, Germany, Switzerland, United Kingdom, Ireland and the United States.

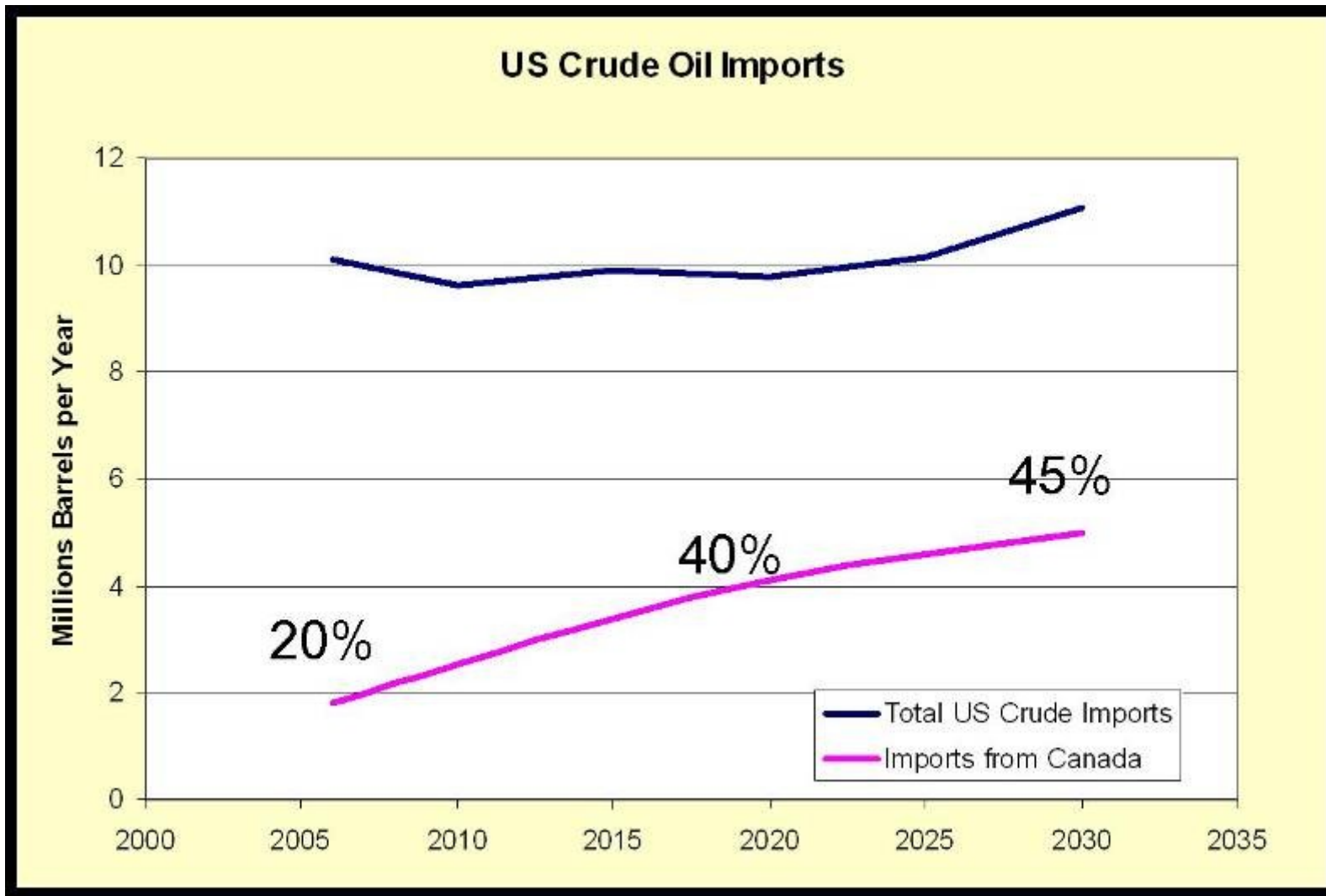
# COP in Ports to Plains



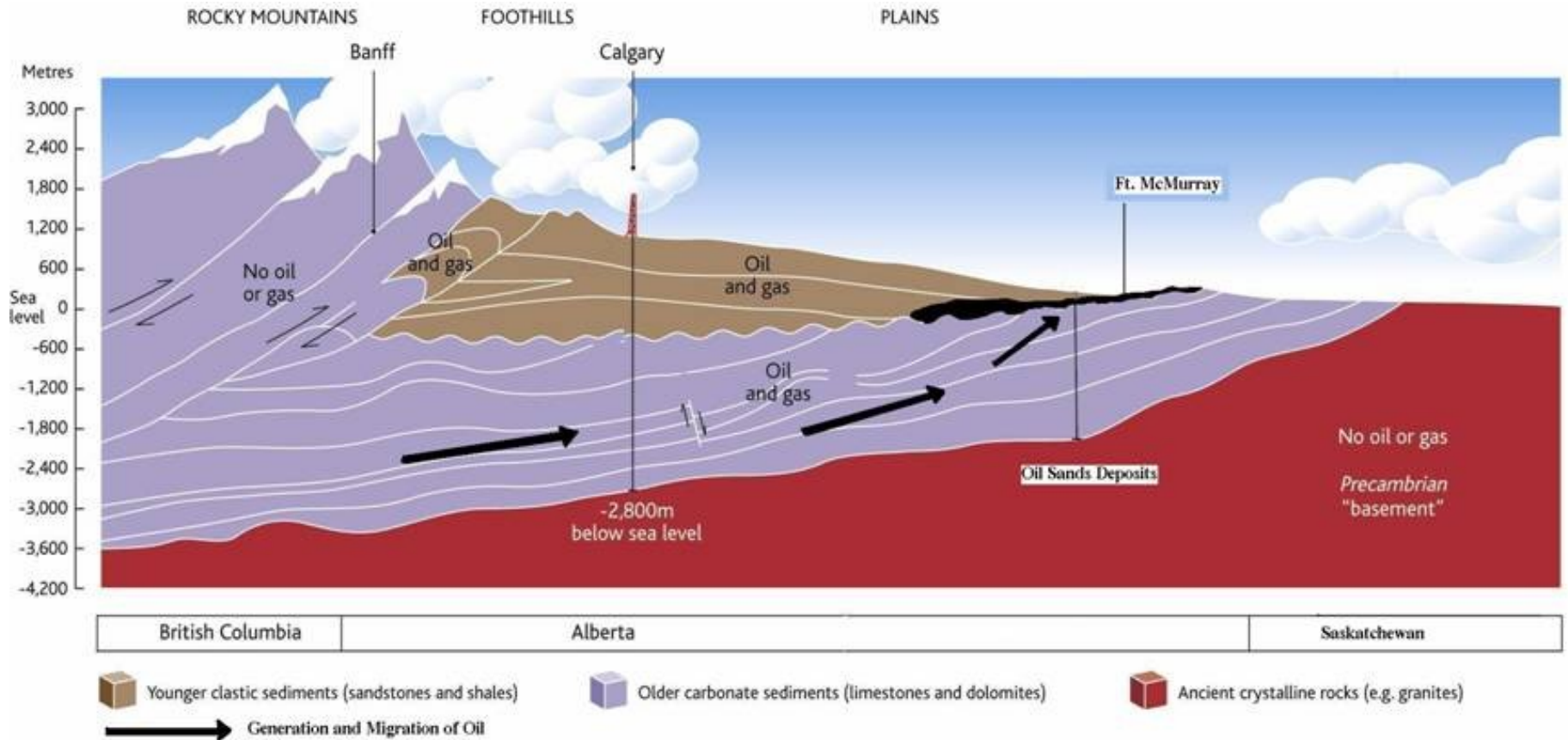
## ConocoPhillips Presence in Member states and Alberta Province

- 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

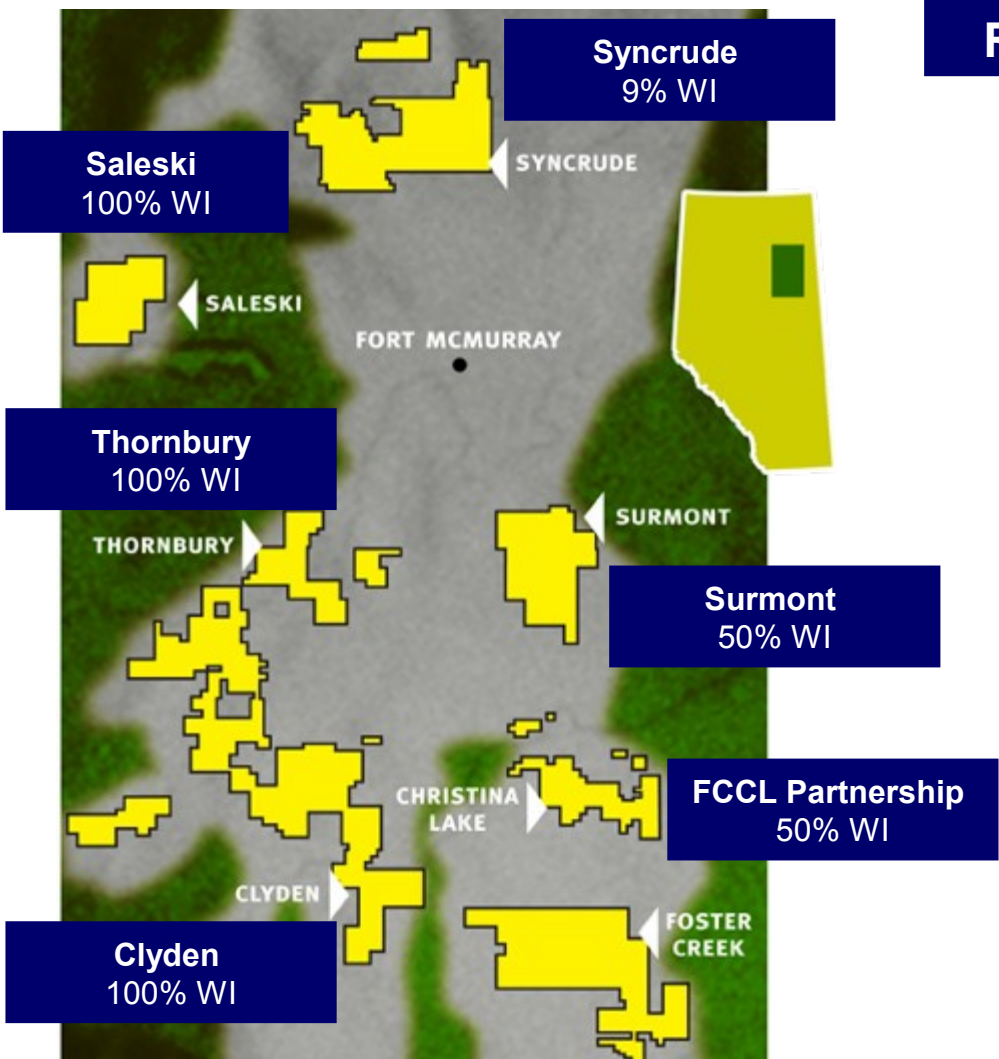


# Canadian Oil Sands: Huge Resource Base

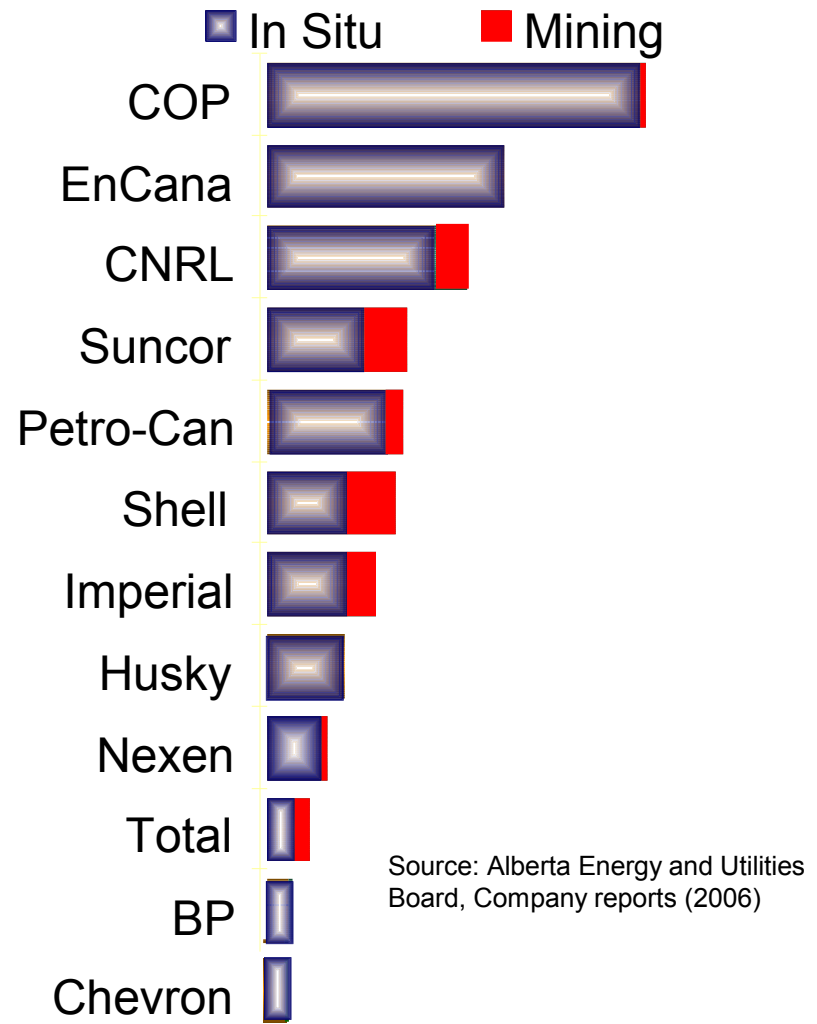


- There are an estimated 1.7 trillion barrels of oil in the Canadian Oil Sands (*Source: CAPP*)
- Only 20% can be mined – the rest (1.4 trillion barrels) is too deep
- Conventional production methods don't work for "in-situ" production – the oil won't flow naturally

# ConocoPhillips' Oil Sands Land Position



## Relative Athabasca Land Positions



Source: Alberta Energy and Utilities Board, Company reports (2006)

Note: Figure is for Athabasca region only.

# Extraction Techniques: Mining

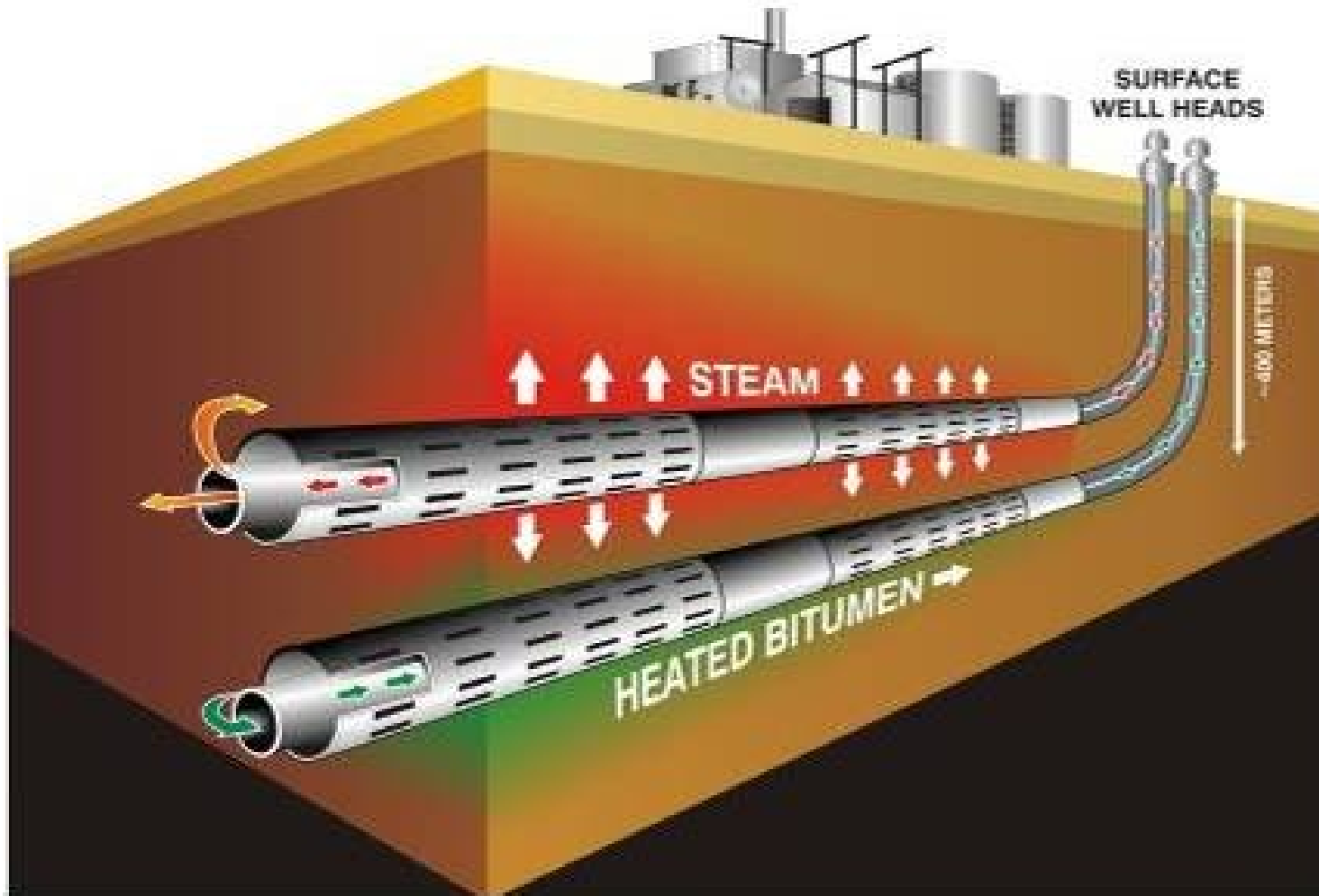


- Uses massive shovels and trucks to scoop the sand from the surface and load into trucks.
- Taken to crushers, where hot water is added before sent to extraction plant.
- Bitumen is extracted from oil sand and water is pumped into settling ponds.
- Typically associated with local upgrading to Synthetic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

# Mining Reclamation



# Extraction Techniques: SAGD



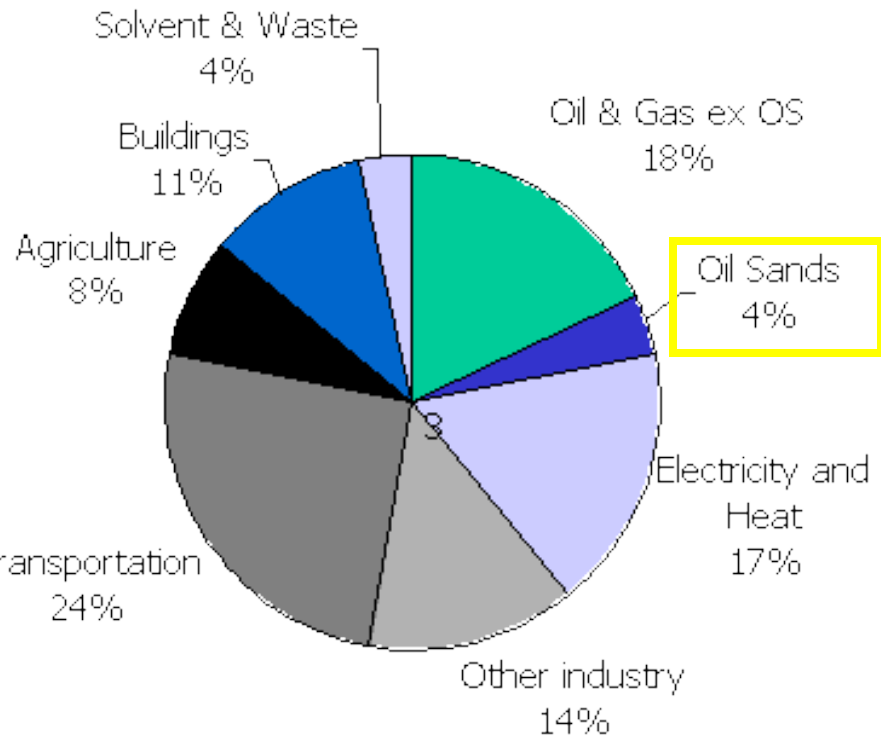
**SAGD = Steam Assisted Gravity Drainage**



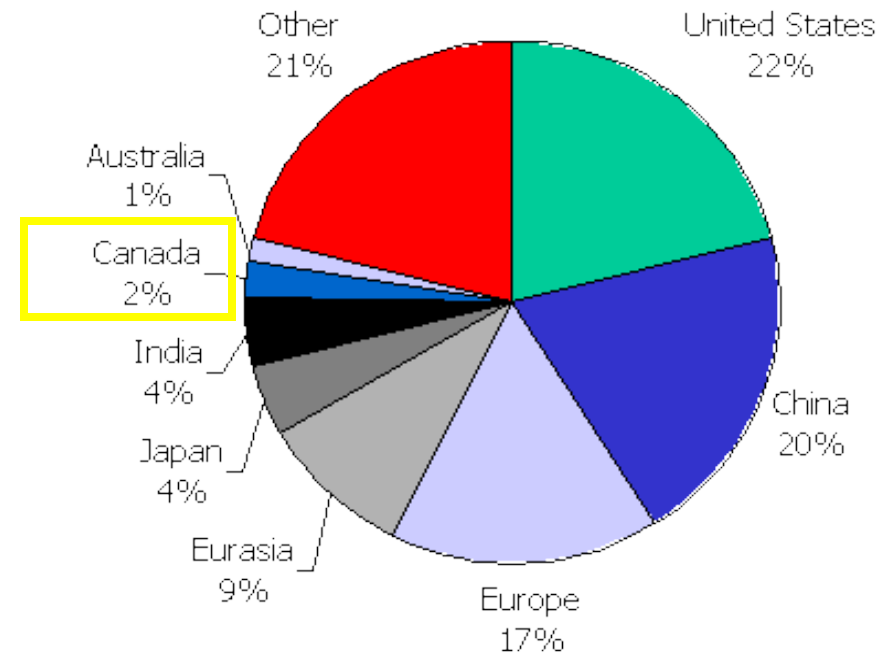
**SAGD development has a similar footprint to conventional oil and gas development.**

# Comparative Emissions

## Canada's GHG Emissions by Sector



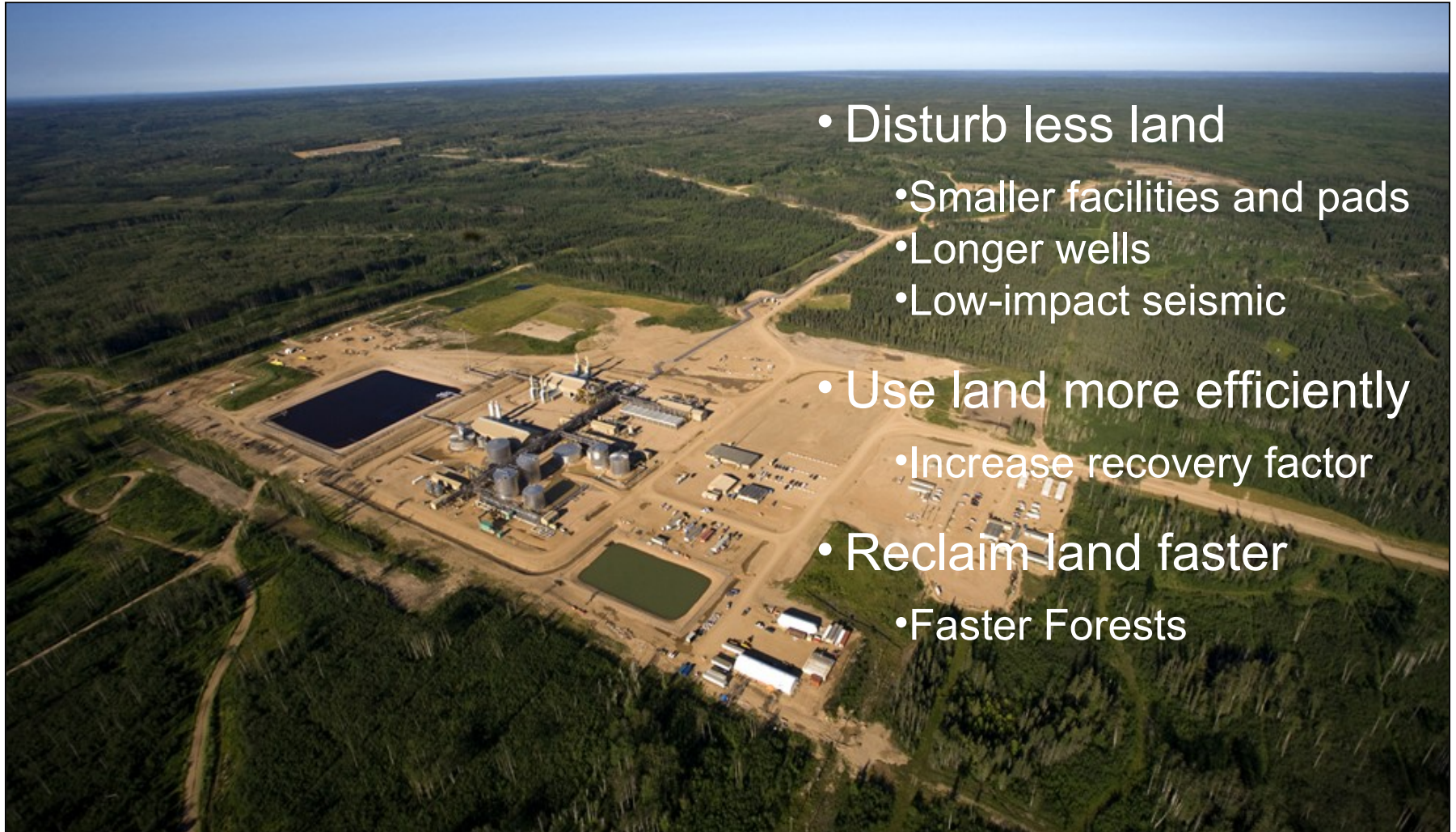
## Global Energy-Related Emissions



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

Source: US Energy Information Administration (2005 data)

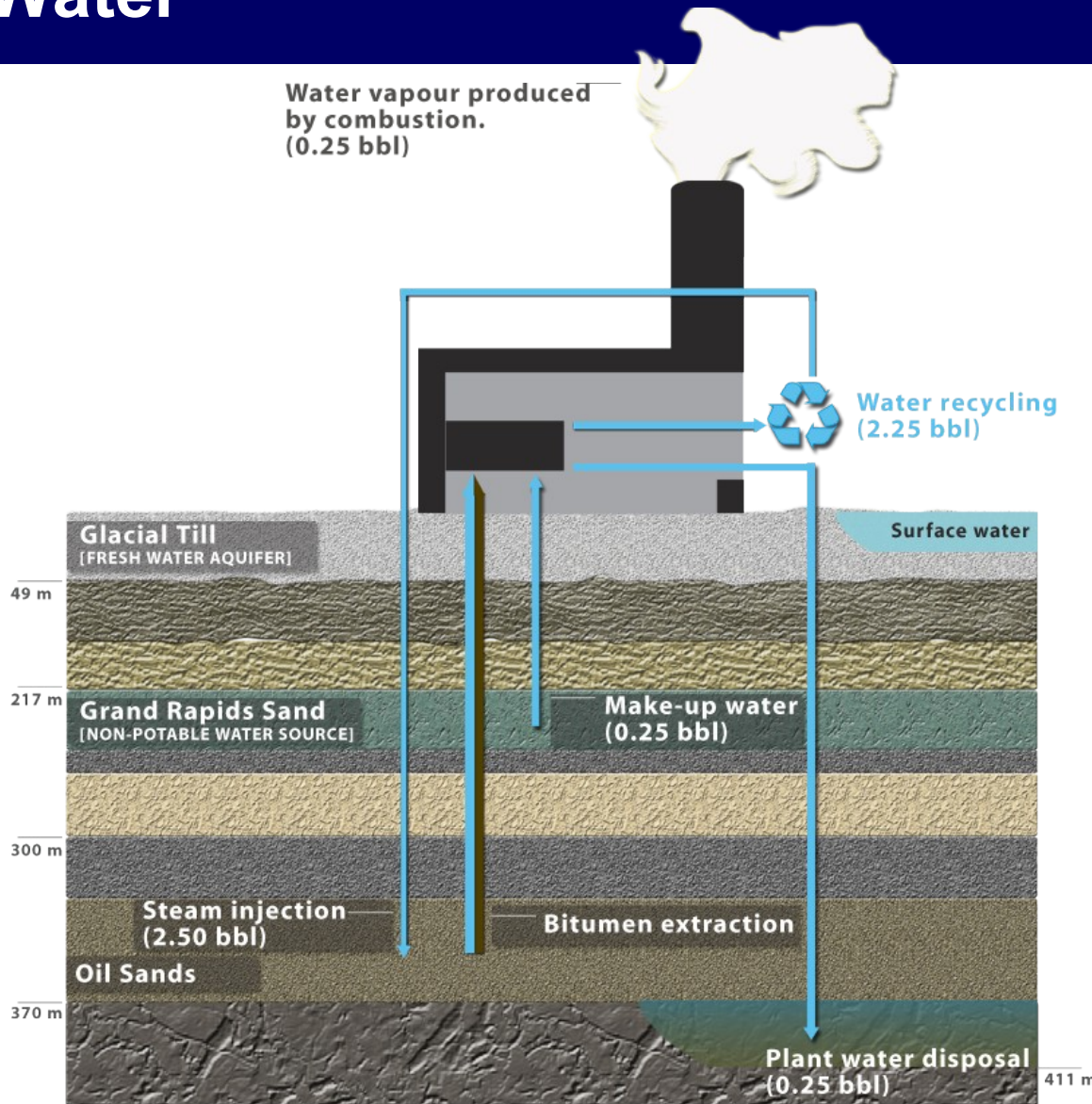
# Technology Focus - Land



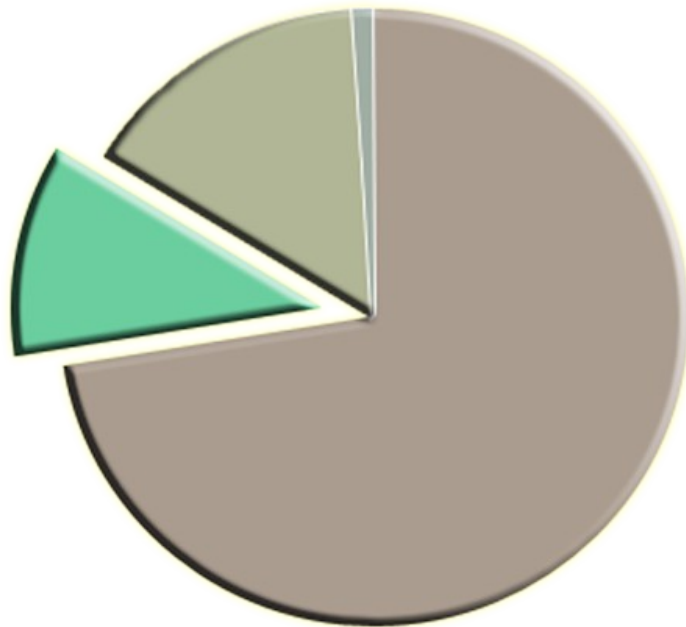
- Disturb less land
  - Smaller facilities and pads
  - Longer wells
  - Low-impact seismic
- Use land more efficiently
  - Increase recovery factor
- Reclaim land faster
  - Faster Forests

# 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

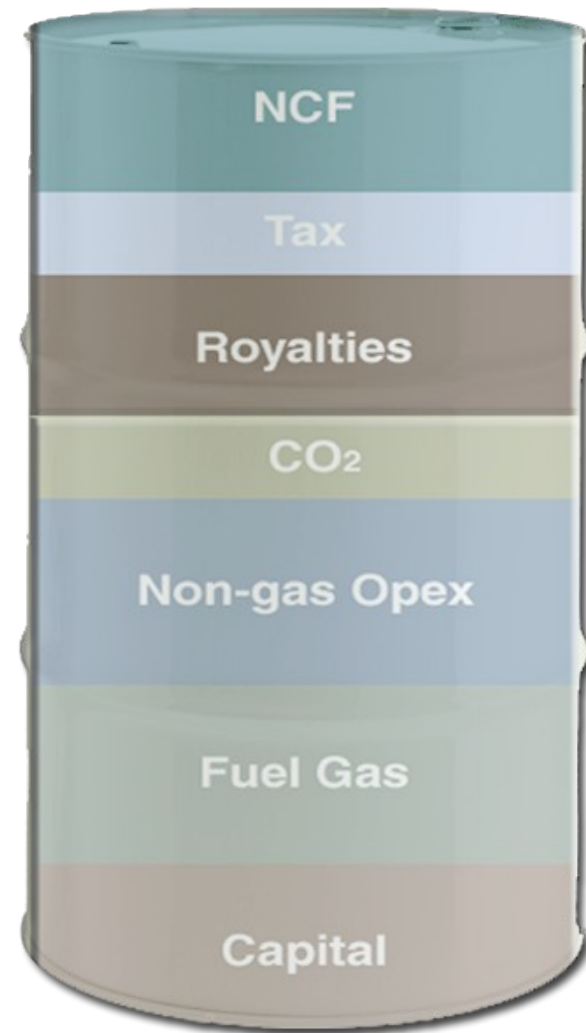


Data source: CERA, 2009

- 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

# Technology Focus - Economics

- Less capital/bbl
  - Improved SOR
- Less opex/bbl
  - Improved SOR
- Less fuel cost/bbl
  - Alternate fuels
  - Efficiency
- Less CO<sub>2</sub>/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

