



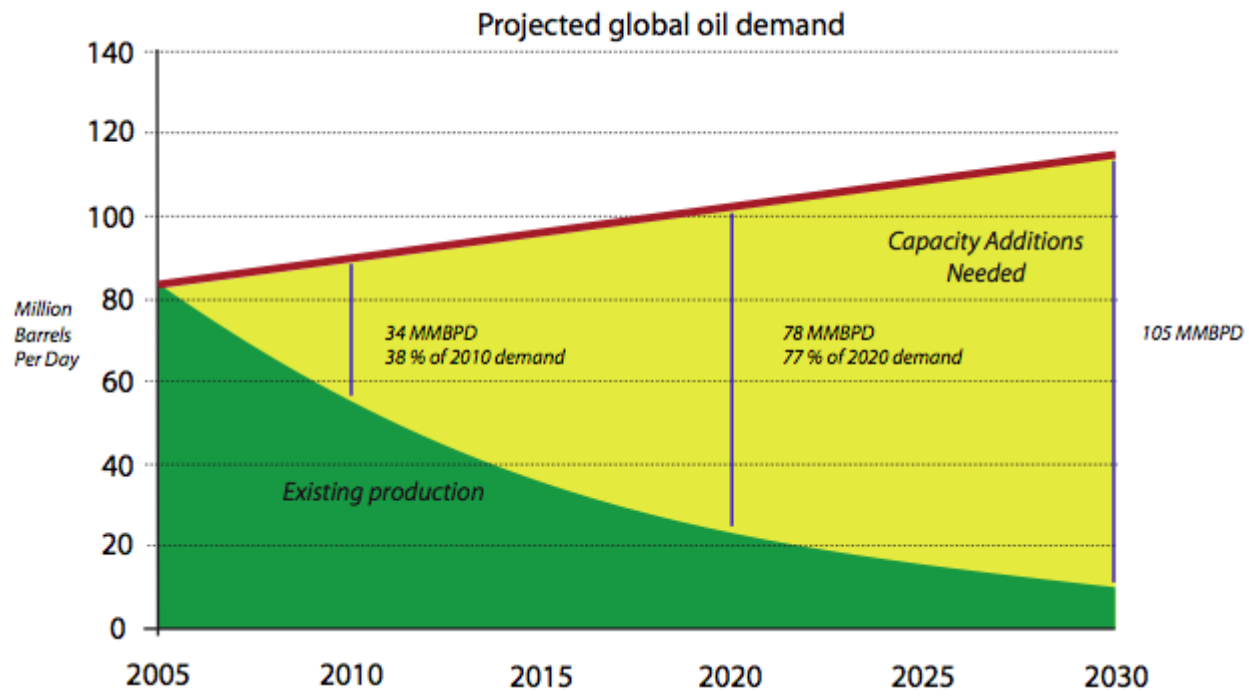
# Energy, The Environment And Value Chains: Owning The Future

Presented by:  
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Ministry Of Energy

May 3, 2011

# International Energy Agency

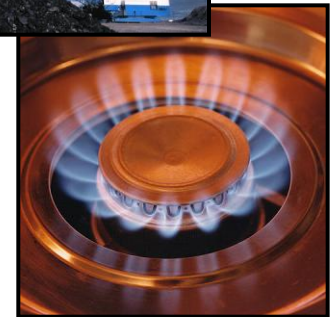
## World Energy Outlook 2009



*Global oil demand is expected to advance 1 per cent a year to 105 million barrels a day by 2030 from 85 million barrels a day in 2008.*

# Alberta energy reserves

- Conventional oil – 1.4 billion barrels
- Oil Sands – 170 billion barrels
- Natural Gas – 39.8 trillion cubic feet
- Coal – 33 billion tonnes
- Electricity – 13,007 MW installed capacity



# Alberta: secure and responsible

## Fact:

- Alberta is a secure and responsible supplier of energy.

## Fact:

- No other oil-producing jurisdiction in the world takes environmental management more seriously than Alberta.

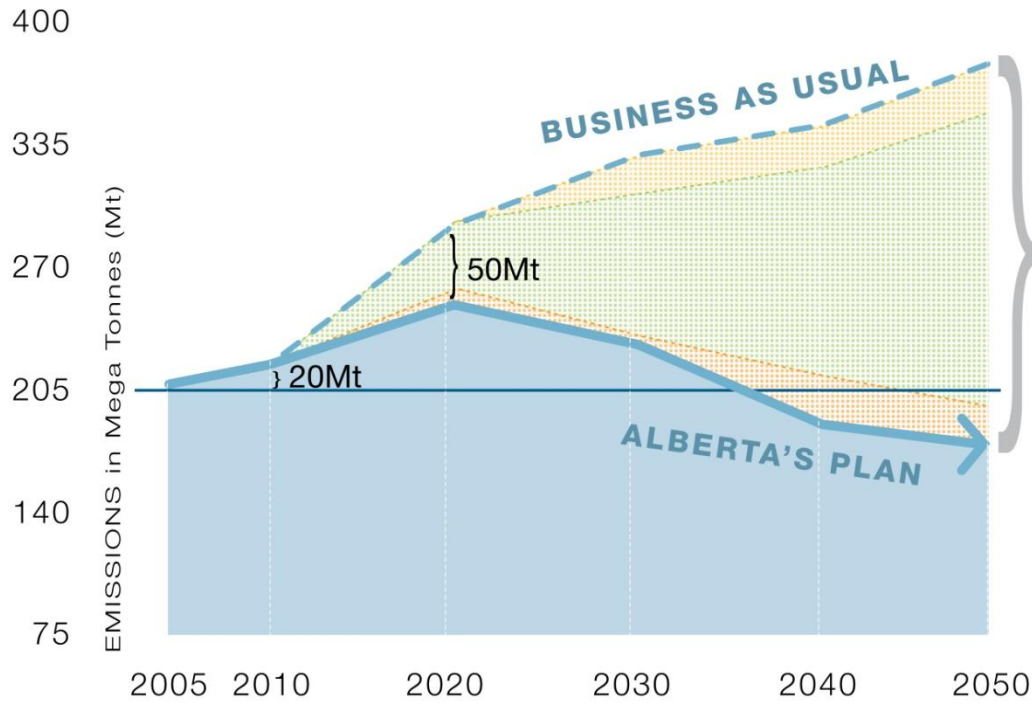
## Fact:

- Alberta cares about the environment. We back it up with laws and regulations that would be the pride of most any jurisdiction.

# Alberta's climate change strategy

## > 200 Mt reduction by 2050


### ALBERTA'S REDUCTION COMMITMENTS



**200M**

- 2050 -- 200Mt reduction or 50 per cent below projected business as usual and 14 per cent below 2005 levels

Million tonnes = 1 Megatonne (Mt)

	CONSERVATION & ENERGY EFFICIENCY	24Mt
	CARBON CAPTURE & STORAGE	139Mt
	GREENING ENERGY PRODUCTION	37Mt

**TOTAL = 200Mt**

# Shift to cleaner energy

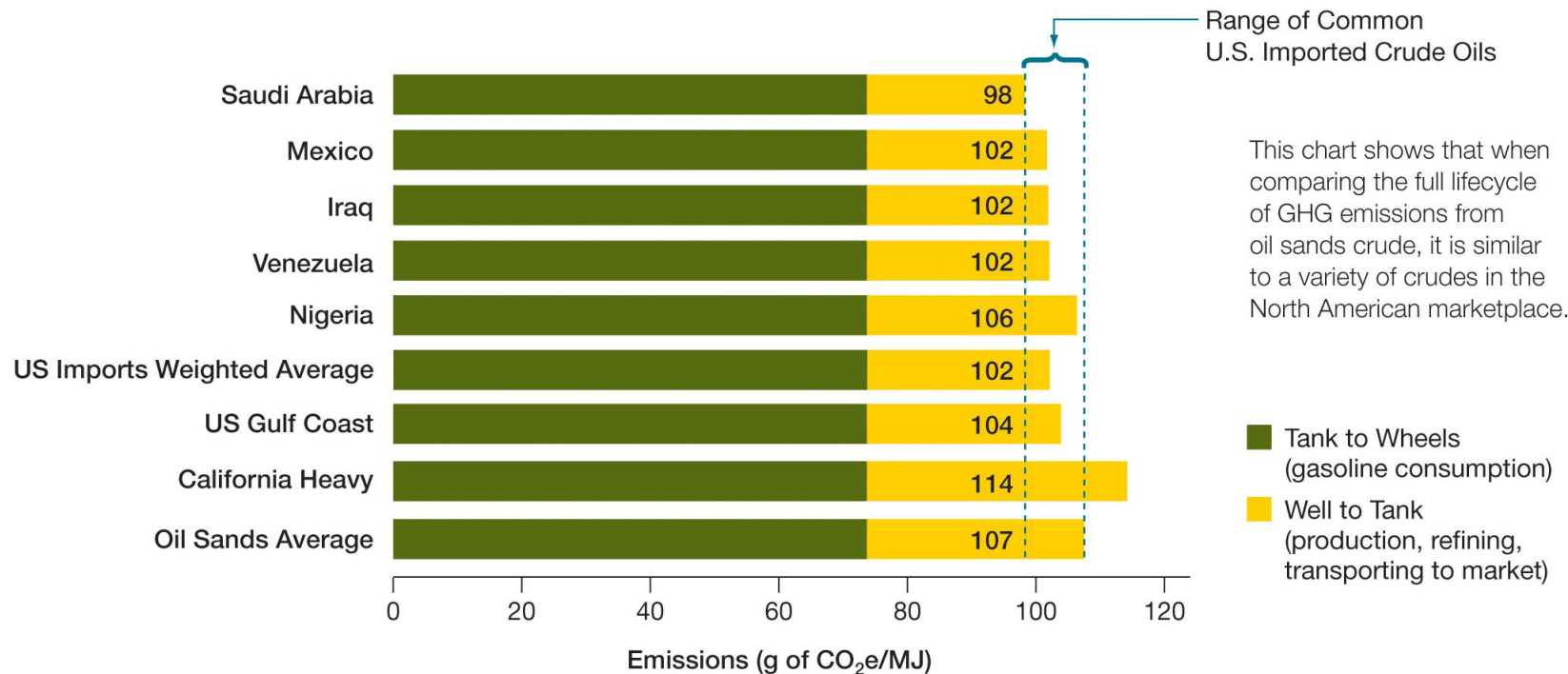
- Shift to cleaner energy is vital...but the world will still need oil and gas.
- International Energy Agency forecasts world energy demand to grow by 40% over next 20 years.
- Demand comes from choices we all make.



# GHG emissions (full life cycle)

> Similar to other crudes in market place

Well-to-Wheels –  
Full Life Cycle GHG Emissions



Range of Common  
U.S. Imported Crude Oils

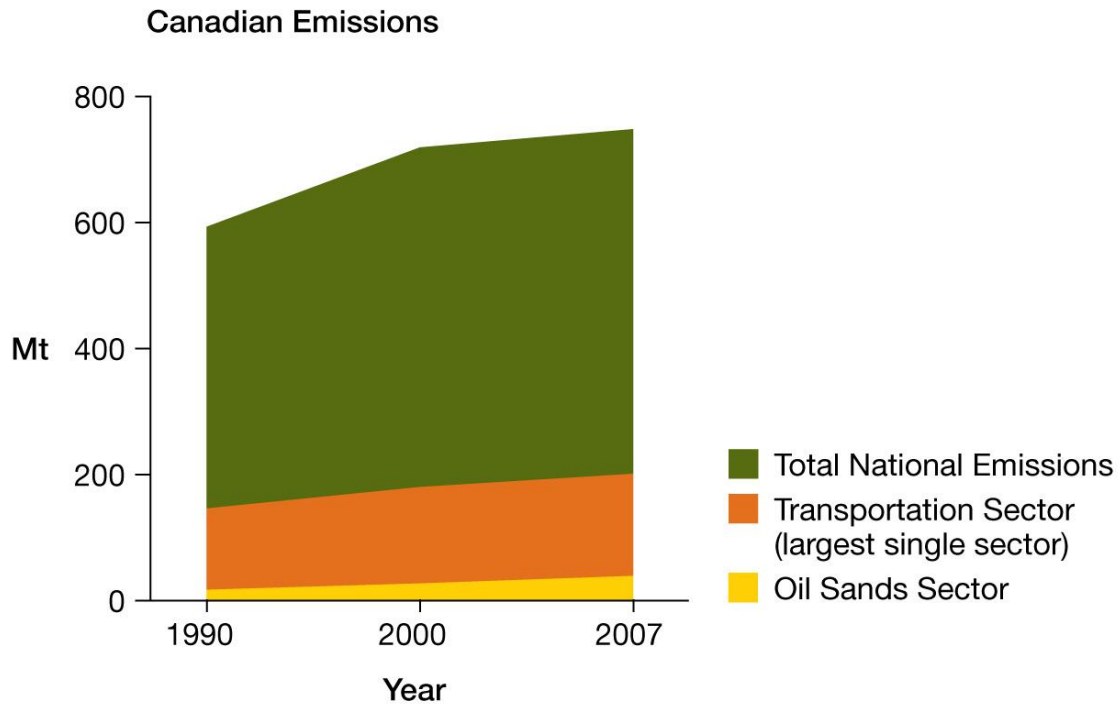
This chart shows that when comparing the full lifecycle of GHG emissions from oil sands crude, it is similar to a variety of crudes in the North American marketplace.

■ Tank to Wheels (gasoline consumption)  
■ Well to Tank (production, refining, transporting to market)

Source: Jacobs Consultancy and Life Cycle Associates, *Life Cycle Assessment Comparison for North American and Imported Crudes*, July 2009

# Canada's GHG emissions

➤ Oil sands create only 5% of Canada's GHGs

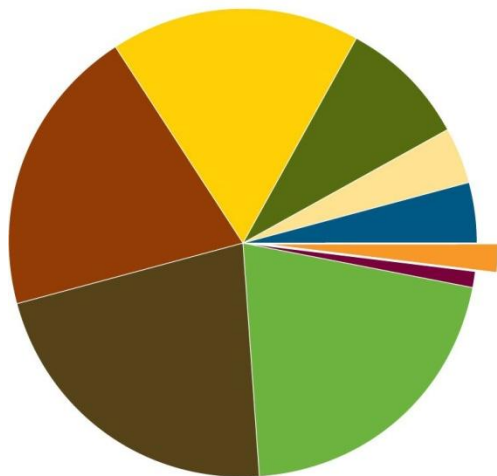


Note: 1Mt = 1 million tonnes

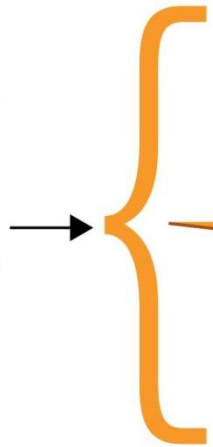


# Global emissions

Global Sources of Emissions



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



- Canada
- Oil Sands

Alberta's oil sands account for less than 1/10 of 1% of the world's greenhouse gas emissions

# Responsible development

New technologies will help:

- Reduce environmental impact of production.
- Reduce energy consumption.
- Advance the role of renewable and alternative energy.



# Regulations and results

- Only jurisdiction in North America with mandatory GHG reduction targets for all large emitters.
- Program includes:
  - price on carbon
  - purchase offsets
  - clean energy technology fund
- Results so far:
  - More than 17 million tonnes of GHG reduced
  - \$187 million paid into clean energy tech fund
  - Almost \$100 million invested into clean energy projects

# Emissions – what's next?



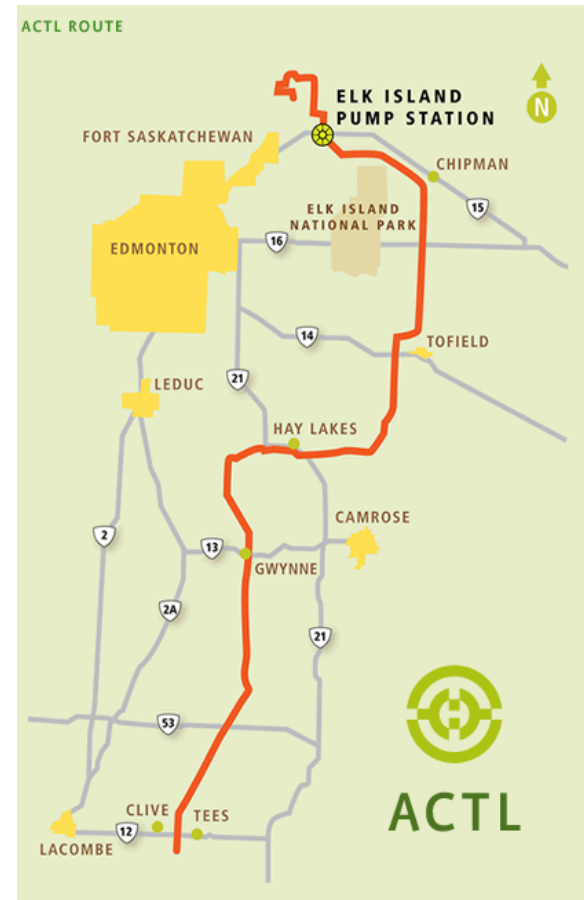
# Oil sands in demand



# Carbon Capture and Storage (CCS)

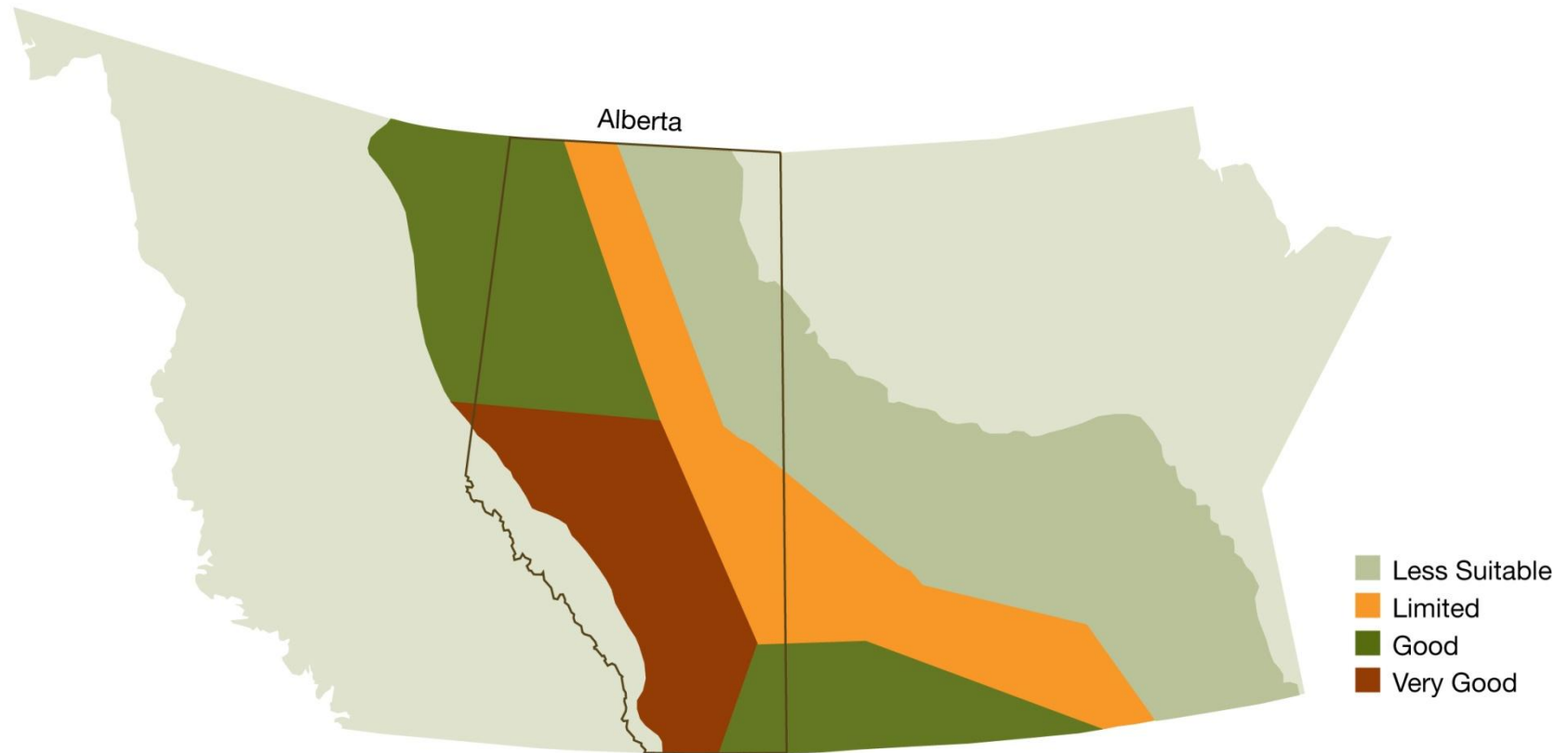
- CCS is a process that captures CO<sub>2</sub> emissions and stores them in geological formations deep inside the earth.
- The province has committed \$2-billion to steel in the ground projects.
- These projects are expected to reduce emissions by five million tonnes annually beginning in 2015.

# Alberta Carbon Trunk Line



# Carbon capture and storage (CCS)

## CCS Suitability in the Western Canadian Sedimentary Basin



Source: Bachu and Stewart, *Geological sequestration of anthropogenic carbon dioxide in the Western Canadian Sedimentary Basin*, 2002



# CCS Projects

1. Enhance Energy/NWU
2. Quest (Shell)
3. Swan Hills Synfuels
4. Project Pioneer (TransAlta)





[www.energy.gov.ab.ca](http://www.energy.gov.ab.ca)