



Alberta's Clean Energy Future.

Government
of Alberta
Canada

Alberta
Freedom To Create. Spirit To Achieve.

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.

Shift to cleaner energy

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



Responsible development

New technologies will help:

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



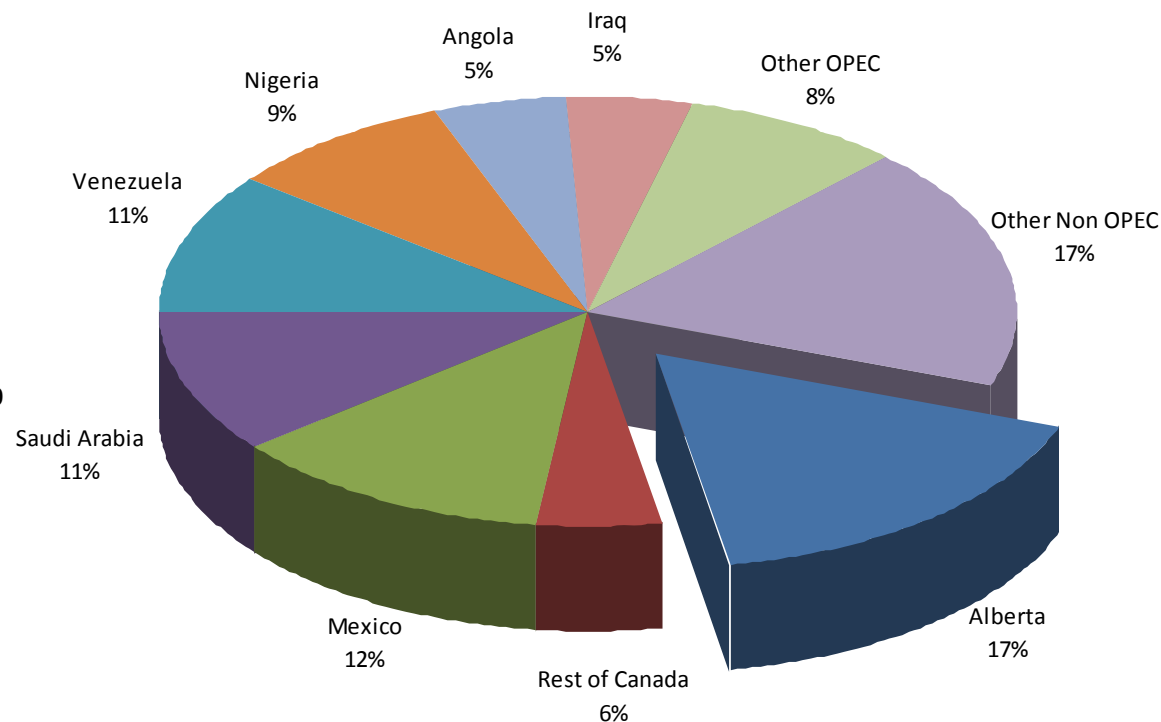
Sources of U.S. imports 2009

> Total U.S.
Demand:
18.7 million
bbl/d

> Total
Imports: 9.1
million bbl/d

Note: Total does not add up
to 100% due to
rounding

> Sources: US Energy
Information
Administration
& Alberta Energy
Resources
Conservation Board



Energy and security

“Significant growth in oil sands imports into the United States will reduce the required volume of oil imports from elsewhere in the world.”

“The oil sands are sourced from a politically stable and secure country adjacent to the United States.”

- Cambridge Energy Research Associates: *Growth in the Canadian Oil Sands: Finding the New Balance*, May 2009

Energy and security

“Perhaps the greatest impact of expanded oil sands exploitation would be a diversion of revenues away from adversarial governments.”

- Council on Foreign Relations: The Canadian Oil Sands: Energy Security vs. Climate Change, May 2009

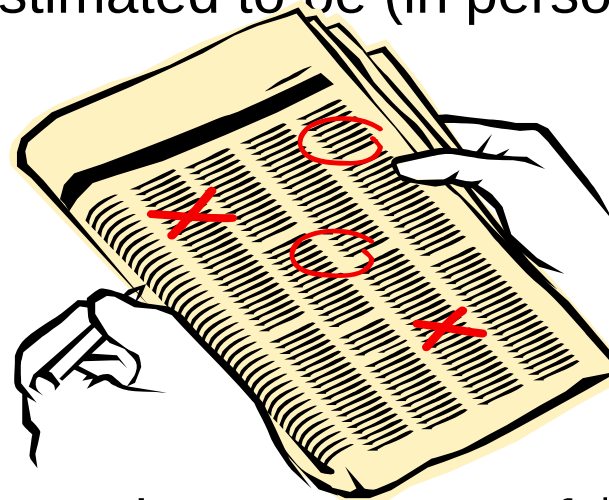
Investment in the oil sands

- > Capital investment in oil sands was nearly \$10 billion in 2009.
- > More than \$140 billion in projects underway or proposed through 2012.
 - Canadian Association of Petroleum Producers



Impact of oil sands on U.S.

- > Canadian oil sands development and production will result in employment increases across the U.S.
- > Incremental employment is estimated to be (in person years):
 - 2009-2010 = 172,000
 - 2011-2015 = 343,000
 - 2016-2020 = 88,000
 - 2021-2025 = 22,000
- > American GDP estimated to grow by an average of \$31.2 billion per year.

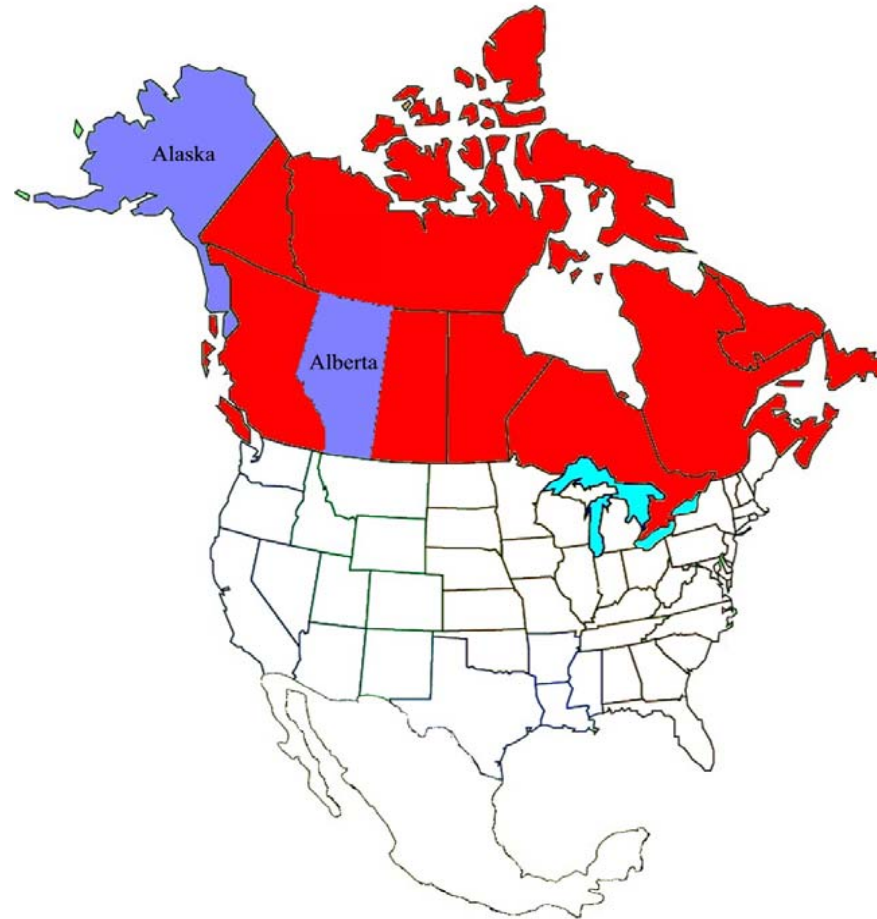


What are the oil sands?

- > Naturally occurring mixture of sand, clay, water and bitumen.
- > Bitumen is separated from the sand and then upgraded to refinery-ready crude.

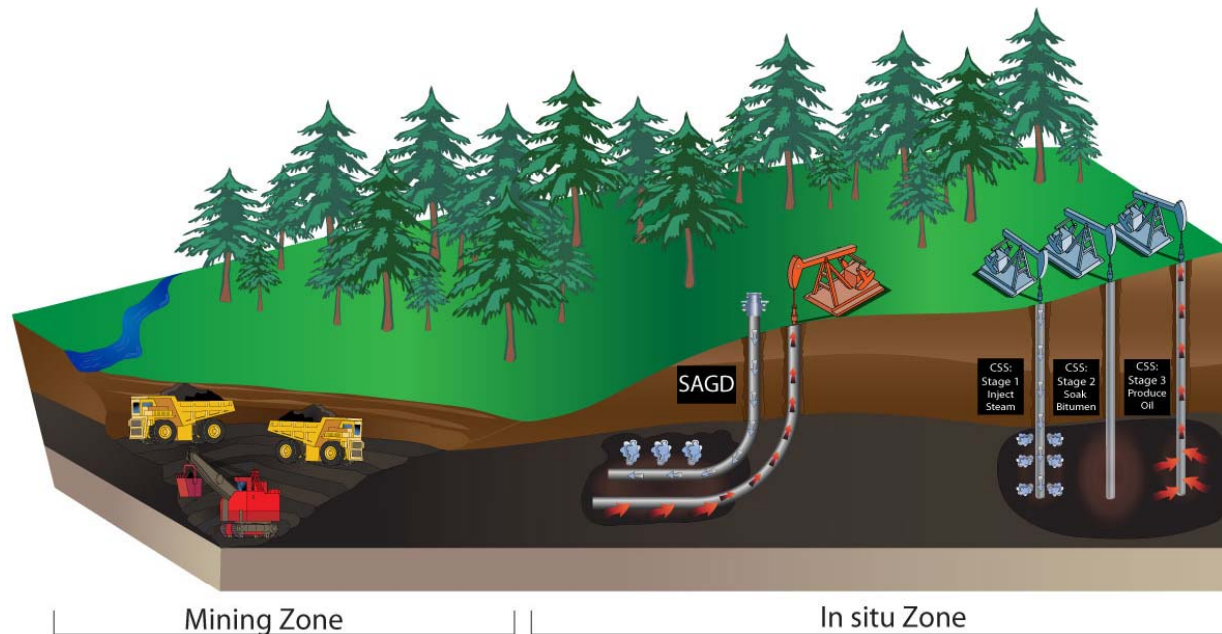


Where are the oil sands?

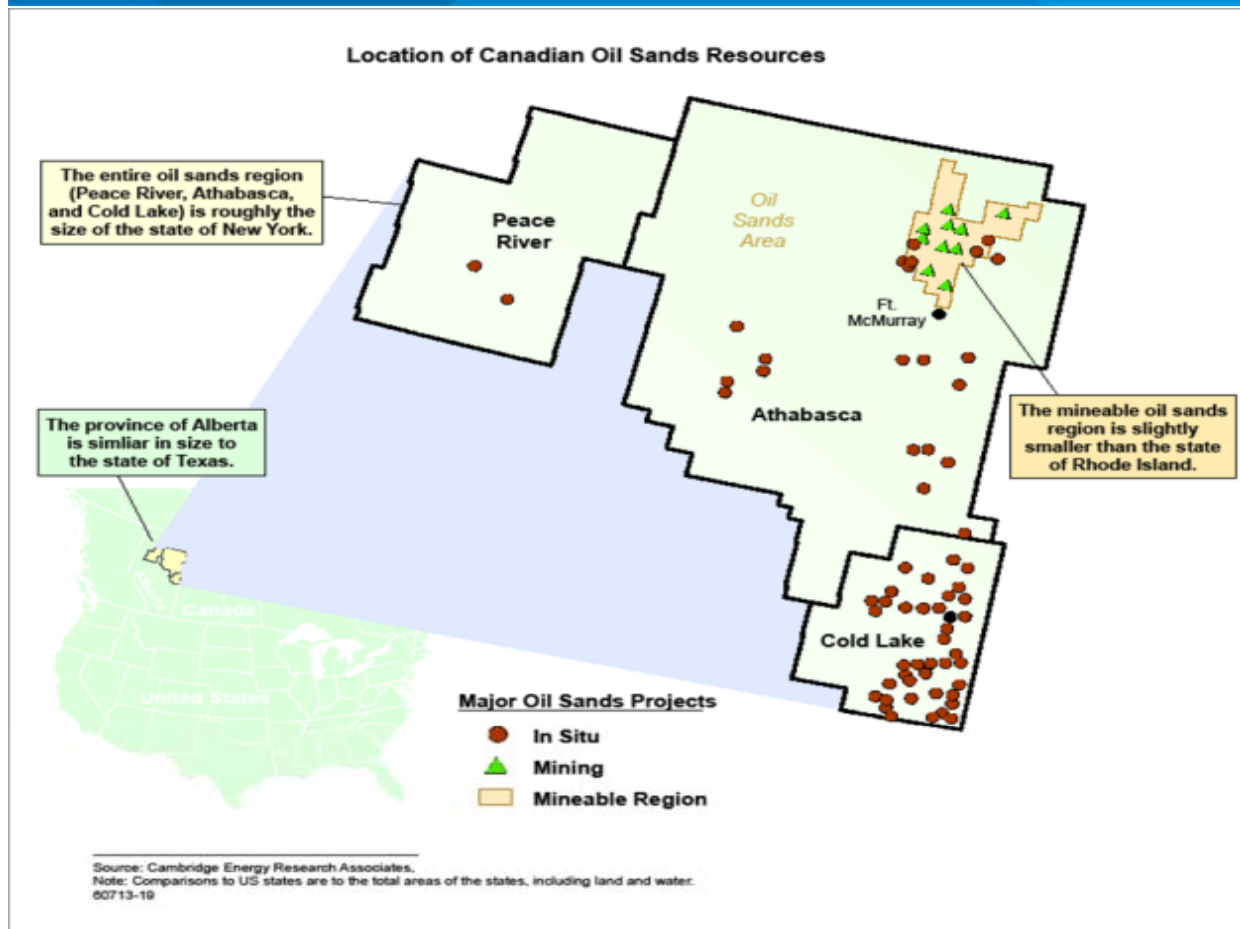


How much is there?

- > 170 billion barrels of recoverable oil (potentially 315 billion barrels)
- > 20% recoverable by mining, 80% recoverable through in-situ techniques



How big are the oil sands?



Oil sands deposits:
-54,903 miles²

Surface mineable deposit:
-1,853 miles²
about 1.25% of Alberta's Boreal forest area

Less than 30% of mineable area has been approved for mining

Land disturbed to date:
- 232 miles²

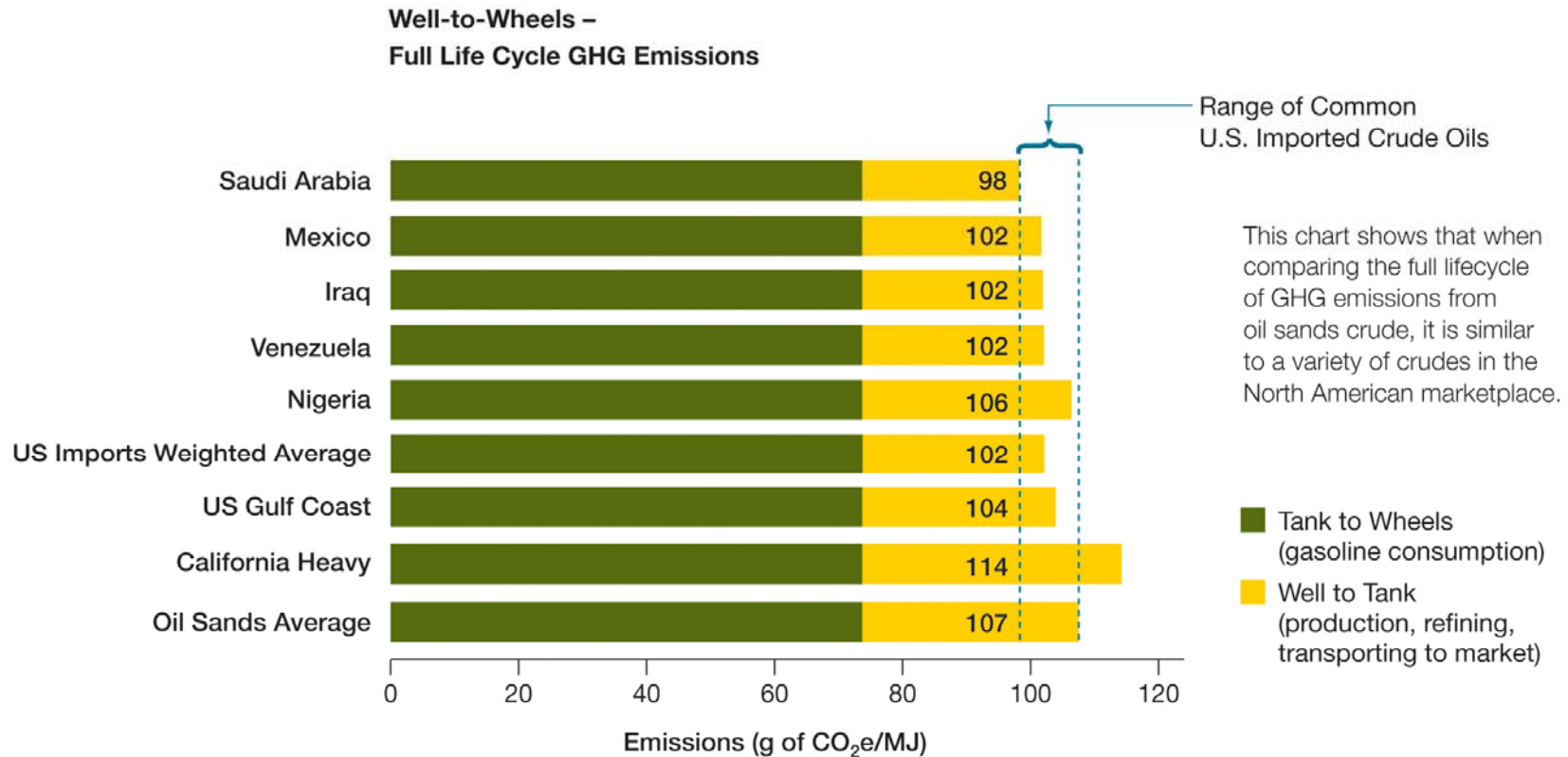
Technology and innovation

- > Oil sands are built on innovation.
- > Technology and innovation will help meet challenges:
 - Efficiency
 - Carbon management
 - Reduced environmental impacts



GHG emissions (full life cycle)

> Similar to other crudes in market place

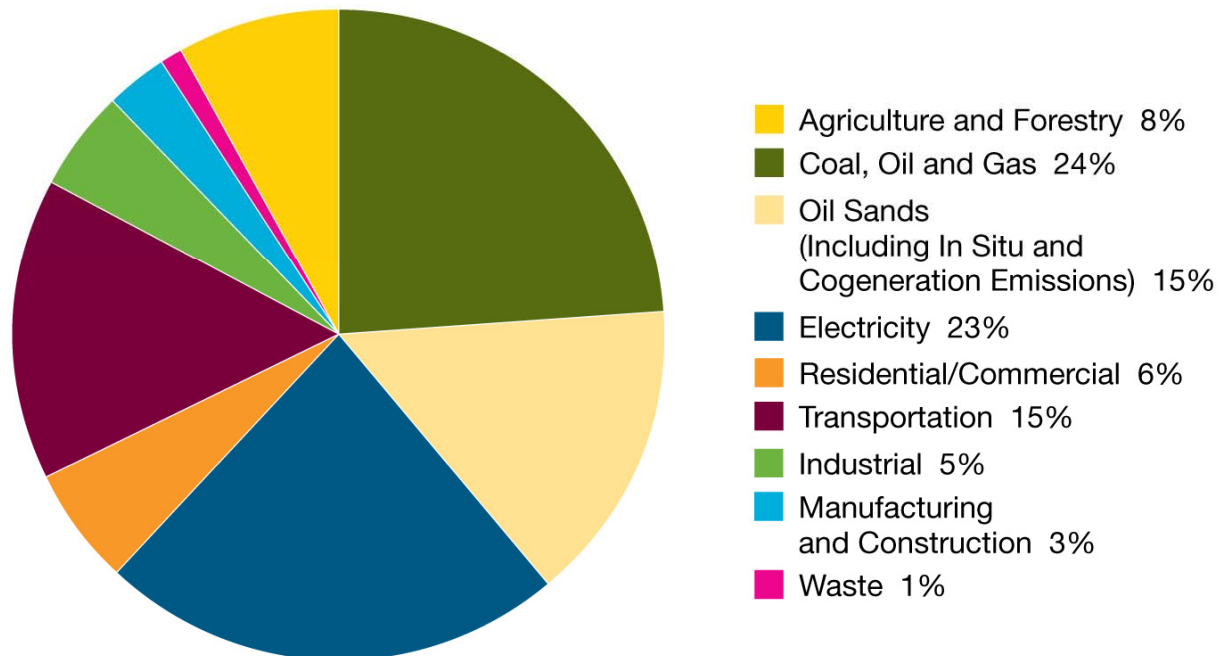


Source: Jacobs Consultancy and Life Cycle Associates, *Life Cycle Assessment Comparison for North American and Imported Crudes*, July 2009

Alberta emissions

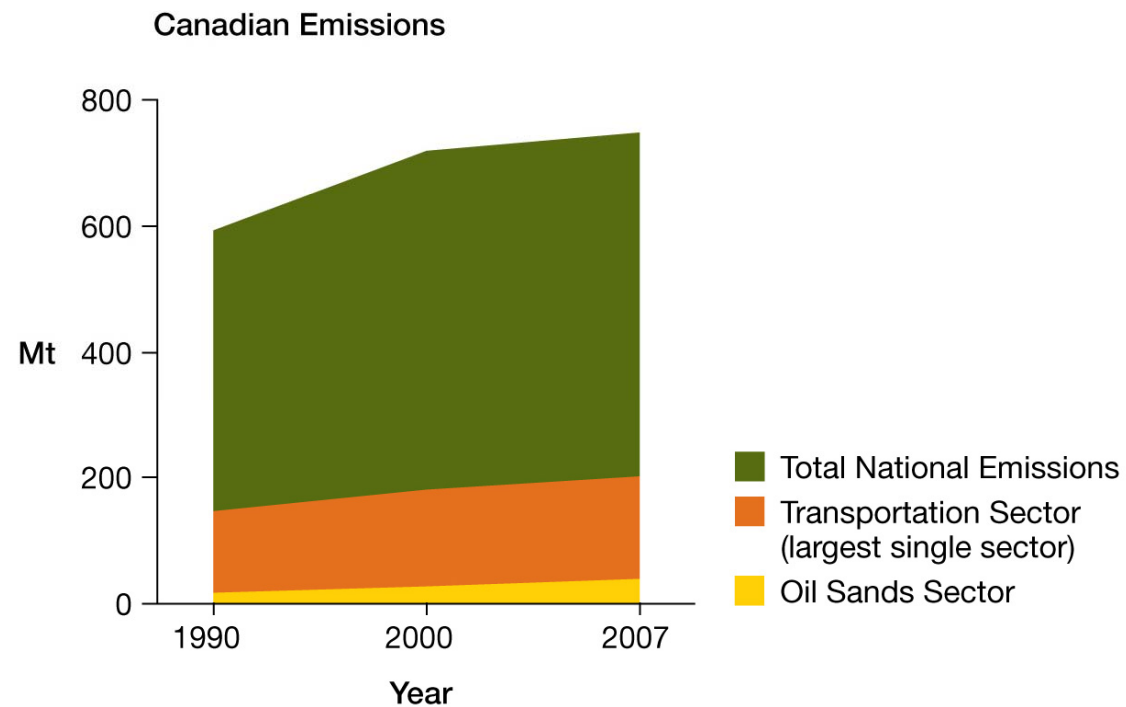
> Oil sands are 15% of Alberta' GHGs

2008 Alberta Greenhouse Gas Emissions (244 Mt Total)



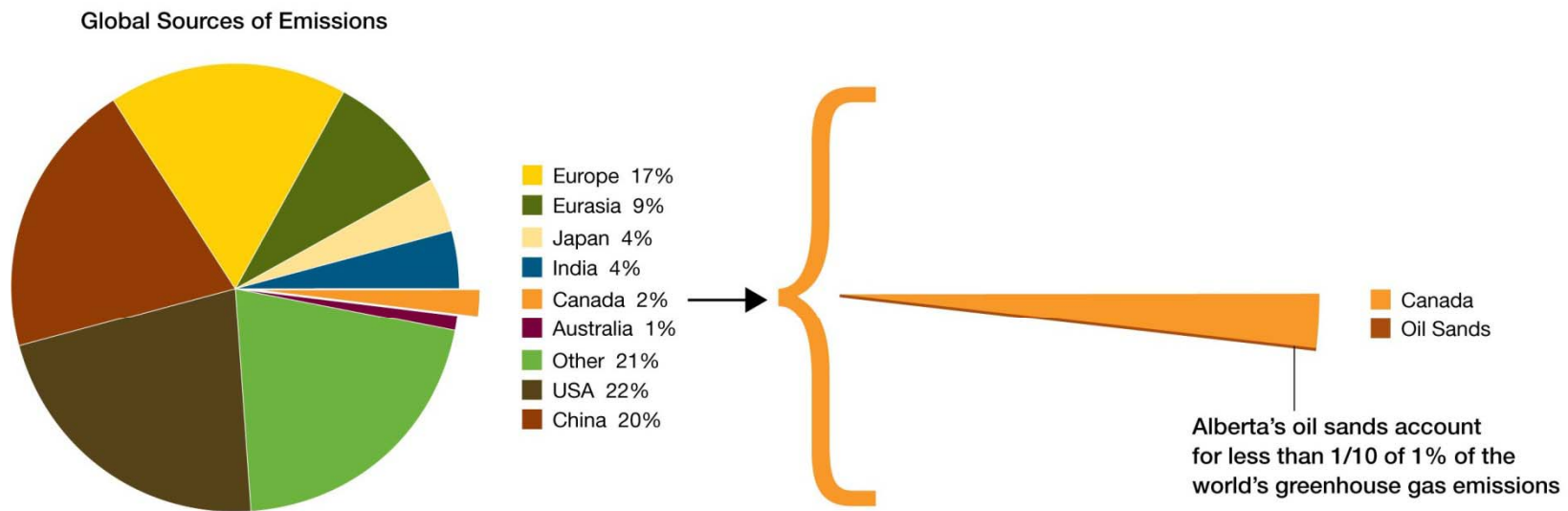
Canadian emissions

> Oil sands are 5% of Canadian GHGs



Global emissions

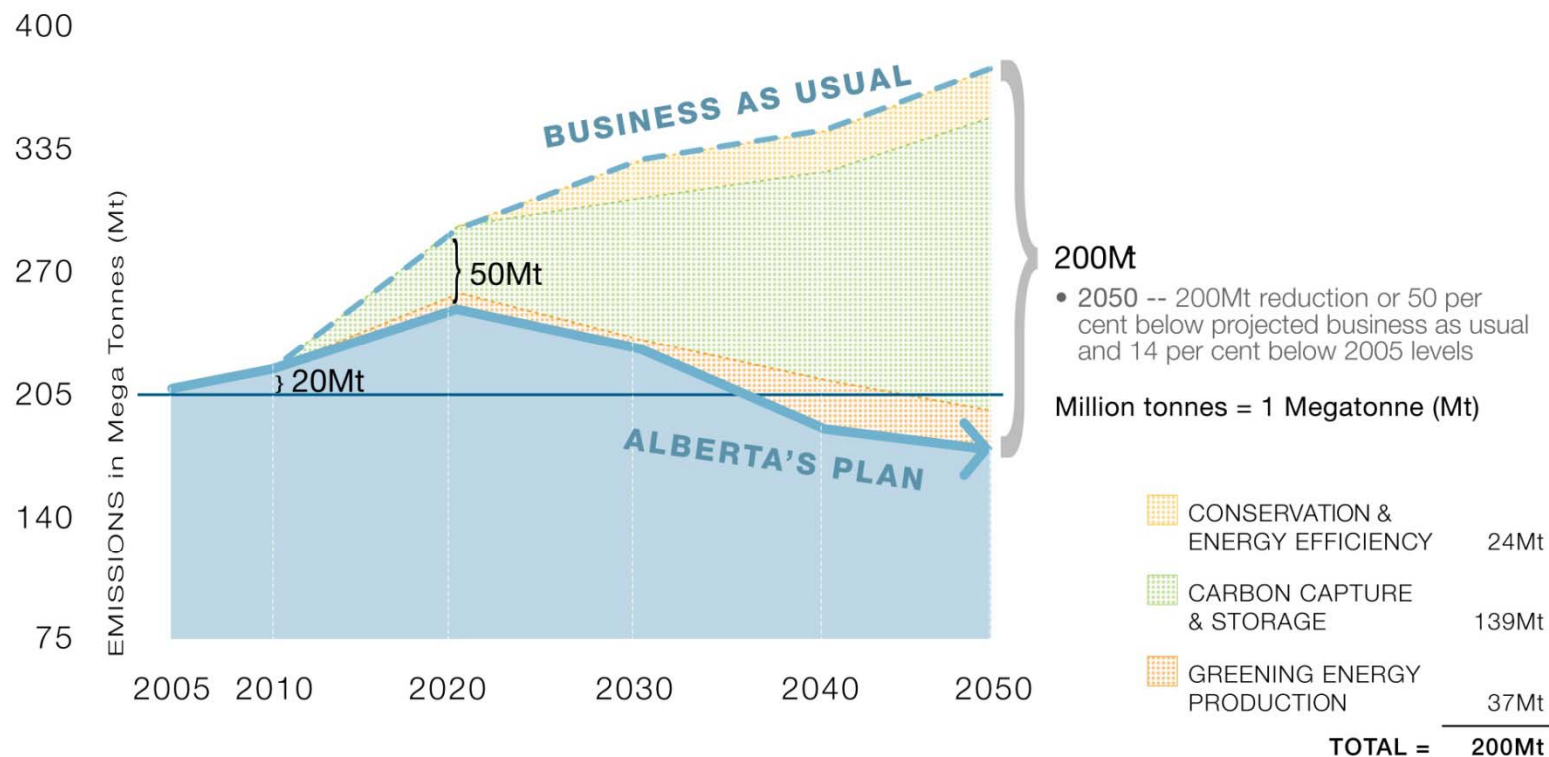
> Oil sands are less than 0.1% of global GHGs



Alberta's climate change plan

> 200 Mt reduction by 2050

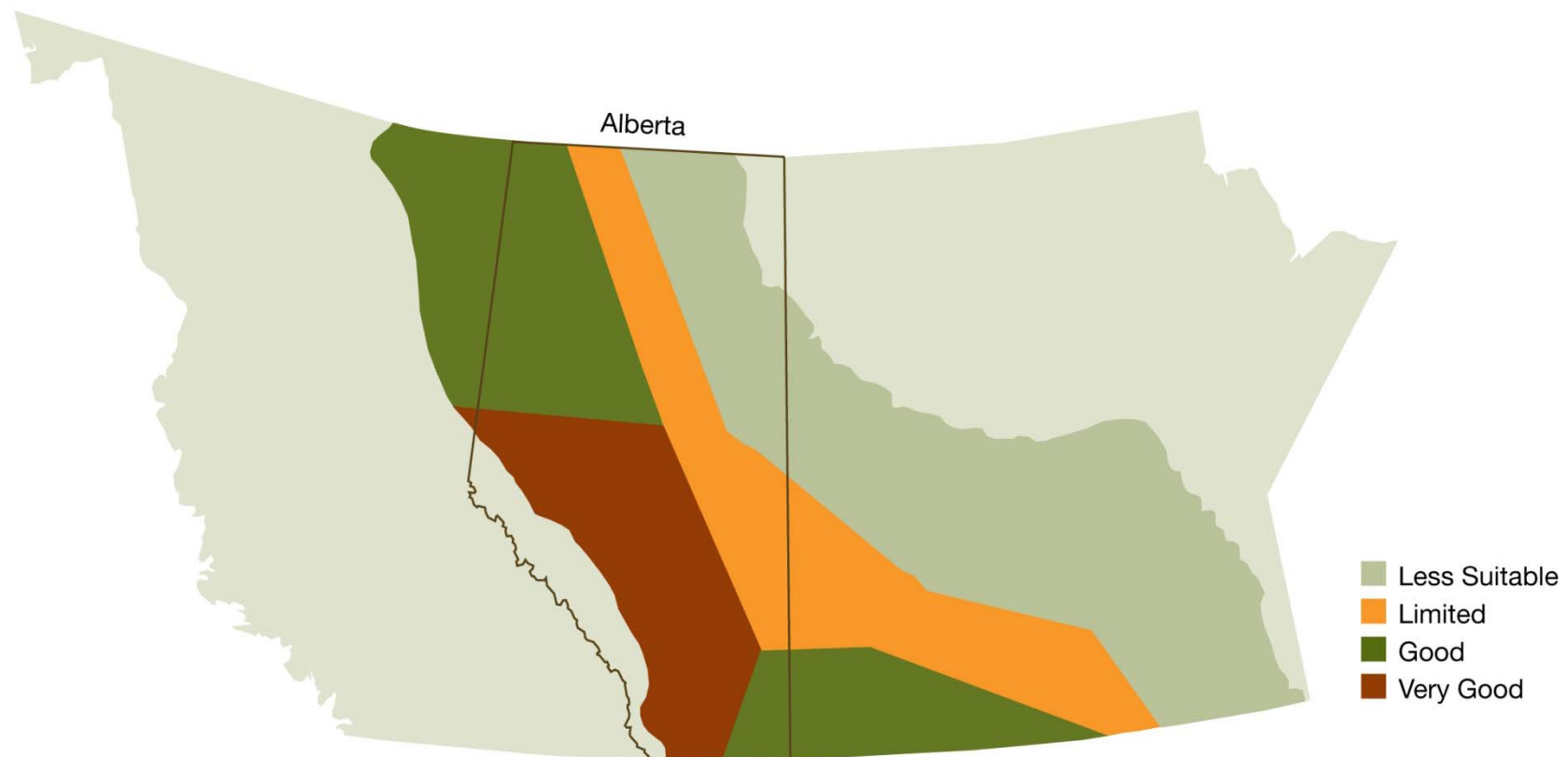
ALBERTA'S REDUCTION COMMITMENTS



Carbon capture and storage (CCS)

> \$2-billion commitment: key part of strategy

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

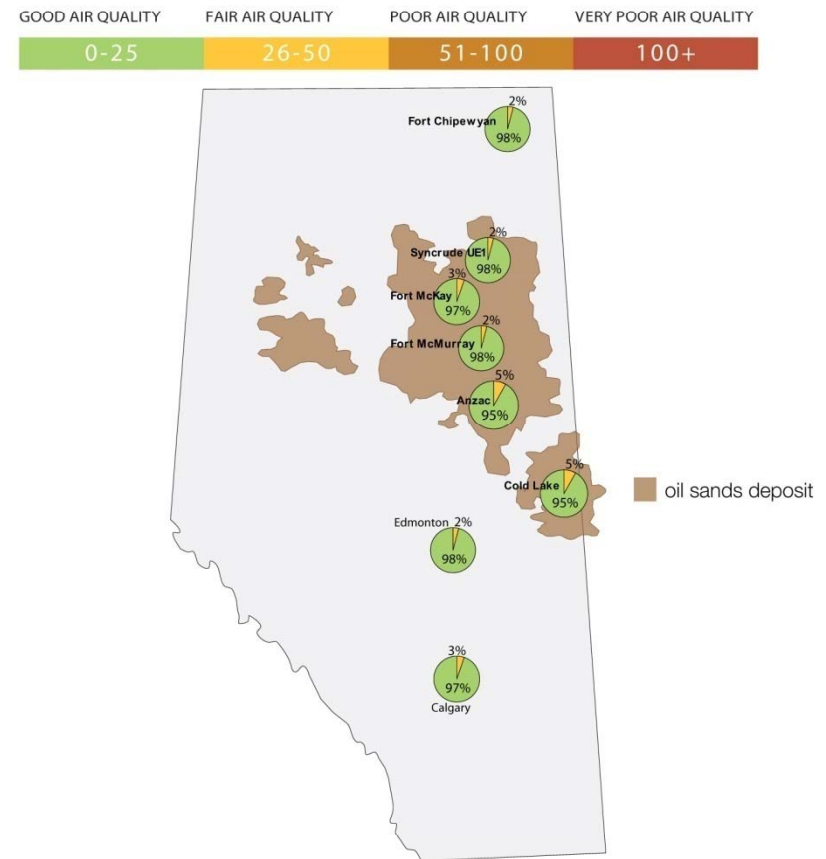
Regulation and results

- > Only jurisdiction in North America with mandatory GHG reduction targets for all large emitters.
- > Program includes:
 - price on carbon
 - clean energy technology fund
- > Results so far:
 - More than 17 million tonnes of GHG reduced
 - \$187 million paid into clean energy tech fund
 - \$71 million invested into clean energy projects

Air quality

- > Air in region is rated “good”
 - the highest rating possible
 - 95% of the time
- > Oil sands region is Alberta’s most heavily monitored region for air quality

Average Air Quality Index Readings for Alberta: 2008



Responsible water use

- > Athabasca River is one of the most protected waterways in North America.
- > All existing and future projects may withdraw no more than 3%.
- > Industry uses less than 1%.
- > Oil sands projects recycle 80-95% of water used.



Managing tailings ponds

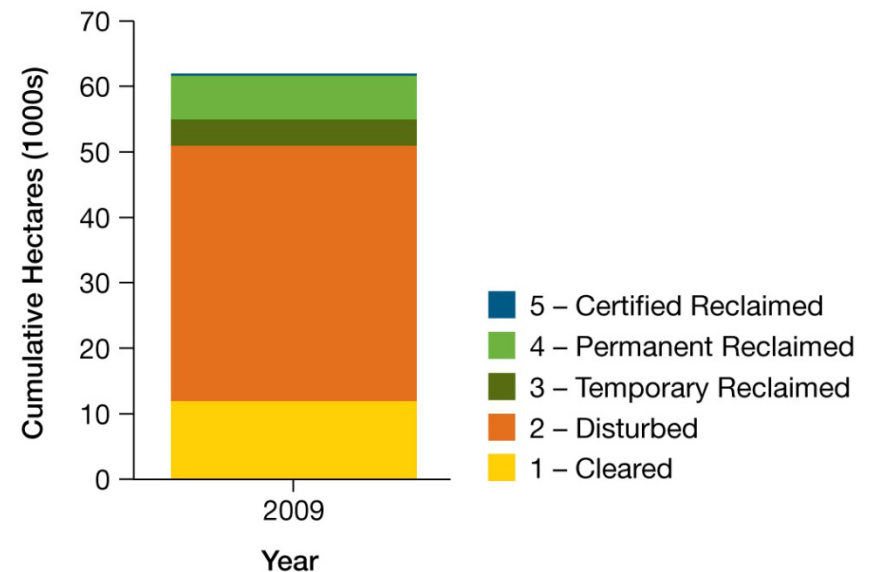
- > New tailings management technologies will shorten lifespan to 10 years or less.
- > New directive:
 - Faster reclamation
 - Less fluid tailings
 - Virtually zero growth after 2016
- > Industry has committed more than \$1.5 billion in upgrades to comply with directive.



Land reclamation

- > Law requires reclamation of all disturbed land.
- > 232 square miles disturbed.
- > 42 square miles reclaimed or under active reclamation.
- > First oil sands reclamation certificate issues to Syncrude in 2008.

Status of All Disturbed Land in Oil Sands Mining
(232 square miles = 60,200 hectares total)



Thank you

- > For more info on the oil sands:
 - www.oilsands.alberta.ca
- > For more info on Alberta:
 - www.alberta.ca

