OIL SANDS

Greenhouse Gases

our challenge

Although per barrel greenhouse gas (GHG) emissions in the oil sands continue to decrease, overall emissions are growing as production increases to meet a growing global demand for energy.

our actions *

Alberta is regulating GHG emissions in the oil sands region by being the only jurisdiction in North America with mandatory reduction targets for large emitters across all sectors. Strong investments in clean energy technology and a price on carbon will also continue to reduce per barrel emissions.

fast facts

> Oil sands GHG emissions were 37.2 Mt (1 Mt = 1 million tonnes) in 2008.
This equals:
- 15 per cent of Albertan emissions
- 5 per cent of Canadian emissions
- **less than 0.1 per cent of global emissions**

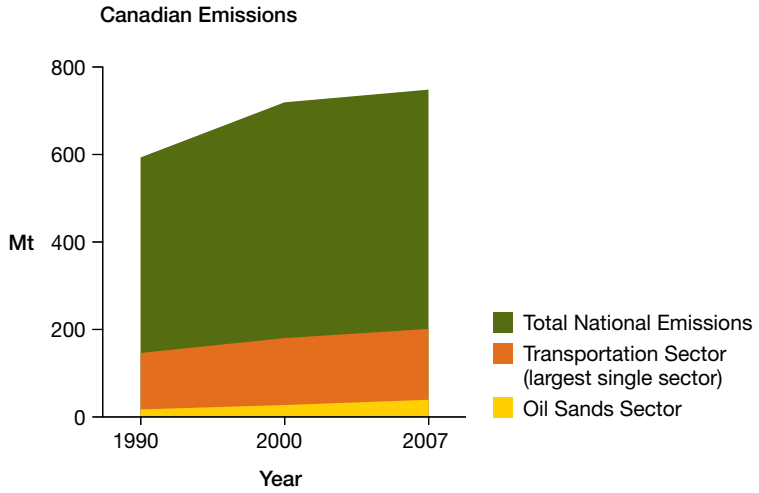
> Canada's total emissions grew by 155 Mt between 1990 and 2007, with oil sands emissions responsible for 14 per cent (22 Mt) of this increase; transportation was responsible for 36 per cent (55 Mt).

regulating large emitters

> Large emitters – those that emit more than 100,000 tonnes per year – must meet mandatory reduction targets. This includes industrial emitters in the oil sands region.

> Emitters unable to meet the target must pay $15 per tonne into a clean energy technology fund, which is worth $187 million as of April 1, 2010, or purchase Alberta offset carbon credits.

> **Alberta has reduced our emissions by more than 17 million tonnes under this program since July 1, 2007.**



Government of Alberta
Canada

Alberta
Freedom To Create. Spirit To Achieve.

efficiency improvements

- **The oil sands industry has reduced GHG emissions per barrel of oil produced by an average of 33 per cent since 1990**, with some facilities achieving reductions as high as 45 per cent.
- The Alberta government is investing $25 million into Carbon Management Canada, a national, university-led research network housed at the University of Calgary that is developing insights, technologies and policies to reduce emissions in Canada's fossil fuel energy sector.

well-to-wheels

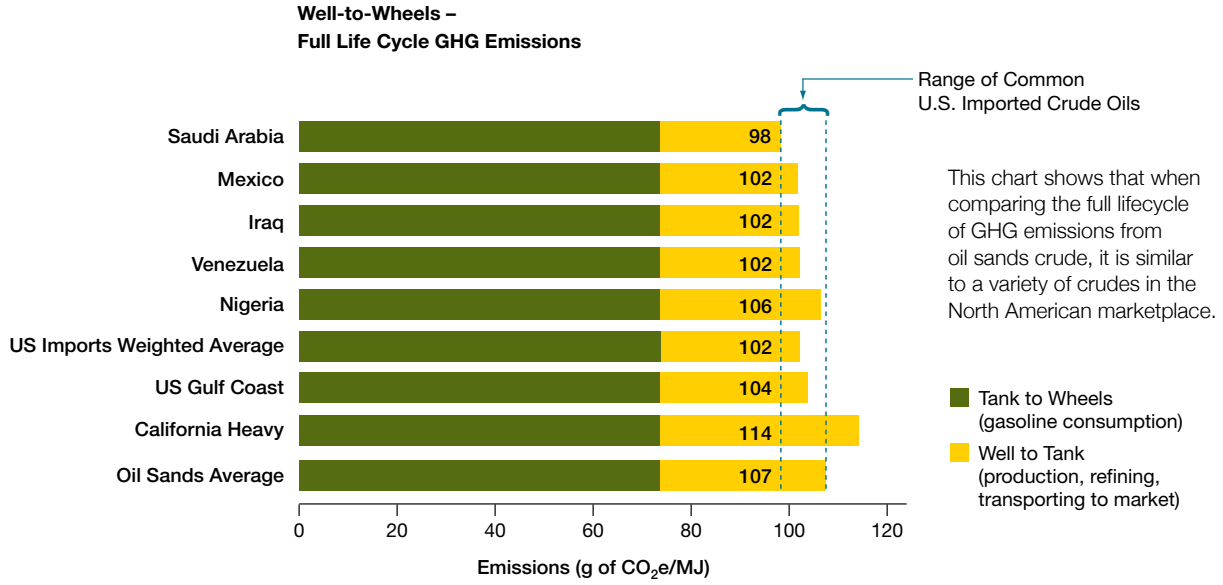
- GHG emissions from various sources of crude oil can be compared at any stage of their development – production, refining, transporting the product to market and final use.
- Lifecycle emissions, often referred to as 'well-to-wheels', provide a comprehensive and comparable assessment of GHG emissions from crude oil.
- **Final combustion of the oil – mostly emerging from vehicle tailpipes – accounts for 70 to 80 per cent of lifecycle emissions.** These vehicle emissions are the same regardless of the crude oil from which the gasoline is derived.

new in situ techniques

- In situ extraction offers many benefits over oil sands surface mining – such as reduced impacts to the land and no tailings ponds. One of the challenges however is that in situ generally produces more GHGs per barrel compared to surface mining.
- There has been significant progress in reducing the amount of emissions from in situ. In fact, several technologies and techniques, such as heating bitumen underground with electric currents, have the potential to further reduce emissions.

cogeneration

- Cogeneration is an important aspect of oil sands operations. It allows facilities to create their own steam and electricity needs at the same time – achieving significant energy savings.
- Facilities use less fuel with this method than if the steam and electricity were created separately, thereby reducing the amount of GHG emissions released to the atmosphere.
- Surplus electricity from cogeneration is fed into the provincial grid, reducing the need for additional coal-fired generation.



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