



# talk about oil sands

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## Reserves and Production

- Alberta has proven oil sands reserves of 170 billion barrels.
- Alberta has one of the biggest proven oil reserves in the world.
- Total oil sands area = 140,200 km<sup>2</sup> (14 million ha) 42,000 ha disturbed by oil sands mining = .3% disturbed.
- Oil sands are composed of three main materials: water, sand and a form of heavy oil called bitumen. Once separated, bitumen must be upgraded to convert it into a synthetic crude oil (SCO). Saturation levels of bitumen in the sand also vary from less than 1% to 18%.
- In 2009, bitumen production averaged 1.49 million barrels a day (bbls/d) while conventional oil production averaged 461,300 bbls/d.
- Current forecasts indicate that by 2019 bitumen production will increase to 3.2 million bbls/d.
- Marketable oil sands production currently represents 43% of Canada's total crude oil production.

## Upgraders

- Alberta has 5 upgraders:

Suncor Base and Millennium (Fort McMurray) OUTPUT: 357,000 barrels of SCO per day
Syncrude (Fort McMurray) OUTPUT: 350,000 barrels of SCO per day
Shell Scotford (near Fort Saskatchewan) OUTPUT: 158,000 barrels of SCO per day
Opti-Nexen Long Lake (near (Fort McMurray) OUTPUT: 58,500 barrels of SCO per day
CNRL Horizon OUTPUT: 114,000 barrels of SCO per day

## Supply

- In 2009, total crude oil and equivalent production in Alberta amounted to almost 2.2 million bbls/d. Of that, Alberta exported about 0.4 million bbls/d within Canada (Saskatchewan, Ontario and BC.) and 1.5 million bbls/d to US markets and offshore. The remaining 0.5 million bbls/d were used within Alberta. Totals may not add up due to rounding.

## Investment

- From 1999-2009, an estimated \$91 billion was invested in oil sands projects.
- In 2009, industry investment in the oil sands is estimated to be in excess of \$10 billion.
- Almost \$170 billion in oil sands related projects are currently underway or proposed.

## Technology

- There are two types of oil sands production methods: mining and in-situ.
- Mining: Oil sands are dug up by shovel and moved by truck to a cleaning facility where the material is mixed with warm water to separate the oil from the sand.
- In-situ: For deeper oil sands reservoirs, some form of in-situ or "in-place" recovery method is used to produce oil sands through wells similar to that of conventional oil production.
- Numerous in-situ technologies have been developed that apply thermal energy to heat the oil sand and allow it to flow to the well bore. Other technologies are emerging such as vapour recovery extraction and toe-to-heel air injection.
- It's estimated that approximately 80% of the total proven oil sands reserves will be recoverable via in-situ techniques.



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## Innovative Energy Technologies Program

- Alberta's *Innovative Energy Technologies Program (IETP)* offers royalty adjustments of up to \$10 million per pilot project that demonstrates the use of new or innovative technologies to increase environmentally sound recovery of existing reserves and encourages responsible development of new oil, natural gas and in-situ oil sands reserves.
- Since 2005, \$148 million has been invested by the province in projects under the IETP.

## Royalty Framework

- A world oil price sensitive sliding scale has been implemented for oil sands royalty rates ranging from 1%-9% of gross revenue in pre-payout and 25%-40% of net revenue in post-payout.
- Under the framework, the province is also considering exercising its right to take bitumen in-kind in lieu of cash royalties. The province's share could then be used to supply upgraders and refineries in Alberta.

## Employment

- The benefits of oil sands development can be found throughout many sectors of the Alberta, Canadian and U.S. economies. The goods, materials, services and labour used to construct and operate oil sands projects and upgraders as well as the many components such as tires, trucks, gauges, valves, pumps, etc. come from across Canada and the U.S.
- The Canadian Energy Research Institute (CERI) forecasts that between 2000 and 2020 development in the oil sands industry will generate 42,000 full-time positions.

- The total effect on employment from 2000-2020: 174,000 full-time positions earning an estimated \$187 billion dollars.

## Oil Sands Environmental Management

- Alberta's oil sands are a unique resource with unique environmental challenges. Every effort is made to ensure that oil sands development does not proceed at the expense of the long-term sustainability of the environment.
- Stringent legislation and on-the-ground measures are already in place to protect air, land and water during oil sands development.
- Companies must remediate and reclaim Alberta's land so that it is able to support a range of activities similar to its previous use.
- Strict limits are placed on industry water use from the Lower Athabasca River.
- In 2007, Alberta became the first jurisdiction in North America to legislate greenhouse gas reductions for large industrial facilities.
- In January 2008, the Alberta and Canadian governments released the study *Canada's Fossil Energy Future: The Way Forward on Carbon Capture and Storage*. The study provides advice on how governments and industry can work together to facilitate and support the development of carbon capture and storage opportunities in Canada.
- Alberta's oil sands account for about 3% of Canada's greenhouse gas emissions and less than one tenth of one per cent of global greenhouse gas emissions.