



talk about oil sands.

June 2006

Facts on Oil Sands

Bigger is better

Alberta's oil sands is an abundant, accessible, and affordable source of crude oil. Alberta's oil sands is one of the few oil deposits in the world with growing production. Under anticipated economic conditions and using current technology, Alberta has about 176 billion barrels of proven oil reserves. (crude bitumen - 174 billion bbls, crude oil - 1.6 billion bbls). Total recoverable oil reserves are estimated to equal almost 335 billion barrels (crude bitumen - 315 billion bbls, crude oil - 19.7 billion bbls).

While conventional oil reservoirs are scattered throughout the province, oil sands underlie 140,800 square kilometres (54,363 square miles) of primarily northern Alberta; an area larger than the state of Florida. In December 2002, the *Oil & Gas Journal* reported that Canada ranks second largest in terms of global proven crude oil reserves (15% of world reserves), after Saudi Arabia. The majority of these reserves are found in Alberta's oil sands.

Currently, there are approximately 2,800 oil sands lease agreements with the Province totalling approximately 43,800 square kilometres (16,900 square miles). Close to 69 per cent of possible oil sands areas are still available for exploration and leasing. Oil sands production of approximately 1.1 million barrels a day (bbls/d) plus conventional crude oil production of 600,000 bbl/d in 2004 now account for approximately accounts for 67 per cent, or two-thirds of Canada's crude oil and equivalent production. By 2015, oil sands production is expected to reach 3 million bbl/d. At current production rates it would take 400 years to deplete the reserves at existing oil sands operations.

Alberta exports over 1 million bbls/d of oil to US markets. Overall, Canada has 15 per cent of the world's crude oil reserves, produces 2.7 million barrels day, and is the largest and most reliable foreign supplier of energy to the United States.

Looking ahead

Producers are focused on improving efficiency and new technology to lower production costs. The recent rise in natural gas prices has prompted development of new extraction and processing methods that don't require gas.

Alberta's Energy Innovation Strategy offers royalty offsets of up to \$200- million over five years to pilot projects that use new, innovative technology to increase environmentally sound recoveries from existing reserves and encourage responsible, development of new oil and natural gas reserves.

There are several technologies to extract oil sands bitumen. Mining operations are used to produce reserves close to the surface. For oil deeper under ground, processes such as Steam-Assisted Gravity Drainage (SAGD) and Cyclic Steam Stimulation (CSS) are used.

New technologies and extraction methods include:

- burning bitumen instead of gas to produce steam;
- vapour extraction (VAPEX) - a solvent-assisted production technique; and,
- Toe-to-Heel-Air-Injection (THAI) - a system that injects air into the oil well and ignites it to stimulate oil flow

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Investing in Tomorrow

- For the period 1996-2016, approximately \$87 billion of investment in oil sands development has been announced.
- Of the 63 oil sands projects under the generic royalty regime - 33 are in pre-payout (1%) while 30 are in post payout (25%).
- Operating costs to produce a barrel of oil from bitumen averaged about \$18 in 2004.
- Value-added upgrading of Alberta's energy resources is a priority for the Alberta government.
- Government and industry are working together to expand our refining and petrochemical industries using bitumen from Alberta's oil sands as a feedstock.
- In his National Energy Policy, U.S. Vice-President Dick Cheney described the oil sands as "a pillar of sustained North American energy and economic security" while the respected British magazine *The Economist* said the oil sands developments in Canada should "put to rest the absurd but still oft-voiced concern that the world is about to run out of oil."
- It takes approximately 2 to 3 barrels of water to produce one barrel of bitumen. However, this is total water use, including recycled produced water. Total make-up water required per barrel of bitumen is much less; usually 0.5 or less once full recycling facilities are in place.
- There are 159 litres (42 US gallons) in a barrel of oil.
- During the early development of the petroleum industry, 42 gallons was deemed to equal a barrel of oil. Because of significant fraud and misrepresentation, the only barrels guaranteed to be 42 gallons were the *blue barrels* manufactured for and used by Standard Oil. Thus the standard measure for oil became the blue 42 gallon barrel or "bbl".
- 1 = Canada's rank as supplier of imported oil/products to U.S.
- 1-1.25 GJ = the amount of natural gas needed per barrel of bitumen for SAGD projects.
- 2 = tonnes of oil sands to produce one barrel of oil.
- 3 = number of days it takes oil to reach Edmonton via pipeline from the oil sands region.
- 9 = percentage of U.S. crude imports supplied by Canada
- 93 = percentage of oil sands reserves designated as in-situ
- 159 = litres (42 US gallons) in a barrel of oil
- 420,000 = barrels of crude approved for production off Canada's East Coast daily
- 1,600,000 = barrels of Canadian crude exported to U.S. daily
- 2,700,000 = barrels of crude produced daily

Stats and stuff

- Bitumen is the name given to the heavy oil extracted from the oil sands. It must be treated and upgraded before it can be used as oil.
- Oil sand from the Athabasca area contains 83% sand, 3% clay, 4% water, and 10% bitumen.
- It takes about two tonnes of oil sand to produce a barrel of oil.
- Oil sands producers move enough product (overburden and oil sands) every two days to fill Toronto's Skydome or New York's Yankee Stadium.
- Alberta's 174 billion barrels of remaining established oil sands is enough oil to fill over 9 million Olympic size swimming pools.