Canadian Oil Sands

Enhancing America's Energy Security

May 2011

The importance of Canada's oil sands stems from the value of oil to our economy and energy security. Global demand for energy continues to rise, and oil sands have the potential to supply much of what we will need in the U.S., while also creating many new American jobs.

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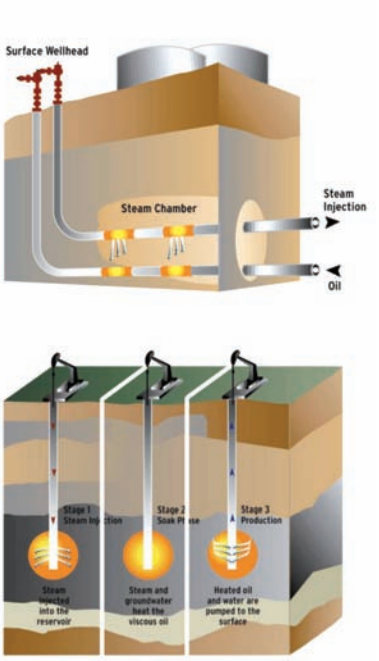
Advanced technologies developed over many years are used to produce oil from oil sands.

Getting oil from oil sands is nothing new.

Surface Mining

Source: Canadian Centre for Energy Information.

In-situ



Source: Canadian Association of Petroleum Producers.

Oil sands are geologic formations that contain a mixture of thick, heavy oil, water and sand. The heavy oil is called bitumen, which is defined as oil that is too heavy or thick to flow or be pumped without being diluted or heated.

Two different methods are used to produce oil from the oil sands – surface mining and in-situ – or producing in place. Today, a majority of the oil derived from oil sands is obtained via surface mining, although only about 20 percent of all oil sand resources are recoverable through this method. This process is used when bitumen is close to the surface.[1]

The remaining 80 percent of oil sands resources are recoverable through in-situ processing. This method is employed when the bitumen deposits are further underground. Most in-situ operations use steam-assisted gravity drainage (SAGD). This involves pumping steam underground through a horizontal well to liquefy the bitumen and pump it to the surface.[1] Current investments in advanced technology will make this method of extraction more widely used in the years to come.

Use of oil derived from oil sands in the U.S. is not new. Projects involving mining and in-situ techniques were developed throughout the 1960s and 1970s. After decades of research, Canada was producing up to 129,000 barrels per day by 1978.[2]

1 www.capp.ca

2 CRS Report to Congress, "North American Oil Sands : History of Development, Prospects for the Future," January 17, 2008.

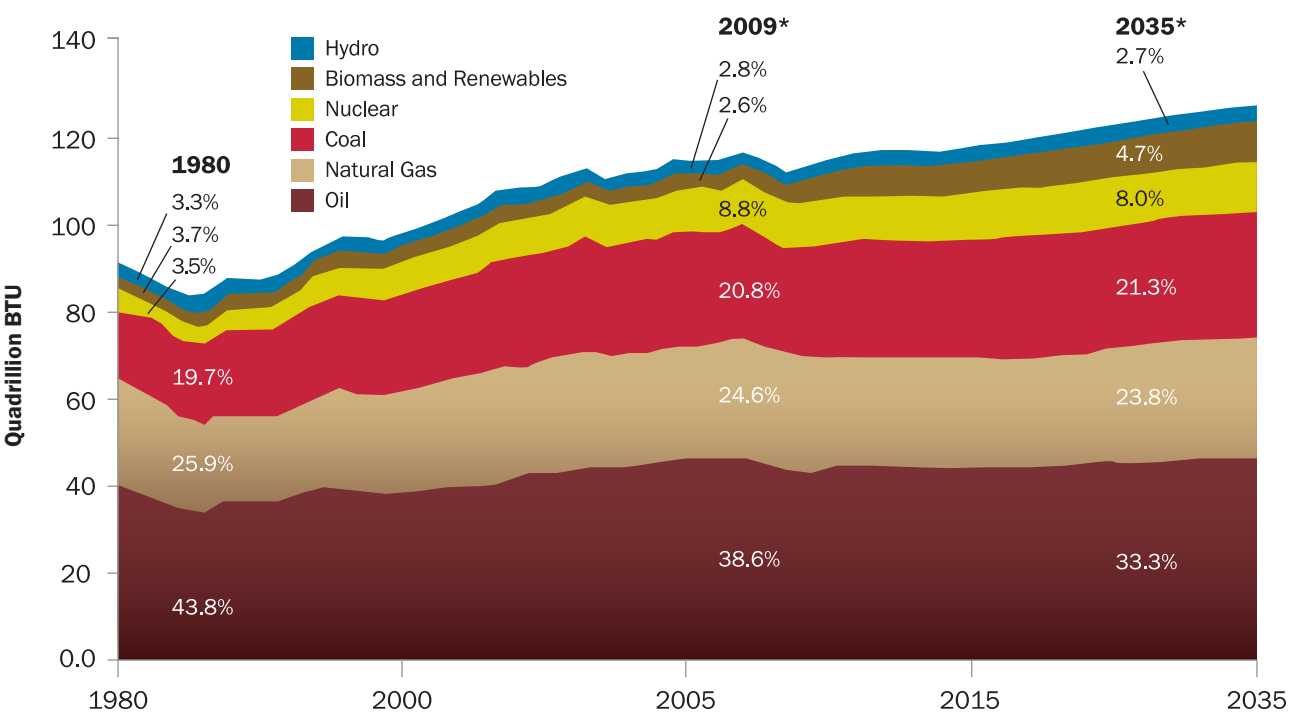
The vast resources of the Canadian oil sands will play a crucial role in enhancing our nation's energy security, serving as a bridge to a future economy increasingly powered by new energy sources.

It's going to take all energy sources to meet growing demands.

Our nation needs more supplies of all energy sources, including oil and natural gas, to meet its growing energy demand and provide consumers with reliable supplies of fuel.

According to federal government forecasts, oil and natural gas will continue to provide more than half of the energy needs for American consumers even as alternative energy sources like ethanol and other renewables expand.

Future U.S. Energy Demand
The U.S. will require 21 percent more energy in 2035 than in 2009.

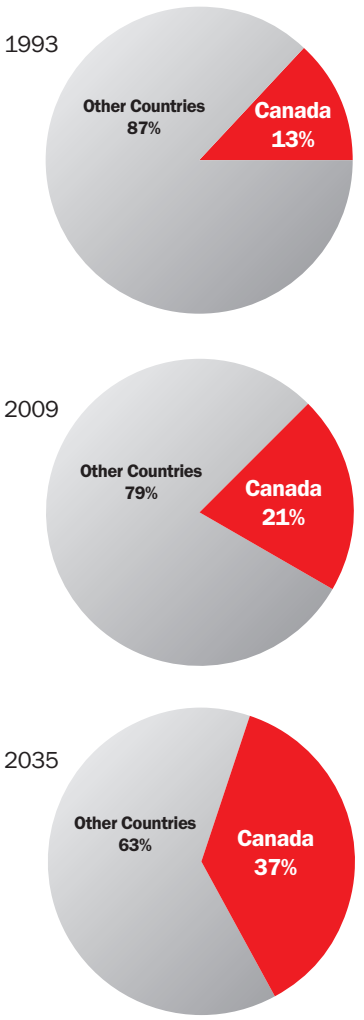


* Excludes non-biogenic municipal waste and net electricity imports. Source: EIA, AEO 2011, Table 1.

Canada is the number one supplier of imported oil to the United States.

Canadian oil is a plentiful resource.

U.S. Oil Imports from Canada



Source: EIA and CERA.

Canadian oil can help meet our growing energy needs and make the United States more energy secure. Canada sends more than 99 percent of its oil exports to the United States. In 2009 that mounted to two and a half million barrels per day of oil and refined products to the U.S., or more than twice as much per day as our second largest supplier of imported oil.

About half of the Canadian crude oil brought into this country is derived from oil sands. According to a study released in May 2009 by Cambridge Energy Research Associates,[3] if oil sands development is maximized, Canada could potentially account for as much as 37 percent of U.S. oil imports by 2035 – up from 21 percent in 2009.

According to the Canadian Association of Petroleum Producers, oil sands now account for half of Canada's total oil production. By 2025, production from Canadian oil sands is expected to rise from about 1.4 million barrels per day to about 3.5 million barrels per day. Canadian oil sands have the potential to continue to provide ever greater fuel supply reliability to the United States.

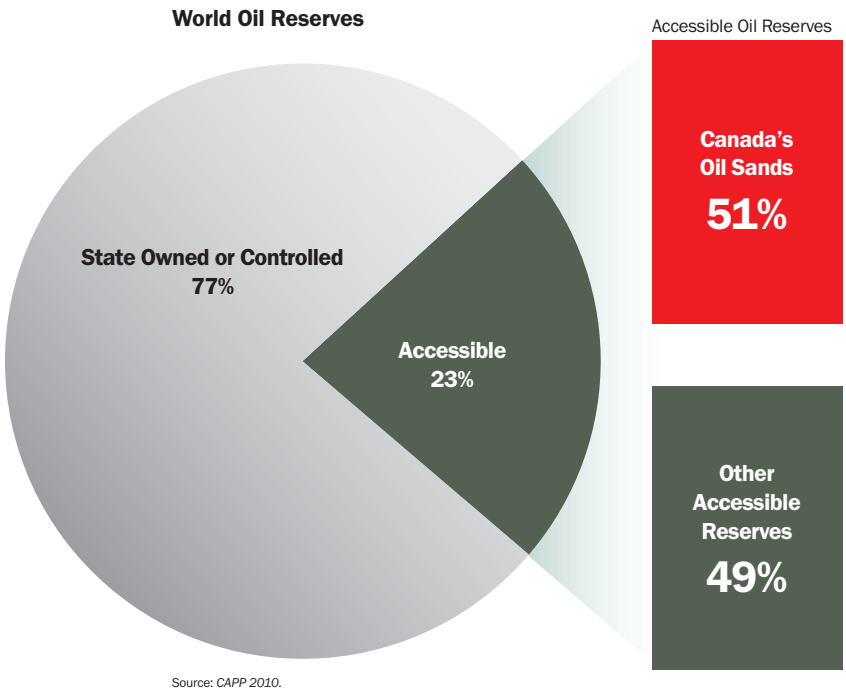
3 Cambridge Energy Research Associates, "Oil Sands Move from the 'Fringe to Center' of Energy Supply," May 2009.

Canadian oil reserves are vast and are some of the largest in the world.

The world of oil has changed.

Forty years ago, world oil reserves were largely the domain of the investor-owned, international oil companies, based principally in the United States and accounting for 85 percent of the world's reserves. Most people still assume international oil companies sit astride the bulk of these world oil reserves. That is no longer the case.

Today, 80 percent of world oil reserves are owned by national oil companies of foreign governments, many formed during the past 40 years. Canada alone accounts for nearly half of the world's remaining oil reserves accessible for investment.



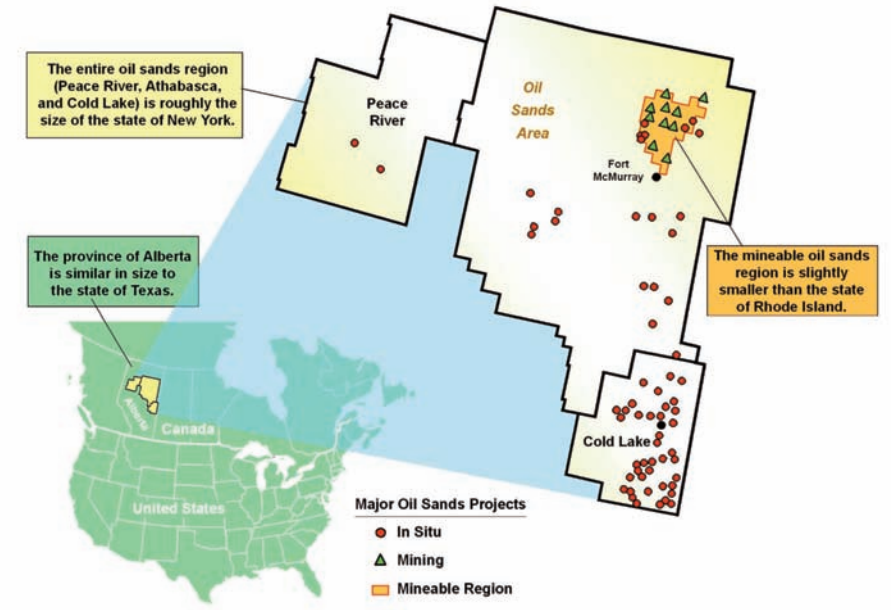
Source: *CAPP 2010.*

Canada's oil reserves can only enhance America's energy security as Canada is a friendly neighbor with whom we have an excellent trading and political relationship.

Our close ties to Canada strengthen our energy and economic security.

Canadian oil sands are located mostly in three major deposits in northern Alberta: The Athabasca oil sands of north northeastern Alberta, the Cold Lake deposits of east northeastern Alberta, and the Peace River deposits of northwestern Alberta.

Location of Canadian Oil Sands Resources



Note: Comparisons to U.S. states are to the total areas of the states, including land and water. 60713-19

According to the *Oil & Gas Journal*, Canada has total proven oil reserves of over 178 billion barrels with 173 billion barrels coming from oil sands.

The Council on Foreign Relations underlined the value of close ties with a friendly neighboring country that does a lot of business with the U.S. In a recent study by them on oil sands and energy security they noted that "a greater fraction of money used to buy Canadian oil will likely later be spent directly on U.S. goods and services and hence contribute directly to U.S. growth."[4]

They also urged policymakers to "resist the misuse of other U.S. environmental regulations to constrain oil sands" and noted that "ill-conceived regulation could undermine U.S. and Canadian climate and security goals."

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

Oil sands production supports thousands of American jobs and is a major contributor to our nation's economic growth.

Canadian oil sands development is a boon to the U.S. economy and a big job creator.

A 2011 study by the Canadian Energy Research Institute (CERI) found that U.S. jobs supported by Canadian oil sands development could grow from 21,000 jobs today to 465,000 jobs by 2035. The study also finds that for every two jobs created in Canada from oil sands development, one is created in the U.S.[5]

Canada is by far the biggest supplier of imported oil and natural gas to the United States. Companies are investing huge sums to build new infrastructure to transport the Canadian oil into the United States and to expand U.S. refineries.

5 CERI, "Economic Impacts of New Oil Sands Projects in Alberta (2010-2035)," May 2011.

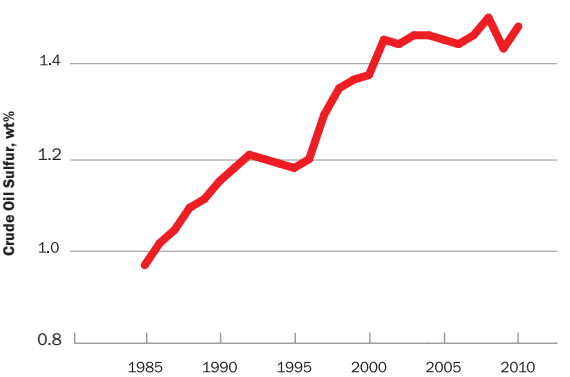
Source: Canadian Association of Petroleum Producers.

U.S refineries have been increasing their capabilities to refine heavier, more energy-intensive crude oils for decades and these projects are providing well-paying jobs for thousands of Americans.

Canadian and U.S. companies are investing heavily to produce cutting-edge products.

An increasing sulfur content and decreasing API gravity are each characteristics of heavier or more complex crude slates.

U.S. Refineries Process Increasingly Higher Sulfur Crude Oils

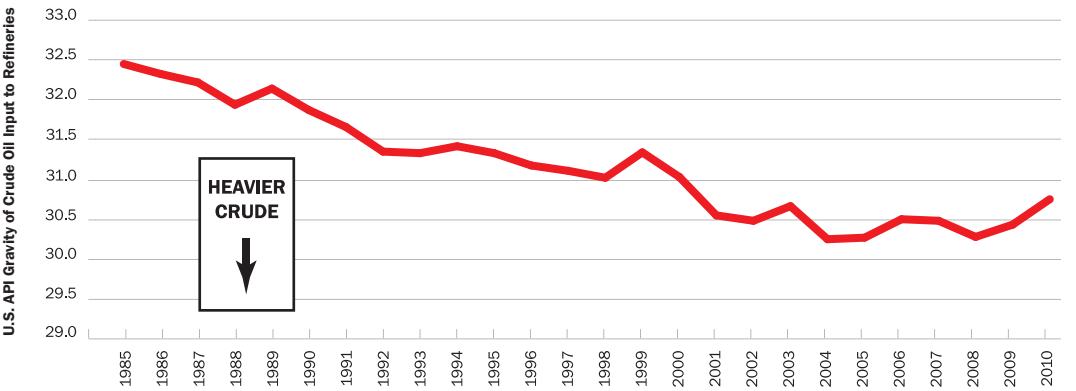


Source: DOE, EIA, "U.S. Sulfur Content (Weighted Average) of Crude Oil Input to Refineries."

Refiners continue to invest in technology to safely produce some of the cleanest fuels in the world from crude slates that are getting heavier and require additional processing in order to produce the cutting-edge petroleum products used today.

Canadian and U.S. companies are making the necessary investments to meet stringent environmental and other regulatory requirements to offset the impact of increased oil sands production and processing. Oil companies are investing huge sums to expand and upgrade refineries in the Midwest and elsewhere to make more gasoline and other refined products from the Canadian oil derived from oil sands.

U.S. Refinery Crude Oil - API Gravity



Source: DOE, EIA, "Crude Oil Input Qualities."

Fuel made from crude derived from oil sands is as clean as fuel made from other crudes.

Using oil sands as a feedstock does not affect the quality of the refined products.

The vast investment refiners and pipeline operators are making to increase capacity and flexibility to process and transport crude oil from oil sands includes all the necessary equipment to make products that meet all the same stringent specifications as products produced from other crude oils.

Every project is required to adhere to applicable federal, state and local regulations and permitting conditions.

Image courtesy of Syncrude Canada Ltd.

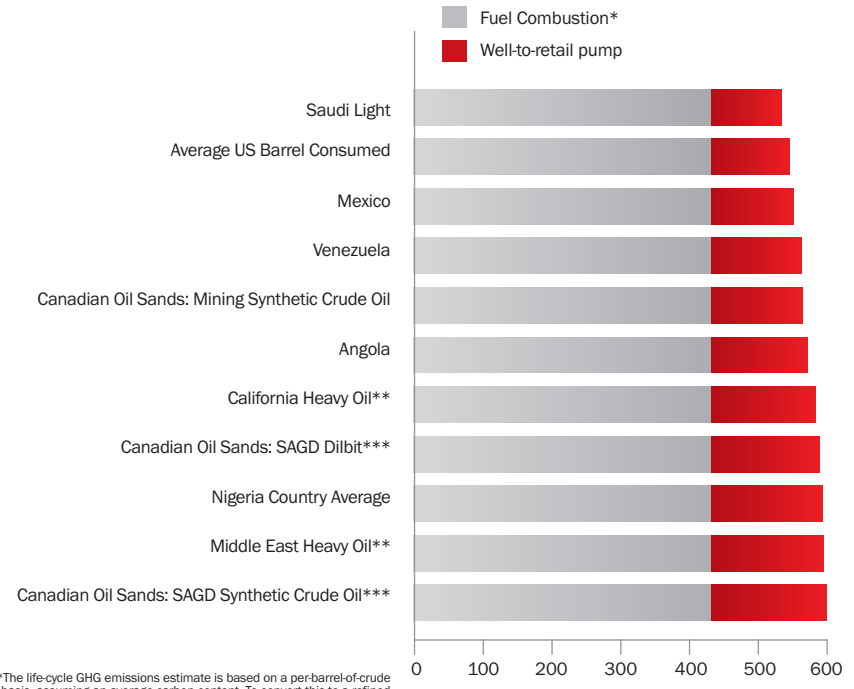
On a life cycle basis, oil sands have comparable greenhouse gas emissions to other sources of oil.

Emissions from California's heavy oil are on a par with Canada's oil sands.

The extraction and processing of oil sands do result in higher greenhouse gas (GHG) emissions on average compared to light, sweet (low-sulfur) crude oil. But so do many of the heavy, high-sulfur crudes that are being produced in the United States and around the world.

On a life cycle (or well-to-wheels) GHG emission basis, oil derived from Canadian oil sands is comparable with other crudes refined in the United States. The average for oil sands imported into the U.S. is only 6 percent higher than the average crude consumed in the U.S., and 70 to 80 percent of the GHG emissions come from the combustion of the fuel in the engine.

We believe that greater care in management of emissions from crude derived from oil sands would occur in the United States than if the oil is processed in other regions of the world that have less stringent environmental standards – not to mention the environmental costs of transporting the crude elsewhere.



*The life-cycle GHG emissions estimate is based on a per-barrel-of-crude basis, assuming an average carbon content. To convert this to a refined product basis, such as gasoline or diesel, additional assumptions would be needed to apportion well-to-retail pump emissions to individual refined products. This depends on the product state associated with individual crude sources and refinery-specific configurations.
**Assumes steam-assisted gravity is used for production.
***Assumes a steam-oil ratio of 3.
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Source: IHS CERA Special Report, *Growth in the Canadian Oil Sands: Finding the New Balance*, May 2009.

Technology is the key to further progress.

According to the Canadian government, the average greenhouse gas emissions per barrel in the oil sands industry has decreased by 39 percent since 1990 due in large part to technology advancements and energy-efficiency improvements.[6] With measures already in place we can anticipate further progress.

When it comes to minimizing the environmental footprint of oil sands, U.S. Energy Secretary Steven Chu said at a Global Energy Summit in June 2009 that he was "a big believer in technology" and that "Canada is a close and trusted neighbor and the oil from Canada has all sort of good things."[7]

We couldn't agree more.

6 CAPP, "The Facts on Oil Sands, 2010."

7 "Technology seen key to oil sands: Chu" *Reuters*, June 1, 2009.

To find out more about oil sands, contact us today.

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