

**The Alberta Oil Sands: Moving Forward
To a Clean Energy Economy in Alberta.**

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The Alberta Oil Sands

Despite Alberta's richness of natural resources, the thirst to find inexpensive energy to satisfy the world's economic needs has come at a great cost to the natural capital of Northern Alberta. This discussion will analyze the history of the Athabasca oil sands, justifications for their maintenance, their effects on the current landscape and ecosystem, and government policies that could be implemented to limit the extraction of oil from the sands.

Background

The Athabasca oil sands, or the Alberta oil sands, are one of the richest deposits of crude oil in the world. The oil sands are located in northwest Alberta, near Fort McMurray, in the area the boreal forest between Clearwater and Athabasca Rivers. The oil sands have helped to make Alberta the second-largest oil reserve in the world, behind Saudi Arabia (Alberta Energy Department, 2006). According to the Alberta government, there are 91 oil sands projects that span over 140,200 square kilometers (Government of Alberta, 2011a). The projects listed by the government include four mining projects, while the remainder deals with crude oil extraction.

The Wood Buffalo municipality, which includes Fort McMurray, has had an extensive history of dealing with oil. The oil sands have a history going back to the late 1800s, when tar was discovered under Lake Athabasca (Energy Resources Conservation Board: Alberta, 2011). According to the Energy Resources Conservation Board of Alberta, this helped spur a chain of events which, by the early 20th century, allowed some oil companies to research and develop oil extraction measures from this area. Canada and

Venezuela are the two top producers in heavy crude oil in the world (Dusseault, M.D., 2001).

Oil sands extraction is more environmentally intensive than conventional crude drilling, mostly due to its higher concentration of bitumen. Extraction is also much more energy intensive. To extract 3.3 billion barrels of oil in a year takes 529 million cubic meters of water (National Energy Board [NEB], 2006). Nonetheless, oil sands extraction has steadily increased. The NEB (2008) noted that mining and situ production in the oil sands in 2007 saw a 13 per cent increase from the previous year.

The Human/Economic and Environmental Interaction of the Oil Sands

Alberta's oil sands are commonly linked to fueling the global economy. The world's population currently stands at around 6.5 to 7 billion people, on track to peak at around 9.2 billion in 2050, according to United States census data (2009). In addition, emerging world markets, including China, India, and Brazil, will require more energy in order to sustain their continued expansions. Because of this, oil demand has increased each year by 2 per cent, according to *The Nature of Things with David Suzuki* (2011), with oil sands production tripling by 2020. As energy demand increases, many point out that we have hit “peak oil” in many oil-producing countries, including the United States. Lester Brown (2008) points out that production has declined in countries like the United States and the United Kingdom, thanks to dwindling reserve supplies. Both countries are in the “falling” oil production category for oil, according to Brown. The other two categories are increasing production and production that will fall soon. With conventional

oil production falling in North America, the Albertan oil sands have put Canada in the last category, increased production, along with other countries, including Russia.

Outside of emerging economies and an increased world population demanding new energy sources, government revenue and economic spin-offs are cited as local reasons for extracting this resource. The Alberta government notes that 139,000 Albertans are employed in oil and gas extraction and mining, while the out-of-province economic impact of the region will yield 450,000 jobs (Government of Alberta, 2011b). However, development of the oil sands carries a price tag of \$18 billion, according to the NEB in 2008.

Economic activity outside of spending and creating jobs also produces revenue for governments. The Alberta government noted that the provincial government will earn \$184 billion in royalties over the next 25 years, while the federal government will receive \$187 billion in the same period. Nonetheless, negligible damage has occurred to this ecosystem, in terms of land, water, air and species.

Human impacts on the Alberta oil sand and the Environment

The attention of the media and the environmental science community has focused on concerns pertaining to the environmental effects of the oil sands. For example, Timoney and Lee (2009) have researched the oil sands' impact on human interactions with the biodiversity in the region. They found some stark results.

They noted that the Muskeg River within the Athabasca region received around 2.50 billion liters of discharge from oil sands production. Timoney and Lee note that, as a percentage of the river's flow, an estimated 3.6% came from oil sand discharge in 2006.

They also found that over an eight year period, between 1999-2007, concentrations increased for alkylated aromatic hydrocarbon (PAH) in the sediment along the Athabasca River Delta. During the same time frame, mercury increased in Lower Athabasca walleye and lake whitefish. Mercury levels in both the walleye and lake whitefish were dangerous to human health and exceeded acceptable U.S. Environmental Protection Agency and Health Canada consumption standards. For his part, Suzuki noted research by Dr. David Schindler (2011) and his team which found 13 toxic metals – including arsenic, lead, and mercury – in the river around Fort Chipewyan, which is within the oil sands’ proximity.

Oil sands extraction also has a large footprint on wildlife. Both coniferous and deciduous forests in the region declined, by 36% and 25% respectively, according to Timoney and Lee. The authors also noted declines in bird populations in these regions. Their research also pointed to the production of tailing ponds increasing by triple percentages between 1992 and 2008. Declining air quality was also noted in the report; the authors found that various toxins, including sulfur dioxide and nitrous dioxide, have seen dramatic increases within the Fort McMurray region, due to air pollution from the oil sands.

Moving forward and moving away from the Alberta Oil Sands

How can Canada and Alberta protect biodiversity and natural resources without damaging the economy or ignoring world demand for energy? It is time to promote policies that address the concerns of all involved parties: environmentalists, members of the energy sector, and the Canadian and Albertan governments.

In terms of protecting the ecosystem within the Alberta oil sands, a moratorium on further drilling should be put in place until sustainable extraction methods can be developed. This would ensure that resource extraction will not prove detrimental to necessary natural resources, including air and water. If no such methods are viable, oil sand production must cease.

Phasing out the drilling process would involve using the royalties earned by the Province of Alberta to fund cleaner energy resources while gradually stopping oil sands production. Federal revenue from extraction should be used to develop Canada's and Alberta's clean energy sectors. This includes the wind industry. Alberta already has 807 mega watts (MW) of wind energy (CANWEA, 2011) and can potentially have more, given that Alberta only gets 2% of its electricity from wind and potentially could get 64,000 MW in wind energy (Bell, J., Weiss, T., 2009). To offset job losses that would result from this transition to cleaner energy, the federal and Albertan governments should set up a fund to assist in training for jobs in the clean energy economy.

One way to monitor the water and air quality and test them on a consistent basis would be to have independent scientists monitoring both, and then release quarterly reports to the government. This would allow for a clear, unbiased analysis of the water and air in the area of the oil sands.

Conclusion

The Alberta oil sands have created jobs, government revenue and economic growth to Canada and Alberta. However, it has come at an ecological cost, through polluted water, air and wildlife in the region. A moratorium on current extraction of the

oil sands, or phasing out production and shifting to cleaner fuels with the use of current royalties and taxes, would be the best way to prevent an environmental tragedy in the making while not damaging the economy and disregarding energy demands.

Works Cited

- Alberta Energy Department. (2006). Alberta's Oil Sands: Manufacturing Opportunities For Canada. *Alberta Energy Department*. <http://nfl.cme-mec.ca/_uploads/_media/g7rjxwtv.pdf>. Retrieved June 12, 2011.
- Bell, J., Weiss, T. (2009, January) Greening the Grid: Powering Alberta's Future with Renewable Energy. *Pembina Institute*. <<http://pubs.pembina.org/reports/greeningthegrid-report.pdf>>. Retrieved May 30, 2011.
- Brown, L.R. (2008). *Plan 3.0. Mobilizing to Save Civilization*. New York, New York. W.W. Norton Company Inc.
- Dusseault, M.D. (2001). *Comparing Venezuelan and Canadian Heavy Oil and Tar Sands. Petroleum Society: Canadian Institute of Mining, Metallurgy, and Petroleum*. <http://www.energy.gov.ab.ca/OilSands/pdfs/RPT_Chops_app3.pdf>. Accessed May 29, 2011.
- Canadian Wind Energy Association [CANWEA]. (2011). Wind Farms. *Canadian Wind Energy Association*. <http://www.canwea.ca/farms/index_e.php>. Retrieved May 30, 2011.
- Energy Resources Conservation Board: Alberta (2011). History of Oil Sands Development. *Energy Resources Board: Alberta*. <http://www.ercb.ca/portal/server.pt/gateway/PTARGS_0_0_312_249_0_43/http%3B/ercbContent/publishedcontent/publish/ercb_home/public_zone/oil_sands/history_of_oil_sands_development/>. Retrieved May 29, 2011.

- Government of Alberta. (2011a). About the Resource. *Government of Alberta*.
<<http://www.oilsands.alberta.ca/resource.html>>. Retrieved May 29, 2011.
- Government of Alberta. (2011b). Economic and Investment Information. *Government of Alberta*. <<http://www.oilsands.alberta.ca/economicinvestment.html>>.
Retrieved May 27, 2011.
- National Energy Board of Canada [NEB]. (2006). Canada's Oil Sands Opportunities and Challenges to 2015. *National Energy Board of Canada*. <<http://www.neb-one.gc.ca/clf-nsi/rnrgynfmtn/nrgyrprt/lsnd/pprntnsndchllngs20152006/pprntnsndchllngs20152006-eng.pdf>>.
Retrieved May 30, 2011.
- National Energy Board [NEB]. (2008) Canadian Energy Review. *National Energy Board of Canada*. <http://www.neb.gc.ca/clf-nsi/rnrgynfmtn/nrgyrprt/nrgyvrvw/cndnnrgyvrvw2007/cndnnrgyvrvw2007-eng.html#s4_3>. Retrieved May 29, 2011.
- Schinder, D. (2011) *From The Nature of Things- The Tipping Point: The Age of the Oil Sands*. *Canadian Broadcasting Corporation*.
<<http://www.cbc.ca/documentaries/natureofthings/2011/tippingpoint/>>.
Retrieved June 12, 2011.
- Suzuki,D. (2011). *The Nature of Things- The Tipping Point: The Age of the Oil Sands*. *Canadian Broadcasting Corporation*.
<<http://www.cbc.ca/documentaries/natureofthings/2011/tippingpoint/>>.
Retrieved June 12, 2011.

Timoney, K., Lee, P. (2009). Does the Alberta oil sands Industry Pollute? The Scientific Evidence. *The Open Conservation Biology Journal*. (3) 65-81.

U.S. Census Bureau. (2010). *Total Mid year population for the world*. 1950-2050. U.S. Census Bureau. <<http://www.census.gov/ipc/www/idb/worldpoptotal.php>>. Retrieved May 26, 2011.