

## Canadian Tar Sands: There's No Such Thing as Ethical Oil (or Nuclear Power)

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Canadian Tar Sands Dump Truck. Photo by Evan O'Neil

After the BP oil spill in the Gulf of Mexico and now the nuclear meltdown at the Fukushima reactors in Japan, it should be clear that oil and nuclear power are not benign forces in our world. Both are toxic, dirty, and insecure forms of energy. It is thus astonishing that the Canadian energy industry proposes [a combination of the two](#).

The boreal forest of northern Alberta sits atop one of the largest fossil fuel deposits in the world: the Athabasca bituminous sands. Energy insiders call it oil sands, while environmentalists prefer tar sands—each side seeing what it wants. At room temperature, raw bitumen has the consistency of asphalt and won't flow through a pipeline without being [diluted](#) or [upgraded](#) into synthetic crude oil.

Underground, the bitumen exists in a mixture with sand and clay, and there are two techniques for extracting it. Surface mines have been the predominant method since commercial production began in the 1960s. At the Suncor mine, for example, the native forests, topsoil, and muskeg bog were cleared, and 50 meters of "overburden" earth was removed to expose a tar sand deposit itself about 50 meters thick. The bitumen is mined 24 hours per day with massive electric shovels that fill dump trucks three stories tall.

The dump trucks haul the tar sands out of the mine to a separation unit where it is mixed with hot water. The bitumen floats to the top and is skimmed off, while the wastewater slurry—containing sand, clay, salts, polycyclic aromatic hydrocarbons, arsenic, naphthenic acid, and other substances—is pumped into large, [open-air tailings ponds](#) where it is left to evaporate. The problem with tailings ponds has been that the finest clay particles take decades to settle into sediment. To accelerate reclamation of the land, some companies are now experimenting with adding polyacrylamide flocculant, in a process similar to municipal waste treatment, to help separate the solids from the water.



Secondary Separation. Photo by Evan O'Neil

Mining for deeper deposits is uneconomical, so the industry also employs in situ drilling. In a typical setup, two horizontal wells are drilled, one above the other. The top well injects steam into the sands, melting out the bitumen, which is then pumped out through the lower well in a process called Steam-Assisted Gravity Drainage, or SAGD.

Mining and in situ operations both consume a lot of energy. The advantage of in situ is that the land is much less disturbed, making it easier to return it to a natural state. SAGD also separates the sand and bitumen below the surface, requiring significantly less infrastructure. Of the total Athabasca deposit, 80 percent is thought to be recoverable through in situ and 20 percent through mining.

SAGD requires a lot of natural gas to make steam. The ratio of steam injected to oil extracted is what determines a project's carbon emissions as well as its profitability. Mining and SAGD together consume hundreds of billions of cubic feet of natural gas per year, a substantial fraction of Canada's entire demand. (See [Oh, Canada!—Natural Gas and the Future of Tar Sands Production](#))

That's where nuclear power enters the picture. As bitumen production in Alberta is slated to expand over the next several decades, gas production will be in decline. This means that eventually producers will have to either burn part of their bitumen, thus eating into their profits, or find new power sources to generate heat and electricity.

Nuclear power has been mooted to fill this gap. Japan, of course, [turned to nuclear power during the 1970s oil shocks to offset its dependence on foreign oil](#). Now, in an ironic twist, Canada is considering nuclear power so that it can expand its oil exports. Most of the tar sands oil is sold south of the border through a pipeline network to meet American demand, while Canada still imports foreign oil to its eastern provinces.

One has to wonder why Canada would burn so much of its natural gas, a relatively clean fossil fuel, to extract an even dirtier energy. The answer is, of course, to make money. Most of the world's remaining accessible oil is controlled by national oil companies, making Canada one of the only remaining patches where the energy industry can really play in the sandbox.

And the Athabasca deposit is a big sandbox. The area is roughly the size of New York State. It contains an estimated 1.7 *trillion* barrels of bitumen, of which about 170 billion barrels are extractable with current technologies. Multiply by \$100 per barrel and pretty soon we're talking real money.

But it is capital intensive to slurp these heavy, unconventional dregs of the global oil barrel. Hundreds of billions of dollars have already been invested in the Alberta tar sands, where it takes an oil price of \$65 to 85 per barrel to recuperate costs. As recently as 2009, oil was back down in the \$40 range, slowing or canceling many projects.

So is tar sands oil dirty oil? Of course it is. All oil is dirty. But is it dirtier than other sources? On average, yes. According to [Cambridge Energy Research Associates](#), oil from Alberta tends to be about 5 to 15 percent more polluting than the average oil consumed in the United States when compared on a well-to-wheels basis. Twenty-five percent of oil's emissions occur during the production phase, while 75 percent comes from combustion in a vehicle.

Industry insiders often repeat the following argument: It's the consumer's fault, whether they mean car owners or America in general. "If you would stop driving so much, we would stop digging up all this oil and pumping it in your direction," goes the typical line. Then whenever the United States wavers on its affection for Canadian energy, the argument becomes a threat: "We'll just sell it to the Chinese instead."

This argument is nonsense on the individual level. American consumers aren't presented with a significant choice at the pump. They get to decide between three octane ratings with maybe a dash of [dubiously efficient ethanol](#) in the blend. The only real power a person has to reduce oil consumption is in deciding where to live. Ditching the car and moving to a dense, pedestrian- and bicycle-friendly community with access to mass transit is the most effective solution. For those who cannot or do not wish to move, the alternative is to work through the local political process to redesign your community.

Most families haven't made the carless choice yet. Instead the typical response is to buy a bigger car when gasoline is cheap and a more efficient one when the price goes back up. Without a price floor of some sort, America will never break its addiction to oil, foreign or domestic. A strong gasoline tax could serve as a de facto price floor if it were set high enough. Unfortunately [the United States has chosen to set the bar very low](#): Gas tax is a pittance relative to the price of gasoline, and it isn't indexed to inflation, meaning the value has actually declined over the last several decades.

It is an abdication of political responsibility to argue that an unorganized and reactionary collective such as consumers is at fault for oil consumption. The essence of ethics is whether our political institutions can make

choices that are in the interest of all affected stakeholders, local and global, regardless of the political cost.

Seen in this light, can the Canadian and Albertan governments be trusted not to morph into petrostates?

Sadly the outlook is bleak. The federal environment minister recently [declared](#) that Canadian oil is "ethical oil." This concept is drawn straight from the title of a book by conservative political activist [Ezra Levant](#), in which he argues that Canada's oil is morally superior to oil from countries with poor human rights records. Even if Canada and the United States were to boycott imports from all countries they consider problematic, an option neither is willing to consider, oil would still remain a globally priced and traded commodity and the benefits of its consumption would continue to flow to unsavory dictators.

On the provincial level, the Alberta government is of the opinion that the tar sands "should" be developed further, despite the fact that a [panel recently found that water and environmental monitoring program has been inadequate](#). Alberta's Energy Resources Conservation Board, its regulatory agency for energy development, has one of the more Orwellian names one can imagine.

Bullish development of the oil sands has also contributed to Canada's violation of its Kyoto Protocol commitments. The goal was to decrease emissions 6 percent below 1990 levels. Instead, Canadian emissions have increased by a whopping 24 percent, in great measure due to tar sands expansion. Tar sands emissions now account for about 5 percent of Canada's total.

Alberta did manage to enact one innovative policy that few other jurisdictions will even consider: [a carbon tax of \\$15 per ton](#). This move should be applauded, but it is unfortunately accompanied by billion-dollar investments in the unproven technologies of carbon capture and sequestration—an expensive crutch to help the fossil fuel industry limp into the future—with minimal focus on renewable energy research, development, and deployment.

Another concern for Canada's energy future is that the royalty regime for tar sands leases is too weak. The rate is set at 1 percent until a project becomes profitable, and then it jumps to 25 percent, which is still low compared to some countries (See [Alberta Oilsands Royalty Guidelines](#), November 30, 2006). Alberta risks squandering an opportunity to build its [Heritage sovereign wealth fund](#) while the people's resources disappear into private pockets, leaving the province without financial means to transition to a cleaner economy.

Is America being a good neighbor in this transaction, or merely abetting a fellow oil junkie? The [proposed Keystone XL extension](#) of the pipeline network that carries Albertan oil to the United States is currently under consideration, and final approval falls to the U.S. Department of State because of the international border crossing. It was [announced](#) on March 15 that a supplemental environmental impact statement would be issued, followed by a new public comment period, to determine whether the project is "in the U.S. national interest."

Buying more energy from a friendly neighbor appears like a good idea on the surface. But while energy security has the ring of a robust and consistent concept, it is actually a relative one. It wears a false halo of military necessity even during peacetime. Supplier countries want security of demand, and consumer countries want security of supply. What the oil industry really worries about is running out of business. "Producers who seek to maximize long-term revenue will want to maintain oil prices stable at the highest price that does not induce substantial investment in substitutes," [writes](#) technology and innovation expert [Philip Auerswald](#).

Should we be worried about today's high prices? Auerswald doesn't think so. High prices merely hasten the inevitable transition to a post-oil economy. Estimations vary on the timing of peak oil, but the finite quantity of the resource is undisputed and so is its eventual depletion to a level where the cost of extraction will equal the value of the product.

Saying that America should be open to more tar sands oil is basically just another version of the "drill here, drill now" arguments for tapping the Arctic National Wildlife Reserve in Alaska. The Obama administration, it should be noted, has been a booster of domestic production, and [production has gone up in the last five years](#). Canadian production has also increased significantly in the last decade, mostly from growth in the tar sands. But after two major oil price spikes during the same period, in 2008 and again now, it should be crystal clear that domestic and Canadian production growth doesn't control the global price, and that a much better strategy lies in finding replacement technologies and actively reducing demand.

But this is a tough sell when you think of things like how many Caterpillar 797B dump trucks are needed to mine the tar sands, and how the parts are manufactured all over the United States, by quite a few workers in quite a few Congressional districts. Add to that the public's resistance to raising gasoline taxes, and it becomes quite easy to see why it's politically difficult to enact bold and necessary energy policy. The hundreds of millions of lobbying dollars the oil industry spends certainly don't help our Senators see things clearly.

American politicians have been saying we need to get off foreign oil for half a century. Canadian energy executives and politicians bristle when they hear things like that. They feel that somehow Canadian oil shouldn't be considered foreign because it comes from North America. But the ethical thing is for both countries to pursue

energy independence based on clean, renewable sources that don't pollute the environment, harm human health, and risk massive destabilization of the global climate.

As it stands, Canada has become a climate change ostrich with its head in the oil sands.

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