

Resources and People

Act or be Acted Upon: The Case for Phasing Out Alberta's Sands

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Excerpts

Executive Summary

Many climate scientists think we cannot extract and burn all of the Sands reserves and still keep the world within the Paris climate target of 2°C above pre-industrial levels. McGlade and Paul Ekins, economists at the University of London, have stated that most of the world's carbon fuels must stay in the ground to avoid catastrophic warming. "No more than *7.5 billion barrels* of oil from the [Alberta] oil sands can be produced by 2050," they wrote. This paper takes 2040 as the date for cessation of Sands

production and emissions.

Instead of peak oil supply, experts now point to peak oil demand, and weak demand leads to a weak oil price. Influential economists warn that fossil fuel investments, especially the high cost and most carbon polluting ones, are becoming stranded assets.

Whatever the future breakeven price will be for Sands projects though, we cannot rely on a low international oil price to cap and phase-out the Sands. Those measures would help, but would not be enough to keep the temperature rise below 2 degrees C. That puts an onus on Canada to act.

Canada ranks 38th in the world by population but ninth by absolute emissions, and with just 0.5% of the world's population, Canada currently emits 1.6% of global GHGs ([greenhouse gases](#)). The Sands emitted 68 Mt in 2014, and Alberta's climate plan allows them to grow to 100 Mt by 2030. Growing emissions from the production of oil and will entirely cancel out Alberta's reductions in electricity, vehicles, and methane by 2030. Allowing Sands GHGs to grow that much will almost certainly prevent Canada from reaching its 2030 Paris Agreement targets.

This paper proposed three steps to meet the target of ending Sands production by 2040: 1) Place a permanent moratorium on new Sands production. 2) Give a closing time for Sands projects and units of projects that long ago paid off the capital costs, starting with the initial Suncor and Syncrude units, which are over 50 years old. 3) Require each Sands project to lower its emissions annually by 3-4% per year (2-3 Mt) starting in 2018. Projects that fail to meet GHG reduction targets must be fined at

a level higher than the costs to comply.

The Alberta and Canadian governments have to choose between allowing the market to determine the timeline of a Sands phase-out and managing the transition off the Sands so that its workers are retrained to help build renewable energy and conservation projects. In other words, we must act so that we are not acted upon.

Will the Market or the Government Phase Out the Sands?

"You can't be producing more oil and reducing emissions—it's a fundamental contradiction." Mark Campanale, *founder and executive director, Carbon Tracker*

Introduction

The fossil fuel belt? With the international oil price crash of 2014 resulting in a slowdown in Sands growth and increased unemployment in the oil patch, some, like the now-governing Alberta NDP and Alberta Federation of Labour have since become champions of renewed growth in the Sands. Meanwhile, the 2015 Paris Agreement of the United Nations Framework Convention on Climate Change has given calls to phase-out the Sands even more urgency than they had in 2006.

The evidence of rising climate disruptions is now much clearer, with 2016 breaking world temperature records, as had 2015 and 2014. Drought and famine plagued parts of Africa, rising sea levels endangered coastal regions, Arctic temperatures of 10-15°C above normal caused unmatched melting of sea ice, and extreme weather events occurred more often. More frequent forest fires and floods in

Alberta and other parts of Canada have been at least partly attributed to climate change. These include more fires in Canada's boreal forests.

Insurance payouts resulting from extreme weather, including destructive floods like the ones that hit Calgary and Toronto in 2013, have more than doubled, every five to 10 years since the 1980s, according to a 2015 report by the Insurance Bureau of Canada. Will the market close the Sands abruptly, or will the Alberta and federal governments manage a transition to ensure a soft landing?

Gargantuan reserves. Only 166 billion barrels—about 10%—of the Sands reserves are deemed viable with current technology and prices. But that 10% is still enormous, making Canada holder of the third-largest proven oil reserves in the world, and accounting for 97% of Canada's total proven oil reserves.

If we extract and burn all the proven reserves, can we still keep the world within the Paris Agreement climate target of 2°C—and preferably 1.5°C—above pre-industrial levels? Many climate scientists think not.

Climate Commitments and Plans. It would take very strong and immediate action to limit the world to a 1.5°C rise because global average temperatures have already risen about 1.2°C above the pre-industrial level. It will be hard even to meet the 2°C target, above which many climate scientists predict that potentially runaway warming would occur as natural "feedbacks" kick in. When the emission reduction targets of all countries party to the Paris Agreement are combined, it is calculated that they will lead to a global temperature rise of 2.6-3.1°C.

The pan-Canadian framework is not ambitious. While he was still

prime minister, Stephen Harper submitted Canada's emissions reductions target to the Conference of the Parties in preparation for the Paris climate talks, pledging to reduce Canadian carbon emissions by 30% from 2005 levels by 2030. If achieved, it would cut the country's total emissions to 524 Mt, or only 11% below the 576 Mt pledge Canada made in Kyoto a decade-and-a-half earlier. The Liberal government initially promised to go beyond the Harper targets, but then decided to stick with them. Canada's Paris pledge to reduce carbon emissions by 1.7% a year until 2030 is also puny compared to European Union and US commitments of cuts of 2.8% a year.

Timeline for phase-out. There is remarkable agreement from a variety of sources that we cannot wait beyond 2040. McGlade and Ekins studied which fossil fuels must remain unused to limit global warming to 2°C above pre-industrial levels, "For the world to have a reasonable prospect of meeting the [2°C] target," they write, "no more than 7.5 billion barrels of oil from the [Alberta] oil sands can be produced by 2050." If CCS is not available, they conclude that all Sands oil production must cease by 2040. This paper takes off from Mr. Trudeau's remarks on the need for a phase-out, and takes 2040 as the target date for a managed reduction and cessation of Sands production and emissions.

Will the Market Phase Out the Sands?

While both Prime Minister Trudeau and Alberta Premier Rachel Notley have argued that their climate change initiatives will help develop the Sands by making them environmentally palatable, Rubin argues their premise that the future of the Sands is critically linked to lower Canadian greenhouse gases is dubious. "It is the oil sands' costs, not their carbon trail, that jeopardizes further development of

the resource in an emissions-constrained world." The Sands are one of the most expensive sources of oil in the world, Rubin contends, rendering them marginal producers in the world supply chain. Lowering their carbon emissions—or that of Canada as a whole—won't remedy that vulnerability.

Peak demand. The World Economic Forum in 2016 released white papers on global demand for oil by Amy Jaffe and Jeroen van der Veer. Three of the authors' four scenarios predict that world oil use will fall below 80 million bpd by 2040, a drop of 20% from today's 97 million bpd. The authors argue that demand will drop because of the post-Paris Agreement push for cleaner energy and the falling price of batteries that power electric vehicles, which should lead to electric vehicles steadily replacing gasoline-powered ones. Oil and gas corporation BP concurs with the IEA's ([International Energy Agency](#)) assessment. In its latest Energy Outlook report, BP forecasts that world demand for oil will rise by an average of 0.7% a year over the next 20 years, about half the growth rate of the past 20 years. But in a gloomy note for Sands producers, BP predicts that the Middle East, Russia, and the US will gain market share at the expense of higher-cost rivals.

Conventional Supplies and the Price of Oil. As mentioned, growth in Sands output also helped drive up global oil supply, but to a much smaller extent, with gains in Sands output of 1.2 million bpd compared to the 4 million bpd growth in US shale oil.

Oversupplied oil in the world led to a price crash from over \$100 a barrel in the summer of 2014 to a low of \$30 by autumn. At that price, US shale and Canadian Sands oil producers lost money on every barrel pumped. Western media often blamed OPEC for refusing to reduce production, but as Jeff Rubin perceptively

observed, North American oil producers were the architects of their own demise. "It is the huge production gains from shale formations and oil sands that are primarily responsible for the supply glut and the subsequent collapse in oil prices that now threatens their commercial viability."

Breakeven prices and the Sands. David Hughes, a prominent Canadian earth scientist, estimates higher break-even costs, pegging new in-situ projects at US\$68 to US\$85 a barrel, and mine projects at US\$96 to US\$100 a barrel. London-based independent financial think tank Carbon Tracker's estimates are similar. It found that 92% of Sands projects require a market price of US\$80 to break even. That does not allow for contingencies or profits. A price above US\$90 is needed for most new Sands projects to get the go-ahead. It's true that some existing Sands projects are expanding; at the end of 2016 and the beginning of 2017, three oil corporations announced the first Sands expansions since the 2014 oil price slump. The combined gains of 110,000 bpd, however, are small in the context of total Sands output in 2017 of about 2.85 million bpd. But no new Sands projects have been announced and several major oil corporations have pulled out.

Postponements and cancellations. Total ASA, the fourth largest international oil and gas corporation, shelved its Joslyn North Sands project in 2014, citing concerns about operating costs. Royal Dutch Shell scrapped its Carmen Creek project in 2015, citing lack of pipeline capacity to coastal waters as a major reason. In December 2016, Koch Oil Sands ULC asked the Alberta Energy Regulator to cancel approval for its 10,000 bpd Muskwa insitu project, a small project by Sands standards. Koch Industries did not believe the economic environment

in Alberta would enable it to turn a profit, and objected specifically to Alberta's Climate Leadership Plan, citing the carbon tax and emissions cap.

Despite its pull out from Muskwa and its criticisms of Alberta's government, Koch, "an American energy conglomerate owned by two powerful billionaire brothers who help fund the Tea Party and climate change denial movements in the U.S.," has invested in the Sands since the 1960s and still has huge bitumen assets of at least 1.1 million acres of Alberta's Sands and other investments.

Divestment. When they reach a tipping point, divestments can lower share and bond prices, raise the cost of capital to fund new carbon fuel projects, and lead to less output and greenhouse gases. Divestment can also succeed politically by focussing enough and media public attention on targets so that governments restrict the target's activities.

Stranded assets. Carbon Tracker started to target climate-related stranded assets in 2011. In a 2015 report, the financial think tank did a stress test on the amounts and kinds of oil, coal, and natural gas that must be shuttered to keep the world on track to meet the Paris Agreement target of keeping temperatures from rising more than 2°C above pre-industrial levels. To reach this goal, Carbon Tracker estimates that over \$2 trillion in capital expenditures (capex) must not be approved. Stopping approvals would purge 156 gigatons of carbon emissions. "Production will not stop overnight," the 2015 report argues, but "planning for the transition is required." Natural gas is a low carbon risk, according to the report, but it may underestimate the GHGs released from fracked gas

(particularly because of damaging and rarely counted attendant fugitive methane emissions), which can equal or even exceed those from coal. HSBC, the world's sixth-largest bank by total assets, also warned that Alberta Sands investments were in danger of becoming stranded assets. "While expensive deepwater, US shale and risky Arctic ventures may be mothballed or abandoned, oil sands face the greatest stranding risks, in our view, given the combination of high breakeven price and higher carbon intensity of production."

The need for Government Action in Canada

Canadian Association of Petroleum Producers' (CAPP) growth forecasts for the Sands. CAPP in June 2016 forecast the Sands output would grow from 2.7 million bpd to 3.7 million bpd by 2030. Canada's total oil production of 3.9 million bpd is forecast to rise to 4.9 million bpd over the same period. Whatever the break-even price will be for Sands oil projects between now and 2040, we cannot rely on a low international oil price to cap and phase-out the Sands when scores of big oil corporations have sunk tens of billions into them. They will do their utmost to lower costs, influence governments and find ways to move and sell their oil so they don't lose their investments.

Canada ranks 38th in the world by population but ninth by absolute emissions, and with just 0.5% of the world's population, Canada has historically released two percent global GHGs and currently emits 1.6% of global GHG's. That puts an onus to act on Canada.

What gives Canada the right to foul humanity's common atmosphere at three times the global per capita average? To get Canada's releases down to its 0.5% fair share of emissions, the federal and provincial

governments need to go well beyond the pan-Canadian climate framework agreed to in December 2016. There's no good reason for Canadians per capita CO2 emissions to be 14.7 tons, a level 25% higher than Norway's 11.7 tons per capita' despite the fact that Norway produces three-and-a half times as much oil per person as Canada. Canada's emissions are likewise 262% above Sweden's 5.6 tons per person. Like Canada, both Nordic countries are cold, sparsely populated and have a high standard of living.

Climate Plans in Canada. As outlined in the introduction, Canada's response to the challenge of climate change has not been credible in the past, and the new pan-Canadian framework is not credible either. Canada ratified the international Kyoto— Protocol in 2002, pledging to cut Canada's greenhouse gases by 6% from 1990 levels by 2012 (from 613 Mt to 576 Mt). Instead, emissions rose by 18%, to 715 Mt. Canada's pre-Paris pledge, made by then-prime minister Stephen Harper and subsequently adopted by Prime Minister Justin Trudeau, committed to reduce Canada's 2005 emissions level of 749 Mt to 622 Mt by 2020 and to 524 Mt by 2030, representing a 30% reduction. In January 2016, however, Environment Canada projected that "with current measures" actual emissions will increase by 5% by 2020 and by 11% compared to 2014. This means Canada's emissions are projected to be 55% above Canada's COP21 commitments by 2030 . The problem with the 2016 pan-Canadian plan is that it allows production from big, mainly foreign oil, to release carbon almost at will. To allow for that expansion, the plan goes after the smaller fish— electricity generated from coal (11%), and emissions from buildings (12%). It also very lightly slaps the wrist of transportation (23%) through carbon taxes (BC and Alberta), and cap-and-trade (Ontario and Quebec). Those measures will take six years to add a meagre 11 cents a litre at the

pumps. Three years ago gasoline prices were 20 to 30 cents a litre more than today, yet those prices did little to curb GHGs. Why should we expect that adding 11 cents a litre will do much? Cutting Canada's 1990 emissions level by 80% by 2050 would leave total emissions at 123 Mt, only 23 Mt above the Sands cap of 100 Mt laid out in the Notley government's plan. If allowed to rise and stay that high, Alberta's Sands would take up 81% of the level of Canada's emissions envisioned by Layton's act in 2050. All other carbon energy uses including driving and heating homes would have to just about shut down.

If Canada is to meet the less-ambitious Harper/Trudeau Paris target of 524 Mt by 2030, and Sands emissions are allowed to rise to 100 Mt a year by then, the Sands will be responsible for almost one-fifth of the country's total GHGs, and the total oil and gas sector will account for 44% of emissions. The rest of the economy would have to cut emissions by almost half—47% in less than 13 years. That clearly won't happen.

Pipeline Problem. But worse than merely being insufficient, Ottawa's actions are actually making things worse. The Trudeau government is facilitating oil and pipeline corporations by approving major expansions of two major bitumen-exporting pipelines: Kinder Morgan's Trans Mountain and Enbridge's Line 3. If the lines are built, they will further encourage the growth of Sands output, as will President Trump's approval of TransCanada's Keystone XL line to the US Gulf coast which Barack Obama killed in 2015. If all these proposed projects are completed, Canada's carbon emissions will grow, not contract. It will also lead to further encroachment on, and damage to, Indigenous lands.

Sands producers have recently been complaining about feeling

the pinch of lack of takeaway pipeline capacity. Some bitumen has been removed by rail, a costly option; it costs up to \$20 a barrel to move by rail and half that—\$8-\$12 a barrel—to move by pipeline. With international oil prices in the US\$50 to US\$55 a barrel range and the price of WCS (Western Canada Select) of around US\$32, the extra \$10 a barrel to move by rail can be the difference between oil corporations operating at a profit or loss, and the difference between deciding to develop new capacity in the Sands and halting or divesting from them.

If, despite enormous opposition, all three pipelines are built, they could drive a stake through the heart of Canada's climate ambitions. The lines would take as much as three decades, until about 2050, to pay off their initial capital costs. The pipeline companies— TransCanada, Kinder Morgan and Enbridge— would want to keep those lines full of mainly Sands oil until then and pressure the Canadian and US governments to allow them to do so. Would Ottawa cave into such pressure? Would Alberta's 100 Mt cap limit the amount of Sands oil that could be produced? If the corporations got their way, and the world oil price was high, Sands output could continue undiminished until mid-century. If they did, how could Canada possibly fulfil its promises to decarbonize by 80% by 2050?

Alberta's climate leadership plan. With its Climate Leadership Plan, the NDP government made an alliance with four of the largest oil corporations in Alberta and a range of environmental groups on a plan that would speed up the phasing out of coal power plants. The essence of the deal between Big Oil and the left-of-centre NDP government was to eliminate enough emissions from coal-generated power and other measures, so that corporate owners of Sands projects could raise their collective GHGs by 47% by 2030.

The Fort McMurray Fire

The beast of a fire that engulfed Fort McMurray in May 2016 gripped all Albertans. The 90,000 inhabitants who had to flee for their lives along highways lined with shooting flames, were billeted all over the province and received an outpouring of financial and material support from their fellow Albertans. But the fire sparked little media talk of climate change, and was presented more as an act of God than as the result of global warming. Now that the evacuation of Fort McMurray is over and rebuilding is well underway, can the issue of global warming increasing the risk of future fires be effectively used to motivate Albertans to go Sands-free?

For every 1°C degree of warming, there needs to be 15% more precipitation to keep fine combustible fuels on the ground amply moist. If temperatures rise by 3°C by 2100, we'll need 45% more rain, and that's not predicted to happen.

Phasing Out the Sands

This is the ideal point to start transitioning off the Sands. Tens of thousands of workers have already been laid off in the Sands and related sectors, including construction, manufacturing, and professional business services. As Jeff Rubin argues, "investment cutbacks today spare potentially massive writedowns tomorrow." It's much more difficult for governments to stop an expanding industry and throw people out of work than it is to help already-displaced workers and communities get off a sunset industry.

Steps to phase out the Sands. It doesn't make sense to allow Sands production to rise and for workers to build their lives around

employment in the Sands and then suddenly shut it all down in 2025. A gradual landing is much better than an abrupt fall.

The first step is to follow the widespread calls made in 2006 to place a moratorium on new Sands projects. And it must be a *permanent moratorium* this time. The second step is to give a closing time for Sands projects that have long since paid off their capital costs, starting with the initial Suncor and Syncrude units that are over 50 years old (they began in the 1960s and early 1970s, respectively). The third step is to apply an *annually lowering GHG ceiling* on all remaining Sands projects until they collectively reach zero by 2040. To sidestep exorbitant compensation claims, the Alberta government should reverse its plan to allow Sands emissions to rise to 100 Mt per year. Instead, it should cap the emissions at the current (2014) 68 Mt level and then require each Sands project to lower its emissions annually by 3-4% per year (2-3 Mt) starting in 2018. Coupled with the retirement of Sands projects that are over 50 years old, such a move could reduce Sands emissions to zero by 2040. Projects that fail to meet GHG reduction targets must be fined at a level higher than the costs to comply, as the US does under CAFE ([corporate average fuel efficiency](#)).

Canada's oil and gas sector is not a good direct or indirect job creator because it is so capital intensive. In other words, for each unit of production, it employs very few workers. Of 107 industry categories in Alberta, oil and gas extraction is tied for last place in jobs per unit of GDP. Construction and manufacturing create several times more jobs per unit of GDP, meaning the building phase of new Sands projects generates many jobs in Alberta but the operation of those projects employs far fewer. Statistics don't allow us to separate Sands construction from general construction jobs in Alberta, but during

the Sands boom from 2002 to 2012, total construction added 80,000 jobs in Alberta, a boost of 57%. The Sands undoubtedly created many of these gains.

Fortunately, a Canadian plan of deep conservation and renewable energy can generate more jobs than Canada's current, failed focus on carbon fuel exports. More jobs are created by saving a unit of carbon energy than in digging up, burning, and emitting one. Manufacturing creates many more jobs per million dollars invested than the petroleum industry, as does construction. New construction jobs should be green jobs, including those that retrofit all buildings, and build high-speed LRT and subways, high-speed inter-city trains, district heating, wind, tidal, geothermal, and solar power.

Conclusion

If global oil demand falls substantially by mid-century, where will the diminished supply likely come from? Will it be from low-cost, low-carbon-intense conventional sources that will still be plentiful in the Middle East, or from high-cost, carbon-intense sources including Alberta's Sands? The answer to this question is readily apparent. We are already seeing the beginnings of a move away from the Sands. They are the target of a growing divestment movement, and more importantly, they are increasingly seen by major financial institutions as stranded assets and poor investment prospects. Today's lower world oil price has already postponed the expansion of some Sands projects and shuttered others.

Prime Minister Trudeau recognizes that the Sands must be phased out in due course, as did the thoughtful advisors appointed by former

Alberta premier Ed Stelmach in 2011. Governments must finally take the lead in doing this. Their challenge is to engage Albertans and other Canadians in discussing the best ways to phase-out the Sands, and this paper was written to help launch this important conversation.