

FAR FROM INEVITABLE:

The Risks of and Barriers to Tar Sands Expansion

EXECUTIVE SUMMARY

November 2014



Alberta's tar sands region holds the third-largest known oil reserve in the world – a fact that excites those who consider the tar sands the great hope of Canada's economy. Over the last two decades, oil production in the region has grown immensely, reaching 1.9 million barrels of oil per day in 2013.

Industry wants to almost triple production between now and 2030.¹ Until recently, this expansion was widely seen as inevitable. But over the past year, there has been a perceptible shift in the level of certainty ascribed to this scenario. It is becoming clear that the rapid pace of tar sands development has depended on a perfect storm of conditions. The key question

It is becoming clear that the rapid pace of tar sands development has depended on a perfect storm of conditions. The key question is will these conditions persist?

is will these conditions persist? The answer on multiple levels is no, because the world today is not the same place it was in the early 1990s when rapid tar sands development began.

It is becoming increasingly evident that investment in the tar sands holds high levels of risk and growing obstacles, including:



Financial risk from rising production costs and declining oil prices, slimming the profit margin,



A growing environmental footprint running up against ecological limits and elected officials in the U.S. and elsewhere voicing their concerns about tar sands projects' impacts on the environment,



Increased opposition from the public, provinces, and Aboriginal communities, which contributes to project delays,



Constraints related to getting the oil to market by pipelines or rail, and



Declining investment in tar sands projects.

Together, these obstacles have already resulted in decreasing investment, major project delays and cancellations, and a loss of certainty in the sector's long-term trajectory that even the most cautious proponents acknowledge. Those who continue to espouse that the tar sands will inevitably be developed are ignoring facts, hoping that business will continue as it has for the past 20 years.

The notion of the inevitability of the tar sands development has stymied critical debate in Canada. We think it's time that changed. It's time for a close look at the facts.

In this document, we outline some of the foremost risks to the future development of the tar sands. We offer these to generate critical discussion. Our interest in this matter stems from a desire to have an informed debate about the prospects for expansion of the tar sands. Our hope is this generates a discussion about these risks and, in turn, a conversation about Canada's economic future and whether the tar sands will dominate that future.



FINANCIAL RISK: RISING COSTS AND DECLINING OIL PRICES

Crude oil from Canada's tar sands has always been among the most expensive in the world to produce. This is because significant processing is required to turn tar sands bitumen into oil that flows through a pipe, requiring additional materials, labour and enormous amounts of energy.^{2,3} Refineries considering the addition of bitumen-derived oil to their mix must address a number of concerns such as higher levels of sulphur, nitrogen, metals, and other pollutants.⁴ The relatively isolated, inland location of the tar sands also adds to material transportation costs and labour costs.⁵

Tar sands production costs have risen rapidly over the past 15 years. The cost of building upgraders and refineries has increased by 70 per cent between 2000 and 2008.⁶ More recently, supply costs for tar sands projects have continued to see significant increases over short time frames due to labour shortages and supply constraints.⁷ The overall costs of projects over the past decade have been 50 to 100 per cent higher than original estimates.⁸ **The higher breakeven costs make projects riskier investments if oil prices weaken.**

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And that is exactly what has happened. Oil prices have declined considerably in the last half of 2014 and are expected to stay as low as \$80 per barrel through 2022.⁹ Industry analysts are now assessing the future of the industry using long-term forecasts of \$85 per barrel.¹⁰ Some of the reasons may be temporary, e.g. a slowdown in the Chinese economy. Other factors may lead to a continued decline in demand: improvements in transport vehicle efficiency, lower oil consumption in response to global climate change, increased use of renewables including for transportation, and increased oil production in the United States. **With the breakeven costs of new projects projected between \$85 and \$109 per barrel,¹¹ a relatively low price of oil threatens the profitability of many tar sands projects in the short- to medium-term.**



UNACCEPTABLE ENVIRONMENTAL IMPACTS AND THE INCREASING LIKELIHOOD OF REGULATION

Rapid expansion in tar sands production is damaging the environment in ways that are impossible to ignore and possibly too great to tolerate. For example, the oil and gas sector is Canada's largest source of carbon pollution and the tar sands are the fastest-growing source of

that pollution.¹² If industry expansion plans are realized, the nearly tripling in carbon emissions from the tar sands will be large enough to cancel out efforts to reduce emissions from all other sectors of Canada's economy, including Ontario's coal ban, and B.C.'s carbon tax.¹³ The Canadian government has been promising greenhouse gas regulations for the oil and gas sector since 2006. As of late 2013, Prime Minister Stephen Harper said that regulations could still be a "couple of years" away.¹⁴ The federal government still does not have a single regulation to limit greenhouse gas emissions from the tar sands.

The Intergovernmental Panel on Climate Change has found that at least three-quarters of all fossil fuel reserves need to stay in the ground in order to avert dangerous climate change.¹⁵

As the world gets serious about tackling climate change, the tar sands – one of the highest carbon and most expensive sources of transportation fuel – would be among the

first to go. President Obama has said that his decision on the Keystone XL tar sands pipeline will depend on its climate impacts.¹⁶ International initiatives such as California's Low Carbon Fuel Standard are already exerting a preference for less carbon intensive fuels, and markets for tar sands-derived oil may end up shrinking rather than expanding.

Beyond climate change, expanding tar sands development has caused significant and growing environmental impacts:

AIR POLLUTION

18 reported instances where pollutants exceeded government warning levels

Air quality in the region surrounding the tar sands is worsening. The Alberta government has reported 18 instances where levels of nitrogen dioxide and sulphur dioxide, two pollutants that affect human health, exceeded government warning levels. Unfortunately, the government's only response was to announce that it would monitor the situation rather than take action to stop this.¹⁷

FRESHWATER USAGE

200 Olympic-sized swimming pools of freshwater were used every day in 2013

The total amount of freshwater used by the tar sands industry has grown by over 50 million cubic metres between 2005 and 2013,¹⁸ and is predicted to increase by almost 100 million m³ more by 2022.¹⁹ The 2013 total is the equivalent of 200 Olympic-sized swimming pools every day. With flow rates in the Athabasca River already in decline due to climate change,²⁰ stricter regulations governing water withdrawal will be required, especially during low-flow periods, to avoid impacts to the river ecosystem.

TOXIC TAILINGS

176 km² of liquid toxic waste currently covers the landscape

Tailings lakes, which contain liquid toxic waste from the tar sands, cover approximately 176 square kilometres of the landscape.²¹ Many are confirmed as leaking into surface and groundwater. For each barrel of bitumen produced, 1.5 barrels of tailings waste will be added to the landscape.²² In 2009, Alberta's Energy Resources Conservation Board put into place a directive requiring tar sands companies to capture and dry a minimum proportion of their new tailings waste.²³ No company has met these requirements²⁴ and the province has yet to issue fines or penalties. There are no regulations in place or in development that would halt the generation of toxic tailings for mining operations. The legacy of toxic waste is growing, creating legal liability for the industry.

LAND DISTURBANCE

715 km² of land has been been disturbed by tar sands mining.

About 715 square kilometers of land has been disturbed by tar sands mining activity.²⁵ Forests and sensitive ecosystems have been decimated. Due to this activity, a number of species including the woodland caribou are in decline.²⁶ According to Alberta's *Environmental Protection and Enhancement Act* (EPEA), land is supposed to be "reclaimed" such that it serves a similar ecological purpose as it did before a project commenced.²⁷ To date, only 0.15 per cent of land disturbance has been certified as reclaimed.²⁸

This poor environmental record is a risk and a liability for the industry as a whole. The tar sands have been opposed by the public because of the significant impacts they produce. **As the world takes greater action on climate change, the attention paid to the tar sands in Canada and abroad will only grow and, in a world that has more oil than we can use without devastating consequences, global markets for tar sands products are likely to shrink.**



PIPELINE OPPOSITION FROM THE PUBLIC, PROVINCES, AND ABORIGINALS

Because of where the tar sands are located, pipelines are key to moving the product to other markets. However, opposition to tar sands pipelines is strong and growing. Two proposed pipelines to the Canadian Pacific coast remain blocked. Strong opposition from the public, B.C. municipalities, and First Nations make both — the already-approved Enbridge Northern Gateway tar sands pipeline and the proposed Kinder Morgan Trans Mountain Expansion project — extremely uncertain and by many accounts unlikely.^{29,30,31} Indeed, financial analysts have already downgraded their expectations for construction of Northern Gateway.³² Clearly, public opposition has reached such a pitch that it can result in costly delays. Announcing a pipeline project is no longer a guarantee the project will be built on time, if ever.

There is also significant opposition against pipelines in the east, not just from residents but from municipalities and businesses. At least 28 municipalities in Quebec have passed resolutions against TransCanada's proposed Energy East pipeline.³³ At least 12 municipalities in Ontario and Quebec opposed Enbridge's Line 9 pipeline reversal before work even began, and at least 46 municipalities along the Montreal-Portland line (in Quebec, Vermont, New Hampshire and Maine) have passed resolutions opposed to or concerned about the Montreal-Portland pipeline.³⁴ Natural gas companies in Quebec and Ontario have joined local governments and natural gas customers, both industrial and residential, in opposing Energy East because that proposal requires taking part of a natural gas line out of service and converting it to crude oil, which could increase natural gas prices.³⁵

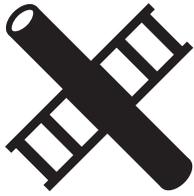
Provincial governments are also making things difficult for pipeline proponents. The province of British Columbia intervened in Northern Gateway hearings to formally oppose the proposal,³⁶ Ontario is currently undertaking provincial Energy Board hearings on the impacts of the Energy East pipeline including its upstream greenhouse gas impacts, and the Quebec government, pushed by a unanimously supported motion in the National Assembly, has

set seven major conditions that need to be met before Energy East can move forward.³⁷ More recently, Quebec and Ontario signed a joint statement saying that climate change needs to be addressed in any plan to ship energy across the country, making specific reference to the Energy East proposal.³⁸

Another key barrier for tar sands and pipeline companies is opposition from Aboriginal Peoples, given that Aboriginal rights and title are enshrined in Canada's Constitution. These rights have been upheld and strengthened by Canadian courts, most recently by last year's Beaver Lake Cree Nation court win against the Alberta government³⁹ and the 2014 Supreme Court ruling in favour of the Tsilhqot'in Nation in its case against the B.C. government.⁴⁰ The courts have shown that tar sands companies can no longer trample or ignore Aboriginal rights and title in the name of tar sands projects.

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In British Columbia, over 150 First Nations have now signed the Save the Fraser Declaration that opposes Enbridge's Northern Gateway pipeline or any other tar sands project from crossing their land or salmon migration routes in the Pacific.⁴¹ At the same time, the Tsleil-Waututh Nation launched litigation challenging the adequacy of the federal government's consultation process in relation to the Kinder Morgan proposal.⁴² **Given the resolve of Aboriginal opposition to tar sands infrastructure, these types of constitutional battles will continue to raise significant legal and financial risk for tar sands developers.**



OTHER TRANSPORTATION CONSTRAINTS

The tar sands industry faces both short- and long-term transportation constraints.

Based on current industry expansion plans, tar sands production is expected to exceed existing pipeline capacity sometime in 2015.⁴³ Without additional export pipelines and capacity to refine tar sands feedstock, planned expansion becomes technically and economically unfeasible. Longer term, all proposed pipelines—totalling 4 million barrels per day by 2030—need to move forward on schedule for the industry to meet its growth forecasts.⁴⁴

But there are high barriers to securing this capacity. Opposition to tar sands pipelines outlined above is a major one, which will continue to create costly delays for pipeline projects. Transporting oil by rail, especially all the way to the Gulf of Mexico, is also expensive. Energy transport analysis firm RBN has indicated that rail to the Gulf carries a cost premium of at least \$15 a barrel relative to pipelines.⁴⁵ In the wake of the Lac Mégantic disaster, new regulations by Transport Canada may further increase that premium. Because of this high cost, shrinking profit margins in the tar sands industry, and rail car capacity constraints, rail is not a serious longer-term option for industry. Industry may claim that if the oil doesn't go by pipe, it will go by rail.

The truth is it costs far too much to ship the majority of tar sands oil by rail and still have a healthy profit margin. Never mind that not enough rail cars are equipped to provide this service.

And then there's refining capacity. Western Canada currently has capacity to refine less than 20 per cent of the 3.5 million barrels of crude oil produced every day (including conventional sources) so the rest has to be exported.⁴⁶ In addition, only specialized refineries can process tar sands crude, refineries on the East Coast of North America have only limited heavy crude processing capacity, and this capacity is largely saturated.⁴⁷



DECLINING INVESTMENT

Given these significant and growing barriers and constraints, it is not surprising that investment

is shrinking in the tar sands sector. Across the industry, capital spending dropped from \$28 billion in 2012 to \$17 billion in 2013 and is forecast to remain flat through 2015,⁴⁸ as lower prices and a lack of transport capacity delay projects. Rising costs, lower oil prices, and transportation constraints have led to the suspension of Shell's Pierre River mine project, Total's \$11 billion Joslyn North mine project, and Statoil's expansion of its Corner project.^{49,50,51,52}

There is also growing concern within the financial community around high risks of long-term investment in fossil fuel reserves.

Mark Carney, the governor of the Bank of England and former governor of the Bank of Canada, recently warned an audience from the World Bank that the "vast majority of reserves are unburnable" if we are to avoid catastrophic climate change.⁵³ A group of 70 global investors managing more than \$3 trillion of collective assets are demanding that the world's 45 top oil, coal, gas and electric power companies assess the financial risks found in scenarios of unburnable reserves.⁵⁴ Across North America, public divestment campaigns are gaining traction as they call on institutions such as universities, churches and pension funds to divest from fossil fuels as a risk aversion strategy in the face of unburnable reserves.⁵⁵

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CONCLUSION

The tar sands industry may act as though nothing has changed in an attempt to maintain the status quo. But the conditions, which enabled rapid tar sands expansion until now, are eroding. The tar sands generate just two per cent of Canada's GDP.⁵⁶ In the future, that number may be even smaller.

The undeniable conclusion is that investment in the tar sands carries serious risks. Individually, each of these risk factors is potentially manageable. Taken together, they constitute a perfect storm of risk and uncertainty for investors and companies alike. Rapid expansion of the tar sands is far from inevitable.

Given the many risks facing tar sands expansion, it doesn't seem wise for Canada to have an "all in" approach to tar sands expansion – not when less risky alternatives exist. Already, other countries around the world, from the U.S. to Finland to China, are investing in the growing renewable energy

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sector to power their homes, businesses and economies. Canada could be a leader in the growing clean economy sector. Instead, we're at risk of being left behind, despite that we have the skilled workforce and the ingenuity to take advantage of this growing sector.

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