

# FAR FROM INEVITABLE:

## The Risks of and Barriers to Tar Sands Expansion

DECEMBER 2014

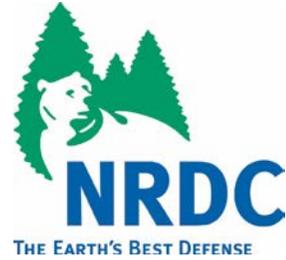


environmental  
defence





environmental  
defence



# Far from Inevitable: The Risks of and Barriers to Tar Sands Expansion

December 2014

Introduction.....	2
Tar sands industry expansion plans.....	5
Constraints on tar sands growth.....	8
Tar sands crude is marginal oil under business as usual.....	9
Declining demand for oil.....	10
Weakening global oil prices .....	11
First Nations legal constraints .....	11
Transportation constraints and access to market.....	14
Declining investment.....	19
Social licence.....	20
Regulations .....	24
Carbon constrained future.....	31
Tar sands: Marginal national economic contributions .....	31
Conclusion.....	35
Endnotes.....	36

# Introduction

From flooding in Calgary to the ice storm in Toronto to Hurricane Sandy in New York, extreme weather is hitting harder and closer to home. The headlines about damaged homes, businesses, bridges and roads are no longer about distant places on the other side of the world. Our friends, relatives and neighbours have gone without power, heat or running water, sometimes for weeks, in the aftermath of storms or floods. As the world heats up, we can expect more of this extreme weather in our own backyard. And the costs – to our homes, businesses, cities and governments – will continue to climb.

The science is undeniable. Ninety-seven per cent of the world's climate scientists agree that climate change is happening, and it's happening because of human activity.<sup>1</sup> According to the International Energy Agency, if we are to avoid the worst of climate change, we need to keep at least three-quarters of known fossil fuels in the ground.<sup>2</sup> This applies to reserves around the world and to the Alberta tar sands.

Alberta's tar sands hold the third-largest oil reserve in the world. This excites those who consider the tar sands the great hope for Canada's economy. The trouble is that tar sands oil is among the most carbon-intensive fuels produced in the world. This means that compared to conventional fuels, tar sands oil produces higher global warming emissions. And, as the world gets serious about addressing global warming, high carbon fuels, such as tar sands oil, will be among the first on the chopping block. Furthermore, because Alberta is landlocked the tar sands industry's expansion plans will depend on multiple pipelines to access refinery centers and international ports. But many of these pipelines are significantly delayed and may not move head at all. As this report will show, these are just a few of the obstacles facing the expansion of the tar sands.

Over the past two decades tar sands production grew immensely. In the early 1990s, tar sands producers ambitiously forecasted producing between 800,000 and 1.2 million barrels of oil per day by 2020.<sup>3</sup> That turned out to be an underestimation. According to the Canadian Association of Petroleum Producers, production reached 1.8 million barrels per day by 2012.<sup>4</sup> The key question is: Will the conditions facilitating the last 20 years of rampant tar sands expansion continue to persist? The answer is no, due to multiple complex obstacles.

The Canadian government and the tar sands industry say that tar sands expansion is inevitable. But the world today is not the same as in the early 1990s. Rather than adapting to a changing world, tar sands producers ignore the evidence and hope that the conditions that favoured tar sands development will return. But these conditions are eroding anyway, with or without the acknowledgement of the tar sands industry. And the myth of the inevitability of tar sands expansion is losing its currency.

The expansion of the tar sands simply cannot continue in a world where governments take stronger action to address climate change. The United States is on track to cut its global warming emissions by as much as 21 per cent by 2020.<sup>5</sup> President Obama has said his decision about the Keystone XL pipeline will depend on the project's impact on global warming emissions.<sup>6</sup> And China recently agreed to an absolute cap on its emissions for the first time.<sup>7</sup> The world's most powerful and largest countries understand that we can't keep burning fossil fuels without

devastating consequences. And that means that the clock is ticking for how much time remains for producing carbon-intensive fuels like the tar sands.

The notion of that the tar sands will inevitably be developed is also being chipped away by a growing movement of North Americans saying no to pipeline projects because they enable tar sands expansion. We've all seen the photos in newspapers and the TV news coverage of protests, from Washington, New York, Vancouver, Toronto and more, where thousands of people are speaking out, loudly, about the climate implications of expanding tar sands development. Consider the backlash in B.C. when Northern Gateway was approved, or the protests in the U.S. where ranchers and Aboriginals joined together to speak out against the proposed Keystone XL tar sands pipeline. In Quebec, thousands of students filled the streets of Montreal to say no to the proposed Energy East tar sands pipeline.

When thousands of people from across the continent protest pipeline projects, it's clear that these projects will have difficulty gaining social license. Public opposition has reached such a pitch that it can result in delays that can impact the bottom line. Already, we've seen pipelines like Keystone XL delayed, with significant cost overruns. Pipeline delays can and already have impacted tar sands mine developments. We've seen projects like the Joslyn mine put on hold. It's clear that announcing a pipeline or tar sands mine no longer means the project will be built on time, if ever.

Then there's the recent drop in the price of oil. Tar sands oil is one of the most expensive in the world to produce.<sup>8</sup> When the price of oil drops, it becomes harder to justify proceeding new tar sands projects as profit margins slim down or disappear. Over the years, the price of oil has volleyed to highs and lows. This is a product whose price history is like a rollercoaster, the higher it climbs, the harder it can fall. That's not exactly a stable product.

Industry and government claim that the tar sands are a safe investment with a stable product managed by a responsible government. Nothing could be further from the truth. Conditions including price volatility, growing public opposition and world leaders taking bolder climate action, all combine to make the tar sands a risky investment. Meanwhile, the government is focused on spending millions to promote the tar sands under the auspices of "responsible resource development." And yet, despite repeated promises, there still isn't a single regulation to limit emissions from the tar sands.

Anyone stating that a high pace and scale of expansion of the Alberta tar sands is inevitable deliberately ignores the evidence that the opposite is true. The drum beat assertion that oil will get to market 'no matter what' is no longer true and not surprisingly, these days seems less confident. Industry and government continue to spout it in a desperate attempt to promote pipelines in the U.S. and Canada, influence the provincial budget in Alberta, prevent low-carbon fuel standards in Europe and create an economic and energy vision of Canada that is based on fossil fuels. They ignore the facts, hoping that business will continue as it has for the past 20 years.

But again, just because industry and government refuse to acknowledge cracks in the inevitability notion doesn't mean the cracks are not there and widening. As this report will show, there are multiple barriers facing the expansion of the tar sands. This report will prove that upon closer examination, rapid tar sands expansion is not

inevitable, but the exploitation of the tar sands is only viable at current levels as a result of a near perfect storm of conditions, conditions which are shifting as we write.

What is inevitable is that developing tar sands projects will become increasingly difficult, expensive and face growing opposition. Investment is wavering and the sector's profitability remains vulnerable to the absence of regulatory and project certainty, and fluctuations in global oil prices.

The tar sands industry and government have been effective at spreading misinformation about the tar sands' role in Canada's economy. Spending millions of dollars on ads to promote the tar sands has effectively created the perception among the Canadian public that the tar sands are a very large part of the country's economy,<sup>9</sup> such that any curtailment of growth would have devastating consequences. The truth is the tar sands represents just two per cent of Canada's GDP, and provides direct employment for just 0.2 per cent of Canada's full-time work force.<sup>10</sup> Although not insignificant, the tar sands are not the engine driving the Canadian economy. They represent a fraction of GDP generated in other sectors like services, manufacturing and the public sector.

Because of the rather small role of the tar sands in Canada's GDP and because of the risks facing the tar sands, it's not impossible to imagine alternative economic drivers. But the notion that tar sands expansion is inevitable has stymied critical discussions around alternatives that could meet the country's economic, environmental, and social goals in the future. This report asks whether Canada should consider investing in other economic strategies rather than the current "all in" approach to tar sands expansion. After all, investment advisors often urge diversification as the key to a healthy portfolio. So why is Canada so afraid to look at a more diverse approach instead of throwing all its eggs in one small, risky basket?

# Tar sands industry expansion plans

The Canadian Association of Petroleum Producers (CAPP) projects rapid growth in the tar sands sector from 1.9 million barrels per day (mbpd) in 2013 to 4.8 mbpd by 2030.<sup>11</sup> Adding up production from all projects that have been approved brings the total to 5.8 mbpd.<sup>12</sup> However, the basis for those forecasts includes assumptions about production costs that, according to a prominent industry analyst, are likely unrealistic.<sup>13</sup>

In 2014, CAPP cut its long-term production forecast for future Canadian oil production from 5.2 mbpd by 2030 to 4.8 mbpd by 2030, attributing the adjustment to growing capital costs.<sup>14</sup> Shorter term projections included production of 3.2 mbpd by 2020; and 4.1 mbpd by 2025. CAPP's forecast "assumes transportation capacity can grow to accommodate the projected increase in supply."<sup>15</sup>

Canada's national energy regulator also foresees considerable tar sands expansion. The National Energy Board (NEB) projects growth to 5.0 mbpd by 2035 under a scenario where the West Texas Intermediate (WTI) price for oil reaches US\$110/barrel by 2035.<sup>16</sup> Like CAPP, the NEB's growth projection assumes the construction of pipelines, noting that:

"Adequate infrastructure and sufficient markets are assumed to exist throughout the projection period. If those assumptions do not hold, pipeline constraints and price differentials will likely impact oil producers, and the broader energy system, in the years ahead. This is a key uncertainty to projections in EF [Energy Futures] 2013."

In a December 2013 submission to the United Nations Framework Convention on Climate Change (UNFCCC), the Canadian government projected that bitumen production would reach 3.3 mbpd by 2020 and 4.6 mbpd by 2030. As a result, the analysis found that tar sands greenhouse gas (GHG) emissions would grow from 55 million tonnes (Mt) in 2011 to 101 Mt in 2020 and to 137 Mt in 2030.<sup>17</sup> While emissions from tar sands mining were projected to almost triple from 2005 to 2030, emissions from in situ production were projected to grow even more quickly, rising from 11 Mt in 2005 to 82 Mt in 2030.<sup>18</sup>

In recent years, total GHG emissions from the tar sands have been closely linked to the rate of development of the tar sands. For example, between 2005 and 2011, bitumen production increased 64 per cent<sup>19</sup> and GHG emissions from the tar sands sector increased by 62 per cent.<sup>20</sup> If emissions intensity — emissions per barrel produced — remains constant, this linear relationship can be expected to continue. As tar sands operations shift to more in situ projects, emissions intensity is likely to grow.<sup>21</sup>

The Government of Canada's UNFCCC submission noted that tar sands emissions intensity has improved since the early 1990s. While improvements were significant during that decade, there have been no notable major gains in efficiency since. Emissions intensity has remained flat since 2004 (see Figure 1). This is acknowledged in the UNFCCC submission where Canada states that "some efficiency improvements have plateaued as technological improvements have been negated by shifts to more energy-intensive extraction techniques and declining reservoir quality." As a result, the report's analysis does not assume that the historical intensity improvement will

be maintained; instead, the analysis assumes that current tar sands emissions intensities continue unchanged.<sup>22</sup>

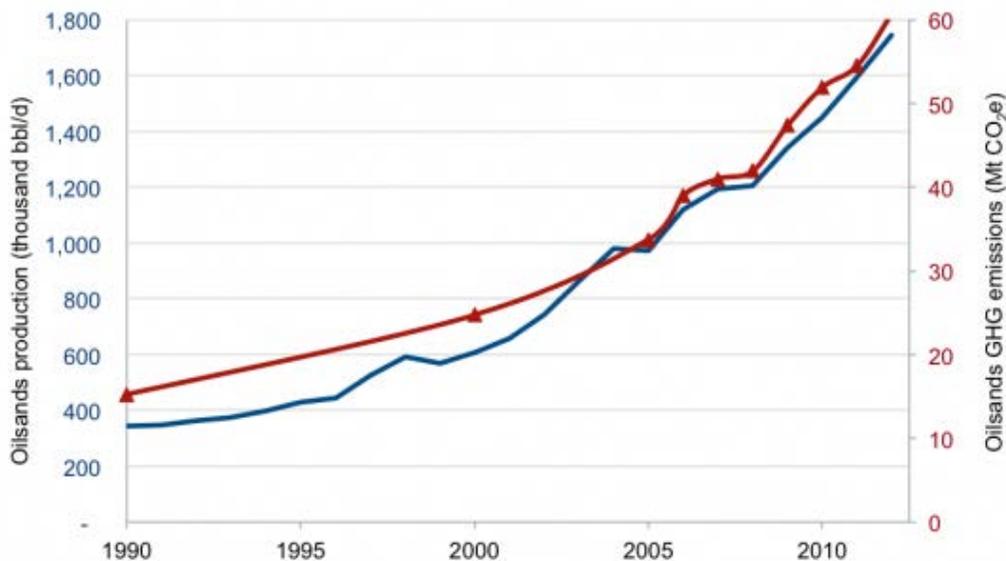


Figure 1: Tar sands production and GHG emissions.<sup>23</sup>

Tar sands production is already Canada’s fastest-growing source of the GHG pollution that causes climate change, according to Environment Canada.<sup>24</sup> If industry expansion plans are realized, the nearly tripling in GHG emissions from the tar sands will be large enough to cancel out nearly all estimated emission reductions from other sectors of Canada’s economy, including Ontario’s coal ban and B.C.’s carbon tax (see Figure 2).

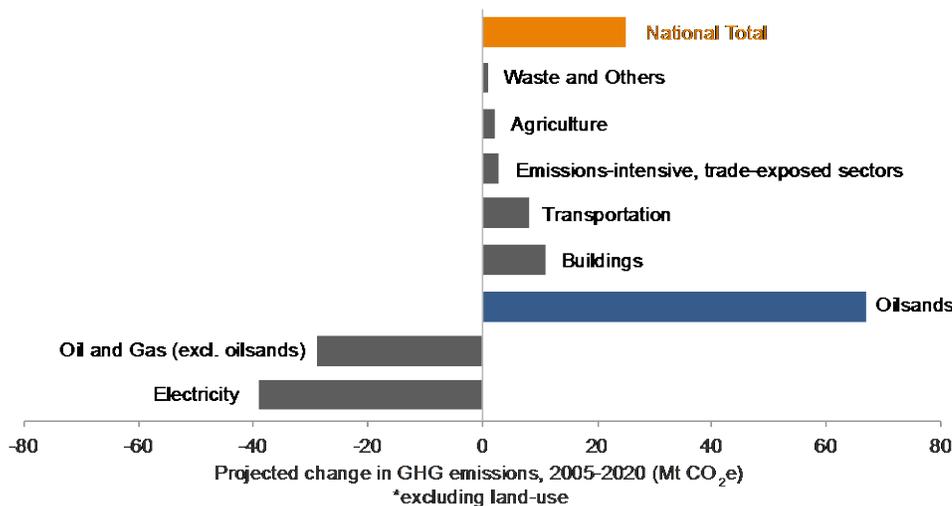


Figure 2. Change in GHG emissions by economic sector, 2005-2020.<sup>25</sup>

In the absence of emission reduction policies strong enough to achieve the national target (a 17 per cent reduction in greenhouse gas emissions from 2005 levels by 2020), the expectation of rapidly increasing production in the tar sands sector is the primary reason for the projected growth in Canada’s emissions to 2020. The

projected growth in greenhouse gas pollution from the tar sands is the single largest barrier to achieving Canada's national 2020 climate target. (As noted above, tar sands emissions are projected to continue growing after 2020, rising from 101 Mt in 2020 to 137 Mt in 2030.)

# Constraints on tar sands growth

In order for the tar sands industry to achieve the growth forecasts outlined in the previous section, a number of conditions would have to remain static, and in some cases change in favour of the industry, to ensure profitability. The potential constraining factors on expansion plans are significant and summarized below.

Table 1: Potential constraints on tar sands growth

Inevitability depends on:	Inevitability could be constrained by:
Strong global oil prices / demand for oil	<ul style="list-style-type: none"> <li>• Weakening global oil prices: emerging cheaper reserves, demand reduction</li> </ul>
Access to the resource	<ul style="list-style-type: none"> <li>• First Nations constitutionally protected rights and landowners legal framework</li> </ul>
Market access	<ul style="list-style-type: none"> <li>• Regional refining and transportation capacity inadequate for expansion</li> <li>• Obstacles and costs to proposed transportation projects: pipelines, rail</li> <li>• Market access constraints for carbon intensive crudes, including a saturated U.S. market</li> <li>• Diminished profitability and price discounts resulting from insufficient market access</li> </ul>
Investment in expansion	<ul style="list-style-type: none"> <li>• Declining investment in expansion and risks to capital investments: regulatory risks, market risks, carbon bubble, political risk, divestment risks</li> </ul>
Minimal regulatory constraints	<ul style="list-style-type: none"> <li>• Upstream regulatory constraints: federal oil and gas regulations, Specified Gas Emitters Regulation (SGER), carbon pricing, water, land use and local air pollution regulations, First Nation-enforced regulations on same</li> <li>• Midstream regulatory constraints: pipeline, rail, and barge regulations</li> <li>• Downstream regulatory constraints: Clean fuel standards, increased support for electrification of transport and fuel efficiency standards</li> </ul>

Social license	<ul style="list-style-type: none"> <li>• Eroding public support for tar sands expansion: upstream risks, transportation risks, social risks, climate impacts</li> <li>• Threatened political support for expansion</li> <li>• Regional challenges and disparity in the federation</li> </ul>
Credible thought leader support	<ul style="list-style-type: none"> <li>• Opinion leaders supporting a clean energy transition and decision makers stimulating alternative energy conversations</li> </ul>

## Tar sands crude is marginal oil under business as usual

Crude oil from Canada’s tar sands is among the most expensive in the world to produce and significant processing is required to upgrade the extracted bitumen into useable fuels.<sup>26,27</sup> The additional materials, energy and labour required to extract, process and transport tar sands bitumen also impacts the sector’s profitability.

### High production costs

Tar sands production costs have risen rapidly over the past 15 years. Between 2000 and 2008, the energy consulting firm IHS CERA calculated an increase in costs of 70 per cent for building upgraders and refineries.<sup>28</sup> Actual tar sands extraction projects had price tags 50 to 100 per cent higher than preliminary estimates.<sup>29</sup> More recently, supply costs for tar sands projects have continued to see significant increases over short time frames.<sup>30</sup> The higher breakeven costs for projects – including both mining and in situ – make them riskier investments if oil prices weaken.<sup>31</sup>

And that is exactly what has happened. Oil prices have fallen, which has been followed by cancellations and delays of significant planned investments (see below). High project costs have been partly offset by higher oil prices over the last several years, but in the last half of 2014 oil prices have plummeted and are expected to stay below \$80 per barrel through 2022.<sup>32</sup>

The inland location of the tar sands adds to material transportation costs as well as labour costs. Competing oil projects closer to ocean ports can benefit from offsite assembly and construction, moving near completed modules rather than individual components to project sites. This has a significant impact on production costs.<sup>33</sup>

In North America, labour typically accounts for 30 per cent of a project’s total cost (including all expenses for constructing a facility, such as materials, equipment, design etc.). In remote Fort McMurray, Alberta, labour costs are even higher because of a limited supply of local workers, recruiting and commuting expenses for non-local workers, and the higher costs for specialized workers.<sup>34</sup> The extreme winter weather also impacts worker productivity on a seasonal basis.<sup>35</sup>

The Canadian Energy Research Institute (CERI) has reported that breakeven costs for new tar sands projects continue to increase. In 2014, breakeven costs for new in situ projects reached \$84.99 per barrel (9.1 per cent higher than 2013), breakeven costs for standalone mines reached \$105.54 per barrel (6.1 per cent higher than 2013) and new mines with upgraders required \$109.50 per barrel (6.1 per cent higher than 2013).<sup>36</sup> These breakeven costs assume low transportation costs of \$3.50 per barrel to ship diluted bitumen via pipelines from Hardisty, Alberta to Cushing, Oklahoma.<sup>37</sup> But, these low transportation costs are not being realized, increasing the breakeven price further, with crude by rail options to the Gulf Coast ranging from \$15.30 to \$22.70 a barrel.<sup>38</sup>

Fixed costs have been increasing rapidly. In 2003, for example, Suncor aimed to get its operating costs—or the costs of physically extracting oil without considering sunk capital costs in the project—down below \$10 per barrel; that year, those costs came in at \$11.50<sup>39</sup> and have since skyrocketed. In a recent quarterly report, Suncor estimated its operating costs at \$36 per barrel.<sup>40</sup>

### Low quality/Low value crude

Natural bitumen deposits are the remnants of conventional oil deposits that have been bacterially broken down and degraded over millennia.<sup>41</sup> As such, natural bitumen bears a strong chemical and physical resemblance to the “residuum” generated during refinery distillation of light crudes.<sup>42</sup> Because of its low quality and unique physical characteristics, natural bitumen is more expensive to extract, transport, and refine than conventional light and heavy crudes.<sup>43</sup>

Refiners considering the addition of natural bitumen-derived feedstocks to their crude oil mix must address a number of concerns related to these crudes’ low quality. These include high sulphur content, high nitrogen content, high concentrations of numerous metals, asphaltenes and naphthenic acids, increased presence of chlorides, and extremely high viscosity.<sup>44</sup> Each of these quality factors negatively impacts refinery performance and increases production costs.

Given the high costs of extracting and refining natural bitumen, increased production of bitumen depends heavily on consistently high world oil prices as well as consistent demand for the variety of bitumen-derived feedstocks.<sup>45</sup> Lower oil prices can instead shrink profit margins and even make projects unprofitable.

### Declining demand for oil

Increasing demand for fossil fuels is no longer being driven by developed countries, with China, India, and the Middle East representing the major future markets for increased fossil fuel consumption.<sup>46</sup> Still, industry analysts point to a number of uncertainties in demand forecasts as a source of risk for crude oil markets. These uncertainties include the slowing of the Chinese economy and significant drops in consumption from the EU and the U.S.<sup>47</sup> Similarly, the International Energy Agency has also found that consumption rates must decline significantly in coming years if catastrophic climate change is to be averted. As the world gets serious about addressing climate change, demand for carbon intensive fuels like the tar sands can be expected to decline. And increasing production levels could lead to significant drops in the price of oil worldwide.<sup>48</sup>

Strong future demand for oil is also uncertain given findings that significant emissions reductions are possible over a relatively short time period through

improvements in transport vehicle efficiency.<sup>49</sup> Efficiency improvements of this nature create a high likelihood of decreasing demand, especially for transport fuels. For instance, new auto-efficiency standards are expected to reduce U.S. carbon dioxide emissions by about 570 million metric tons by 2030 and avoid 3.1 mbpd of oil consumption.<sup>50</sup>

In 2012, government subsidies to renewable energy projects passed the \$100 billion mark and are projected to reach \$220 billion by 2035.<sup>51</sup> At the same time, energy produced from renewable sources is becoming increasingly cost-competitive with energy produced from fossil fuels.<sup>52,53</sup> As subsidies for alternative energy rise and costs decline, there is a strong possibility that renewable energy sources will continue to erode worldwide crude oil demand, thereby exerting additional downward pressure on crude oil prices.

Because tar sands are a high carbon, high cost form of crude oil, continued investment in their development is likely to expose investors to higher levels of investment risk.<sup>54</sup> This risk exists due to demand uncertainties, an invigorated international regulatory focus on climate change, development costs, and dependence on high and rising oil prices.<sup>55</sup>

## Weakening global oil prices

Given the high costs of tar sands production, global oil prices must remain at relatively high levels in order for tar sands projects to remain profitable. But oil prices are at a five-year low. As explained above, the drop in oil prices has been followed by cancellations and delays of significant planned investments in the tar sands.

### Market forecasts predict weakening global oil prices

Oil prices have fallen precipitously in recent months, trading below \$80 per barrel, with some analysts predicting prices as low as \$65 per barrel in the near future.<sup>56</sup> The Chicago Mercantile Exchange (CME), where crude oil futures contracts are bought and sold, expects global oil prices to remain low. The CME forecasts Western Texas Intermediate (WTI) prices will remain below \$80 per barrel to 2022.<sup>57</sup>

### Emerging cheaper reserves eroding oil prices

The tight oil boom in the United States has led to higher oil production than forecasted by the International Energy Agency (IEA). The IEA's analysis forecasts that global oil production will reach 103.6 million bpd by 2018 – six million bpd higher than estimates from the U.S. Energy Information Administration. Recently, the Organization of Petroleum Exporting States (OPEC) decided to not cut production, despite the drop in oil prices.<sup>58</sup> This will create further downward pressure on oil prices, impacting the breakeven prices of marginally profitable projects such as tar sands. As prices stagnate or decline, new investments will dwindle and planned expansions will be delayed or cancelled—as has been seen on numerous occasions in the past 12 months.<sup>59</sup>

## First Nations legal constraints

Opposition from Aboriginal People's is a key barrier for tar sands expansion. The rights of Aboriginal Peoples in Canada are recognized and affirmed by Canada's Constitution.<sup>60</sup> This places a number of important restrictions and duties on the federal and provincial Crown when making decisions about resource development

that may affect those rights, and has caused projects to be substantially delayed or even cancelled where the Crown's legal obligations have not been met.

Because the Constitution is Canada's highest law, its entrenched protection of Aboriginal and treaty rights means that legislation or action by the federal or provincial Crown that unjustifiably infringes upon an existing Aboriginal or treaty right is invalid to the extent of the infringement.<sup>61</sup> And the courts have shown that government and tar sands companies cannot trample or ignore Aboriginal rights and title in the name of tar sands projects.

### Landmark court cases

The constraints that this may impose on tar sands development are evident in the ongoing case of the Beaver Lake Cree Nation in northeast Alberta. In 2013, the Beaver Lake Cree Nation was successful in arguing that the Alberta Court of Queen's Bench must hear its case alleging that the federal and provincial governments have unjustifiably infringed the treaty rights of its people by permitting various oil and gas, forestry, mining and other activities in the treaty area while systemically failing to manage the cumulative effects of those activities, thereby adversely affecting their rights including rights to hunt, fish and trap.<sup>62</sup> It has been noted in the media that the case, which has been dubbed the Tar Sands Trial,<sup>63</sup> "could force the governments to revamp the way they review and approve industrial projects – namely the tar sands."<sup>64</sup>

The Constitution also recognizes and affirms Aboriginal title as a type of Aboriginal right.<sup>65</sup> In a recent landmark victory for First Nations in *Tsilhqot'in Nation v. British Columbia*, the Supreme Court of Canada found that the Tsilhqot'in had proven Aboriginal title to a wide swath of territory, affirming that such title included "the right to use and control the land and enjoy its benefits."<sup>66</sup> Further, where Aboriginal title is established, the Court clarified that the federal or provincial Crown cannot make decisions that cause incursions on Aboriginal title without the consent of the First Nation, unless the Crown meets a stringent justification test. To justify an incursion on Aboriginal title without the First Nation's consent, the Crown must demonstrate a "compelling and substantial public purpose"<sup>67</sup> that furthers the goal of reconciliation, and must also meet a host of requirements including:

"...the requirement that the incursion is necessary to achieve the government's goal (rational connection); that the government go no further than necessary to achieve it (minimal impairment); and that the benefits that may be expected to flow from that goal are not outweighed by adverse effects on the Aboriginal interest (proportionality of impact)."<sup>68</sup>

Importantly, the Court also found that: "incursions on Aboriginal title cannot be justified if they would substantially deprive future generations of the benefit of the land."<sup>69</sup> This dramatically increases the power of non-treaty First Nations in British Columbia to block tar sands expansion infrastructure projects.

In British Columbia, where the majority of the lands and waters are not covered by any treaty, many First Nations assert Aboriginal title to areas that would be taken up or affected by proposed tar sands infrastructure such as the Enbridge Northern Gateway pipeline. While it is beyond debate that Aboriginal title applies to lands within British Columbia, the question of *which* lands specifically has not been comprehensively answered in Canadian law. This creates considerable legal

uncertainty for projects such as Northern Gateway, which is staunchly opposed by many First Nations asserting title to territories along the proposed route of Enbridge's pipelines and tankers (indeed, some First Nations are currently making that assertion in court challenges against Northern Gateway.)<sup>70</sup>

### Growing First Nations opposition

The Save the Fraser Declaration, which has been signed by representatives of more than 80 First Nations in British Columbia, as well as many other supporting First Nations elsewhere in Canada and the United States, reads in part:

“Therefore, in upholding our ancestral laws, Title, Rights and responsibilities, we declare: We will not allow the Proposed Enbridge Northern Gateway Pipelines, or similar Tar Sands projects, to cross our lands, territories and watersheds, or the ocean migration routes of Fraser River salmon.”<sup>71</sup>

The resolve of this opposition to tar sands infrastructure, combined with strong claims to constitutionally-protected Aboriginal rights and title in areas necessary for proposed tar sands infrastructure development to proceed, continues to pose considerable legal risk for such proposals now and into the future.

Lastly, where the federal or provincial governments have knowledge of an asserted Aboriginal or treaty right, even if the claimed right has not yet been “proven” in Canadian law, and these governments contemplate action that may adversely affect the claimed right, then they have a constitutional duty to consult and, where applicable, accommodate the First Nation claiming the right. The Supreme Court of Canada explains the duty to consult and accommodate as follows:

“...the principle of the honour of the Crown grounds the Crown's duty to consult and if indicated accommodate Aboriginal peoples, even prior to proof of asserted Aboriginal rights and title. The duty of honour derives from the Crown's assertion of sovereignty in the face of prior Aboriginal occupation. It has been enshrined in s. 35(1) of the *Constitution Act, 1982*, which recognizes and affirms existing Aboriginal rights and titles.”<sup>72</sup>

Where the federal or provincial governments fail to adequately consult or accommodate a First Nation in relation to a particular action or decision, a court may grant an array of remedies ranging from an injunction against the activity in question, to monetary damages, to an order to conduct sufficient consultation before the Crown may proceed.<sup>73</sup>

The implications that the duty to consult and accommodate can have for tar sands infrastructure development are evident in the example of Enbridge's Northern Gateway pipeline and tanker project. In late 2006, the Carrier Sekani Tribal Council brought a lawsuit against the federal Crown alleging that Canada failed to adequately consult the Council before imposing a process for assessing the project.<sup>74</sup> Shortly afterward, Enbridge put the project on hold causing PetroChina, an early investor, to walk away.<sup>75,76</sup> Since Enbridge reinitiated its pipeline and tanker proposal in 2008, many First Nations have continued to argue that Canada is failing to discharge its duty to consult and accommodate. The federal government's conditional approval of the Enbridge Northern Gateway proposal in June 2014, together with the report of the Northern Gateway Joint Review Panel upon which it was based, have been challenged by eight First Nations in 11 separate ongoing

lawsuits which, among other things, raise serious questions about the adequacy of the Crown's consultation process.<sup>77</sup>

Legal challenges regarding the Crown's obligation to consult and accommodate First Nations in relation to tar sands infrastructure projects are by no means limited to the Enbridge Northern Gateway proposal. For example, in May 2014 the Tsleil-Waututh Nation launched early litigation challenging the adequacy of the federal government's consultation process in relation to Kinder Morgan's proposed Trans Mountain pipeline and tanker project.<sup>78</sup> These types of constitutional battles will continue to raise significant legal and financial risk for tar sands infrastructure development.

Infrastructure delays, whether they come from blockades or legal challenges, will compromise the industry's hopes of achieving significant growth in production from the tar sands. The next section explains this in further detail.

## Transportation constraints and access to market

*Additional pipelines that provide access to new markets and refining capacity are necessary for continued expansion of tar sands, but these pipelines face growing obstacles*

The tar sands industry faces both short and long term transportation constraints. Export pipelines from the tar sands region are reaching capacity and there is either limited or no ability for refineries to take additional tar sands oil in both Canada and most regions of the United States where tar sands currently flow, such as the Midwest and the Rockies. Consequently, without more export pipelines to reach markets with additional capacity to refine tar sands feedstock—such as the U.S. Gulf Coast—the planned expansion to these levels is technically and economically infeasible, because there would be no way to get the product to new markets.

Based on current industry expansion plans, tar sands production is expected to exceed existing pipeline capacity by 2015.<sup>79</sup> To meet its production growth forecasts, the tar sands industry requires more than 4 million barrels per day (bpd) of new transportation capacity by 2030.<sup>80</sup> These expansion plans effectively require all proposed pipelines to move forward on schedule (See figure 3).<sup>81</sup> But as will be discussed below, there are very high barriers to industry securing this capacity. Given higher costs of transport by rail within the context of shrinking tar sands sector profit margins, and rail system capacity constraints, rail is not seen as a serious longer-term option by industry. With these known constraints widely accepted, industry's long-term production goal beyond 2030 for 9.4 million bpd of tar sands production<sup>82</sup> appears dubious.

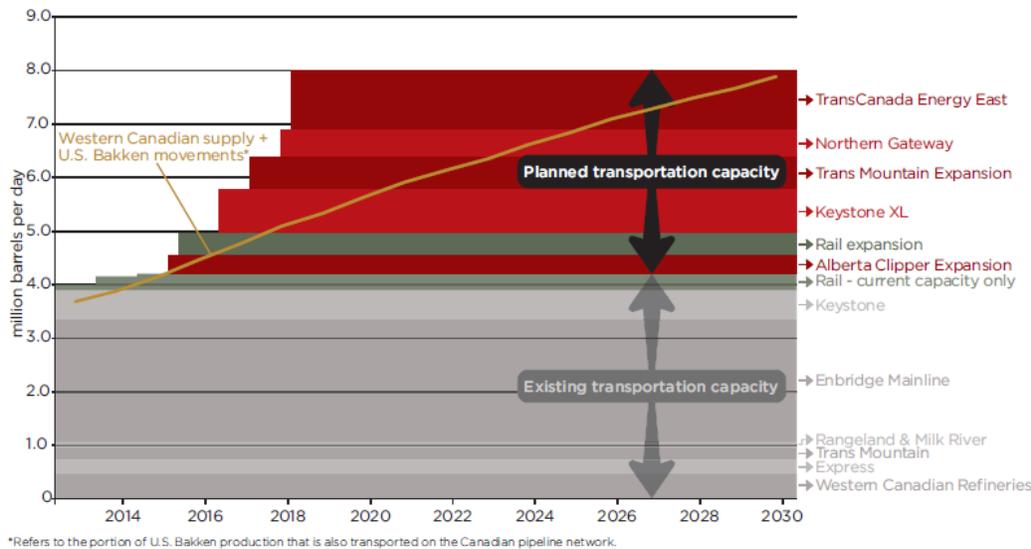


Figure 3: Pipeline capacity and planned production growth<sup>83</sup>

The tar sands industry's expansion plans are entirely contingent on its ability to access new refinery markets with the capacity to accept additional volumes of heavy crude. Western Canada currently has limited capacity to refine the 3.5 million barrels of crude oil produced in Canada every day, which includes production from both tar sands and conventional sources.<sup>84</sup> The region's refineries have the capacity to process 680,000 bpd of production, and with no proposals for new refineries, the rest must be exported to be refined elsewhere.<sup>85</sup>

But the issue is not only getting diluted bitumen to refineries, with all the barriers and constraints laid out in this paper, but also getting it to refineries that can process the heavy oil. Over 90 per cent of Western Canadian production increases – or 2.9 million bpd – are expected to be heavy tar sands crude which can only be processed by *specialized* refineries.<sup>86</sup> For example, refineries on the East Coast of North America have only limited heavy crude processing capacity, and this capacity is largely saturated.<sup>87</sup>

### Obstacles to proposed pipeline projects

#### *Western Canadian pipelines (Northern Gateway; Kinder Morgan)*

Access to the Canadian Pacific coast for tar sands pipelines remains blocked. Strong opposition from the public and First Nations make both the proposed Enbridge Northern Gateway and Kinder Morgan Trans Mountain Expansion tar sands pipeline projects very uncertain and by many accounts unlikely.<sup>88,89,90</sup>

While Canada's Joint Review Panel recommended approval of the Northern Gateway pipeline in December 2013 and the federal cabinet agreed, strong opposition from the public and First Nations is expected to derail or delay this project.<sup>91,92</sup> The province of British Columbia opposed the 525,000 bpd pipeline in its formal comments to the Joint Review Panel in May 2013 and has reasserted its opposition following federal cabinet approval.<sup>93,94,95,96</sup>

Financial analysts have downgraded their expectations for approval of Northern Gateway.<sup>97</sup> Oil industry commentators and federal cabinet ministers who have

historically supported west coast pipelines are more muted in their support.<sup>98</sup> Even if the project were to be approved by 2017, as Enbridge anticipates, such a decision will likely be contested in courts for many years by concerned British Columbians and First Nations. And despite discussions around an agreement on west coast pipelines between the leaders of Alberta and British Columbia,<sup>99</sup> substantial First Nations opposition remains a clear legal barrier, causing most industry analysts to believe that the Northern Gateway project will not move ahead.<sup>100</sup>

Proof of this outlook can be found in the U.S. State Department's Keystone XL pipeline analysis. There, the Department stated that, "it remains uncertain at this time if the project would receive permits and be constructed and therefore...was eliminated from detailed analysis."<sup>101</sup>

Similar obstacles face the proposed Trans Mountain expansion by Kinder Morgan, which is being met by rising public opposition in the Vancouver region of British Columbia.<sup>102</sup> On December 16, 2013, Kinder Morgan formally applied to Canada's National Energy Board to expand and reroute its Trans Mountain pipeline that will enable the company to move up to 890,000 bpd up from 300,000 bpd.<sup>103</sup> The expansion would require a new environmental assessment and public consultation given it is a new pipeline (the route is different from the original pipeline.) It will require new permits, new and renegotiated landowner agreements, agreements with First Nations, and changes in regulations to allow increased tanker traffic. Even at this early stage, some of these elements of the project proposal have generated substantial opposition. The mayors of Vancouver, West Vancouver, Victoria, and Burnaby, British Columbia, have spoken out strongly against the pipeline proposal and the associated tanker traffic.<sup>104</sup> Opposition from the public, First Nations and municipalities are significant obstacles for this project.

#### *Enbridge Alberta Clipper pipeline expansion (U.S. Midwest)*

The Canadian pipeline company Enbridge has proposed an expansion of its Alberta Clipper tar sands pipeline (Line 67) to facilitate a capacity increase of 350,000 bpd (less than half of the size of the proposed Keystone XL).<sup>105</sup> This pipeline expansion project faces considerable opposition from local communities.<sup>106</sup> The debate about tar sands has changed dramatically in the United States, with much more awareness and understanding about pipeline safety and climate risks from tar sands, and a strong coalition has come together to oppose this expansion project.

Like the Keystone XL proposed pipeline, the Alberta Clipper pipeline crosses the Canadian border. As such, environmental groups and tens of thousands of citizens sent letters to the U.S. State Department to insist that the expansion project needs a Presidential Permit that would be issued or not based on the results of an environmental impact assessment and a study determining whether the project is in the national interest.<sup>107</sup> The State Department agreed and published a notice in the Federal Register in March 2013 indicating its intent to prepare a supplemental environmental impact statement (SEIS).<sup>108</sup>

While waiting for the State Department to finish its analysis, however, Enbridge has decided to build an interconnection that will allow tar sands oil to be transferred to a different pipeline to get it over the border, and then transfer that oil back to the Alberta Clipper pipeline. This "switcheroo" was initially approved by a low-level State Department staffer, but is seen by environmental advocates as an illegal attempt by Enbridge to circumvent the established Presidential Permit process. Not surprisingly, the move is being met by strong opposition.<sup>109</sup>

### *TransCanada's Energy East pipeline*

While the large TransCanada Energy East pipeline was only recently proposed (TransCanada filed with the National Energy Board on October 30<sup>th</sup>), there is already considerable uncertainty over its viability. This highly complex project requires multiple approvals from Canadian regulators for different aspects of the project including permits in the six provinces and hundreds of towns through which it would pass.<sup>110</sup> Ontario is currently undertaking provincial Energy Board hearings on the impacts of the pipeline including its upstream greenhouse gas impacts<sup>111</sup> and Quebec's National Assembly has unanimously called on the Quebec government to conduct its own environmental evaluation as well. The review by Quebec will include consideration of the pipeline's cumulative impact on global climate change.<sup>112</sup> 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.<sup>113</sup> Communities potentially affected include over 180 First Nations from Saskatchewan to New Brunswick.<sup>114</sup> Municipal opposition to this project is discussed below.

A portion of Energy East will require taking a natural gas line out of service and converting it to crude oil – something that by itself is a contentious issue for local governments, industrial customers and residential consumers alike. Natural Gas companies in Quebec and Ontario are lining up against the proposal. The CEO of Gaz MÈtro said of the Energy East proposal,

“I refuse [to accept] that the Children's Hospital of Montreal pays a higher price for its gas because Western Canada needs to export its oil to the international markets. What TCPL [TransCanada Pipelines Ltd.] is asking now is that the gas customers subsidize the oil shippers and I don't believe this is in the best interests of Canada.”<sup>115</sup>

Moreover, a recent report by the U.S. Pipeline and Hazardous Materials Safety Administration (PMHMSA) raises serious concerns about the safety of pipelines repurposed from natural gas service to crude oil service.<sup>116</sup>

### *Reversal of Enbridge-ExxonMobil pipeline (Central Canada and New England)*

The oil industry faces considerable opposition to the transport of tar sands oil eastward through some of the most important natural and cultural landscapes in central Canada, Vermont, New Hampshire, and Maine. Enbridge will soon be completing its expansion of its Line 9 going through Ontario and Quebec, enabling transport of up to 300,000 bpd of Canadian tar sands oil. A portion of this oil could flow from Quebec to the United States via one of the two ExxonMobil majority-owned lines that make up the Portland-Montreal pipeline. However, the City of South Portland, Maine passed the Clear Skies Ordinance in July 2014 prohibiting the loading of crude oil into tankers in its port.<sup>117</sup> If the ordinance survives legal challenges, it will effectively block an expected reversal of this aging pipeline.

### *Obstacles to proposed rail transport*

While there is growth in the use of rail as an option to transport oil, rail options for tar sands are limited, expensive, and not likely to be a major contributor to facilitating major transportation routes for the tar sands industry. There are several reasons why moving tar sands crude-by-rail will not enable significant expansion of the tar sands industry.

### *Tar sands by rail is uneconomic*

Economic and logistical obstacles have prevented significant volumes of heavy crude such as tar sands oil from moving by rail. To date, the crude-by-rail boom has predominantly moved increasing volumes of light crude oil from North Dakota, Saskatchewan, and southern Alberta – not tar sands. Northern Alberta's tar sands are about 900 miles farther away from U.S. refinery markets than North Dakota's Bakken oil fields.<sup>118</sup>

There are other significant logistical obstacles to shipping heavy tar sands by rail that increase costs and slow capacity expansion.<sup>119</sup> Tar sands oil has to be either diluted or heated to transport it by rail and both carry additional costs. Trains moving light crude can carry nearly 30 per cent more crude than trains moving tar sands bitumen that has been diluted (700 barrels versus 550 barrels).<sup>120</sup> Heating the bitumen, coupled with specialized rail offloading and on-loading train terminals, also increases the per-barrel costs relative to transporting conventional light crude.<sup>121,122</sup>

The many factors making transport of crude by rail more complex than transport of crude by pipeline also increase the average transportation costs. 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.<sup>123</sup> With breakeven points for new tar sands production facilities ranging from \$85 to \$109 per barrel, this price increase makes rail an unattractive option for substantial tar sand transport.<sup>124</sup> Carbon Tracker's analysis of the production-level impacts of transport via Keystone XL vs. rail found that the rejection of Keystone XL would reduce tar sands expansion by 675,000 bpd because the higher cost of rail.<sup>125</sup>

Only very limited volumes of tar sands have moved by rail to major heavy crude refinery districts like the Gulf Coast. Less than 40,000 bpd of Canadian heavy conventional and tar sands crude reached the Gulf Coast by means other than pipeline in 2013.<sup>126</sup> This stands in contrast to light crude producers, who moved over 800,000 bpd by rail in December of 2013.<sup>127</sup>

Both the rail companies and tar sands producers that pioneered tar sands by rail to the Gulf – and are still responsible for much of that volume – are on the verge of insolvency because of high transportation costs. The Canexus rail facility, one of Alberta's first tar sands by rail projects, has faced substantial cost overruns, delays and declining customer support. The facility loads less than 15,000 bpd – less than 10 per cent of volumes previously forecasted – and the company has lost the majority of its market value.<sup>128</sup> The first tar sands producer to announce a long term contract to ship tar sands by rail to the Gulf in 2012 is now on the verge of bankruptcy, having lost 98 per cent of its shareholder value in the face of substantial increases in transportation costs.<sup>129</sup> These companies highlight the challenges of making tar sands by rail profitable for tar sands producers and rail companies.

While the volume of crude oil transported by rail has seen significant increases in the past few years, future increases are likely limited by logistical constraints related to competing transport demands, especially from the agricultural sector. In Canada, in 2013, record wheat and canola harvests were essentially stranded and unable to quickly reach target markets due to rail capacity displacement caused by the crude-by-rail boom.<sup>130</sup> A similar situation occurred in the United States.<sup>131</sup>

Finally, new rail regulations advocated by the National Transportation Safety Board (NTSB) and the Canadian Transportation Safety Board (TSB) will likely increase the cost of rail, making this mode of transport even less economic. The proposed amendments to Canada's Transport of Dangerous Goods regulations were published in July and include requirements for improved modifications to new tank cars carrying crude oil as well as more accurate classification of dangerous materials, including oil.<sup>132</sup> Though modest in scope, these measures will likely increase the per barrel costs of rail relative to pipelines for tar sands producers, increasing the impact of upcoming pipeline decisions on tar sands expansion. Other measures, such as the use of non-crude spacer tank cars and reduced speed for crude unit trains, could also be included in the final updated regulations, creating additional barriers for producers considering crude-by-rail in the absence of pipeline capacity.

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.

### *Rail is a niche market*

The companies behind the major heavy crude-by-rail terminal proposals have stated that rail is a niche market for a pipeline-constrained tar sands sector, not a replacement for pipelines.<sup>133</sup> Rail is viewed as a stop-gap while pipelines are viewed as essential to enable the tar sands industry's long term expansion plans. The tar sands industry doesn't have sufficient pipeline capacity to transport the 1.9 million bpd of current production and the additional 1.2 million bpd of production capacity currently under construction – much less the 6.5 million bpd of proposed tar sands expansion which wait on the sidelines.<sup>134</sup> Current tar sands producers are turning to rail as an emergency option to prevent their product from being shut in as production exceeds cross-border pipeline capacity in 2014. Both Goldman Sachs and RBC Capital have recently reiterated that despite marginal crude-by-rail volumes in Alberta, new pipelines remain critical to the expansion of tar sands production:

“We remain very, very confident that rail is here to stay not as a replacement for pipelines, but as a supplement to pipelines,”

*-Stew Hanlon, president of Gibson Energy Inc., a company proposing a rail terminal in Alberta.*<sup>135</sup>

### Declining investment

Across the tar sands industry, capital spending dropped from \$28 billion to \$17 billion between 2012 and 2013 and is forecast to remain flat through 2015 as lower prices and a lack of transport capacity has delayed greenfield projects (see Figure 4).<sup>136</sup> This has led to pared down expansion plans from Shell and Total including the suspension of both Shell's new 100,000 bpd Pierre River mine project, Total's \$11 billion dollar 160,000 bpd Joslyn North mine project and the postponement of Statoil's 44,000 bpd expansion of its Corner project.<sup>137,138,139,140</sup>

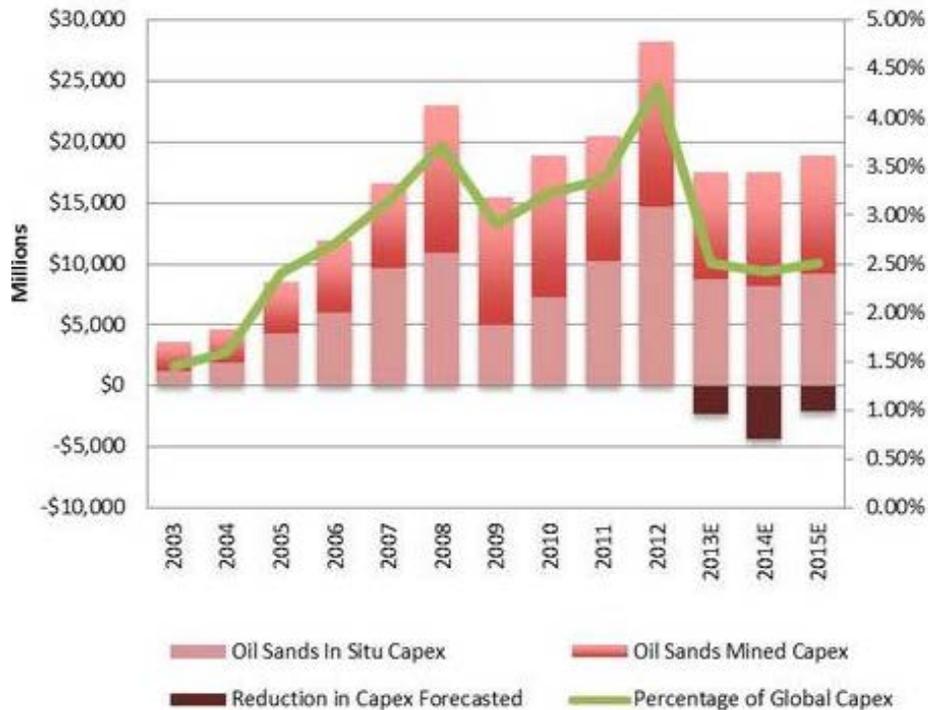


Figure 4: Declining capital investment in the tar sands<sup>141</sup>

Over two thirds of proposed tar sands expansion projects needed to achieve industry's expansion plans are not yet under construction and will require improving rather than deteriorating investment conditions to get underway.<sup>142, 143</sup>

## Social licence

The quantitative impacts of a lack of social license on a company's bottom line are difficult to determine. However, there is little question that growing public and political concern related to the environmental and social dimensions of tar sands projects has had notable implications on industry's development and expansion plans. The most prominent examples are the delays to TransCanada's Keystone XL pipeline and Enbridge's Northern Gateway pipeline in B.C. Without meaningful policies to address concerns that include water and air pollution, land disturbances, greenhouse gas emissions, health impacts, and treaty rights, it is highly likely that public opposition will continue to grow.

Tight profit margins and the cash flow needed to offset high capital costs in the tar sands sector are sensitive to drops in production volumes and bitumen pricing. As such, even if the impact of social license issues is small, it can significantly impact project economics. A recent study by CERl noted the correlation between Canadian tar sands production, social license, and market access.<sup>144</sup> In the four scenarios examined by the study, the damage of social license on production volumes and bitumen pricing is clear. In a scenario titled *Opportunity Lost*, which includes a lack of social license and restricted market access, production is forecast to flatten at 3.8 million bpd, limiting production increases by half relative to scenarios with unconstrained infrastructure expansion (see Figure 5.)

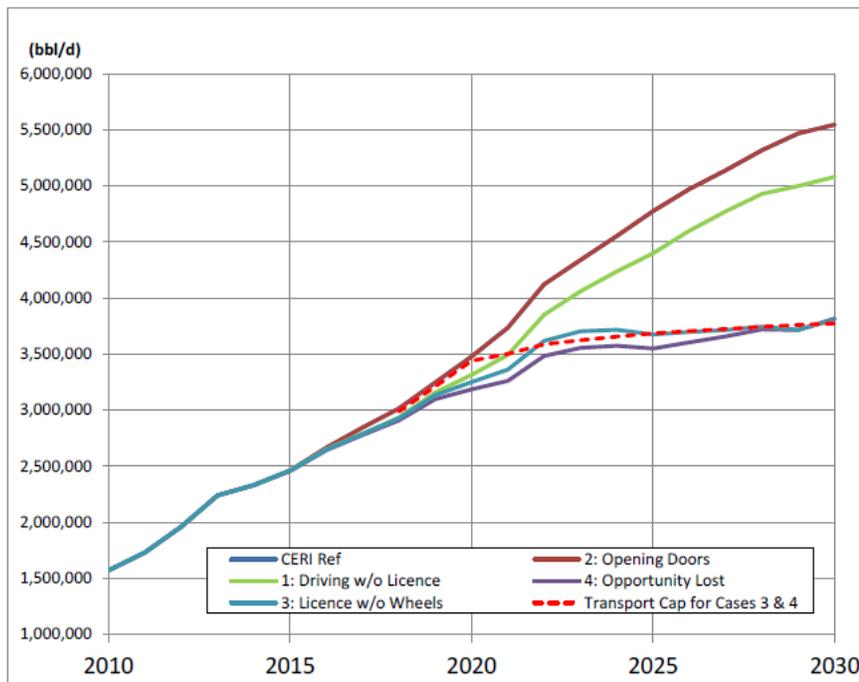


Figure 5: Approximate volume of bitumen production by case<sup>145</sup>

## Eroding public support for tar sands expansion

### *Public perception: greenhouse gas pollution and environmental protection*

Polling completed in October of 2013 for the Canadian Association of Petroleum Producers (CAPP) showed that while Canadians believe the tar sands have an important role in the Canadian economy, the majority (51 per cent) believe that, “while there is a need for energy in Canada, it does not outweigh the environmental risks with tar sands development.” Forty-nine per cent identified more with the statement, “while there are some risks to the environment with tar sands development, the need for energy in Canada outweighs those risks.” The same survey also indicated that 80 per cent of Canadians would assign the tar sands industry a grade of C or less when it comes to protecting the environment.<sup>146</sup> And a different survey found that 76 per cent of Canadians believe that, given concerns about climate change, the country should be moving away from fossil fuels and towards clean energy instead.<sup>147</sup>

Eighty-four per cent of Canadians believe that the federal government should take primary responsibility for addressing climate change with 71 per cent believing that climate change should be a federal government priority. Currently, only 16 per cent believe that combating climate change actually is a top priority for the government according to a November 2013 poll done for Canada 2020.<sup>148</sup> Literature reviews of major climate polling have shown a consistent concern for climate change among Canadians, as well as suggesting that Canadians look to government to address climate change.<sup>149</sup> A recent poll conducted by Environics shows Canadians confidence in the government’s action on climate change has dropped 6 points in a year, down to 53 per cent in late 2013.<sup>150</sup>

In late 2013, Canada was ranked 55<sup>th</sup> of 58 countries when it comes to tackling greenhouse gas pollution in a report by Germanwatch, a European think tank.<sup>151</sup> The Center for Global Development also released a report ranking Canada last on environmental issues in an analysis of the world's 27 wealthiest nations.<sup>152</sup> Canada's global reputation is being tarnished by our climate inaction.

### *Public perception: Transportation risks*

Recent Nanos polling has shown that support for the Keystone XL pipeline in Canada has dropped from 60 per cent to 47 per cent between April of 2013 and January of 2014.<sup>153</sup> Similar declines in support for the pipeline have been shown in the U.S.<sup>154</sup>

Findings from a poll conducted in British Columbia by Justason Market Intelligence for environmental organizations showed that close to two-thirds of British Columbians oppose Enbridge's Northern Gateway pipeline proposal. The results also found that 50 per cent of respondents 'strongly' oppose the project, four times more than the 12 per cent who 'strongly' support the project.<sup>155</sup>

Opposition to pipelines and tar sands is reflected in growing public mobilizations against tar sands and infrastructure in Canada and the United States. A record 2 million people submitted comments in the National Interest Determination process for the Keystone XL pipeline urging a rejection.<sup>156</sup>

Citizens from several U.S. states including Nebraska, South Dakota, and Texas (crossed by the proposed route of Keystone XL), have raised concerns about the unique issues associated with the transportation of diluted bitumen and risks posed to farmland and critical aquifers. In early 2014, for example, Nebraskan ranchers won a lawsuit overturning a new state law on eminent domain, resulting in the Keystone XL pipeline having no approved route through Nebraska.<sup>157</sup>

Communities across North America are passing motions or resolutions against the tar sands or tar sands pipelines. At the time of publication, at least 28 municipalities in Quebec had passed resolutions against TransCanada's Energy East pipeline, at least 12 municipalities in Ontario and Quebec passed resolutions against Enbridge's Line 9 pipeline 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.<sup>158</sup> In British Columbia, over 150 First Nations have now signed the Save the Fraser Declaration<sup>159</sup> that opposes Enbridge's Northern Gateway pipeline and future tar sands infrastructure project from crossing their land or salmon migration routes in the Pacific. Ten local governments in northern B.C. and the Union of B.C. Municipalities have passed motions or resolutions against the Northern Gateway pipeline or against any expansion of oil tanker traffic off the West Coast. In 2010, just south of the Washington state-B.C. border, the community of Bellingham unanimously passed a motion to shift its operations and consumption away from tar sands oil, despite rising dependency of the county's refineries on Alberta oil previous to the motion passing.<sup>160</sup>

## Eroding political support for tar sands expansion

### *Canadian federal views on greenhouse gas policy and tar sands development*

The New Democratic Party of Canada – the Official Opposition – has been heavily critical of the federal government’s failure to regulate GHG emissions from the oil and gas sector and has announced an economy-wide cap and trade system if they were to form government. The NDP has also said they would reinstate and strengthen environmental laws that were gutted in the 2012 federal budget. In a 2013 speech, the leader of the NDP, Thomas Mulcair, outlined their plan to ensure Canada was well positioned in a clean energy economy.<sup>161,162</sup> The NDP have vocally opposed the Northern Gateway pipeline as well as the Keystone XL pipeline.<sup>163,164</sup> They are conditionally supportive of west to east pipelines if there are robust environmental assessments as well as domestic refining of the oil.<sup>165</sup> Thomas Mulcair has also been vocal on how oil production and exports are artificially increasing the Canadian dollar and making Canada’s manufacturing exports less competitive, and proposed an end to federal subsidies for the tar sands.<sup>166</sup>

Under the relatively new leadership of Justin Trudeau, the Liberal Party of Canada has continued to be very critical of the government’s management of the tar sands and related environmental and climate policy. Without specifying, Trudeau has been clear that strong regulations and a price on carbon will be part of the Liberals 2015 election platform.<sup>167,168</sup> Supportive of the Keystone XL pipeline, the Liberals blame the government’s environmental and climate record for the ongoing failure to secure presidential approval of the pipeline.<sup>169</sup> The Liberal Party also supports a focus on building a cleaner energy economy.<sup>170</sup>

The Green Party platform proposes a revenue-neutral carbon price, an end to fossil fuel subsidies and a plan to move ambitiously towards a cleaner energy economy.<sup>171</sup>

### *Canadian provincial politics*

Provincial governments have been expressing concern regarding risks to tar sands production and transportation. The B.C. government has opposed the Northern Gateway tar sands pipeline proposal, unsatisfied with answers to its questions about safeguards against environmental risks. The government of Ontario has announced public hearings on TransCanada’s Energy East pipeline, the results of which will be presented to the National Energy Board.<sup>172</sup> The scope of the review will include upstream GHG impacts as well as spill and transportation risks.<sup>173</sup> 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.<sup>174</sup> 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.<sup>175</sup>

The consideration of upstream impacts has been restricted in the national pipeline hearings.<sup>176</sup> The provincial hearings may become one of the only places that the GHG impacts of tar sands expansion will be accepted and considered in the public review process.<sup>177</sup> As the climate impacts of pipelines become better known, opposition may grow amongst provinces wanting action on climate change, as well as with the public and federal opposition parties.

## *International pressure and political concern from major trading partners on climate policy and environmental protection*

Canada has faced significant scrutiny and criticism internationally for its withdrawal from the Kyoto Protocol and failure to be on track to meet its international climate targets.<sup>178,179,180</sup> President Obama has clearly tied his decision on the Keystone XL pipeline to climate change and Canada's management of emissions from the tar sands.<sup>181</sup> The President's focus on the climate impact of the pipeline is a testament to unprecedented grassroots organizing across the U.S. and North America in recent years calling for climate action and a rejection of the pipeline, opposition that is likely to grow as a decision nears.<sup>182,183</sup> Growing opposition from U.S. citizens may also bring attention to and create barriers for future projects intended to carry bitumen across the border.

## Regulations

The tar sands industry is subject to various regulatory regimes upstream, midstream and downstream. Enforcement of existing regulations alone (which are currently not being fully enforced) could significantly affect profit margins, thus impacting the pace and scale of tar sands development. Moreover, as environmental impacts of rapid tar sands development become more prominent, increased public pressure may result in further strengthening of regulatory requirements. This regulatory uncertainty results in a cost burden, which in some cases is already being incorporated by project proponents themselves via shadow carbon pricing and other accounting measures.

### Upstream regulatory constraints

#### *Greenhouse Gases*

The Canadian government has been negotiating on the design and structure of GHG regulations for the oil and gas sector since 2006.<sup>184,185</sup> At the time of writing, regulations for the oil and gas sector have yet to be presented. Prime Minister Stephen Harper said in late 2013 that these regulations could still be a "couple of years" away.<sup>186</sup> The federal government still doesn't have a single regulation to limit global warming emissions from the tar sands.

Although Canada and the U.S. have a common climate change target, emissions in Canada are expected to increase while those in the US are expected to decrease. The tar sands sector is the principal reason why Canada will not meet its Copenhagen target.<sup>187</sup> For Canada to be on track to meet its climate change target, federal GHG regulations would require a sector-wide emissions intensity improvement of at least 40 per cent and a carbon price of \$40 that gradually increases to at least \$100 per tonne by 2020.<sup>188</sup>

The current provincial regulation in Alberta requires 12 per cent emission intensity improvement (full implementation of which are delayed for nine years for new facilities) and a carbon tax of \$15.<sup>189</sup> Due to requirements for emission intensity improvements (instead of a cap on emissions), in a low carbon tax applied to only a fraction of emissions, and access to unlimited low cost offsets, emissions from the sector and the province are rapidly growing as tar sands production increases.

According to the Pembina Institute, the maximum cost of the sector’s compliance with existing provincial GHG regulation would be only \$1.80 per tonne, were it applied to all carbon emissions produced.<sup>190</sup> The Institute estimates that potential federal GHG regulations that are consistent with Canada’s Copenhagen commitment would cost tar sands producers between \$3.82 and \$5.73 per barrel of bitumen produced.<sup>191</sup>

Table 2: The impacts of carbon pricing to tar sands production costs

Regulatory Scenario	Current Alberta: 12 per cent - \$15/tonne	Strengthening: 40 per cent - \$40/tonne	IEA - 2 deg limit 100 per cent - \$120/tonne
Per Barrel Costs	\$/Bbl		
In situ	0.13	1.18	8.88
Mining	0.13	1.17	8.76
Per cent of Average Breakeven Costs*	per cent		
In situ	0.15 per cent	1.63 per cent	10.4 per cent
Mining	0.12 per cent	1.11 per cent	8.3 per cent
*Breakeven costs range from \$84.99/Bbl for new in situ and \$105.50/Bbl for new mining operations. <sup>192</sup>			

Canada’s current federal government has publicly stated it is not in favour of an economy-wide price on carbon. However, both the federal Liberal and New Democratic Party have stated their support for a price on carbon and stronger regulations to control Canada’s rising GHG emissions.<sup>193,194, 195</sup>

Canada has fixed elections, with the next election currently scheduled for October 19<sup>th</sup>, 2015.<sup>196</sup> If either the New Democratic or Liberal parties receive a majority or minority mandate, it is reasonable to assume tar sands operators can expect significant changes to Canadian GHG emissions management. Historically, the Conservative government has also supported cap and trade models, and it is plausible to imagine a change of position that results in an economy-wide carbon price in the future. Any strengthened greenhouse gas policy would need to address carbon emissions from the tar sands, further risking the industry’s expansion plans.

### *Air pollution and health impacts*

Alberta’s Ambient Air Quality Objectives (AAAQO’s) establishes limits for ambient pollutant concentration for over 50 air pollutants. The levels are intended to provide protection of the environment and human health but also consider technical, economic, social, and political feasibility.<sup>197</sup> Because of these caveats, the limits should not be considered as a level of pollution that can be maintained without causing adverse effects to humans or the environment. In the tar sands region, of greatest concern are fine particulate matter (PM<sub>2.5</sub>), nitrogen dioxide, and sulphur dioxide.

A recent Government of Alberta report found 18 instances in 2012 where levels of nitrogen dioxide and sulphur dioxide exceeded government warning levels. Despite a

warning that the maximum limit was approaching, the government announced that it would simply continue to monitor rather than require pollution reduction.<sup>198</sup> Recent regulatory submissions that predict the cumulative impacts to air quality in the tar sands region have identified exceedances of the nitrogen dioxide and PM<sub>2.5</sub> ambient air quality objectives in regional communities and in the case of nitrogen dioxide they indicate that the exceedances are “due to the addition of planned projects in the region.”<sup>199</sup>

Projected air pollution based on planned oilsands development

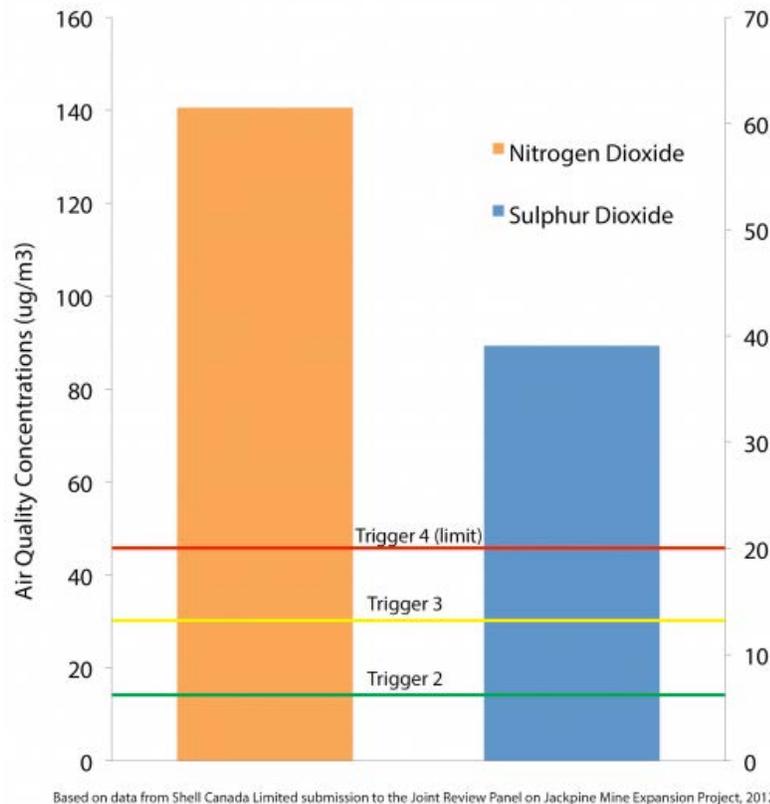


Figure 6: Projected air pollution based on planned tar sands development

A growing body of scientific evidence strongly suggests that airborne pollutants from tar sands operations include toxic constituents that are carcinogens (cancer-causing chemicals). A 2009 study published by the National Academy of Sciences showed that the snow and water in an area extending outward 30 miles from upgrading facilities at Fort McMurray contained high concentrations of pollutants associated with fossil fuels, known as polycyclic aromatic hydrocarbons (PAHs).<sup>200</sup> A follow up study in 2014, published by the National Academy of Sciences, modeled the PAH levels measured in the tar sands region and found that environmental impact studies conducted by the tar sands industry in support of further development have systematically underestimated PAH emission levels and thus did not adequately account for human health risks.<sup>201</sup> In a landmark study published in the November 2013 issue of the journal *Atmospheric Environment*, scientists noted the presence of elevated levels of numerous hazardous air pollutants near major upgrading facilities just north of Edmonton. Among the pollutants found at elevated levels, many are carcinogens, including benzene and styrene.<sup>202</sup> The study also noted

elevated rates of leukemia and other cancers of the lymph and blood-forming systems in areas surrounding upgrading and petrochemical manufacturing facilities just north of Edmonton. Further, this same study also noted that experts have found similar elevated risks in other populations living downwind of industrial facilities with similar emissions, which have also been linked to increased rates of leukemia and childhood lymph hematopoietic cancers.

The impacts of increased air pollutants and noxious odors from excavating tar sands have been the subject of significant attention in the remote community of Peace River.<sup>203</sup> There, the Alberta Energy Regulator is finally responding to years of reports by residents that emissions and odors from tar sands drilling and processing are making them sick.<sup>204</sup> According to news reports, public hearings began in early 2014 following complaints that the tar sands operations have caused nausea, headaches, skin rashes, memory loss, joint pain, exhaustion, and respiratory problems, and have forced several families to leave the area.<sup>205</sup>

### *Water and Tailings*

The total amount of freshwater used by tar sands mining operators has grown at a rate of 5.2 per cent per year since 2005, reaching 167.0 million m<sup>3</sup> in 2013.<sup>206</sup> Total freshwater use in all tar sands operations (including mining, in situ and upgrading) has grown at a rate of 4.6 per cent per year since 2005, reaching 185 million m<sup>3</sup> in 2013.<sup>207</sup> The 2013 total is the equivalent to filling 200 Olympic-sized swimming pools with freshwater every day. Total freshwater use in 2022 is projected to reach 282 million m<sup>3</sup>.<sup>208</sup>

The Athabasca River is subject to declining long-term flow rates due to the implications of climate change and reduced glacial flow. It is expected that runoff below Fort McMurray will decrease by 30 per cent by 2050.<sup>209</sup> Under these conditions stricter regulations governing withdrawals during low-flow periods will be imperative. Companies will need to invest in onsite water storage facilities or, in a worst case scenario, may have to shut down if there is a string of years during which the river is drier than normal.<sup>210</sup> It is also possible that a new transboundary agreement with the Northwest Territories government, currently underway and nearing completion, will require additional action not only on monitoring but in limiting impacts to downstream territorial communities.<sup>211</sup>

Tailings are stored in large settling basins, referred to as tailings lakes, which currently cover approximately 176 square kilometres of the landscape.<sup>212</sup> Typically, tailings lakes, which contain liquid toxic waste from the tar sands, account for between 30 to 50 per cent of a mine's total footprint.<sup>213</sup> The current volume held in these lakes is approximately 830 million cubic meters.<sup>214</sup> For each barrel of bitumen produced, 1.5 barrels of tailings waste will be added to the landscape.<sup>215</sup>

For more than 40 years, tailings management in Alberta was voluntary. In 2009, the Energy Resources Conservation Board (ERCB) announced *Directive 074: Tailings Performance Criteria and Requirements for Tar sands Mining Schemes*. Directive 074 requires tar sands companies to capture and dry a minimum proportion of their new tailings waste, and to continue to reduce the rate of liquid tailings stored on the landscape each year.<sup>216</sup> No tar sands company has met tailings requirements under Directive 074,<sup>217</sup> Despite this, the province has yet to issue any fines or penalties for the tar sands companies. Furthermore, 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.

Table 3: ERCB 2012 Tailings Management Assessment Report data, June 2013

	Project tailings capture requirements	Accepted tailings captured
Suncor	30.0 per cent	8.5 per cent
Syncrude (Mildred Lake)	12.0 per cent	8.8 per cent
Shell (Muskeg River)	23.5 per cent	8.8 per cent
Shell (Jackpine)	15.0 per cent	0.0 per cent

Despite significant capital investments in research and development, new tailings technologies have not advanced at the rate that industry and government had expected. While avoiding questions around the impact of tailings on the environment, Alberta justified its lack of enforcement by saying its targets were “too optimistic” and that companies appear to be “doing what they can” to meet the directive.<sup>218</sup> The Alberta government is currently drafting a Tailings Management Framework, which will require companies to reduce tailings, but allow for existence of tailing ponds beyond a mine’s operational life.<sup>219</sup>

#### *Land use regulations*

Tar sands deposits are leased from the Crown to the highest bidder via a public offering. These leases include the right to the minerals associated with a particular piece of land for a set time period in exchange for a bonus payment, annual rent, a fee, and royalty on recovered minerals.<sup>220</sup> These lease agreements convey the right to “drill for, win, work, recover and remove” tar sands that are owned by the Crown.

As of January 2013, the Alberta government had granted 93,000 square kilometres of tar sands leases.<sup>221</sup> Of this amount, nearly the entire minable region – or 4,750 square kilometers – has already been leased. The remaining 88,250 square kilometers has been leased for in situ drilling activity. The total amount of tar sands deposits suitable for in situ extraction underlies approximately 135,250 square kilometres.

To date, about 715 square kilometers of land have been disturbed by tar sands mining activity.<sup>222</sup> According to the *Alberta Environmental Protection and Enhancement Act* (EPEA) regulations, the objective of land reclamation is to return the land to “an equivalent land capability,” which means that “the ability of the land to support various land uses after conservation and reclamation is similar to the ability that existed prior to an activity being conducted on the land, but that the individual land uses will not necessarily be identical”.<sup>223</sup> There are no binding reclamation timelines within EPEA. To date, only 0.15 per cent of land disturbance due to mining activities has been certified as reclaimed.<sup>224</sup>

Due to land disturbances, a number of species, including the woodland caribou, are declining.<sup>225</sup> Forests and sensitive ecosystems have been decimated. Federal and provincial governments have yet to implement a legally required recovery strategy for the declining caribou population.

## Midstream regulatory constraints

### *Pipeline*

Any new pipeline that crosses the international border between the U.S. and Canada must receive a so-called “Presidential Permit” before it can be constructed.<sup>226</sup> Under this permitting process, designated federal agencies provide the U.S. State Department with input regarding the propriety of granting such a permit and the U.S. State Department is obligated to undertake a complete environmental impact study of the proposed pipeline. Following the controversy over the proposed Keystone XL pipeline, the Presidential Permitting process has become a significant regulatory hurdle for any new tar sands oil pipeline. Because of this, the transportation constraints experienced by tar sands producers are likely to remain a long-term challenge.

### *Rail*

Accidents, such as the tragedy of Lac MÈgantic, involving oil tanker railcars have led to calls from all sectors for updated rail safety regulation applicable to transporting crude oil by rail. Draft regulations require that new tanker cars have improved and strengthened designs, which are likely to increase the premium producers pay to ship crude by rail (as compared to pipelines.) The risk of increased transport costs places additional pressure on the narrow profit margins realized by tar sands producers.<sup>227</sup>

### *Barge*

Recent moves by the Governor of New York signal a new era of scrutiny for movement of crude oil by barge. In an April 30, 2014 announcement, Governor Cuomo called on the state to enact new regulations applicable to rail-to-barge operations that could limit the location and timing of such activities.<sup>228</sup>

## Downstream regulatory constraints

The tar sands are particularly exposed to the risks of downstream regulatory constraints. Because of the long lifecycle of a tar sands project and given that 70 per cent of the lifecycle emissions from the tar sands are exposed to regulations in jurisdictions where they are purchased—including refining increases that percentage to 80 per cent—future carbon pricing and regulation in a major market would have a significant impact on the industry. Examples of such precedent-setting downstream policies are emerging in key markets such as Europe and California.

### *Fuel Quality Directive (FQD) - European Union*

The fuel-quality directive (FQD) is a policy instrument designed to support the European Union’s commitment to reduce GHG emissions from the transportation sector by 20 per cent by 2020. To help fulfill this goal, suppliers of transport fuels must reduce the life cycle GHG intensity of their transportation fuel products by six per cent by 2020 (relative to 2010).<sup>229</sup> Though it once singled out high carbon fuels such as tar sands, the current proposal does not due to high-pressure lobbying from the Canadian government and tar sands producers.<sup>230</sup> Nevertheless, the measure is an important first step by the EU in what will be a long-term effort to lower its transportation sector’s emissions and will allow member states to track feedstocks entering the European market.<sup>231</sup> Further, the European Commission’s inherent power

to revise baseline GHG intensity values over the current period of implementation could force fuel suppliers to avoid high carbon fuels in the event that the carbon intensity is not moving in a downward direction.<sup>232</sup>

Life-cycle based fuel standards can constrain the number and size of markets available to tar sands operators. According to the EU's analysis, tar sands bitumen emits on average 22 per cent more GHGs on a life-cycle basis than the average conventional crude oil currently being processed in the EU.<sup>233</sup> Because of this GHG gap, directives can be designed to force distributors to limit the amount of tar sands in their feedstock mix in order to meet lowering carbon intensity targets.

A strengthened fuel-quality directive could make future tar sands producers less competitive against other, less GHG-intensive fuel producers. This would remove a large target market from the table for tar sands producers, placing serious constraints on the viability of any major expansion plan.

### *Low Carbon Fuel Standard (LCFS) – California*

The California Low Carbon Fuel Standard (LCFS), adopted in 2009 by the California Air Resources Board, is designed to decrease the GHG intensity of California's transportation fuel pool (excluding aircraft, military operations, trains and ships). The LCFS seeks to reduce the carbon-intensity of California's transportation fuel pool by 10 per cent by 2020.<sup>234</sup> As a performance-based, technology-neutral standard, the LCFS provides suppliers with the flexibility to reduce emissions through innovations across the fuel supply chain, including integrating advanced biofuels, cleaner electricity, biogas, or even cleaning up petroleum facilities. Suppliers are rewarded with credits for fuels with lower carbon-intensities and deficits for fuels with higher carbon-intensities, relative to a baseline in 2010.<sup>235</sup> The carbon-intensity of any given fuel is calculated using a lifecycle approach, or "well-to-wheels" (WTW), to assess the full greenhouse gas emissions of the fuel. Average WTW emissions for tar sands products rank among the highest in the LCFS framework, with values of 106 to 111 grams of CO<sub>2e</sub> per mega joule of energy.<sup>236</sup>

The California LCFS could threaten future investment in the tar sands by constraining the number of markets in which it can be sold unless emissions are reduced. Its performance approach provides incentives for importers, refiners and wholesalers to reduce their consumption of high carbon fuel sources, such as tar sands bitumen, while increasing their production and use of lower-carbon fuels.

### *Future low-carbon fuel standards in the United States*

It is clear that low carbon fuel standards pose an increasing risk for tar sands producers who ultimately may have a product they cannot sell. Unless significant GHG improvements are achieved in the tar sands, it is likely that additional markets will close or establish a competitive advantage for lower-carbon fuel sources. Other jurisdictions considering implementing a low-carbon fuel standard include Washington, Oregon, and the Northeast and Mid-Atlantic states.<sup>237</sup>

### *Canadian lobbying (as evidence of a threat)*

The Canadian government has launched an unprecedented lobby campaign in Europe and the United States to protest these clean fuel standards. The goals of the campaign include, "defending Canada's image as a responsible energy producer and steward of the environment including climate change issues; and to ensure non-

discriminatory market access of tar sands derived products.”<sup>238</sup> This strategy included no fewer than 110 lobby meetings between Canadian and European officials in 2010 alone regarding the FQD.<sup>239</sup>

The Government of Canada has been clear regarding its concerns about the FQD, stating:

“You can have all the oil and gas in the world, but it’s not much good if you can’t get it to market...the FQD could stigmatise the oil from Canada and impact on our access to some markets. It would clearly not be helpful. While the growth in demand is not as high [as in Asia], Europe is the biggest single market in the world right now.”<sup>240</sup>

## Carbon constrained future

It’s become increasingly clear that the world can’t burn all of the oil we know about, without devastating consequences. The International Energy Agency’s World Energy Outlook (2012) estimated that only one-third of proven global fossil fuel reserves can be burned between now and 2050 in order to have a 50 per cent chance of limiting global warming to two degrees Celsius.<sup>241</sup> The Intergovernmental Panel on Climate Change uses a 100-year timeframe for its warming analysis and estimates that only one-quarter to one-seventh of known fossil fuel reserves can be burned over the next 100 years.<sup>242</sup> The balance—the vast majority of fossil fuel reserves, no matter what figure one uses—has been called ‘unburnable carbon.’ Placing these numbers in context, current rates of fossil fuel consumption would have us crossing into “unburnable” territory by 2030.<sup>243</sup>

There is growing concern within the financial community around high risks of long-term investment in carbon 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” in order to avoid catastrophic climate change.<sup>244</sup> A group of 70 global investors managing more than \$3 trillion of collective assets have launched the first-ever coordinated effort to demand the world’s 45 top oil, coal, gas and electric power companies assess the financial risks found in scenarios of unburnable reserves.<sup>245</sup>

Public divestment campaigns are also gaining traction, calling on institutions such as universities, churches and pension funds to divest from fossil fuels both as a risk aversion strategy in the face of unburnable reserves and as an ideological challenge to institutions to stop investing in products that exacerbate climate change.<sup>246</sup> High profile advocates, including Archbishop Desmond Tutu, are calling for divestment similar to that which happened during the Apartheid era in South Africa.<sup>247</sup>

In the face of mounting carbon constraints, tar sands projects are particularly vulnerable because of their long investment horizons. While conventional crude oil projects like wells could produce a significant portion of their total oil within 18 months, tar sands projects take significantly longer to reach even initial production phases. This leaves capital investments exposed for much longer and in conditions where risk is growing.

## Tar sands: Marginal national economic contributions

Crude oil from Canada’s tar sands is among the most expensive in the world to produce<sup>248</sup> and significant processing is required to upgrade bitumen extracted into

useable fuels.<sup>249</sup> The tar sands sector accounts for a small portion of Canada's national GDP and is expected to stay marginal even under the most optimistic growth scenarios.

### Tar sands are a marginal contributor to national GDP and federal government revenues

Industry reports and news articles regularly paint the tar sands as the “economic engine” or the “giant” of Canada's economy.<sup>250,251</sup> However, Canada's unconventional oil and gas sector, which consists primarily of tar sands, contributed just 2 per cent to national GDP in 2013.<sup>252</sup> The sector has grown at an annualized rate of 8.4 per cent per year since 2007.<sup>253</sup> Despite rapid growth in this subsector, its overall contribution to economic growth in Canada remains small and does not drive national economic growth.

Despite the increase in the tar sands share of GDP, overall the energy sector has consistently lagged behind other major sectors when it comes to economic growth.<sup>254</sup> Between 2006 and 2013, the energy sector has accounted for an average of just over 1 per cent of GDP growth in Canada. The International Monetary Fund reports that if tar sands expansion were to occur slower than planned, Canada's GDP would be 0.5 percentage points lower in 10 years than it would have otherwise been.<sup>255</sup> In a scenario where tar sands growth proceeds with zero restrictions, Canada's GDP would be two percentage points higher in 10 years.<sup>256</sup>

Sector profit margins in the tar sands have also declined significantly according to Statistics Canada from 21.5 per cent in 2005 to 8.5 per cent in 2011, leading to a decrease in collected taxes from industry that are paid on net revenue.<sup>257</sup> The oil and gas sector accounted for 8 per cent of taxable corporate income in the country in 2006, a number that had dropped to 4.3 per cent by 2011.<sup>258</sup> The industry has been helped somewhat in the past decade by decreases in corporate income taxes in Canada, a trend that is unlikely to be sustained in the near future.<sup>259</sup>

The oil and gas sector paid \$1.3 billion in federal corporate income taxes in 2012, representing 0.5 per cent of total government revenues. The oil and gas share of total taxes paid fell from 9.4 per cent in 2006 to 3.7 per cent in 2012.<sup>260</sup>

Canada's federal government currently provides significant subsidies to the oil sector, primarily through tax expenditures, i.e. subsidies in the form of reduced taxes that oil companies pay. Estimates by the OECD and the International Institute for Sustainable Development value these subsidies at between \$0.5 and \$1.4 billion per year.<sup>261,262</sup> At the upper end of this estimate, foregone annual tax revenues are potentially larger than the annual taxes the federal government collects.

The Conference Board of Canada estimates that total federal revenues over the period of 2012-2035 from the tar sands are \$45.3 billion, working out to an average of \$1.9 billion per year. Total expected federal government revenues were \$264 billion in 2013/14 and are expected to grow to \$318.9 billion by 2017/18.<sup>263</sup> Interestingly, \$1.9 billion represents just 0.6 to 0.7 per cent of these amounts, far from a significant contribution and insufficient to support the federal government's promises of health care, schools and housing across Canada.<sup>264</sup>

## Alberta's challenge and the bitumen bubble

In fiscal year 2011/12, natural resource revenues in Alberta were equal to \$11.7 billion, accounting for nearly 30 per cent of the Alberta government's \$39.5 billion in total revenues. Of these revenues, \$4.8 billion came from bitumen royalties.<sup>265,266</sup>

In its 2012/13 budget, the Alberta government put forward an optimistic forecast for oil prices that exceeded private market expectations.<sup>267</sup> Based on this forecast, it estimated bitumen royalties of \$5.6 billion in 2012/13, and set targets of \$7.6 billion in bitumen royalties in 2013/14 and \$9.9 billion in 2014/15.

In 2012, oil prices fell short of the Government of Alberta's forecasts, and the differential between the North American price of oil (Western Texas Intermediate (WTI)) and the mid-continental heavy oil price (Western Canadian Select (WCS)), sharply increased. The combination of both events led to what then Premier Alison Redford termed the "bitumen bubble" and a warning of an austerity budget for 2013.<sup>268</sup> The 2013 budget revealed a \$6.2 billion shortfall in forecasted natural resource revenues.<sup>269</sup> Of that, \$4.2 billion came from lower than anticipated bitumen royalties, which fell to an estimate of \$3.4 billion in 2013, a decrease of 56 per cent from the government's target of \$7.6 billion from just one year prior.<sup>270</sup>

Alberta's experience with the bitumen bubble in 2013 is one example of a longer-term trend in revenue volatility in the province. A report from the C.D. Howe Institute in 2010 found that from 1982 to 2007, the annual per cent change in Alberta's real per capita own-source revenues exceeded 10 per cent on nine occasions.<sup>271</sup> Conducting further analysis, the report concluded that, over the period considered, Alberta's own source revenues were more than twice as variable as Saskatchewan, British Columbia and Ontario.<sup>272</sup> When excluding resource revenues from the analysis, however, it found that Alberta's revenues were no more volatile than the other provinces – a clear indication that Alberta's revenue volatility can be linked back to its over-reliance on resources.<sup>273</sup>

At some point, Albertans, and even the Alberta government, may decide that this financial and economic volatility is not in the best interest of the province. The conclusion they may reach is to cease the single-minded focus on developing energy resources, in particular the development of the tar sands, and instead diversify the economy towards other forms of energy and other forms of economic activity.

## Inequality of provincial benefit from oil and pipeline development

Government, industry and the media regularly bill the Energy East and Northern Gateway pipeline proposals as "nation building" projects for Canada.<sup>274</sup> Similarly, rarely does government or industry comment on Keystone XL without highlighting the national benefits that are at stake – claims of tens of thousands of jobs for Canadians, billions of dollars in economic activities, and the tax revenues<sup>275</sup> from tar sands expansion that will pay for social services for the entire country.

Recent reports from CERI and the Conference Board of Canada show that while most provinces will receive some benefit from future tar sands development, the vast majority of benefits are concentrated in Alberta. Over the period of 2010 to 2035, the CERI report finds that 95 per cent of the GDP benefit and 86 per cent of new employment opportunities will be realized in Alberta.<sup>276</sup> Ontario is second on both

accounts, receiving approximately 3 per cent of the GDP benefit and 7 per cent of jobs, followed by British Columbia, Quebec, Saskatchewan and Manitoba.

In recent years, there has been a rapid emergence of transportation infrastructure proposals —pipelines and rail — for transporting tar sands to the east and west coasts of Canada. Provinces and communities across the country carry the risk of spills or other failings in this infrastructure. The Line 9 pipeline reversal was recently approved despite an international pipeline expert finding a high risk of rupture, and concluding that the leak detection system and emergency response plans along much of the pipeline are inadequate.<sup>277</sup> The Lac MÈgantic disaster caused incalculable loss at the time of the derailment, and with MM&A filing for bankruptcy and other private companies contesting the order to contribute to the costs of environmental cleanup, it is unclear how these costs will be covered.<sup>278</sup> To date, the federal government has committed to paying 50 per cent of the costs, which were most recently estimated at \$400 million.<sup>279</sup>

### Impacts of an oil-linked currency on provinces and other sectors

Over the period of 2001 to 2013, the correlation between the Canadian dollar and the WTI oil price was 92 per cent.<sup>280</sup> The rise in oil prices over this period corresponded to a steadily increasing value of the Canadian dollar, which rose from a low of \$0.62US in 2002 to a high of \$1.10US in 2007.<sup>281</sup> The value of the Canadian dollar dropped with the price of oil in the 2008 recession, recovered and remained near parity from late 2010 to 2012.<sup>282</sup> In 2013, it declined below parity and has fallen further to approximately \$0.89US in late 2014.<sup>283</sup>

In the manufacturing sector of Canada's economy, the high dollar has had a negative impact, increasing the relative cost of Canadian manufactured goods on the international market.<sup>284</sup> This has led to weak international demand for Canadian goods and services and low capital investment in the manufacturing sector over the last decade.<sup>285</sup> Since 2000, investment in Canada's manufacturing sector has remained relatively stagnant and manufacturing's share of total investment has fallen from 15.3 per cent in 2000 to 8.2 per cent in 2012.<sup>286</sup> Bank of America Merrill Lynch has blamed the 11 per cent decline in Canadian manufacturing production and the 24 per cent decline in employment in the sector on the strengthening Canadian dollar.<sup>287</sup> The OECD concurs, linking the downturn in Canada's manufacturing sector to the booming energy sector that has boosted the loonie *vis à vis* the U.S. dollar.<sup>288</sup> Between 2004 and 2010 alone, that meant 550,000 lost jobs lost in the manufacturing sector.<sup>289</sup>

The decline in Canadian manufacturing is most apparent in the manufacturing-heavy provinces of Quebec and Ontario. From 2000 to 2012, real GDP growth in Quebec and Ontario was 20.4 per cent and 19.0 per cent respectively, lagging behind the provincial nation-wide average of 25.0 per cent.<sup>290</sup> Over the same time period Alberta led all provinces with real GDP growth of 40.5 per cent.<sup>291</sup> But despite the Alberta economic boom, employment in manufacturing in that province still declined by 11,000 jobs between 2002 and 2012.<sup>292</sup>

### Insignificant contribution to direct job creation

The tar sands provided direct employment to 22,340 workers in 2012, representing only 0.2 per cent of Canada's full-time work force.<sup>293,294</sup> The entire oil and gas sector (consisting of tar sands, conventional exploration and production, oil and gas services and pipelines) directly employed 195,200 workers in 2012, or 1.4 per cent of

Canada's full-time workforce.<sup>295</sup> For comparison, the retail sales sector provided direct employment to 3.9 per cent of Canada's workforce in 2012 and the manufacturing sector provided 5.4 per cent.<sup>296</sup>

Estimates of direct, indirect and induced employment from the tar sands range from 351,000 to 468,000 jobs in 2012, representing between 2.5 and 3.3 per cent of Canada's full-time workforce.<sup>297,298,299</sup> Including induced employment—those jobs created by employees spending money in the local economy—may be a dubious effort to inflate economic benefits. Regardless, these totals are still less than the direct contribution of the retail sales sector and the manufacturing sector. Investment in any industry will create indirect and induced jobs through a multiplier effect. As a relatively capital intensive industry, the job creation potential of developing the tar sands is significantly less than other industries. For example, a \$1 million investment in oil and gas creates two direct and indirect jobs, whereas a \$1 million investment in clean energy creates nearly 15 direct and indirect jobs.<sup>300</sup>

## Conclusion

The tar sands industry has successfully propagated a narrative in Canada wherein the continued rapid development of the tar sands is seen as inevitable. But as the risks and challenges highlighted above clearly show, there are many obstacles to continued tar sands expansion and the future for this industry is an open question. Furthermore, it is clear that the expansion of the tar sands industry is tied directly to whether it has access to new pipelines such as Keystone XL or Northern Gateway and that industry will need all of these transportation options to reach its production goals.

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 and in the future, that number may be even smaller.

The undeniable conclusion is that investment in the tar sands carries serious risks, including price volatility, growing public opposition, increased regulation and other factors. Individually, each of these risks is 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, including the U.S., are investing in the growing renewable energy 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.

It's clear that Canadians have a choice about the role the tar sands industry will play in shaping our economy and our environment. Given that tar sands expansion is not only inevitable but significantly challenged, Canadians should give some thought to the future we wish for our country, and the role of the tar sands in that future.

# Endnotes

- 
- <sup>1</sup> NASA. (2014). *Consensus: 97% of climate scientists agree*. Retrieved from: <http://climate.nasa.gov/scientific-consensus/>
- <sup>2</sup> Intergovernmental Panel on Climate Change. (2014). *Fifth Assessment Synthesis Report*. p. SYR-24. Retrieved from: [http://ipcc.ch/pdf/assessment-report/ar5/syr/SYR\\_AR5\\_LONGERREPORT.pdf](http://ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_LONGERREPORT.pdf)
- <sup>3</sup> National Oil Sands Task Force. (1995). *The Oil Sands: A New Energy Vision for Canada* (1995). p. 33.
- <sup>4</sup> The Canadian Association of Petroleum Producers (2013) *Crude oil forecast, markets and transportation*. Retrieved from: <http://www.capp.ca/forecast/Pages/default.aspx>
- <sup>5</sup> U.S. Department of State, *United States Climate Action Report 2014, First Biennial Report of the United States of America, Sixth National Communication of the United States of America*, January 1, 2014, p. 18.
- <sup>6</sup> Obama, B. (2013). *Remarks by the President on climate change*. Retrieved from: <http://www.whitehouse.gov/the-press-office/2013/06/25/remarks-president-climate-change>
- <sup>7</sup> White House. (2014). *FACT SHEET: U.S.-China Joint Announcement on Climate Change and Clean Energy Cooperation*. Retrieved from: <http://www.whitehouse.gov/the-press-office/2014/11/11/fact-sheet-us-china-joint-announcement-climate-change-and-clean-energy-c>
- <sup>8</sup> International Energy Agency. (no date). *Resources to Reserves – Executive Summary*. Retrieved from [http://www.iea.org/textbase/npsum/oil\\_gasSUM.pdf](http://www.iea.org/textbase/npsum/oil_gasSUM.pdf), p. 17.
- <sup>9</sup> Environmental Defence. (2014). *Canadians dramatically overestimate the contribution of tar sands to Canadian economy*. Retrieved from: <file:///C:/aDale%20Marshall%20-%20EDC/Inevitability%20paper/ED%20polling.pdf>
- <sup>10</sup> Energy Mix. (2014, October 3). *BREAKING: Clean Energy Employs More Canadians Than Tar Sands/Oil Sands*. *Energy Mix*. Retrieved from: <http://smartershift.com/energymix/2014/10/03/clean-energy-employs-more-canadians-than-tar-sandsoil-sands/>
- <sup>11</sup> Canadian Association of Petroleum Producers. (2014). *Crude Oil forecasts, markets, and transportation*. Retrieved from: <http://www.capp.ca/forecast/Pages/default.aspx>
- <sup>12</sup> Author calculations; data source: Oilsands Review. (2014). *Oilsands Projects – Statistics*. Retrieved from <http://www.oilsandsreview.com/statistics/projects.asp>
- <sup>13</sup> Leach, A. (2014, April 2). *How large will the oil sands sector grow? Maclean's*. Retrieved from: <http://www.macleans.ca/politics/ottawa/andrew-each-on-th-oil-sands/>
- <sup>14</sup> Williams, N. (2014, June 9) *Canadian oil industry body cuts long term production forecast*. *Reuters*. Retrieved from <http://www.reuters.com/article/2014/06/09/canada-oil-capp-idUSL2N00Q12J20140609>
- <sup>15</sup> *Ibid.*
- <sup>16</sup> National Energy Board. (2013). *Canada's Energy Future 2013: Energy Supply and Demand Projections to 2035*. pp. 38–39.
- <sup>17</sup> Government of Canada. (2014). *Canada's Sixth National Report on Climate Change — 2014*, p. 85–86.
- <sup>18</sup> Ross, E. (2014, January 19). *Canadian greenhouse gas emissions forecast to grow beyond 2020*. *Business Vancouver*. Retrieved from: <http://www.biv.com/article/2014/1/canadian-greenhouse-gas-emissions-forecast-to-grow/>
- <sup>19</sup> Energy Resources Conservation Board. (2013). *ST98-2013: Alberta's Energy Reserves 2012 and Supply/Demand Outlook 2013-2022*. Retrieved from <http://www.aer.ca/documents/sts/ST98/ST98-2013.pdf>
- <sup>20</sup> Environment Canada. (2013). *National Inventory Report: Greenhouse Gas Sources and Sinks in Canada 1990-2011*. Table 2-13.
- <sup>21</sup> Parrington, P. (2014). *Oilsands talking point collides with reality*. Retrieved from: <http://www.pembina.org/blog/787>.
- <sup>22</sup> *Ibid.* p. 84. The analysis notes that “under a scenario where historical trends in intensity reductions continue, oil sands emissions could be 10 per cent lower in 2020 than under the reference scenario assuming a 10-year moving average.”
- <sup>23</sup> Pembina Institute calculation; data sources: i) Canadian Association of Petroleum Producers. (2013). *CAPP Statistical Handbook 2013*. Retrieved from <http://statshb.capp.ca/SHB/Sheet.asp?SectionID=3&SheetID=85>; ii) Environment Canada. (2014). *National Inventory Report 2014*. Retrieved from

- 
- [http://unfccc.int/national\\_reports/annex\\_i\\_ghg\\_inventories/national\\_inventories\\_submissions/items/8108.ppt](http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8108.ppt); iii) Environment Canada. (2013). Canada's Emissions Trends (2013). Retrieved from <http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=1723EA20-77AB-4954-9333-69D1C4EBD0B2>.
- <sup>24</sup> Environment Canada. (2013). *Canada's Emissions Trends 2013*. p. 25. Retrieved from <http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=1723EA20-77AB-4954-9333-69D1C4EBD0B2>.
- <sup>25</sup> *Ibid.*
- <sup>26</sup> International Energy Agency. (no date). *Resources to Reserves – Executive Summary*. Retrieved from [http://www.iea.org/textbase/npsum/oil\\_gasSUM.pdf](http://www.iea.org/textbase/npsum/oil_gasSUM.pdf), p. 17.
- <sup>27</sup> Energy information Administration. (2009). *Meeting the World's Demand for Liquid Fuels: A Roundtable Discussion*. [Presentation slides]. A new Climate for Energy conference, Washington D.C. Retrieved from <http://www.eia.gov/conference/2009/session3/sweetnam.pdf>, p. 11.
- <sup>28</sup> IHS CERA. (2013). *Extracting Economic Value from the Canadian Oil Sands Upgrading and Refining in Alberta (or not)?* Special Report. p. 4.
- <sup>29</sup> *Ibid.*
- <sup>30</sup> Lewis, J. (2013, May 28). Oil sands mines face growing challenges as supply costs rise. *Financial Post*. Retrieved from: [http://business.financialpost.com/2013/05/28/oil-sands-mines-face-growing-challenges-as-supply-costs-rise/?\\_isa=5191-4b51](http://business.financialpost.com/2013/05/28/oil-sands-mines-face-growing-challenges-as-supply-costs-rise/?_isa=5191-4b51)
- <sup>31</sup> Canadian Energy Research Institute. (2014). *Canadian Oil Sands Supply Costs and Development Projects (2012-2048)*. Study No. 141. p. 2.
- <sup>32</sup> CME Group. (2014). *Crude Oil Futures Quotes*. Retrieved from <http://www.cmegroup.com/trading/energy/crude-oil/light-sweet-crude.html>.
- <sup>33</sup> IHS CERA, *Extracting Economic Value from the Canadian Oil Sands Upgrading and refining in Alberta (or not)?* Special Report, 2013. p. 4.
- <sup>34</sup> *Ibid.*
- <sup>35</sup> *Ibid.*
- <sup>36</sup> Canadian Energy Research Institute. (2013). *Canadian Oil Sands Supply Costs and Development Projects (2014-2048)*. Study No. 141. p. ix. Retrieved from [http://www.ceri.ca/index.php?option=com\\_content&view=article&id=145:ceri-study-141-canadian-oil-sands-supply-costs-and-development-proejects-2014-2048](http://www.ceri.ca/index.php?option=com_content&view=article&id=145:ceri-study-141-canadian-oil-sands-supply-costs-and-development-proejects-2014-2048)
- <sup>37</sup> Canadian Energy Research Institute. (2013). *Canadian Oil Sands Supply Costs and Development Projects (2014-2048)*. Study No. 141. p. 26, [http://www.ceri.ca/index.php?option=com\\_content&view=article&id=55&Itemid=59](http://www.ceri.ca/index.php?option=com_content&view=article&id=55&Itemid=59).
- <sup>38</sup> Canadian Association of Petroleum Producers. (2014). *Crude Oil forecasts, markets, and transportation*. Retrieved from: <http://www.capp.ca/forecast/Pages/default.aspx>
- <sup>39</sup> Leach, A. (2014, April 2). How large will the oil sands sector grow? *Maclean's*. Retrieved from: <http://www.macleans.ca/politics/ottawa/andrew-each-on-th-oil-sands/>
- <sup>40</sup> *Ibid.*
- <sup>41</sup> USGS. (2007). *Survey of Energy Resources: Chapter 4, Natural Bitumen and Extra-Heavy Oil*. p. 121.
- <sup>42</sup> *Ibid.*
- <sup>43</sup> Sayles, S. & Routt, D.M. (2011). *Unconventional Crude Oil Selection and Compatibility*. KBC Advanced Technologies. p. 6, Table 5.
- <sup>44</sup> *Ibid.*
- <sup>45</sup> U.S. Geological Society. (2007). *Survey of Energy Resources: Chapter 4, Natural Bitumen and Extra-Heavy Oil*. pp. 126-29.
- <sup>46</sup> International Energy Agency. (2013). *World Energy Outlook 2013—Executive Summary*. p. 1
- <sup>47</sup> CommodityPoint. (2013). *Global Oil Markets—Increasing Uncertainty and Risk*. p. 6.
- <sup>48</sup> International Energy Agency. (2013). *World Energy Outlook 2013*. pg. 503.
- <sup>49</sup> Spedding, P. (2013). *Oil & Carbon Revisited: Value at Risk From “Unburnable” Reserves*. HSBC. pp. 2-3.
- <sup>50</sup> Tonachel, L. (2012). Strong Clean Car and Fuel Economy Standards Finalized, Here Are the Details and the Numbers.... *NRDC Switchboard*. Retrieved from: [http://switchboard.nrdc.org/blogs/ltonachel/strong\\_clean\\_car\\_and\\_fuel\\_econ.html](http://switchboard.nrdc.org/blogs/ltonachel/strong_clean_car_and_fuel_econ.html).
- <sup>51</sup> International Energy Agency. (2013). *World Energy Outlook 2013—Executive Summary*. p. 3.

- 
- <sup>52</sup> U.S. Department of Energy. (2013). *2012 Wind Technologies Report*. p. 52.
- <sup>53</sup> Smith, T. (2013). Renewable Energy Increasingly Cost-Competitive, Say Industry Experts. Tcktcktck. Retrieved from <http://tcktcktck.org/2013/08/renewable-energy-increasingly-cost-competitive-say-industry-experts/56141>
- <sup>54</sup> Spedding, P. (2013). *Oil & Carbon Revisited: Value at Risk From "Unburnable" Reserves*. HSBC.
- <sup>55</sup> Carbon Tracker. (2014). *Carbon Supply Cost Curves: Evaluating Financial Risk to Oil Capital Expenditures*.
- <sup>56</sup> Reuters. (2014, November 10). JPMorgan cuts Brent price forecasts, most bearish of big banks. *Reuters*. Retrieved from : <http://www.reuters.com/article/2014/11/10/us-research-jpmorgan-brent-idUSKCN0IU23820141110>
- <sup>57</sup> CME Group. (2014). *Crude Oil Futures Quotes*. Retrieved from <http://www.cmegroup.com/trading/energy/crude-oil/light-sweet-crude.html>.
- <sup>58</sup> Tutt, P & Clinch, M. (2014, November 27). Oil falls as OPEC opts not to cut production. *CNBC*. Retrieved from: <http://www.cnn.com/id/102222286#>.
- <sup>59</sup> Oil Change International & Institute for Energy Economics and Financial Analysis. (2014). *Material Risks: How Public Accountability Is Slowing Tar Sands Development*. Retrieved from: [http://priceofoil.org/content/uploads/2014/10/IEEFA.OCI\\_Material-Risks-FINweb2-1.pdf](http://priceofoil.org/content/uploads/2014/10/IEEFA.OCI_Material-Risks-FINweb2-1.pdf).
- <sup>60</sup> *Constitution Act, 1982*, see RSC 1985, App II (No 44), s 35(1).
- <sup>61</sup> See e.g. *R. v. Sparrow*, [1990] 1 SCR 1075; *R. v. Nikal*, [1996] 1 SCR 1013; *R. Van der Peet*, [1996] 2 SCR 507.
- <sup>62</sup> *Lameman v Alberta*, 2013 ABCA 148.
- <sup>63</sup> See for example <http://www.thetarsandstrial.ca/>.
- <sup>64</sup> Tait, C. and Cryderman, K. (2013, June 4). Alberta First Nations band wins right to trial over oil sands' effect on treaty rights. *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/alberta-first-nations-band-wins-right-to-trial-over-oil-sands-effect-on-treaty-rights/article12353571/>.
- <sup>65</sup> *Delgamuukw v. British Columbia*, [1997] 3 SCR 1010.
- <sup>66</sup> *Tsilhqot'in Nation v. British Columbia*, 2014 SCC 44
- <sup>67</sup> *Tsilhqot'in*, *ibid* at para 84, see also para 82.
- <sup>68</sup> *Tsilhqot'in*, *ibid* at para 87.
- <sup>69</sup> *Tsilhqot'in*, *ibid* at para 86.
- <sup>70</sup> See *Gitxaada Nation v. Attorney General of Canada et al*, Federal Court of Appeal Docket Number A-437-14; *Gitga'at First Nation v. Attorney General of Canada et al*, Federal Court of Appeal Docket Number A-445-14.
- <sup>71</sup> Gathering of Nations. (2014). *Save the Fraser Declaration*. Retrieved from <http://savethefraser.ca/>.
- <sup>72</sup> *Taku River Tlingit First Nation v. British Columbia (Project Assessment Director)*, 2004 SCC 74 at para 24.
- <sup>73</sup> *Carrier Sekani Tribal Council v. British Columbia (Utilities Commission)*, 2010 SCC 43.
- <sup>74</sup> *Carrier Sekani Tribal Council v. Canada (Minister of the Environment)*, File Number T-1863-06 (Federal Court), filed 25 October 2006. Discontinuance with Consent of the Applicants filed 27 September 2007.
- <sup>75</sup> Reuters. (2013, December 18). Timeline: Enbridge's Northern Gateway Oil Pipeline Proposal. *Reuters*. Retrieved from <http://www.reuters.com/article/2013/12/18/enbridge-northerngateway-idUSL2N0JX2FQ20131218>;
- <sup>76</sup> Canadian Press. (2007, July 13). PetroChina dropping \$3B pipeline, Enbridge still online. *CBC News*. Retrieved from <http://www.cbc.ca/news/canada/calgary/petrochina-dropping-3b-pipeline-enbridge-still-online-1.650702>
- <sup>77</sup> For a summary of the legal proceedings against Enbridge Northern Gateway as of October 2014 see: Gavin Smith. (2014, October 20). First Nations, Environmental Organizations and Union Get Green Light to Proceed with a Barrage of Court Cases Against Enbridge Northern Gateway Proposal. *West Coast Environmental Law*. Retrieved from <http://wcel.org/resources/environmental-law-alert/first-nations-non-governmental-organizations-and-union-get-green-l>.
- <sup>78</sup> For a legal backgrounder on the case see: Tsleil-Waututh Nation. (2014). Media Legal Backgrounder: Tsleil-Waututh Nation (TWN) Legal Challenge to the National Energy Board's (NEB) Review of the Kinder Morgan Trans Mountain Pipeline and Tanker Project. *Tsleil-Waututh Nation*. Retrieved from [http://www.twnation.ca/en/~media/Files/Press%20Releases/TWN%20-%20NEB%20-%20Legal%20Backgrounder%20-%20CLEAN\\_VAN\\_LAW-1461360-v4.ashx](http://www.twnation.ca/en/~media/Files/Press%20Releases/TWN%20-%20NEB%20-%20Legal%20Backgrounder%20-%20CLEAN_VAN_LAW-1461360-v4.ashx).

- 
- <sup>79</sup> Canadian Association of Petroleum Producers. (2013). *Crude Oil, Forecasts, Markets and Pipelines*. Retrieved from <http://www.capp.ca/forecast/Pages/default.aspx>. p. 31.
- <sup>80</sup> *Ibid.* p. 37
- <sup>81</sup> Western Canada has 3.7 million bpd of pipeline capacity. Industry plans to expand production to 7.8 million bpd by 2030 will require an additional 4.1 million bpd of transportation capacity.
- <sup>82</sup> *Oilsands Review*. (2012, October). Retrieved from <http://www.oilsandsreview.com/issue.asp?id=1903>
- <sup>83</sup> Citing Canadian Association of Petroleum Producers 2014 figures. Oil Change International & Institute for Energy Economics and Financial Analysis. (2014). *Materials Risks: How Public Accountability is Slowing Tar Sands Development*. p. 21. Retrieved from: [http://priceofoil.org/content/uploads/2014/10/IEEFA.OCI\\_Material-Risks-FINweb2-1.pdf](http://priceofoil.org/content/uploads/2014/10/IEEFA.OCI_Material-Risks-FINweb2-1.pdf).
- <sup>84</sup> Canadian Association of Petroleum Producers. (2013). *Crude Oil, Forecasts, Markets and Pipelines*. Retrieved from <http://www.capp.ca/forecast/Pages/default.aspx>.
- <sup>85</sup> *Ibid.* p. 10.
- <sup>86</sup> As Canadian crude production increases from 3.5 million to 6.4 million bpd from 2013 to 2030, 4.8 million bpd of increased heavy oil sands production. Canadian Association of Petroleum Producers. (2013). *Crude Oil, Forecasts, Markets and Pipelines*. Retrieved from <http://www.capp.ca/forecast/Pages/default.aspx>. p.38.
- <sup>87</sup> PBF Energy's Paulsboro and Delaware City refineries and NuStar Energy's asphalt refinery in New Jersey are the only refineries on the east coast with the coking capacity to process heavy bitumen blends from western Canada, with 122,000 bpd of capacity. Canadian Association of Petroleum Producers. (2013). *Crude Oil, Forecasts, Markets and Pipelines*. Retrieved from <http://www.capp.ca/forecast/Pages/default.aspx>. p. 13.
- <sup>88</sup> VanderKlippe, N. (2012, September 18). Opposition to Trans Mountain pipeline nearing Northern Gateway level. *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com/news/british-columbia/opposition-to-trans-mountain-pipeline-nearing-northern-gateway-levels/article4551051/>
- <sup>89</sup> CBC News. (2013, October 14). B.C. First Nations protest Kinder Morgan pipeline. *CBC News*. Retrieved from <http://www.cbc.ca/news/canada/british-columbia/b-c-first-nations-protest-kinder-morgan-pipeline-1.2054039>
- <sup>90</sup> Cooper, S. (2013, November 18). Thousands rally in Vancouver against Enbridge's proposed Northern Gateway pipeline. *The Province*. Retrieved from <http://www.theprovince.com/news/Thousands+rally+Vancouver+against+Enbridge+proposed+Northern+Gateway+pipeline/9176134/story.html>.
- <sup>91</sup> National Energy Board. (2013). *Joint Review Panel Report on Enbridge Northern Gateway Project*. Retrieved from <https://docs.neb-one.gc.ca/ll-eng/llisapi.dll?func=ll&objId=2396699&objAction=browse&viewType=1>
- <sup>92</sup> Government of Canada. (2014). *Government of Canada accepts recommendation to impose 209 conditions on Northern Gateway proposal*. [Press release]. Retrieved from: <http://news.gc.ca/web/article-en.do?nid=858469>
- <sup>93</sup> Argument of the Province of British Columbia Re: Hearing Order OH-4-2011 and File No. OF-Fac-Oil-N304-2010-01 01 Enbridge Northern Gateway Project Application, May 31, 2013. Retrieved from [http://www.env.gov.bc.ca/main/docs/2013/BC-Submission-to-NGP-JointReviewPanel\\_130531.pdf](http://www.env.gov.bc.ca/main/docs/2013/BC-Submission-to-NGP-JointReviewPanel_130531.pdf)
- <sup>94</sup> CBC News. (2013, May 31). B.C. officially opposes Enbridge Northern Gateway pipeline. *CBC News*. Retrieved from <http://www.cbc.ca/news/canada/british-columbia/story/2013/05/31/bc-northern-gateway-rejected.html>
- <sup>95</sup> Tait, C. and Vanderklippe, N. (2011, May 13). First nations dig in against Enbridge Pipeline. *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/first-nations-dig-in-against-enbridge-pipeline/article2021928/page1/>
- <sup>96</sup> Hunter, J. and Stueck, W. (2014, June 17). BC Government to Northern Gateway pipeline proposal: 'No'. *The Globe and Mail*. Retrieved from: <http://www.theglobeandmail.com/news/british-columbia/bc-to-northern-gateway-no/article19213866/>
- <sup>97</sup> Canadian Press. (2012, December 17). Oil industry faced with 'serious challenge' as pipelines fill up, TD warns. *Financial Post*. Retrieved from <http://business.financialpost.com/2012/12/17/oil-industry-faced-with-serious-challenge-as-pipelines-fill-up-td-warns/>.
- <sup>98</sup> Radia, A. (2012, December 3). Northern Gateway may soon need extraordinary political measures to survive. *Yahoo News*. Retrieved from <http://ca.news.yahoo.com/blogs/canada-politics/northern-gateway-pipeline-may-soon-extraordinary-political-measures-183201589.html>.

- 
- <sup>99</sup> Bailey, I. and Jang, B. (2013, November 5). Clark, Redford have framework for pipeline deal. *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com/news/national/clark-redford-reach-deal-on-pipelines/article15260483/>.
- <sup>100</sup> Hussain, Y. (2013, October 25). Enbridge's Northern Gateway stands least chance of approval among proposed pipelines, analysts say. *Financial Post*. Retrieved from [http://business.financialpost.com/2013/10/25/enbridge-northern-gateway-pipelines/?\\_lsa=9fdd-09c3](http://business.financialpost.com/2013/10/25/enbridge-northern-gateway-pipelines/?_lsa=9fdd-09c3).
- <sup>101</sup> State Department FEIS 2.2 34
- <sup>102</sup> Jeff Lewis. (2013, March 16). Kinder Morgan's pipeline ambitions on West Coast raises oil tanker concerns. *Financial Post*. Retrieved from [http://business.financialpost.com/2013/03/16/kinder-morgans-pipeline-ambitions-on-west-coast-raises-oil-tanker-concerns/?\\_lsa=9fdd-09c3](http://business.financialpost.com/2013/03/16/kinder-morgans-pipeline-ambitions-on-west-coast-raises-oil-tanker-concerns/?_lsa=9fdd-09c3).
- <sup>103</sup> Reuters. (2013, December 16). Kinder Morgan files application to expand Trans Mountain pipeline. Retrieved from <http://www.reuters.com/article/2013/12/16/kindermorgan-transmountain-expansion-idUSL2N0JV1GL20131216>. Kinder Morgan proposes to expand the scope of the expansion project to 890,000 bpd from 300,000.
- <sup>104</sup> Lee, J. and Morton, B. (2012, April 14). Vancouver and Burnaby mayors decry Kinder Morgan pipeline expansion. *Vancouver Sun*. Retrieved from <http://www.vancouversun.com/business/Vancouver+Burnaby+mayors+decry+Kinder+Morgan+pipeline+expansion/6457014/story.html>.
- <sup>105</sup> Enbridge. (2014). *Alberta Clipper (Line 67) Capacity Expansion Phase II*. Retrieved from <http://www.enbridge.com/MainlineEnhancementProgram/Canada/Alberta-Clipper-Capacity-Expansion-Phase-II.aspx>. The expansion proposal would enable an increase in capacity from 450,000 barrels per day to 800,000 barrels per day.
- <sup>106</sup> Snyder, J. and Penty, R. (2013, May 2). Enbridge Expansion Could Turn Into Keystone-Like Fight. *Bloomberg News*. Retrieved from <http://www.bloomberg.com/news/2013-05-02/enbridge-expansion-could-turn-into-keystone-like-fight.html>.
- <sup>107</sup> Sierra Club. (2013). *State Department to Review Tar Sands Pipeline Expansion*. Retrieved from <http://sierraclub.typepad.com/compass/2013/01/state-dept-to-review-tar-sands-pipeline-expansion.html>.
- <sup>108</sup> See Federal Register Notice from January 2, 2013. Retrieved from <https://www.federalregister.gov/articles/2013/01/02/2012-31557/application-for-a-presidential-permit-to-operate-and-maintain-pipeline-facilities-on-the-border-of>; and Federal Register Notice from March 15, 2013. Retrieved from <https://www.federalregister.gov/articles/2013/03/15/2013-06039/notice-of-intent-to-prepare-a-supplemental-environmental-impact-statement-seis-and-to-conduct>
- <sup>109</sup> Haggett, S. (2014, August 21). Enbridge plans Alberta Clipper pipeline boost despite U.S delays. *Reuters Canada*. Retrieved from <http://ca.reuters.com/article/idCAL2NOQR2HD20140821>.
- <sup>110</sup> Natural Resources Defense Council. (2013). *TransCanada's Energy East tar sands pipeline faces major hurdles*. Retrieved from <http://switchboard.nrdc.org/blogs/eshope/transcanadas-energy-east-tar-s.html>.
- <sup>111</sup> Paris, M. (2013, November 13). Energy East Pipeline to face Ontario scrutiny. *CBC News*. Retrieved from <http://www.cbc.ca/news/politics/energy-east-pipeline-to-face-ontario-scrutiny-1.2425544>.
- <sup>112</sup> Breton, D. (2014, November 6). TransCanada: motion unanime à l'Assemblée Nationale. *Journal de Montréal*. Retrieved from : <http://blogues.journaldemontreal.com/danielbreton/transcanada/transcanada-motion-unanime-a-lassemblee-nationale/>
- <sup>113</sup> CBC News. (2014, November 24). Ontario, Quebec sign deals on electricity, climate change. Retrieved from: <http://www.cbc.ca/news/business/ontario-quebec-sign-deals-on-electricity-climate-change-1.2844837>
- <sup>114</sup> McCarthy, S. (2013, December 8). Energy companies struggle with aboriginal needs on pipelines. *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/energy-companies-struggle-with-aboriginal-needs-on-pipelines/article15818477/>
- <sup>115</sup> McCarthy, S. (2014, October 15). Gas interests lining up against TransCanada's Energy East pipeline. *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/gas-interests-lining-up-against-transcanadas-energy-east-pipeline/article21117847/>
- <sup>116</sup> Douglas, E. (2014, November 17). Pipeline Alert From Federal Regulator Is First of Its Kind. *Inside Climate News*. Retrieved from: <http://insideclimatenews.org/news/20141117/pipeline-alert-federal-regulator-first-its-kind>

- 
- <sup>117</sup> CBC News. (2014, July 22). South Portland, Maine, votes against crude oil export. *CBC News*. Retrieved from <http://www.cbc.ca/news/canada/montreal/south-portland-maine-votes-against-crude-oil-export-1.2714101>.
- <sup>118</sup> The greater distance requires longer transit times and more trains to supply a given daily capacity of tar sands to the Gulf, increasing per barrel costs. The trip between northern Alberta and the Gulf Coast takes 18 days roundtrip by train. Ruckers, P. (2013, April 18). Analysis: Oil-by-train may not be substitute for Keystone pipeline. *Reuters*. Retrieved from <http://www.reuters.com/article/2013/04/18/us-usa-keystone-railroads-idUSBRE93H07I20130418>.
- <sup>119</sup> Goldman Sachs. (2013). *Getting oil out of Canada: Heavy oil diffs expected to stay wide and volatile*. Retrieved from [http://www.eenews.net/assets/2013/06/10/document\\_pm\\_04.pdf](http://www.eenews.net/assets/2013/06/10/document_pm_04.pdf)
- <sup>120</sup> Heavy crude is denser than light crude, and therefore a barrel of tar sands weighs more than a barrel of light crude oil. Train car weight restrictions will allow loading of approximately 700 barrels of light crude oil or 550 barrels of heavier tar sands. Wilkins, D. (2012). *Crude By Rail Forum*. Integrated Midstream Solutions, TD Securities. p. 11.
- <sup>121</sup> *Ibid*.
- <sup>122</sup> Goldman Sachs. (2013). *Getting oil out of Canada: Heavy oil diffs expected to stay wide and volatile*. Retrieved from [http://www.eenews.net/assets/2013/06/10/document\\_pm\\_04.pdf](http://www.eenews.net/assets/2013/06/10/document_pm_04.pdf)
- <sup>123</sup> RBN Energy. (2014). *Go Your Own Way: The Road to Market for Canadian Bitumen Crude*. Retrieved from: <https://rbnenergy.com/go-your-own-waythe-road-to-market-for-canadian-bitumen-crude>.
- <sup>124</sup> BMO Capital Markets. (2014). *U.S. Tight Oil Shale vs. the Canadian Oil Sands: Not the Gap You Think*. p. 4.
- <sup>125</sup> Carbon Tracker. (2014). *Keystone XL Pipeline: The "Significance" Trap*. p.9.
- <sup>126</sup> Rucker, R. (2014, March 5). Canada Oil-by-Rail Deliveries in 2013 Lagged U.S. Estimate. *Reuters*. Retrieved from <http://www.reuters.com/article/2014/03/05/usa-keystone-rail-idUSL2N0JI15H20140305>.
- <sup>127</sup> In Dec. 2013 rail shipments moved 73 per cent, or nearly 800,000 bpd, of North Dakota's production to market. Murtaugh, D. et. al. (2014, March 4). Pipelines Filled With Oil Amid Changing Economics and Rail Rules. *Bloomberg*. Retrieved from <http://www.bloomberg.com/news/2014-03-05/pipelines-filled-with-oil-amid-changing-economics-and-rail-rules.html>.
- <sup>128</sup> Swift, A & Stockman, L. (2014). *Tar Sands Train That Couldn't*. NRDC. Retrieved from: [http://switchboard.nrdc.org/blogs/aswift/canexus\\_brunderheim\\_terminal\\_th.html](http://switchboard.nrdc.org/blogs/aswift/canexus_brunderheim_terminal_th.html).
- <sup>129</sup> Swift, A & Stockman, L. (2014). *Tar Sands Train to Ruin: How tar sands producer Southern Pacific Resources is going broke on shipping tar sands by rail*. NRDC & OCI. Retrieved from: [http://switchboard.nrdc.org/blogs/aswift/tar\\_sands\\_train\\_to\\_ruin\\_how\\_ta.html](http://switchboard.nrdc.org/blogs/aswift/tar_sands_train_to_ruin_how_ta.html).
- <sup>130</sup> Skerritt, J. (2014, January 23). Record Grain Crop Stuck on Prairie as Railways Tap Oil. *Reuters*. Retrieved from <http://www.bloomberg.com/news/2014-01-23/recrod-grain-crop-stuck-on-prairie-as-railways-tap-oil.html>
- <sup>131</sup> Christie, N. & Singh, S.D. (2014, September 19). Oil Clogging U.S. Railways Seen Limiting Exports of Grain. *Bloomberg News*. Retrieved from: <http://www.bloomberg.com/news/2014-09-18/oil-clogging-u-s-rail-seen-constricting-grain-exports-freight.html>.
- <sup>132</sup> Transport Canada. (2014). *Proposed Amendments to the Transport of Dangerous Goods regulations for preliminary consultation*. Retrieved from <https://www.tc.gc.ca/eng/tdg/clear-modifications-menu-1192.html>
- <sup>133</sup> Rucker, P. (2013, October 29). Keystone review assesses potential of oil-by-rail. *Reuters*. Retrieved from <http://www.reuters.com/article/2013/10/29/usa-keystone-rail-idUSL1N0IJ0DN20131029>
- <sup>134</sup> Swift, A. (2013). *Tar sands expansion projects and associated climate emissions waiting on Keystone XL decision*. Natural Resources Defense Council. Retrieved from: [http://switchboard.nrdc.org/blogs/aswift/tar\\_sands\\_growth\\_at\\_risk\\_milli.html](http://switchboard.nrdc.org/blogs/aswift/tar_sands_growth_at_risk_milli.html)
- <sup>135</sup> Rucker, P. (2013, October 29). Keystone review assesses potential of oil-by-rail. *Reuters*. Retrieved from <http://www.reuters.com/article/2013/10/29/usa-keystone-rail-idUSL1N0IJ0DN20131029>
- <sup>136</sup> Goldman Sachs. (2013). *380 projects to change the world*. p. 26. Retrieved from <http://www.docstoc.com/docs/159977188/Goldman-Sachs----380-projects-to-change-the-world>.
- <sup>137</sup> Vanderklippe, N. (2012, August 10). A Wary Oil Patch Gears Down. *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com/globe-investor/wary-oil-patch-gears-down/article4470876/m>
- <sup>138</sup> Rosser, A. (2014). Letter to the Canadian Environmental Assessment Agency. Retrieved from <http://www.ceaa-acee.gc.ca/050/documents/p59539/98333E.pdf>

- 
- <sup>139</sup> Tait, C. (2014). Total shelves 11 billion Alberta oil sands mine. *The Globe and Mail*. Retrieved from: <http://www.theglobeandmail.com/report-on-business/joslyn/article18914681/>
- <sup>140</sup> Healing, D. (2014, September 26). Statoil puts oilsands expansion on hold. *Calgary Herald*. Retrieved from <http://www.calgaryherald.com/business/Statoil+puts+oilsands+expansion+hold/10235539/story.html>
- <sup>141</sup> Wood Mackenzie, Pegasus Global, Company Data, Nomura estimates. Reproduced in Casey-Lefkowitz, S. (2014). *Keystone XL will significantly increase oil industry investment in the tar sands*. Natural Resources Defence Council. Retrieved from [http://switchboard.nrdc.org/blogs/sclefkowitz/keystone\\_xl\\_will\\_significantly.html](http://switchboard.nrdc.org/blogs/sclefkowitz/keystone_xl_will_significantly.html)
- <sup>142</sup> Canadian Association of Petroleum Producers. (2013, September). *Oilsands Review*, Volume 8, Number 10. Retrieved from <http://www.capp.ca/forecast/Pages/default.aspx>
- <sup>143</sup> Cattaneo, C. (2014, April 4). Oil Sands Investment Slowing because of tough market not new SOE rules. *Financial Post*. Retrieved from [http://business.financialpost.com/2014/04/04/oil-sands-investment-slowing-because-of-tough-market-not-new-soe-rules-execs-say/?\\_lsa=39c1-94cf](http://business.financialpost.com/2014/04/04/oil-sands-investment-slowing-because-of-tough-market-not-new-soe-rules-execs-say/?_lsa=39c1-94cf);
- <sup>144</sup> Canadian Energy Research Institute. (2014). *Canadian Oil Pathways*. Retrieved from [http://www.ceri.ca/images/stories/2014-08-21\\_CERI\\_Study\\_144.pdf](http://www.ceri.ca/images/stories/2014-08-21_CERI_Study_144.pdf)
- <sup>145</sup> *Ibid.*
- <sup>146</sup> National Post staff. (2013, October 13) Here's what Canadians think of the oil sands industry. *National Post*. Retrieved from: [http://business.financialpost.com/2013/10/30/heres-what-canadians-think-about-the-oil-sands-industry/?\\_lsa=21a3-b64e](http://business.financialpost.com/2013/10/30/heres-what-canadians-think-about-the-oil-sands-industry/?_lsa=21a3-b64e)
- <sup>147</sup> Environmental Defence. (2014). Canadians dramatically overestimate the contribution of tar sands to Canadian economy. Retrieved from: <file:///C:/aDale%20Marshall%20-%20EDC/Inevitability%20paper/ED%20polling.pdf>
- <sup>148</sup> Paterson, A. (2013). *Canadians want federal leadership on climate change: New Canada 2020 poll*. Retrieved from <http://canada2020.ca/canadians-want-federal-leadership-on-climate-change-new-canada-2020-poll/>
- <sup>149</sup> Carney, D. (2013) *Polling Canada's climate*. Canada 2020. Retrieved from: <http://canada2020.ca/publications/polling-canadas-climate/>
- <sup>150</sup> Cheadle, B. (2013, November 18). Canada ranks worst on climate policy amongst industrialized countries: report. *The Canadian Press*. Retrieved from: <http://www.canada.com/technology/Canada+ranks+worst+developed+world+climate+policy+European+report/9180025/story.html>
- <sup>151</sup> Germanwatch. (2013). *Climate change performance index 2014*. Retrieved from: <http://germanwatch.org/en/7704>
- <sup>152</sup> Waldie, P. (2013, November 18) Canada dead last in ranking for environmental protection. *The Globe and Mail*. Retrieved from: <http://www.theglobeandmail.com/news/world/canada-dead-last-in-oecd-ranking-for-environmental-protection/article15484134/>
- <sup>153</sup> CBC News. (2014, January 16) Support for Keystone XL pipeline on the decline: Nanos. Retrieved from: <http://www.cbc.ca/news/politics/support-for-keystone-xl-pipeline-on-the-decline-nanos-1.2498835>
- <sup>154</sup> Kock, W. (2014, January 28). USA Today poll: Slight majority backs Keystone pipeline. *USA Today*. Retrieved from: <http://www.usatoday.com/story/news/nation/2014/01/28/keystone-pipeline-poll/4935083/> (reporting on a January 2014 poll showing 56 per cent of Americans are in favour of the pipeline compared to 65 per cent who were in favour in September of 2013); Pew Research Center. (2014). *Little Enthusiasm, Familiar Divisions After the GOP's Big Midterm Victory*. Retrieved from: <http://www.people-press.org/2014/11/12/little-enthusiasm-familiar-divisions-after-the-gops-big-midterm-victory/> (showing a 59 percent support for the pipeline compared with a 2013 survey of 66 percent).
- <sup>155</sup> Hoekstra, G. (2013). Majority of British Columbians oppose Northern Gateway pipeline: poll. *Vancouver Sun*. Retrieved from: <http://www.vancouversun.com/technology/Majority+British+Columbians+oppose+Northern+Gateway+pipeline+poll/9469513/story.html>
- <sup>156</sup> Shope, Elizabeth. (2014). *Over 2 Million Comments Ask for Rejection of the Keystone XL Tar Sands Pipeline*. Natural Resources Defence Council. Retrieved from [http://switchboard.nrdc.org/blogs/eshope/over\\_2\\_million\\_comments\\_ask\\_for.html](http://switchboard.nrdc.org/blogs/eshope/over_2_million_comments_ask_for.html)

- 
- <sup>157</sup> The Canadian Press. (2014, February 19). Keystone XL access through Nebraska shut down by judge. *CBC News*. Retrieved from: <http://www.cbc.ca/news/business/keystone-xl-access-through-nebraska-shut-down-by-judge-1.2543898>
- <sup>158</sup> Equiterre. 2014. "Adoptez une Résolution." Retrieved from : <http://www.equiterre.org/solution/adoptez-une-resolution>
- <sup>159</sup> Gathering of Nations. (2014). *Save the Fraser Declaration*. Retrieved from [http://savethefraser.ca/fraser\\_declaration.pdf](http://savethefraser.ca/fraser_declaration.pdf)
- <sup>160</sup> CBC News. (2010, June 9). Wash. city votes against Alberta oilsands. *CBC*. Retrieved from: <http://www.cbc.ca/news/world/wash-city-votes-against-alberta-oilsands-1.934652>
- <sup>161</sup> Mucair, T. (2013). *A new vision for a new century. Our plan for a prosperous and sustainable energy future*. New Democratic Party. Retrieved from: <http://www.ndp.ca/news/new-vision-new-century-our-plan-prosperous-and-sustainable-energy-future>
- <sup>162</sup> Leach, A. (2013, December 6). Seven ways Thomas Mulcair aims to change Canada's energy landscape. *MacLeans*. Retrieved from: <http://www2.macleans.ca/2013/12/06/seven-ways-ndp-leader-thomas-mulcair-aims-to-change-canadas-energy-landscape/>
- <sup>163</sup> Mas, S. (2013, December 18). Tom Mulcair's NDP firmly against Northern Gateway pipeline. *CBC News*. Retrieved from: <http://www.cbc.ca/news/politics/tom-mulcair-s-ndp-firmly-against-northern-gateway-pipeline-1.2468882>.
- <sup>164</sup> New Democratic Party. (2014). *Keystone XL a bad deal for Canadians*. Retrieved from: <http://www.ndp.ca/news/keystone-xl-bad-deal-canadians>
- <sup>165</sup> Mucair, T. (2013). *A new vision for a new century. Our plan for a prosperous and sustainable energy future*. New Democratic Party. Retrieved from: <http://www.ndp.ca/news/new-vision-new-century-our-plan-prosperous-and-sustainable-energy-future>
- <sup>166</sup> Beltrame, J. (2013, June 13). Thomas Mulcair's dutch disease warning supported by OECD report. *The Canadian Press* . Retrieved from: <http://news.nationalpost.com/2012/06/13/thomas-mulcairs-dutch-disease-warning-supported-by-oecd-report/>
- <sup>167</sup> LeRoy, W. (2013, November 6). Trudeau considering how to put a price on carbon. *The Canadian Press*. Retrieved from: <http://www.nationalnewswatch.com/2013/11/06/trudeau-considering-how-to-put-a-price-on-carbon-pollution/#.UwuQCvldVwU>
- <sup>168</sup> Liberal Party of Canada. (2014). *Policy resolutions. 6. Climate change action*. Retrieved from: <https://www.liberal.ca/6-climate-change-action/>
- <sup>169</sup> Comisso, C. (2014, February 23). Stronger environmental laws would encourage Keystone's approval: Trudeau. *CTV News*. Retrieved from: <http://www.ctvnews.ca/politics/stronger-environmental-laws-would-encourage-keystone-s-approval-trudeau-1.1699899>
- <sup>170</sup> Liberal Party of Canada. (2014). *Policy resolutions. 139. Clean renewable energy, energy efficiency and the electrification of transport*. Retrieved from: <http://www.liberal.ca/139-clean-renewable-energy-energy-efficiency-electrification-transport/>
- <sup>171</sup> Green Party of Canada. (2011). *Smart economy. Strong Communities. True Democracy*. Retrieved from: <http://www.greenparty.ca/files/attachments/green-book-2011-en.pdf>
- <sup>172</sup> CBC News. (2013, May 31). B.C. officially opposes Enbridge Northern Gateway pipeline. Retrieved from: <http://www.cbc.ca/news/canada/british-columbia/b-c-officially-opposes-enbridge-northern-gateway-pipeline-1.1386317>
- <sup>173</sup> Paris, M. (2013, November 13). Energy East pipeline to face Ontario scrutiny. *CBC News*. Retrieved from: <http://www.cbc.ca/news/politics/energy-east-pipeline-to-face-ontario-scrutiny-1.2425544>
- <sup>174</sup> Breton, D. (2014, November 6). TransCanada: motion unanime à l'Assemblée Nationale. *Journal de Montréal*. Retrieved from : <http://blogues.journaldemontreal.com/danielbreton/transcanada/transcanada-motion-unanime-a-lassemblee-nationale/>
- <sup>175</sup> CBC News. (2014, November 24). Ontario, Quebec sign deals on electricity, climate change. Retrieved from: <http://www.cbc.ca/news/business/ontario-quebec-sign-deals-on-electricity-climate-change-1.2844837>
- <sup>176</sup> Moreau, J. (2014, February 17). Climate change not part of Kinder Morgan hearing. *Burnaby Now*. Retrieved from: <http://www.burnabynow.com/news/climate-change-not-part-of-kinder-morgan-hearing-1.856433>.

- 
- <sup>177</sup> Environmental Defence. (2013). *New undemocratic rules create barriers to public participation in upcoming pipeline hearings*. Retrieved from: <http://environmentaldefence.ca/articles/new-undemocratic-rules-create-barrier-public-participation-in-upcoming-pipeline-hearings-co>
- <sup>178</sup> McKinnon, H. (2012). *Dirty oil diplomacy: The Canadian government's global push to sell the tar sands*. Climate Action Network Canada. Retrieved from: <http://climateactionnetwork.ca/2012/03/08/dirty-oil-diplomacy>
- <sup>179</sup> Gatehouse, J. (2009, December 15). Suddenly the world hates Canada. *MacLeans*. Retrieved from: <http://www2.macleans.ca/2009/12/15/suddenly-the-world-hates-canada/>
- <sup>180</sup> Carrington, D. (2011, December 13). Canada condemned at home and abroad for pulling out of Kyoto treaty. *The Guardian*. Retrieved from: <http://www.theguardian.com/environment/2011/dec/13/canada-condemned-kyoto-climate-treaty>
- <sup>181</sup> Obama, B. (2013). *Remarks by the President on climate change*. Retrieved from: <http://www.whitehouse.gov/the-press-office/2013/06/25/remarks-president-climate-change>
- <sup>182</sup> Bagley, K. (2013, May 23). To defeat Keystone, environmental movement goes from beltway to grassroots. *Inside Climate News*. Retrieved from: <http://insideclimatenews.org/news/20130523/defeat-keystone-environmental-movement-goes-beltway-grassroots>
- <sup>183</sup> Bagley, K. (2014, February 10). Environmental movement to test its muscle in Keystone final stretch. *Inside Climate News*. Retrieved from: <http://insideclimatenews.org/news/20140210/environmental-movement-test-its-muscle-keystone-final-stretch>
- <sup>184</sup> Government of Canada. (2013). *Reducing Greenhouse Gases*. Retrieved from <http://climatechange.gc.ca/default.asp?lang=En&n=4FE85A4C-1>
- <sup>185</sup> Demerse, C. (2013). *Canada's Oil and Gas Sitcom*. Pembina Institute. Retrieved from <http://www.pembina.org/blog/768>
- <sup>186</sup> Wingrove, J., Leblanc, D., & McCarthy, S. (2013, December 19). Canada's new emissions rules on hold again, Harper says. *The Globe and Mail*. Retrieved from: <http://www.theglobeandmail.com/news/politics/canadas-new-emissions-rules-on-hold-again-harper-says/article16065033/>
- <sup>187</sup> The Pembina Institute. (2014). *Oilsands: Climate Impacts*. Retrieved from: [www.pembina.org/oil-sands/os101/climate](http://www.pembina.org/oil-sands/os101/climate).
- <sup>188</sup> Partington, P.J., Horne, M., and Demerse, C. (2013). *Getting on Track for 2020: Recommendations for Greenhouse Gas Regulations in Canada's Oil and Gas Sector*. The Pembina Institute and the Pembina Foundation.
- <sup>189</sup> Province of Alberta. (2014). *Climate Change and Emissions Management Act*. Retrieved from [http://www.qp.alberta.ca/documents/Regs/2007\\_139.pdf](http://www.qp.alberta.ca/documents/Regs/2007_139.pdf)
- <sup>190</sup> Read, A. (2014). *Climate change policy in Alberta*. Pembina Institute. Retrieved from <http://www.pembina.org/docs/oil-sands/sger-climate-policy-background.pdf>
- <sup>191</sup> Demerse, C., Horne, M., and Partington, P.J. (2013). *Getting on track for 2020*. The Pembina Institute. Retrieved from <http://www.pembina.org/pub/2427>
- <sup>192</sup> Canadian Energy Research Institute, (2014). *Canadian Oil Sands Supply Costs and Development Projects (2014-2048)*. Study No. 141. p. 26. Retrieved from: [http://www.ceri.ca/images/stories/2014-07-17\\_CERI\\_Study\\_141\\_Oil\\_Sands\\_Supply\\_Cost\\_Update\\_2014-2048.pdf](http://www.ceri.ca/images/stories/2014-07-17_CERI_Study_141_Oil_Sands_Supply_Cost_Update_2014-2048.pdf)
- <sup>193</sup> Bryden, J. (2013, April 14). Justin Trudeau offers key glimpses of next Liberal platform. *Canadian Press*. Retrieved from <http://www.ctvnews.ca/canada/justin-trudeau-offers-key-glimpses-of-next-liberal-platform-1.1237125#ixzz2tKQ3C1RX>
- <sup>194</sup> Payton, Laura. (2013, December 11). Justin Trudeau defends performance as 2013 draws to close. *CBC News*. Retrieved from <http://www.cbc.ca/news/politics/justin-trudeau-defends-performance-as-2013-draws-to-close-1.2460445>
- <sup>195</sup> Mucair, T. (2013). *A new vision for a new century. Our plan for a prosperous and sustainable energy future*. New Democratic Party. Retrieved from: <http://www.ndp.ca/news/new-vision-new-century-our-plan-prosperous-and-sustainable-energy-future>
- <sup>196</sup> Parliament of Canada. (2006). *Bill C-16: An Act to amend the Canada Elections Act*. Retrieved from <http://www.parl.gc.ca/HousePublications/Publication.aspx?Docid=2475836&file=4>
- <sup>197</sup> Alberta Environment and Sustainable Resource Development. (2014). *Ambient air quality objectives*. Retrieved from <http://environment.alberta.ca/0994.html>

- 
- <sup>198</sup> Government of Alberta (2014). *Lower Athabasca Region: Status of Management Response for Environmental Management Framework*, Retrieved from <http://esrd.alberta.ca/focus/cumulative-effects/cumulative-effects-management/management-frameworks/documents/LARP-StatusAirSurfaceWaterQuality-Mar2014.pdf>.
- <sup>199</sup> Shell Canada Limited. (2013). *Pierre River Mine: Joint Review Panel Supplemental Information Requests, Appendix 3.2: Air Emissions and Modelling Predictions*. p. 43.
- <sup>200</sup> Kelly, E. *et al.* (2009). Oil Sands Development Contributes to Polycyclic Aromatic Compounds to the Athabasca River and Its Tributaries. *Proc. Natl. Acad. Sci. U.S.* Retrieved from: [www.pnas.org/content/early/2009/12/04/0912050106.full.pdf](http://www.pnas.org/content/early/2009/12/04/0912050106.full.pdf). These chemicals often present serious risks to human health—some are known to damage DNA, others are carcinogens, and many cause developmental impacts. They also typically accumulate and remain present in the environment over long periods of time
- <sup>201</sup> Parajulee, A. & Wania, F. (2014). Evaluating Officially Reported Polycyclic Aromatic Hydrocarbon Emissions in the Athabasca Oil Sands Region with a Multimedia Fate Model. *Proc. Natl. Acad. Sci. U.S.* Retrieved from: [www.pnas.org/cgi/doi/10.1073/pnas.1319780111](http://www.pnas.org/cgi/doi/10.1073/pnas.1319780111).
- <sup>202</sup> Simpson, I. *et al.* (2013). Air Quality in the Industrial Heartland of Alberta, Canada and Potential Impacts on Human Health. *Atmospheric Environment*. Retrieved from: [www.sciencedirect.com/science/article/pii/S135223101300705X](http://www.sciencedirect.com/science/article/pii/S135223101300705X).
- <sup>203</sup> CBC. (2014, January 21). Public Hearings Begin in Peace River, Alberta Over Concerns About Oilsands Operations,” *CBC*. Retrieved from: <http://www.cbc.ca/asithappens/features/2014/01/21/peace-river-fumes/>.
- <sup>204</sup> Canadian Press. (2014, January 19). Hearings on Peace River Oilsands Odours Starting This Week. *Toronto Star*. Retrieved from: [http://www.thestar.com/news/canada/2014/01/19/hearings\\_on\\_peace\\_river\\_oilsands\\_odours\\_starting\\_this\\_week.html](http://www.thestar.com/news/canada/2014/01/19/hearings_on_peace_river_oilsands_odours_starting_this_week.html)
- <sup>205</sup> Wohlberg, M. (2013, October 14). Alberta Regulator Investigates Health Complaints Around Peace River Oilsands Projects. *Northern Journal*. Retrieved from: <http://norj.ca/2013/10/alberta-regulatorinvestigates-health-complaints-around-peace-river-oilsands-projects/>.
- <sup>206</sup> Alberta Environment and Sustainable Resource Development. (2014). *Oil Sands Mining Operators – Water Allocation and Water Use by Year*. [Oil Sands Information portal]. Retrieved from <http://environment.alberta.ca/apps/OSIPDL/Dataset/Details/51>
- <sup>207</sup> Alberta Environment and Sustainable Resource Development. (2014). *Oil Sands Operators – Water Use History*. [Oil Sands Information Portal]. Retrieved from <http://environment.alberta.ca/apps/OSIPDL/Dataset/Details/56>
- <sup>208</sup> Grant, J., Angen, E., and Dyer, S. (2013). *Forecasting the impacts of oilsands expansion*. Pembina Institute. Retrieved from <http://www.pembina.org/pub/2455>. p. 3.
- <sup>209</sup> Dyer, S., Lemphers, N., and Grant, J. (2013). *Beneath the Surface: A review of key facts in the oilsands debate*. Retrieved from <http://www.pembina.org/pub/2404>. p. 30.
- <sup>210</sup> Weber, B. (2014, March 19). Alberta’s plan for Athabasca River ‘pathetic,’ critics say. *Financial Post*, Retrieved from [http://business.financialpost.com/2014/03/19/albertas-plan-for-athabasca-river-pathetic-critics-say/?\\_lsa=52cb-6b89](http://business.financialpost.com/2014/03/19/albertas-plan-for-athabasca-river-pathetic-critics-say/?_lsa=52cb-6b89)
- <sup>211</sup> Northwest Territories government. (2014, November 6). Statement by Minister J. Michael Miltenberger, *Transboundary Water*. Retrieved from: <http://news.exec.gov.nt.ca/j-michael-miltenberger-transboundary-water/>
- <sup>212</sup> Canadian Association of Petroleum Producers. (2014). *Oil Sands Today*. Retrieved from <http://www.oilsandstoday.ca/topics/Tailings/Pages/default.aspx>.
- <sup>213</sup> WWF-Canada. (2010). *Tailings, A Lasting Oil Sands Legacy*. Retrieved from [http://awsassets.wwf.ca/downloads/wwf\\_tailings\\_report\\_october\\_2010\\_final.pdf](http://awsassets.wwf.ca/downloads/wwf_tailings_report_october_2010_final.pdf)
- <sup>214</sup> Alberta Environment and Sustainable Resource Development. (2014). *Tailings Management*. [Oil Sands Information portal]. Retrieved from: <http://www.osip.alberta.ca>
- <sup>215</sup> WWF-Canada. (2010). *Tailings, A Lasting Oil Sands Legacy*. Retrieved from [http://awsassets.wwf.ca/downloads/wwf\\_tailings\\_report\\_october\\_2010\\_final.pdf](http://awsassets.wwf.ca/downloads/wwf_tailings_report_october_2010_final.pdf)
- <sup>216</sup> Energy Resources Conservation Board. (2009). *Directive 074: Tailings Performance Criteria and Requirements for Oil Sands Mining Schemes*. Appendix A, page 7. A kilopascal is a unit of pressure (force per

---

area).

<sup>217</sup> Energy Resources Conversation Board. (2012). *Tailings Management Assessment Report*. Retrieved from [http://www.aer.ca/documents/tar\\_sands/tailings-plans/TailingsManagementAssessmentReport2011-2012.pdf](http://www.aer.ca/documents/tar_sands/tailings-plans/TailingsManagementAssessmentReport2011-2012.pdf)

<sup>218</sup> Vancouver Sun. (2013, June 12). Missed tailings reduction targets 'overly optimistic': energy board. Retrieved from <http://www.canada.com/story.html?id=92ec82b6-bf0f-44ae-a8d5-fe73b16143b8>

<sup>219</sup> Weber, Bob. (2013, December 16). Industry, governments discuss conditions for oil sands water release. Canadian Press. Retrieved from <http://business.financialpost.com/2013/12/16/industry-governments-discuss-conditions-for-oil-sands-water-release/>

<sup>220</sup> Alberta Energy. (2009). *Alberta Oil Sands Tenure Guide, Chapter Two: Acquiring Oil Sands Rights*. Retrieved from [http://www.energy.alberta.ca/OilSands/pdfs/GDE\\_OST\\_2009\\_Ch2.pdf](http://www.energy.alberta.ca/OilSands/pdfs/GDE_OST_2009_Ch2.pdf)

<sup>221</sup> Alberta Energy. (2013). *Alberta's Leased Tar sands Area*. Retrieved from <http://www.energy.alberta.ca/LandAccess/pdfs/OSAagreeStats.pdf>

<sup>222</sup> Alberta Energy. (2014). *Facts and Statistics*. Retrieved from <http://www.energy.alberta.ca/oilsands/791.asp>

<sup>223</sup> Government of Alberta. (2014). *Environmental Protection and Enhancement Act*. Retrieved from <http://www.qp.alberta.ca/documents/acts/e12.pdf>

<sup>224</sup> Government of Alberta. (2014). *Alberta's Oil Sands : Reclamation*. Retrieved from <http://www.oilsands.alberta.ca/reclamation.html>.

<sup>225</sup> Dyer, S. (2011). *Four years overdue: government's failure to protect woodland caribou triggers another oilsands lawsuit*. Retrieved from <http://www.pembina.org/blog/550>.

<sup>226</sup> U.S. Government. (2004). *Presidential Documents: Executive Order 13337*. Retrieved from <http://www.gpo.gov/fdsys/pkg/FR-2004-05-05/pdf/04-10378.pdf>.

<sup>227</sup> Carbon Tracker. (2013). *Keystone XL Pipeline: A Potential Mirage for Oil-Sands Investors*. pp. 3, 16.

<sup>228</sup> Cuomo, A.M. (2014). *Governor Cuomo Takes Action to Better Protect New York From Crude Oil Transportation Disasters*. [Press Release]. Retrieved from <http://www.governor.ny.gov/press/04302014-crude-oil-disasters>

<sup>229</sup> European Commission. (2014). *The 2020 climate and energy package*. Retrieved from [http://ec.europa.eu/clima/policies/package/index\\_en.htm](http://ec.europa.eu/clima/policies/package/index_en.htm)

<sup>230</sup> Lewis, B. (2014, October 7). EU abandons 'dirty' label for tar sands oil. *Reuters*. Retrieved from <http://www.reuters.com/article/2014/10/07/us-energy-eu-canada-tarsands-idUSKCN0HWOYS20141007>

<sup>231</sup> European Commission. (2014). *Methodology for the calculation and reporting of the life cycle greenhouse gas intensity of fuels and energy by fuel suppliers*. Retrieved from [http://ec.europa.eu/clima/policies/transport/fuel/docs/com\\_2014\\_617\\_annexes\\_en.pdf](http://ec.europa.eu/clima/policies/transport/fuel/docs/com_2014_617_annexes_en.pdf)

<sup>232</sup> Transport & Environment. (2014) *Briefing: The revised FQD: weakened proposal must still be implemented*. Retrieved from

[http://www.transportenvironment.org/sites/te/files/publications/2014%2010%20new%20FQD%20proposal%20-%20TE%20Briefing\\_FINAL\\_2.pdf](http://www.transportenvironment.org/sites/te/files/publications/2014%2010%20new%20FQD%20proposal%20-%20TE%20Briefing_FINAL_2.pdf)

<sup>233</sup> Brant, A. R. (2011). *Upstream greenhouse gas (GHG) emissions from Canadian oil sands as a feedstock for European refineries*. Stanford University.

<sup>234</sup> California Energy Commission. (2014). *Low Carbon Fuel Standard*. Retrieved from [http://www.energy.ca.gov/low\\_carbon\\_fuel\\_standard/](http://www.energy.ca.gov/low_carbon_fuel_standard/).

<sup>235</sup> National Round Table on the Environment and the Economy. (2012). *Canada's opportunity: Adopting life-cycle approaches for sustainable development*. p. 75. Retrieved from <http://collectionsCanada.gc.ca/webarchives2/20130322183636/http://nrtee-trnee.ca/wp-content/uploads/2012/05/NRT-Life-Cycle-Approaches-report-eng.pdf>.

<sup>236</sup> Center for Climate and Energy Solutions. (2014). *Low Carbon Fuel Standard*. [Online map]. Retrieved from <http://www.c2es.org/us-states-regions/policy-maps/low-carbon-fuel-standard>.

<sup>237</sup> *Ibid.*

<sup>238</sup> Gera, S. (2010). *Pan-European Oil Sands Team mid year report*. [Obtained through Access to Information request # A-2010-02237]. Retrieved from

---

<http://climateactionnetwork.ca/2010/08/20/pan-european-oil-sands-team-mid-year-report-20-august-2010>

<sup>239</sup> Rowell, A., de Clerck, P., and Urbaniak, D. (2011). *Canada's dirty lobby diary: Undermining the EU Fuel Quality Directive*. Friends of the Earth Europe. Retrieved from

[http://www.foeeurope.org/publications/2011/FOEE\\_Report\\_Tar\\_Sands\\_Lobby\\_Final\\_July82011.pdf](http://www.foeeurope.org/publications/2011/FOEE_Report_Tar_Sands_Lobby_Final_July82011.pdf)

<sup>240</sup> Carrington, D. (2013, November 19). Europe 'stigmatising' Canada by labelling tar sands oil highly polluting. *The Guardian*. Retrieved from <http://www.theguardian.com/environment/2013/nov/19/canada-tar-sands-oil-eu>.

<sup>241</sup> International Energy Agency. (2012). *World Energy Outlook 2012, Executive Summary*. Retrieved from <http://www.iea.org/publications/freepublications/publication/english.pdf>. p. 6.

<sup>242</sup> Intergovernmental Panel on Climate Change. (2014). *Fifth Assessment Synthesis Report*. p. SYR-24. Retrieved from: [http://ipcc.ch/pdf/assessment-report/ar5/syr/SYR\\_AR5\\_LONGERREPORT.pdf](http://ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_LONGERREPORT.pdf)

<sup>243</sup> Carbon Tracker. (2014). *Unburnable Carbon: Are the world's financial markets carrying a carbon bubble?* Retrieved from <http://www.carbontracker.org/wp-content/uploads/2014/09/Unburnable-Carbon-Full-rev2-1.pdf>

<sup>244</sup> Shankleman, J. (2014, October 13). Mark Carney: most fossil fuel reserves can't be burned. *The Guardian*. Retrieved from: <http://www.theguardian.com/environment/2014/oct/13/mark-carney-fossil-fuel-reserves-burned-carbon-bubble>

<sup>245</sup> Douglass, E. (2013, October 24). Wall Street Demands Answers From Fossil Fuel Producers on 'Unburnable' Carbon. *Inside Climate News*. Retrieved from <http://www.ceres.org/press/press-clips/wall-street-demands-answers-from-fossil-fuel-producers-on-unburnable-carbon>

<sup>246</sup> Goldenberg, S. (2014, April 10). Harvard faculty members urge university to divest from fossil fuels. *The Guardian*. Retrieved from <http://www.theguardian.com/environment/2014/apr/10/harvard-faculty-letter-divest-fossil-fuels-oil>.

<sup>247</sup> Carrington, D. (2014, April 10). Desmond Tutu calls for anti-apartheid style boycott of fossil fuel industry. *The Guardian*. Retrieved from <http://www.theguardian.com/environment/2014/apr/10/desmond-tutu-anti-apartheid-style-boycott-fossil-fuel-industry>

<sup>248</sup> International Energy Agency. (no date). *Resources to Reserves – Executive Summary*. Retrieved from [http://www.iea.org/textbase/npsum/oil\\_gasSUM.pdf](http://www.iea.org/textbase/npsum/oil_gasSUM.pdf), p. 17

<sup>249</sup> Aldescu, M. (2012). Challenges of heavy crude processing. *Sour & Heavy 2012*. Retrieved from <http://www.digitalrefining.com/data/articles/file/75860510.pdf>

<sup>250</sup> Leong, M. (2012, November 15). Oil sands will be Canada's economic engine for the next 25 to 30 years: Deloitte. *Financial Post*. Retrieved from [http://business.financialpost.com/2012/11/15/oil-sands-will-be-canadas-economic-engine-for-next-25-to-30-years-deloitte/?\\_lsa=52cb-6b89](http://business.financialpost.com/2012/11/15/oil-sands-will-be-canadas-economic-engine-for-next-25-to-30-years-deloitte/?_lsa=52cb-6b89)

<sup>251</sup> Cooper, D. (2014, February 12). Oilsands the giant of Canada's economy, study finds. *Edmonton Journal*. Retrieved from

<http://www.edmontonjournal.com/Oilsands+giant+Canada+economy+study+finds/9496310/story.html>

<sup>252</sup> Pembina Institute calculation; data source: Statistics Canada. (2014). *CANSIM Table 379-0031: Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS)*. Retrieved from <http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=3790031>

<sup>253</sup> *Ibid.*

<sup>254</sup> Leach, A. (2013, November 4). Canada, the failed petrostate? *Maclean's*. Retrieved from <http://www2.macleans.ca/2013/11/04/canada-the-failed-petrostate/>

<sup>255</sup> International Monetary Fund. (2014). *IMF Country Report No. 14/28 Canada Selected Issues*. Retrieved from: <http://www.imf.org/external/pubs/ft/scr/2014/cr1428.pdf>

<sup>256</sup> *Ibid.*

<sup>257</sup> Leach, A. (2013, November 4). Canada, the failed petrostate? *Maclean's*. Retrieved from <http://www2.macleans.ca/2013/11/04/canada-the-failed-petrostate/>

<sup>258</sup> *Ibid.*

<sup>259</sup> Dobson, S. (2014). *The Cross-Canada Impacts of Developing the Oil and Gas Industry of the Energy Sector*. Retrieved from <http://www.pembina.org/reports/rnnr-briefing-note-2014.pdf>.

<sup>260</sup> Leach, A. (2013, November 4). Canada, the failed petrostate? *Maclean's*. Retrieved from <http://www2.macleans.ca/2013/11/04/canada-the-failed-petrostate/>

- 
- <sup>261</sup> Sawyer, D. and Stiebert, S. (2010). *Fossil Fuels – At What Cost? Government support for upstream oil activities in three Canadian provinces: Alberta, Saskatchewan and Newfoundland and Labrador*. International Institute for Sustainable Development. Retrieved from [http://www.iisd.org/gsi/sites/default/files/ffs\\_awc\\_3canprovinces.pdf](http://www.iisd.org/gsi/sites/default/files/ffs_awc_3canprovinces.pdf), p. 34.
- <sup>262</sup> Organisation for Economic Co-Operation and Development. (2011). *Inventory of estimated budgetary support and tax expenditures for fossil fuels*. Retrieved from <http://www.oecd.org/site/tadffss/48805150.pdf>. pp. 82-84.
- <sup>263</sup> Government of Canada. (2013). *Jobs, Growth and Long-Term Prosperity: Economic Action Plan 2013*.
- <sup>264</sup> See for example Wright, T. (2013, July 24). Pipelines critical to Canada's economic future: Clement. *The Guardian*. Retrieved from <http://www.theguardian.pe.ca/News/Local/2013-07-24/article-3327087/Pipelines-critical-to-Canadas-economic-future-per-cent3A-Clement/1>; and Natural Resources Canada. (2013). *Statement by the Honourable Joe Oliver, P.C., M.P., Minister of Natural Resource, on the Keystone XL Pipeline*. [Press release]. Retrieved from <http://www.nrcan.gc.ca/media-room/news-release/2013/1631>
- <sup>265</sup> Government of Alberta. (2013). *Budget 2013: Responsible Change*. Retrieved from <http://www.finance.alberta.ca/publications/budget/budget2013/fiscal-plan-tables.pdf>, Fiscal Plan Tables, p. 130.
- <sup>266</sup> *Ibid.*
- <sup>267</sup> Leach, A. 2013. *On bubbles of bitumen*. Retrieved from <http://andrewleach.ca/oilsands/on-bubbles-of-bitumen/>
- <sup>268</sup> Alison Redford. (2013). *Premier Redford's Address to Albertans - January 24, 2013*. Retrieved from <https://soundcloud.com/your-alberta/premier-redfords-address-to>
- <sup>269</sup> Government of Alberta. (2013). *Budget 2013: Responsible Change Overview*. Retrieved from <http://budget2013.alberta.ca/Fact-Card-Budget-2013-Overview.pdf>
- <sup>270</sup> Government of Alberta. (2013). *Budget 2013: Responsible Change*. Retrieved from <http://www.finance.alberta.ca/publications/budget/budget2013/fiscal-plan-tables.pdf>, Fiscal Plan Tables, p. 130.
- <sup>271</sup> Landon, S. and Smith, C. (2010). *Energy Prices and Alberta Government Revenue Volatility: Commentary 313*. C.D. Howe Institute. [www.cdhowe.org/pdf/Commentary\\_313.pdf](http://www.cdhowe.org/pdf/Commentary_313.pdf). p. 2.
- <sup>272</sup> *Ibid.* p. 3.
- <sup>273</sup> *Ibid.* p. 20.
- <sup>274</sup> See for example: Cattaneo, C. (2013, August 1). Why Canada can, and must, pull of nation-building Energy East pipeline. *Financial Post*. Retrieved from [http://business.financialpost.com/2013/08/01/transcanada-energy-east-pipeline/?\\_lsa=897c-cec6](http://business.financialpost.com/2013/08/01/transcanada-energy-east-pipeline/?_lsa=897c-cec6); and Postmedia News. (2011, December 6). Oil industry's 'nation-building' pipeline won't be stopped by protesters: Natural Resource Minister. *National Post*. Retrieved from <http://news.nationalpost.com/2011/12/06/oil-industrys-nation-building-pipeline-wont-be-stopped-by-protesters-natural-resources-minister/>
- <sup>275</sup> See for example McCarthy, S. (2014, February 14). If Keystone won't affect oilsands development, why is Harper pushing so hard? *The Globe and Mail*. Retrieved from <http://www.theglobeandmail.com/news/politics/globe-politics-insider/if-keystone-wont-affect-oil-sands-development-why-is-harper-pushing-it-so-hard/article16706287/>
- <sup>276</sup> Honarvar, A., Millington, D., Rozhon, J., Walden, D. and Murillo, C. (2011). *Economic Impacts of Staged Oil Sands Projects in Alberta (2010–2035) Study no. 125*. Canadian Energy Research Institute. Retrieved from [http://www.ceri.ca/images/stories/2011-08-24\\_CERI\\_Study\\_125\\_Section\\_1.pdf](http://www.ceri.ca/images/stories/2011-08-24_CERI_Study_125_Section_1.pdf). p. 12.
- <sup>277</sup> Équiterre. (2013). *Pipeline safety expert finds "high risk of Line 9 rupture" if National Energy Board approves Enbridge's Reversal Plan*. [Press release]. Retrieved from <http://www.equiterre.org/en/communique/pipeline-safety-expert-finds-high-risk-of-line-9-rupture-if-national-energy-board-approve>
- <sup>278</sup> Kovac, A. & Sparks, R. (2013, August 10). *Who's liable for the Lac-Mégantic disaster? Montreal Gazette*. Retrieved from: <http://www.montrealgazette.com/technology/liable+M%C3%A9gantic+disaster/8775349/story.html>
- <sup>279</sup> QMI Agency. (2014, February 11). *Feds to pay 50 per cent of Lac-Mégantic bill*. *Toronto Sun*. Retrieved from <http://www.torontosun.com/2014/02/11/feds-to-pay-50-of-lac-megantic-bill>

- 
- <sup>280</sup> Author calculations; data source: (i) Statistics Canada. (2014). *CANSIM Table 176-0064: Foreign exchange rates in Canadian dollars*. Retrieved from <http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=1760064>; and (ii) U.S. Energy Information Administration. (2014). *Cushing, OK WTI Spot Price FOB*. Retrieved from <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RWTC&f=M>.
- <sup>281</sup> Bank of Canada. (2014). *Exchange Rates*. Retrieved from <http://www.bankofcanada.ca/rates/exchange/>
- <sup>282</sup> Statistics Canada. (2014). *CANSIM Table 176-0064: Foreign exchange rates in Canadian dollars*. Retrieved from <http://www5.statcan.gc.ca/cansim/a26?lang=eng&retrLang=eng&id=1760064&paSer=&pattern=&stByVal=1&p1=1&p2=31&tabMode=dataTable&csid=>
- <sup>283</sup> *Ibid.*
- <sup>284</sup> Pembina Institute. (2013). *Booms, busts and bitumen: The economic implications of Canadian oilsands development*. Retrieved from <http://www.pembina.org/reports/booms-busts-bitumen-en.pdf>
- <sup>285</sup> Spiro, P. (2013). *More Stability, Please: A new policy approach to Canada's exchange rate*. Mowat Centre. Retrieved from <http://mowatcentre.ca/pdfs/mowatResearch/80.pdf>
- <sup>286</sup> Pembina Institute calculations; data source: Statistics Canada. (2014). *CANSIM Table 031-0002: Flows and stocks of fixed non-residential capital, by North American Industry Classification System (NAICS) and asset, Canada, provinces and territories*. Retrieved from <http://www5.statcan.gc.ca/cansim/a05?id=0310002&retrLang=eng&lang=eng>
- <sup>287</sup> Babad, Michael. (2014, September 10). The Canadian dollar, oil and 'Canada's Dutch Disease.' *The Globe and Mail*. Retrieved from: <http://www.theglobeandmail.com/report-on-business/top-business-stories/the-canadian-dollar-oil-and-canadas-dutch-disease/article20509692/>
- <sup>288</sup> Organization for Economic Cooperation and Development. (2012, June). *OECD Economic Surveys: CANADA*. p. 4.
- <sup>289</sup> Dobson, S., Lemphers, N., and Guilbeault, S. (2013). *Booms, busts and bitumen: The economic implications of Canadian oilsands development*. Pembina Institute and Equiterre. p. 19.
- <sup>290</sup> Author calculations; data source: (i) Statistics Canada. (2014). *CANSIM Table 379-0030: Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS), provinces and territories*. Retrieved from <http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=3790030> and (ii) Statistics Canada. (2012). *CANSIM Table 379-0025: Gross domestic product (GDP) at basic prices, by North American Industry Classification System (NAICS) and province*. Retrieved from <http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=3790025>
- <sup>291</sup> *Ibid.*
- <sup>292</sup> Dobson, S., Lemphers, N., & Guilbeault, S. (2013). *Booms, busts and bitumen: The economic implications of Canadian oilsands development*. Pembina Institute and Equiterre. p. 19.
- <sup>293</sup> Petroleum Human Resources Council of Canada. (2013). *The decade ahead: Labour Market Outlook to 2022 for Canada's Oil & Gas Industry*, Petroleum Labour Market Information. Retrieved from [http://www.petrohrsc.ca/media/85483/canada\\_labour\\_market\\_outlook\\_to\\_2022\\_report\\_may\\_2013.pdf](http://www.petrohrsc.ca/media/85483/canada_labour_market_outlook_to_2022_report_may_2013.pdf). p. 34.
- <sup>294</sup> Pembina Institute calculation based on a total number of full time jobs in Canada in 2012 of 14,212,900; data source: Statistics Canada. (2014). *CANSIM Table 282-0010: Labour force survey estimates (LFS), by National Occupational Classification for Statistics (NOC-S) and sex annual*. Retrieved from <http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=2820010> Retrieved from <http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=2820010>
- <sup>295</sup> *Ibid.*
- <sup>296</sup> *Ibid.*
- <sup>297</sup> Canadian Association of Petroleum Producers. (2014). *Economy, Oil Sands: An important asset generating benefits across Canada*. Retrieved from <http://www.capp.ca/canadaIndustry/oilSands/Energy-Economy/economy/Pages/default.aspx>
- <sup>298</sup> Cooper, D. (2014, February 12). Oilsands the giant of Canada's economy, study finds. *Edmonton Journal*.
- <sup>299</sup> Pembina Institute calculations; data source: Statistics Canada. (2014). *CANSIM Table 282-0010: Labour force survey estimates (LFS), by National Occupational Classification for Statistics (NOC-S) and sex annual*.

---

Retrieved from <http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=2820010> Retrieved from <http://www5.statcan.gc.ca/cansim/pick-choisir?lang=eng&p2=33&id=2820010>

<sup>300</sup> Blue Green Canada. (2012). *More Bang For Our Buck: How Canada Can Create More Energy Jobs and Less Pollution*. Retrieved from

<http://bluegreencanada.ca/sites/default/files/resources/More%20Bang%20for%20Buck%20Nov%202012%20FINAL%20WEB.pdf>. p. 16.