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Canada's oil sands: The mark of a new 'oil age' or a potential threat to Arctic security?

Abstract

For more than a decade, nation states globally have been actively engaged in the exploration of unconventional fuel sources such as tight oil, shale gas and coal bed methane. As technology has developed over time, these newer sources of hydrocarbon, once thought economically nonviable, are now offering renewed hope for increased energy security. In Canada, while deposits of shale gas are in development, it is, however, the nation's oil sands that are proving most lucrative. Located in the province of Alberta, oil sands are being touted as the means to make Canada 'an emerging energy superpower'. While this geopolitical posturing and plans for pipelines through Canada's Arctic North are being welcomed by some, others fear the heavy toll oil sands extraction will make on the environment. In addressing these arguments, this paper tells two stories: one of the development of oil sands through the lens of the peak oil/scarcity debate and the other, of the narratives being utilised by the Canadian government to create a nexus between nation building and securing its Arctic spaces. Both essentially suggest that it is the same factors regionally and globally that are pursuing an agenda where 'liquid modernity' has become a reality (Bauman, 2000).

Key Words

Oil/tar sands; Canada; Keystone XL; Arctic energy gateway; Sovereignty.

Introduction

In 1999, the UK-based magazine, *The Economist*, claimed that the world was “drowning in oil” and was likely to remain so. Fast forward 15 years, however, and its March 2014 headline tells a very different story. It reads: “the North Sea – running on fumes”. This headline, like many others appearing over the last decade, suggest another, more troubling reality, one where rather than being awash with oil, many conventional oil supplies are in decline and oil scarcity in many parts of the world is becoming a very real scenario. This situation has increased concerns about long-term energy security globally and has prompted many nation states, particularly those with Arctic coastal boundaries, to start exploring options in this region for both onshore and off shore development of oil and gas reserves. This increased focus has also included plans for new and as yet untested transportation routes through Arctic waters to bring any future exploitation to market.

While the recent exploration operations of energy companies such as Royal Dutch Shell off the northern coast of Alaska in the Beaufort and Chukchi seas are well known, less well-known are the various plans and debates surrounding the extraction and transportation of Alberta’s oil sands (Zalik, 2010; Sherval, 2013; Veltmeyer and Bowles, 2014). This paper therefore has two aims. The first is to provide a theoretical understanding of the oil sands industry in Canada by initially situating the research in the literature on scarcity. From here, the paper seeks to show how by framing the development of oil sands through these means, the Government of Canada has also been able to translate the idea of energy insecurity into a discussion about Arctic sovereignty and national development.

The second aim of the paper is to provide a brief analysis of the diverse debates associated with this unique and highly controversial form of extraction. By examining the central arguments of opposition groups, the government and industry bodies, the paper seeks to highlight

the different ways through which arguments for and against the extraction and transportation of this resource are being framed. Likewise, through an evaluation of two of the pipeline options the Government of Canada is considering for transportation of the resource, as well as an appraisal of the amount of greenhouse gas emissions that could be released by these forms of delivery, it is hoped that a more coherent approach to this issue might be offered. Currently, most debates focus on the binary between project approval or lost economic opportunity rather than broadening the debate to include the long-term implications of policy decisions concerning the associated issues of increased environmental risk, community concerns and the ongoing security of Arctic spaces more generally (Palen et al, 2014; Shum, 2013).

The paper concludes on a cautionary note, suggesting that once the lines between energy security and national sovereignty are blurred, the greater the need for strict environmental standards to be in place. With the composition and geography of tomorrow's oil being dramatically different to the 'black gold' of the past, and given that the high Arctic is being visualised as the next hydrocarbon frontier, how its resources and fragile ecosystems are managed will essentially determine the future of the region. Whether it is merely to serve as a stop-gap to final depletion or as a testament to careful planning, human ingenuity and long-term balanced decision making fundamentally rests upon an enduring will to lead judiciously and the desire for an equitable collective energy future.

2. Framing the debate

Energy security is influenced by a number of factors, including ongoing supply, appropriate regulation, investment, and, in the modern era, constantly - evolving technology and political resolve. In many nation states, there has been a blurring of the lines between the economic concerns of ensuring constant energy supply and the political concerns of national defence. This situation, as Cuita (2010:124) suggests, brings energy into the security domain and as such, "it is likely to affect the manner in which energy policies are pursued" and where. Add to this

conflicting debates about the degree of oil scarcity amid increasing geopolitical tensions globally, and national governments whose economies are leveraged against an ongoing supply of cheap oil begin to imagine apocalyptic outcomes for society. Some of the future scenarios for North American energy security in particular involve exploiting new sources of hydrocarbon as well as ensuring their transportation to both evolving regional and international markets. The historical debates about scarcity and modern responses to these are outlined here.

2.1. Oil insecurity

Framed in terms of ‘peak oil’, scenarios of scarcity have long existed. First documented by the analysis of Marion King Hubbert in 1956 which proposed that U.S. oil production would peak by the 1970s, this theory was later applied to other oil regions implying that anywhere unrestrained oil production was occurring, a peak would be reached once approximately half of the reserves were depleted and extraction costs rose as a result of the need to distil lower quality, harder to reach deposits (Bardi, 2009; Hemmingsen, 2010). Unsurprisingly, this theory ignited contentious and often polarising debates that remain prevalent today. As Bridge and Wood (2010:567) suggest “scarcity is oil’s meta-narrative”, an unfolding drama that pits optimistic oil producers (also known as ‘anti-depletionists’ or ‘sceptics’) against those who see themselves as Realists, including many environmentalists, climate change scientists, and several well-known geologists and petroleum engineers (see: Campbell, 2002; Deffeyes, 2005; Tertzakian, 2007; Laherrere, 2013; Miller, 2013).

Essentially, the ‘Realist’ argument (sometimes labelled the ‘pessimist’ side of the debate by detractors) suggests that oil supplies have already ‘peaked’ or reached a ‘break point’ and that alternate and non-conventional sources will be unable to ‘fill the gap’ in the timescale required, thus leading to a permanent shortfall (Deffeyes, 2005; Goodstein, 2004; Tertzakian, 2007). Most Realists believe that the rise and decline of oil fields is an inevitable consequence of geological factors that determine supply and claim that the world will never be able to produce more than 85 million barrels of oil a day, irrespective of the fact that demand is now higher than this (Elkington

and Kendall, 2009). Missing from this argument, however, is an acknowledgement that measuring the actual size of a field, ease of access and the degree of recoverability of resources remains difficult to determine as this is limited to, and by our current economic and technical understanding of prediction models based on probabilistic estimates, which are subject to change over time. Thus as Labban (2010:543) aptly notes, we are constrained by “the temporal logic of the forecast”. Sorrell et al (2009: viii) also suggest that the “ultimate recoverable resources of a region depend upon economic and technical factors as much as geology and can only be estimated to a reasonable degree of confidence when exploration is well advanced”, which for some newer resource-producing regions of the globe, such as the Arctic, it is not. As such, Meng and Bentley (2008:1183) remind us that in reality the only sure indicator of peak is a combination of factors such as:

... the quantity of oil that has already been found, ...the history of when these discoveries occurred (the discovery trend), geological knowledge on what the rest of the region is likely to yield in new discovery, and *sensible* estimates on when such discoveries are likely to occur.

Many ‘Optimists’ suggest that there have in fact been many ‘peaks’ observed historically during periods of political and economic turmoil and that when these occur, the price mechanism of the free market prevents the peak from taking effect by stimulating more investment in exploration and extraction technologies, and that this in turn increases the amount of oil found and brought to market; hence, there is no peak (Bardi, 2009). As Klare (2014) suggests, from this perspective, the world’s supply of oil is essentially ‘boundless’. In 2014, the International Energy Agency (IEA) stated that global supply was at 92.9 million barrels of oil a day (IEA, 2014a:1). Optimists suggest that this indicates that if fully supported by increased investment and technology, current supplies will be able to meet future demand as this figure is much higher than the physical limits the Realist argument suggested could ever be reached. This argument, however, does not appear to take into account the predictions by the National Petroleum Council (2007:8) which suggest that future demand levels are expected “to rise 50-60 per cent by 2030”.

In 2015, this seems very likely to be the case especially with the price of oil dropping below US\$50 a barrel for the first time since 2009 (see Fig. 1). Some pundits suggest that this could in fact become the “new ceiling for oil” prices or at least a possible demarcation line between global monopolistic and competitive oil regimes (Kaletsky, 2015). As Kaletsky (2015) notes, until mid- 2014:

oil operated under a monopoly-price regime, because Saudi Arabia became a ‘swing producer’, restricting supply whenever it exceeded demand. But this regime created powerful incentives for other oil producers, especially in the U.S. and Canada, to expand output sharply.

These competitive market conditions, however, also impacted upon investment by lowering profit margins and increasing development costs, a scenario which could make some energy projects economically nonviable especially if the cost of oil were to drop below US\$20 as it did in the late 1990s (see Fig 2). In late 2014, the IEA stated that “deepwater, oil sands, and oil from North American shale plays...[were] widely considered to be those types of crude oil production most sensitive to lower prices”, with some requiring a price of US\$80 bbl¹ or higher to break even (IEA, 2014b). Given that these commodities are so price sensitive, it brings into question just how reliable Optimist arguments of the future are and whether they are based on a realistic appraisal of production, reserves and price fluctuations, or simply reflect an inability to consider the alternative – that the days of big oil may be numbered.

Fig.. 1. Decrease in Oil price 2014-2015. *Source:* Adapted from Bird (2015).

¹ The term ‘bbl’ refers to billion barrels of oil. Bbl/d is billion barrels of oil per day.

Optimists like Daniel Yergin continue to suggest that innovations such as the ‘digital oil field’² will “help to recover an enormous amount of additional oil worldwide – by one estimate, an extra 125 bbls, almost equivalent to the current estimate reserves of Iraq” (Yergin, 2011). This estimate assumes greater access to resources through technology and in the case of the North America, visualises this growth potential coming from a combination of sources, including Canadian oil sands, offshore sources (including oil from the Arctic and the Gulf of Mexico), tight oil and oil shales (see: Fig 3). This optimism, which Klare (2014) refers to as “techno-dynamism”, is also unsurprisingly shared by energy giants which have recently branded the digital oil field with their own trademarks such as the ‘Field of the Future’ (BP), the ‘iField’ (Chevron) or the ‘Smart Field’ (Shell), all implying that data is now in fact “the new oil” (Leber, 2012).

Fig. 2. The real price of Oil since 1970. Source: Katletsky (2015).

² The concept of the Digital Oil field (DOF) largely focuses on leveraging the combined benefits of modern IT services, automation and communications to enhance all the conventional aspects of oil and gas operations, from exploration and production to environmental monitoring and safety. Essentially DOF is about unifying disparate oil field processes into a more easily digestible stream of information, making it easier to get the big picture on an operation and thus optimise productivity in real-time, while minimising labour-intensive and risk-laden complexities (See: Goode, 2005; Lo, 2013). The literature in this emerging field is small and tends largely to emanate from within the Oil, Petrochemical and Insurance industries.

Sounding a note of caution, however, Sorrell et al. (2009: vi) suggest that the extent to which increased investment alone can overcome geological constraints is contested. Confirming this, Labban (2010:542) highlights the fact that an overreliance on plentiful future investment fails to take into account the fact that oil circulates in two distinct spaces: the financial space of futures markets and the physical space of pipelines and repositories. To assume that new investment in exploration and production will precipitate a rise in market prices incorrectly assumes that oil trade markets are not speculative nor subject to volatility, especially when investment is leveraged against predicted new discoveries which may fail to eventuate or against commodities that may fail to sell (thereby reducing potential profit). This ultimately creates further uncertainty rather than reducing it thereby returning the scarcity argument to where it first began: questioning if and when oil's peak has been or will soon be reached.

Fig. 3. Energy potential. Source: U.S. National Petroleum Council (2011)

While this debate continues to rage on unabated, it is a conversation that is nevertheless important to have. The fact remains that without sufficient investment in ways to reduce

consumer demand and find alternate sources of energy, a major decline in the global production of conventional oil will occur. This, in conjunction with an increase in the start-up costs of unconventional oil sources and an unstable oil price, will ultimately have major economic and geopolitical repercussions for our world now and into the future. For many Optimists, the ongoing answer to this lies in accessing new resource frontiers where greenfield opportunities still exist and current geologic predictions appear encouraging. The Arctic is one such space being visualised as a new frontier of hope where it is believed that tomorrow's natural resources lie *in situ*. For nation states, particularly those with Arctic boundaries and heavily dependent on ready oil supplies, this area is seen as the means for ensuring not only ongoing security of supply but also future prosperity.

2.2. Sovereign visions of oil security

While the existence of Arctic oil was known as far back as the eighteenth century, initially Arctic oil was to come from the sea rather than the land, in the form of whale oil which became the first globally traded Arctic commodity (Emmerson, 2010). Geologically-formed oil, however, would take a great deal longer to become commercially available from this region as logistically, accessing sites in the Arctic North was, and remains, a costly and risky enterprise. Even when the discovery of oil at Prudhoe Bay (Alaska) occurred in 1968, it required a large consortium of oil companies to design, engineer, build and operate a 1250 km (780 mile) pipeline across the whole State to the southern port of Valdez to get the resource to market, some 10 years later. Then, as now, oil security was a highly politicised issue but the achievements at Prudhoe Bay were to signify “the beginning of the first sustained Arctic oil rush” (Emmerson, 2010: 203). Nearly 50 years on and it is widely acknowledged that future oil and gas production, including

unconventional new sources such as ‘extreme’, ‘tight’ and ‘offshore’³ resources will still most likely be found in this region.

Once thought to be of little worth economically, recent geological surveys suggesting that the Arctic could hold nearly one-fifth of the world’s remaining untapped hydrocarbon resources, have seen the region gain increased attention from both major energy companies and bordering nation states (AEO, 2012; Bird et al, 2008). All of the five countries with Arctic boundaries – Canada, Russia, the United States (U.S.), Denmark (through its control of Greenland) and Norway – are reaffirming their historic claims in the area and taking renewed action to protect their interests there; none more so, than Canada (Klare, 2013:94).

Highly cognisant of the Arctic’s potential, Canadians have always glanced northwards, imagining their ‘True North’ lands to be ‘strong and free’ and as Prime Minister (PM) Stephen Harper recently told Canadians, “the Arctic is in its ascendancy, [it is] our last frontier, and thus our future” (Harper in Brown and Power, 2014:2). No stranger to resource booms, (think the Klondike/Yukon Gold Rush 1896-1899, the Mackenzie Valley oil finds in the 1920s, and the Northwest Territory diamond discoveries in the 1990s), today’s rush for resources in Canada’s North is very much an organised affair, with Ottawa spending over CAN\$100 million on programmes to map the mineral resources of the Canadian Arctic, with a view to accelerating its’ development (Emmerson, 2010:196). Framed in terms of improving the lives of those living in Canada’s North, in August 2014, PM Stephen Harper announced that his government recognised “the full potential of the North” and would “continue to support northern development by ensuring sustainable, low impact, responsible resource development in the Arctic” (Harper, 2014). This essentially builds upon the country’s ‘Northern Strategy’ (2009) which presents an overarching vision for the North based on four priorities: exercising Arctic sovereignty; promoting social and economic development; protecting environmental heritage; and, improving

³ The terms ‘extreme’, ‘tight’ and ‘offshore’ are all used to refer to unconventional sources of oil and gas. These sources tend to be heavy, complex, carbon-laden and trapped between or bound to sand, tar or rock, usually requiring mining, fracking techniques or high pressure, deep water drilling for extraction (See: Gordon 2012; Rees and Sharp, 2011).

and devolving Northern governance, to provide places like the Northwest Territories (NWT) with greater decision making powers (Harper, 2013).

While these strategies are seen as essential for provincial development of the Yukon, the NWT and Nunavut in particular which account for 40 per cent of the country's land mass, it is a lack of infrastructure in these regions that could essentially prevent the vision of a resource boom there from becoming a reality. As executive director of the NWT Chamber of Commerce, Mike Bradshaw (in McDiarmid, 2014), suggests:

the North is on the cusp of another boom, with 20 mining projects in all three territories in the approval stage. The big oil and gas companies are coming back, too. There are plans to explore offshore in the Beaufort Sea and to frack for oil in the Sahtu region of the Mackenzie Valley where the new Canol Shale Oil reservoir is estimated to be as large as the Bakken oil fields of North Dakota, but the lack of infrastructure — roads and paved airport runways — could slow that boom to a trickle... Only 10 out of 65 airports...have paved runways.

Echoing this state of affairs, critics of the Government of Canada's Northern Strategy claim that "sovereignty is best advanced by building healthy communities" and by acknowledging that people in these remote places *are* "living the sovereignty, so... the idea of 'use it or lose it' (promoted by Stephen Harper) is a moot point, because it is used" (Kines in Chase, 2014). Acknowledging the enormous costs involved in addressing the ongoing issues in these important, but sparsely populated regions, the federal government has recently refocused its attention on its southern provinces such as Alberta, where there are numerous external operators vying to mine the oils sands of the Athabasca and its surrounds (AER, 2014a). Income raised from exploiting this resource alone could provide the federal government with the necessary means to continue its ambitious projects in the North and ultimately, to ensure that its Arctic spaces play a larger role in providing not only a pathway for future resource exploitation and transportation, but also a means to ensure sovereign control over this valuable territory. How this industry has developed to be the country's largest source of new oil products and what it means overall for the government's Arctic plans, is discussed further in Section 3.

3. Alberta's oil sands: when 'oils ain't oils'.

In the mid-1990s, when the rest of the globe was beginning to investigate the possibility of exploitation of shale oil, gas and coal bed methane, Canada was beginning to take advantage of the huge reserves of carbon-saturated energy found in its province of Alberta. Oil sands, also known as 'tar sands' because they consist of bitumen mixed with sand (like asphalt), represent, according to critics, "a true symbol of peak oil" (Nikiforuk, 2010:8) while for others, they signify capturing the elusive "brass ring" (Moore et al., 2011) and the possible "beginning of a new oil age" (The Economist, 2011). Essentially, what these diverse arguments illustrate is that oil sands, perhaps the most unconventional source of all hydrocarbons, offer two very distinct visions of the energy future: the first, where oil sands are seen as part of the great hope for an ongoing solution to declining oil reserves and insecurity; and the second, as an industry potentially responsible for an unmitigated environmental disaster which threatens to contaminate water courses, dramatically increase global warming, wreck vast areas of boreal forest and override the customary practice treaties of traditional owners (Homer-Dixon, 2013; LeClerc and Keeling 2015). These disparate arguments and how the industry developed from one that subsisted on the margins of the global petroleum industry 25 years ago through to its prominent position today are outlined below.

3.1. A brief history of the resource

As early as 1714, James Knight (a Director of the Hudson Bay Trading Company), assigned to Fort Albany in James Bay (bordering the provinces of Quebec and Ontario), was told by local Cree and Chipewyan of a great river far inland where there was a "certain gum or pitch that runs down the banks of a river (the Athabasca) in such abundance that they cannot land (their canoes) but at certain places" (CCFE, 2011:2). This was believed to be the first report by a European on the oil sands deposits in Western Canada. It was to be 180 years later, however, before the Canadian parliament passed a bill authorising funds for the Geological Survey of Canada to

investigate oil sands as a potential source of petroleum (CCFE, 2011:2). By 1967, locally based companies such as Syncrude Consortium were in operation and processing bitumen into synthetic crude oil. The rest of the world's major energy corporations, however, believing that extracting large quantities of bitumen from sand and then converting it into liquid form was too costly, left the region only to return in the 1990s, when oil prices had risen and the size of conventional oil fields had dramatically declined (Klare, 2013).

Essentially, because bitumen is found in solid form as opposed to the liquid form of conventional oil, its extraction can require both conventional mining methods and non-conventional *in situ* methods. The extraction of oil sands involves excavation of the bitumen-rich sand using traditional open pit mining methods. Herweyer and Gupta (2009) suggest, that this is the most efficient form of extraction when there are large deposits of bitumen with little overburden, as is the case for 20 per cent of Alberta's resource or approximately 500 km² of the total oil sands land area (illustrated in Fig. 4). *In situ* methods, however, are required to access the other 80 per cent of the resource which lies approximately 70 -80 metres below the surface (Mawdsley et al, 2005). Once the bitumen is removed, it has to be converted or 'upgraded' to a synthetic crude oil before it can be refined into common petroleum products such as gasoline or kerosene, thus giving credence to the old Castrol oil company slogan: 'Oils ain't oils' (Castrol Ltd, 2014).

The oil sands industry in Alberta, which has the third largest known deposits in the world (after Saudi Arabia and Venezuela), contains the equivalent of 170 billion barrels of oil, 168 billion barrels recoverable from bitumen (Alberta Canada, 2014). It has been suggested though that the figure of 168 billion barrels of bitumen represents what is considered economically recoverable with today's technology, but with new technologies, this reserve estimate could be significantly increased, with total oil sands reserves in place estimated to be as much as 1.8 trillion barrels (Alberta Canada, 2014:2). In 2013, Alberta produced 11,821 petajoules of energy from all sources, the equivalent of more than 5.3 million barrels per day of conventional light-

medium crude oil (AER, 2014:1-2). In 2013, the U.S. alone imported 3.1 million bbl/d of oil and petroleum products from Canada and over the past decade, U.S. imports of Canadian crude have increased by 59 per cent, allowing it to significantly reduce its foreign imports (U.S. EIA, 2014). While its own supply of oil and gas has grown over the past decade through record amounts of new oil from the shale boom, demand, however, continues to increase. Canadian producers, therefore, have not been threatened by more U.S. shale producers coming online. While oil sands are more expensive to produce than shale oil, their costs are more akin to a mining operation than to a conventional oil drilling operation. This makes a world of difference in terms of investment and risk (Phillips, 2014). As Phillips (2014) suggests further:

While Oil sands projects require massive upfront investments, once those are made, they can go on producing for years with relatively low costs. That's made oil sands, and the companies that produce them, quite profitable over the past few years... Frackers in the U.S. [in comparison] who operate on a much shorter time horizon... tend to produce most of their oil within about 18 months or so. That means that to maintain production and rates of return, frackers need to keep reinvesting in projects with fairly short lifespans, whereas an oil sands project, once up and running, can continue to chug along, even in the face of lower prices, since its costs are spread out over a decade or more rather than over a couple years.

This situation alone should keep oil sands production from falling and help insulate oil sands producers from lower prices, at least for now. Likewise, the positive prediction that by 2023 Canada's oil sands production should rise to the equivalent of over 7.1 million barrels per day as well as the fact that in the last decade alone, cumulative investment in the industry surpassed \$100 billion, (with hundreds of billions more expected over the next 25 years), has allowed Canada to portray itself as a new 'petro-state' and oil sands as the cornerstone of the Canadian economy (AER, 2014a; Burt et al., 2012).

Fig.4. Alberta's Oil fields and oil sands deposits. Source: Alberta Energy Regulator/ Alberta Geological Survey (2014b).

It has been suggested that it is Canada's unique combination of large untapped reserves, a stable political environment, and an openness to investment that is driving the oil sands industry today and that as a result, it is expected to become the fourth-largest oil producer in the world before 2035 (Burt et al., 2012:1). The fact that there are currently 48 foreign and locally-owned oil sands producers in Canada would seem to support this claim, though whether this actually translates into increased energy security "hinges on perspective" (Pascual and Elkind, 2010:2). The participation of international oil companies, both private and state-owned, in Canada's oil sector continues to increase rapidly and as the U.S. EIA (2014) notes, aside from economic and political motivations, investments in oil sands enables foreign companies to gain technological

expertise that can also be applied to unconventional resources elsewhere. While the ‘Investment Canada Act’ stipulates that any large investment in Canada must be of net benefit to Canada, (indicating possible limits on foreign control of strategic commodities), these limits, however, have rarely been invoked. Tsai (2014:6) suggests that this is a widely-known fact which not only compromises Canadian sovereignty of natural resources but also thwarts its attempts to access other markets outside of North America. Under Article 605 (the ‘Energy Proportionality clause’ - EPC) of the North American Free Trade Agreement, Canada alone is required to export energy to the U.S. “indefinitely at the average proportion to total supply of the previous 36-months”, which although can vary over time, theoretically can only increase (Tsai, 2014:5; Laxer and Dillon, 2008:7). Negotiated at a time when Canada was seeking trading partners for its overabundance of energy products, and when the U.S. was looking for a stable and secure energy source as an alternative to its reliance on Middle Eastern oil, the EPC seemed to fulfil both countries’ needs (Laxer and Dillon, 2008:12). However, as the U.S. has gained what appears to be a monopolistic hold over Canadian energy resources, it has become clear that this trade mandate is compromising Canada’s own energy security and is stifling its ability to service other markets.

Equally concerning are the difficulties Canada has faced in transporting its energy products to market. As Elkington and Kendall (2009) suggest: “the oil question is now, more than ever, a transport question”. While Canada has been the largest supplier of oil to the U.S. since 2001 (including three out of every four barrels of oil sands produced), ongoing concern over transportation routes and bottlenecks to the U.S. and other potential markets have been raised with calls to expand Canada’s pipeline export capacity (Chastko, 2010). Alberta’s Energy Minister Ken Hughes (in Van Loon, 2013) acknowledging these calls, has openly stated that:

It is a strategic imperative, it is in Alberta’s interest, it is Canada’s interest, that we get access to tidewater, whether that’s east, north or west, to diversify away from the single continental market and be part of the global market.

Several pipeline options, including expansion of existing infrastructure, are being explored in Canada to increase the capacity and coverage of the oil sands transportation network.

These include: the Enbridge Mainline pipeline (extending from Fort McMurray, Alberta through to Montreal and Portland via the Atlantic coast); the Northern Gateway pipeline (through central Alberta to the port at Kitimat, British Columbia, via the Pacific Coast); the Kinder Morgan–Trans Mountain pipeline (from Edmonton to Burnaby, British Columbia, also on the Pacific coast); the TransCanada East Coast project (from Hardisty to Quebec on the Atlantic coast) and various other extensions known simply by their line numbers, such as Line 5, Line 6A, Line 6B, Line 9 and Line 61 (see Fig. 5). Given the number of options currently in play and the limited space available for detailed analysis, this paper only explores two of these options. One is the controversial Keystone XL pipeline and the other is the newest plan to emerge from research completed for the Alberta Provincial Government on ‘Arctic Gateway’ options.

Fig. 5 - Oils Sands pipeline options. *Source:* adapted from Catherine Mann and Inside Climate News (2012).

3.2. The keystone XL pipeline

The proposed Keystone XL (KXL) pipeline is not a new pipeline but an extension of the current TransCanada Keystone pipeline which in total plans to stretch a full 1,897 km (1,179 miles) from Hardisty, Alberta through Saskatchewan, Montana, South Dakota, Nebraska and eventually onto Cushing, Oklahoma (Figure 6). As the pipeline would cross the U.S.-Canada border, its successful completion will require the Obama administration justifying that building it is in its national interest (McElroy, 2013). A further extension from Texas northwards to Cushing has already been endorsed by President Obama and opened in January 2014, thereby reducing one of the bottlenecks for mid-Western crude to reach markets in Asia and beyond. This new section will also facilitate further transfer of oil from Cushing to the refineries on the Gulf of Mexico, which currently are supplied by dwindling Mexican and Venezuelan sources (Jefferies, 2013). The final component of KXL, however, remains locked in the courts as a powerful coalition of Indigenous peoples, landowners, grassroots activists and environmental NGOs across the U.S. and Canada protest, blockade and debate the potential for disaster that could be caused by the final piece of this pipeline and the amount of fuel it will carry. This is estimated to be up to 830,000 barrels of oil per day—though not all from Alberta tar sands, the pipeline would also carry oil from the Bakken shale formation in North Dakota (McElroy, 2013:38). While the numerous legal wrangles continue, however, President Obama will not sign off on the legislation approving its construction, much to the chagrin of the Government of Canada and industry pundits who have waited for over six years to finalise this section of the project.

Arguments for the pipeline, and the need for oil sands exploitation generally, can be summed up most clearly by the polemic and provocative work of Levant (2011:12-13) who has suggested that Alberta's oil is the most "democratic" and "ethical oil of all" when compared to oil produced in places like Saudi Arabia, which he calls an "Islamic feudal state", and its neighbours, some of the world's worst "dictatorships, human rights abusers and warmongers". While it might

be assumed that most government and industry leaders would distance themselves from such obvious vitriolic diatribe, instead, this argument is proving a persuasive and attractive foil and is being frequently used to frame the rhetorical and practical response of proponents to opposition groups. As Aronczyk (2014:132) suggests:

the phrase “ethical oil” and the ideas accompanying it pepper senators’ and ministers’ speeches, pipeline companies’ power point presentations, and economists’ reports on both sides of the Canada/US border. Indeed, the... ideas have expanded into an ongoing counter campaign against environmental activism, supported by a network of state actors, lobbyists, and spokespeople and amplified via conservative Canadian media outlets, a website (ethicaloil.org) and a robust social media feed.

Indeed, officials in the U.S. employing these types of arguments also suggest that relying on Canada’s oil sands may help “limit OPEC's influence, reduce America's susceptibility to Middle East supply disruptions, and insulate against terrorist activities by utilizing secure infrastructure” (Levi, in Jefferies, 2013:80). Thus it can be seen that security remains one of the main incentives used to argue for the exploitation and transportation of oil sands to regional markets and beyond. In 2014, subsequent to initially labelling oil sands as “one of the dirtiest forms of oil” and suggesting that its proposed ‘Fuel Quality Directive’⁴ would effectively make Canadian crude unwelcome in European refineries, after a souring of relations with Russia over the continuing war with Ukraine, the European Commission has been compelled to take another look at Alberta crude in order to reduce its dependence on Russian oil and gas supplies (Hussain, 2014). Likewise, Japan and India have also shown interest in the development of infrastructure to assist in the refining of oil sands to facilitate advancement of the product to Asian markets (Hussain, 2014).

Opponents contend, however, that expanding the use of oil sands will not only exacerbate climate change, but will also pose unacceptable risks to aquifers and local wildlife, as well as

⁴ The European Commission’s ‘Fuel Quality Directive’ proposed new standards for transportation fuels in the hope of reducing their contribution to climate change and air pollution. The new standards aim not only to make petrol, diesel and gas/oil ‘cleaner’ but will also allow the introduction of vehicles and machinery that pollute less. A key measure is that, to encourage the development of lower-carbon fuels and biofuels, suppliers will have to reduce the greenhouse gas emissions caused by the production, transport and use of their fuels by 10 per cent between 2011 and 2020. This is expected to cut emissions by a cumulative total of 500 million tonnes of carbon dioxide by 2020. (For further information see: <http://ec.europa.eu/environment/air/transport/fuel.htm>).

further entrench society's reliance on energy from fossil fuel rather than on more renewable sources. In Canada, while the federal government is investing CAN\$281 million over five years in renewable clean energy technologies, when compared to the estimated CAN\$2.8 billion provided in subsidies and tax breaks to oil sands operators, there is clearly an inequity in its commitment to renewables (Smith, 2014). First Nation communities such as the Athabasca Chipewyan are also concerned with what are seen as weak environmental standards that will do nothing to ensure the protection of caribou and other wildlife, and which could also threaten local food and water sources (Worth, 2009). Likewise, in the U.S., Native and non-Native American communities along the path of the KXL remain concerned about the potential for contamination should an oil spill occur. Highly cognisant of the huge impact the 2010 Deepwater Horizon oil spill had in the Gulf of Mexico as well as the Enbridge pipeline spill of 2011, during which an estimated 877,000 U.S. gallons of oil sands flowed into the Kalamazoo River near Michigan, many fear the possibility of an oil spill near fresh water sources such as the Ogallala Aquifer in the Sand Hills region of Nebraska. The Ogallala Aquifer is one of the world's largest aquifers, covering an area of approximately 450,000 km². A spill here would be devastating to many communities, both human and non-human (Hoberg 2012:2).

Somewhat ironically, and clearly doing very little to dispel ongoing local concerns, the 2014 release of the U.S. Department of State Final Environmental Impact Statement (FEIS), which considered the possible effects of a KXL spill, suggested that "pipeline spills are inevitable, particularly smaller ones" and it estimated that "the Keystone XL pipeline will leak an average of 518 barrels of oil per year", despite the fact that TransCanada is putting monitoring systems and other leak-prevention technology in place. Other findings by the U.S. EPA suggest that between 1980 and 2004, there have been 4.3 million oil spills of greater than 100,000 gallons, with an average of 8 million gallons spilling annually into U.S. waters (Beasley, 2004). Further, it suggests that the areas of greatest concern are oil production, storage, and pipeline facilities, due to structural failures associated with 42 per cent of all spills (Etkin, 2004). In terms

of oil sands specifically, Young (2013), using data obtained from the Energy Resources Conservation Board reports that Alberta has had an average of two crude oil spills per day, every day for the past 37 years.

Fig. 6. Keystone XL Pipeline extensions. *Source:* TransCanada (2015).

Causing the most alarm, however, and a key argument of opponents is that producing and transporting oil sands will increase greenhouse-gas (GHG) emissions and worsen global warming overall. A U.S. National Energy Technology Laboratory Report (2009:12) suggests that oil sands pollute between 3.2 and 4.5 times more per barrel than conventional oils produced in North America and that from 2005 to 2020, oil sands are projected to grow nearly four times more than Canada's industrial emissions as a whole. To make matters worse, currently, there are no federal regulations to limit greenhouse gas pollution from oil sands (Environment Canada, 2011).

In response to these concerns more generally, the KLX FEIS estimates that the incremental (*i.e.* net) life-cycle GHG emissions associated with the pipeline will be 1.3 - 27.4 million metric tonnes of carbon dioxide per year or only 0.02-0.4 per cent of U.S. GHG emissions annually (Ramseur et al., 2014: ii). Refuting this, however, climate scientists Erickson and Lazarus (2014:778) have stated in *Nature* that the State Department's economic model has failed to account for the pipeline's effect on global oil prices and overall consumption. They estimate that:

...for every barrel of increased production, global oil consumption would increase 0.6 barrels owing to the incremental decrease in global oil prices. As a result, and depending on the extent to which the pipeline leads to greater oil sands production, the net annual impact of Keystone XL could range from virtually none to 110 million tons CO₂ equivalent annually. This spread is four times wider than that found by the U.S. State Department (1–27 million tons CO₂e), who did not account for global oil markets.

Obviously, these estimates, much like everything else associated with this pipeline and others more generally, continue to be vigorously debated, though realistically, given the world's addiction to oil, whether KXL receives final U.S. approval or not is unlikely to stop the Government of Canada and its supporters from pursuing other options to get crude to port. In a move perhaps designed to avoid further scrutiny of its newest industry, in 2011, Canada formally withdrew from the Kyoto Protocol with Environment Minister Peter Kent, stating at the time that "Kyoto for Canada is in the past" (Curry and McCarthy, 2011). This action essentially opens the way for the federal government to consider other, more precarious options to transport its fuel to market, including more dangerous options such as road, rail and a route through the Arctic.

3.3. The Arctic energy gateway plan

While the Keystone XL route is considered ideal for getting oil sands quickly to the Gulf of Mexico and beyond, in reality, the long-term outlook for Canadian oil sands production is not tied to the fate of it. As stated earlier, there are several other alternate routes planned and most recently, a report commissioned by the Alberta Provincial Government suggested that it was

“technically feasible” for Alberta to export its oil sands north to the Beaufort Sea coastline, through the Bering Straits or the Arctic Ocean and on to “world markets in the Asia-Pacific region and the Atlantic coasts” (Jolles and Tiffin, 2013:1-2). This route is just one of four different Arctic routes being proposed which together form part of the ‘Arctic Energy Gateway’ plan, which seeks to keep the building of any transport infrastructure solely in Canadian hands. This plan, like the others on offer, provide Canada with additional alternatives should the final component of the KXL pipeline fail to win U.S. approval which at present, it seems likely to do. The two favoured routes would essentially see oil shipped north from landlocked Alberta to two possible terminuses (Bennett, 2014): one in Tuktoyaktuk (NWT) to facilitate easy access to Asian markets, and another in Churchill, Manitoba (located on the west coast of Hudson Bay) to facilitate access to European markets (Fig. 7).

Fig. 7. Arctic Gateway Options. *Source:* Adapted from Jolles and Tiffin (2013).

Until recently, the plan was dismissed as doubtful by sceptics, though since the release of the Canatec (Arctic petroleum consultants) report, the right combination of favourable conditions may finally have presented themselves. These include: a hunger for resource development in Yellowknife (NWT), a desperate need to find new markets for oil-sands bitumen, an aggressive push from the federal government to reduce environmental oversight in the NWT, and a changing northern and global climate (Ling, 2014). Promoting this plan would not only bypass the need for U.S. approval but also allow the Government of Canada to achieve another plank of its Northern Strategy: promoting social and economic development in its Northern regions (GoC, 2009). This plan, although not without significant challenges, may well end up taking precedence over other pipeline plans as several Canadian provinces such as British Columbia in the west and Nova Scotia in the east have large opposition groups, rejecting the idea of pipelines carrying oil sands through their region.

While equally as ambitious as KXL at some 2,400 km (1,242 miles) in length, this plan will undoubtedly raise environmental concern over possible risks to areas of pristine wilderness, though it is believed that many in the NWT will support the plan as it will create much-needed jobs in the region. This could explain why recently, First Nations groups there have been supportive of local fracking operations. In the past, one of the longstanding barriers to development was the hurdle of an interlocking regime of local oversight and a difficult approval process for externally-developed projects. In finalizing the province's devolution agreement in 2014, however, the Harper government effectively reduced the layers of oversight, centralizing the territory's complex land- and water-board system into a single review board, akin – somewhat ironically – to what currently exists in Alberta (Ling, 2014). With the right support, and now a far more streamlined approvals system, there is potential for the new pipeline to be ushered through in record time.

Although other logistical problems remain, such as negotiating an ice laden Beaufort Sea and an as of yet unopened Northwest Passage, the report does candidly acknowledge that a

shipping route from Tuktoyaktuk to both the Pacific and Atlantic markets would “be a revolution in global logistics, equal in impact to the opening of the Suez or Panama Canals” and that any high Arctic shipping would likely be seasonal for at least the next decade (Jolles and Tiffin, 2013:7). Despite this, it is also recognised that increased global warming has the potential to reduce many of the risks that 20 years ago, might have stopped this plan outright. The report suggests that a quickly melting Arctic would improve navigation, extend the shipping season, and decrease the risks associated with increased industrial activity on the permafrost (Jolles and Tiffin, 2013:26). It is proposed that during the periods when the ice proves impassable, storage facilities could stockpile oil until icebreakers could again clear a navigable path through the Arctic waters. Obviously, plans of this scale will also require huge amounts of investment, development of advanced technological innovation in the areas of communications, shipping and cold weather power supply, not to mention the political resolve to see such a long-term project completed. As Jolles and Tiffin (2013:123) conclude, however, “the prize for Canada is enormous”, but if nothing is done, “the Russian route will become the standard choice”, since investment in such infrastructure there is already well underway.

Clearly, this route also brings sharply into focus the reality of opening up more Arctic spaces to development, and presents a greater possibility for environmental disaster to occur. Considering that it is located in the Arctic where global warming is most dramatic, and loss of permafrost, sea ice and snow cover constantly threaten Arctic infrastructure, traditional food supplies and the integrity of entire ecosystems, it is difficult to predict how successful the Government of Canada will be in bringing this large project to fruition (Lemmen et al, 2007). Undoubtedly, there will be a large and vocal global opposition to this development occurring, particularly as many groups are now beginning to call for a decarbonisation of our world. Moreover, given that recent scientific studies have suggested that development of any resources in the Arctic and any increase in unconventional oil production will be incommensurate with

efforts to limit average global warming to 2°C, building this pipeline may in reality prove more challenging than any of the others previously suggested (McGlade and Ekins, 2015:187).

4. Conclusion

While Canada's plans to make its Arctic spaces 'productive' may at present be more of an ideal than a reality, the presence of abundant resources, such as Alberta's oil sands, present an unprecedented opportunity to achieve many of the Harper government's long-term goals. By seriously contemplating new plans such as the Arctic Energy Gateway, the federal government could also achieve many of the objectives its Northern Strategy seeks to address by not only making provinces such as the remote and underdeveloped Northwest Territories more 'productive', but also in doing so, further entrenching its sovereignty over its Arctic regions. By framing this and the development of oil sands as being in the 'national interest', the government has resolutely attempted to downplay and dismiss any criticism of its actions as being simply "unpatriotic, radical, or subversive" and an attempt to stifle economic growth (Leslie, 2014). By labelling opposition groups in this way, the aim appears to be to erase or effectively silence any alternate ideas that do not rely on or promote industrial-scale hydrocarbon exploitation. As Doremus (2000:42) poignantly reminds us, political rhetoric is designed to "camouflage complexity"; a situation which authors such as Bergmann (2013: 1348) suggest signifies that Canada, much like many other resource-rich nation states, is "bound by chains of carbon". This being the case, it is in the government's interest to quash any debate which does not support the national agenda, including denying that anthropogenic climate change is a major concern.

Ultimately, as Homer-Dixon (2013) suggests, the two global problems facing our world today – those of climate change and peak oil – are really one: a carbon problem. Thus, by continuing to promote oil dependency and oil sands exploitation as a new kind of 'resource triumphalism' (Bridge, 2001), in effect, national governments such as the Harper government in Canada, prevent investment in more renewable energy sources and continue to threaten the

security of one of the last remaining greenfield spaces in the world which is not only short-sighted, but unnecessary. As Labban (2010:543) suggests, while new technologies and new energy sources may buy us some time, in reality, they will only delay a peak in oil reserves, not prevent one. There is, therefore, no long-term technical fix for the global energy security problem as irrespective of what spin governments and lobbyists put on it, ultimately, oil, no matter where it comes from geographically or how it is sourced, continues to remain a finite resource. Thus, Canada's goal of promoting itself as an 'energy superpower' is as much about the country's desire to position itself as a big player in a tight global energy market as it is about its desire to be taken seriously as an Arctic authority in the Circumpolar North.

While the benefits of positioning itself this way are understandable from a geopolitical perspective, what Canada and other Arctic nation states need to ensure is that protection of the fragile environment of the Arctic remains paramount in their minds. Any future involving unchecked development there risks leaving a legacy of ecological and cultural damage within already-vulnerable communities. As such, guaranteeing an ongoing integrity of environmental health, justice and security in these spaces must remain an important determinant if ongoing, long-term protection is to be achieved. With a strong commitment to do this, the Government of Canada could lead the way, but ultimately, this will require courage as it may entail taking a zero approach to further carbon-based development in the Arctic, a big ask of any Arctic country in an energy-hungry world. As McGlade and Ekins (2015, 190) suggest, however, nothing short of this is necessary if a global temperature rise of over 2°C is to be avoided. Irrespective of this, with increased pressures on global energy markets from proponents and interested stakeholders alike, the time for balanced forward planning and difficult decision-making must start now.

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