Forks in the Road: Energy Policies in Canada and the US since the Shale Revolution[§]

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This article examines policy responses in Canada and the US to the shale revolution and changing North American oil and gas markets. We outline the effect of the shale revolution on North American oil and gas markets, and how the subsequent energy policy choices in each country changed the relationship between Canada and the US. In the US, increasing production combined with the policy imperative of maintaining energy security led to less support for Canadian supply, and the subsequent on-off-on saga of the Keystone XL pipeline. In Canada, growing concern about the balance between the environment and the economy led to stalled pipeline development and reform of regulatory systems, problems exacerbated by the new policy direction in the US.

Keywords: energy policy; oil; pipelines; Canada; US.

Introduction

The United States and Canada are closely linked when it comes to energy production and use. It is a cliché to say that geological features do not recognize political boundaries, and in the case of these two countries this is true for several known hydrocarbon deposits such as the rich Bakken and Utica shale plays, which straddle Montana, North Dakota, Saskatchewan and Manitoba; and New York and Québec, respectively. The first successful commercial oil wells in North America were drilled in Oil Springs, Ontario in 1858, then in Oil Creek near Titusville, Pennsylvania the following year (Parks Canada n.d.; Yergin 2008). Wildcatters, workers and financial capital from both countries worked across the border in the 150 years since then to build a truly North American energy industry. One of Alberta's flagship oil sands companies, Suncor, which today is Canada's largest integrated energy company, was led for over 20

years by the late Rick George, an American who subsequently became a Canadian citizen and Officer of the Order of Canada. For several decades as the US imported half of its daily oil consumption, Canada was a secure, reliable and steady supplier, slowly supplanting OPEC as America's main source of oil imports (U.S. Energy Information Administration n.d.-c; Prentice and Rioux 2017).

Since 2008, however, Canada and the United States have diverged and, as the title of this article points out, energy policies in Canada and the US since the "shale revolution" have taken a fork in the road. The US has reduced its crude oil imports by 20% as its domestic oil production more than doubled from 2008 to 2018. It built almost 80,000 kilometers of new pipelines and passed legislation and executive orders to facilitate and increase oil exploration and production in 2005, 2007, 2011 and 2015. Indeed, the decade after 2008 was a boon to US oil production and pipeline construction.

By contrast, Canada has built less than 2,000 kilometers of new pipelines, and oil production increased by 84% in the same period. Moreover, efforts to increase export capacity to the US have been negated for the past decade by Presidential Orders and judicial reviews of international pipelines designed to carry Canadian crude to US refineries. Why have energy policies diverged? What explains this turn of events?

We argue in this paper that the main explanatory factor is the "shale revolution" that enabled US producers to access heretofore uneconomical and technically challenging reservoirs, thus increasing US energy security of supply through domestic production of oil. Canada, on the other hand, was always energy secure and did not face the same strategic incentives to access markets other than the US. While US oil production is predicted to further increase, Canada seems destined to remain a supplier

to its single historical customer as domestic politics are aligned against building infrastructure to enable overseas exports of Canadian oil.

Oil reserves, production, and energy security

Canada's proven oil reserves are the third largest in the world, ranking behind only Venezuela and Saudi Arabia[1]. They comprise over 167.8 billion barrels of recoverable resource using current technologies; to put that number in perspective, it represents approximately 100 years of production with today's technologies and at current levels (4.3 million barrels per day in 2018), and 9.7% of the total known world reserve of oil (BP 2019). Although 97% of Canada's petroleum reserves are accounted for by the oil sands, Canada's total hydrocarbon deposits comprise both conventional and non-conventional resources and significant offshore reservoirs on Canada's east coast (National Energy Board 2018a).[2] Between early 2008 and mid-2019, Canada increased its oil production from 2.6 million barrels per day to 4.8 million barrels per day, an increase of 84% (Figure 1). Oil sands production has supplied most of Canadian production growth, accounting for 45% of total production in 2008 to 63% currently.

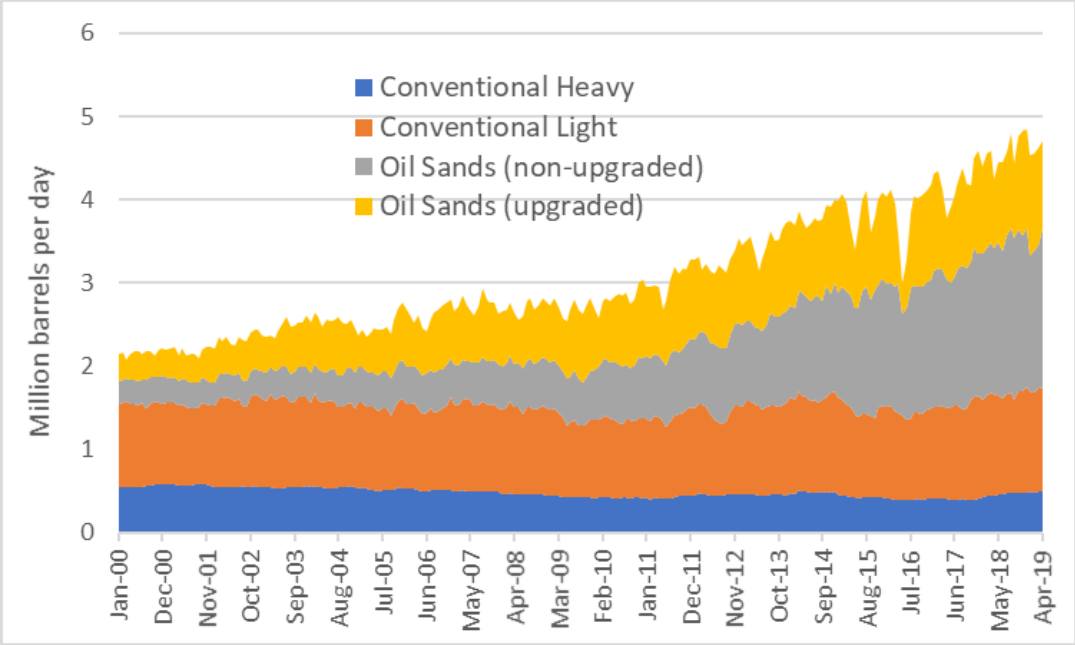
By contrast, the United States' proven oil reserves are estimated at 61.2 billion barrels (BP 2019). U.S. crude oil production was slowly declining; this production

[1] Reserves are said to be "proven" if they can be recovered under existing economic conditions, using existing technology: the US Securities and Exchange Commission (2009, 2160) defines "proved oil and gas reserves" as "those quantities of oil and gas, which, by analysis of geoscience and engineering data, can be estimated with reasonable certainty to be economically producible (…) based on existing economic conditions."

[2] Canada's resource base in the Arctic is estimated to be significant but remains largely unexplored and cannot yet be 'proven'.

decline was reversed by the introduction of multi-stage hydraulic fracturing in conjunction with horizontal drilling. The combination of the two technological

Figure 1: Canadian Crude Oil Production by Type



Source: Canada Energy Regulator (n.d.-e).

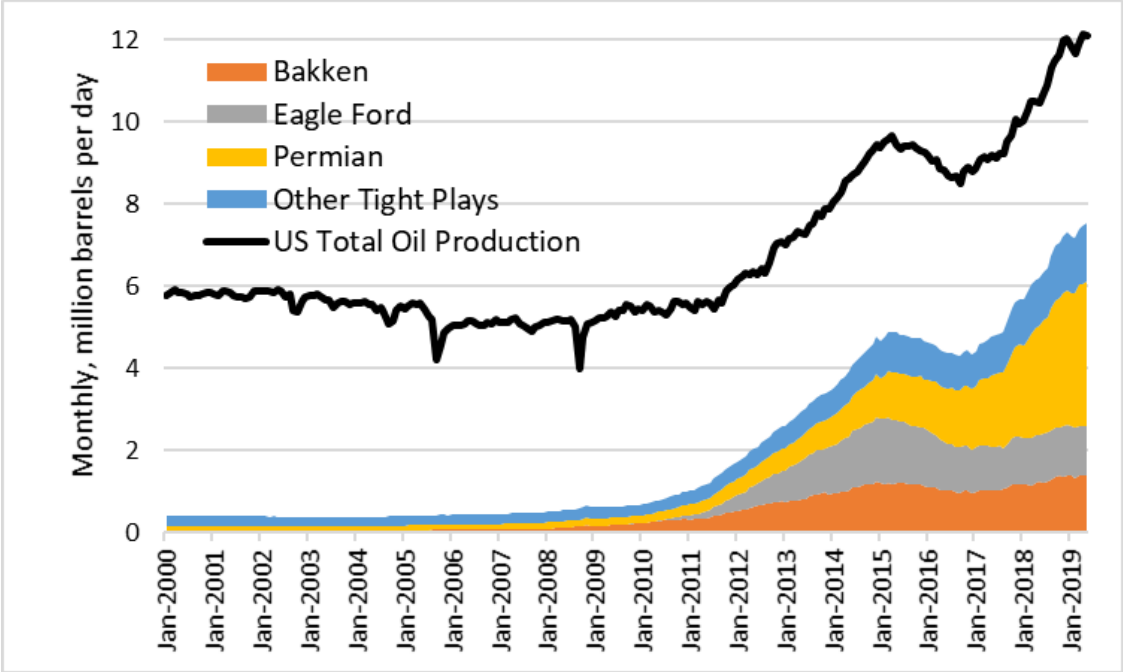
Note: Conventional Light and Conventional Heavy includes tight and shale oil volumes. The sharp decline in oil sands production in mid-2016 is due to the Fort McMurray fire.

innovations (starting around 2008)[3] enabled the extraction of long-known but previously inaccessible hydrocarbon deposits. US production boomed, increasing from around five million barrels per day in late 2007 to above 12 million barrels per day in mid-2019 (Figure 2). Production of tight and shale oil, initially from the Bakken in

[3] According to *The Wall Street Journal*'s Gregory Zuckerman, engineers at Mitchell Energy perfected fracking in 1998 in their quest to extract more natural gas from the Barnett shale region in northern Texas. Over the next decade, their techniques were adapted with better computing power, software, and techniques that enabled more precise deep and long-distance horizontal drilling which enabled multi-stage fracking; see Zuckerman (2014).

North Dakota and the Eagle Ford in Texas, followed by the Permian (Texas) and other tight plays, are driving U.S. production increases.

Figure 2: U.S. Tight Oil and Total Crude Oil Production



Source: (U.S. Energy Information Administration n.d.-a, n.d.-d).

Yet, the US still cannot meet its daily oil consumption of 20.4 million barrels per day (BP 2019) and therefore must import the difference. This dependence on oil imports has had a defining impact on American foreign policy since the end of World War II. Students of American foreign policy will recognize that many major crises of the last several decades were directly related to oil geopolitics: the Suez Crisis of 1956; the Arab and OPEC oil embargoes of 1967/1973; the enunciation of the Carter Doctrine in 1980 in response to the Iranian Revolution of 1979 followed by the start of the Iran-

Iraq War in 1980; the Iraqi invasion of Kuwait in 1990; etc.[4] The scope of this chapter does not allow for a similar recounting of British, French, Japanese or other of the historical powers' quest for energy, but their histories of conflicts also indubitably include an energy dimension. Currently, China is a major global power and access to oil is a critical issue for that country and underlines its foreign policy orientations (Bridge and Le Billon 2017, 157; Andrews-Speed and Dannreuther 2011). Similarly, recent Middle East history is also the history of oil-related conflict and diplomacy: from FDR's 'grand bargain' with King Saud in 1945; to the OPEC embargo or 1973; the Carter Doctrine of 1980; the first Gulf War in 1991; and the invasion of Iraq in 2003, this remote region containing a small population has driven a disproportionate share of global geopolitics in the last one hundred years due to its vast reserves of oil (Klare 2009). Oil is and has been a geostrategic commodity for over a century.

Given the "unique strategic significance of oil" (Moran 2009, 30) — or of energy more generally — it is among the key natural resource endowments that defines the concept of *energy security.* The International Energy Agency "defines energy security as the uninterrupted availability of energy sources at an affordable price" (International Energy Agency n.d.). Two subsidiary concepts follow: the first pertains to states that do not have domestic sources of, say, oil, and therefore require its 'uninterrupted availability' from foreign sources. States in this predicament seek *energy security of supply* and use their diplomatic and commercial assets to secure the energy

[4] The New York based Council on Foreign Relations, which publishes the influential journal *Foreign Affairs*, has an instructive timeline document on its website titled "Oil Dependence and U.S. Foreign Policy, 1850-2017" which recounts 40 historical milestones in which the US' dependence on oil shaped its foreign policy (Council on Foreign Relations 2019).

they need for their military and economic objectives. States endowed with energy resources can be exporters and will seek foreign buyers to earn income from exports; these states are likely to be more concerned with *market access for energy*. The interplay between states seeking stable sources of *energy supply* and those that seek to position their energy endowment to their greatest export or strategic advantage is what drives the geopolitics of energy and, according to many analysts, drives much of global politics (Bridge and Le Billon 2017). As Moran and Russell (2009, 2) wrote, "'[e]nergy security' is now deemed so central to 'national security' that threats to the former are liable to be reflexively interpreted as threats to the latter."

Countries that possess enough energy in the form of oil or gas to become exporters have sometimes used their resource endowment as both carrots and sticks: Russia has used its position as an important exporter of hydrocarbons both to secure friends (Cuba, Central and Eastern Europe and most recently China) and to threaten recalcitrant neighbours (Ukraine). More generally, Russia demonstrates "a proclivity to use its empowered energy position to either grab more resource rents from its immediate neighbours, or to wrest geopolitical or political benefits using energy as a lever" (Jaffe and Soligo 2009, 122). Venezuela under the late president Hugo Chavez also used its oil wealth to build coalitions of states that opposed US policies in Latin America: he claimed to have helped get Evo Morales elected in Bolivia and Daniel Ortega in Nicaragua (Trinkunas 2009).

In sum, energy resources, particularly in the form of hydrocarbons — oil, natural gas and coal, which currently fuel 85% of global energy demand (BP 2019, 11) — are among the main natural resource attributes that contribute to a state's relative level of power, influence, and diplomatic weight in international relations and foreign policy analysis (Hudson 2007; Morin and Paquin 2018). If we focus specifically on oil and

gas, these account for 57% of global energy use (BP 2019, 11). Around half of all the oil produced in the world — 48.7% — is concentrated in the top-five oil producing countries, two of which are the subject of this article: the US, Saudi Arabia, Russia, Canada and China (U.S. Energy Information Administration n.d.-b).

We surmise that the differences that emerged in energy policy are due to the fact that Canada and the US have different imperatives when it comes to the geopolitical importance of oil: the United States, although the world's largest producer of oil, is not (yet) energy independent, and its policies are incentivized by the need for energy security of supply. Faced with the option of either continued dependence on foreign oil or expanding its energy exploration and production, it chose the latter at the exact time when advances in computing and software, global positioning and directional drilling made hydraulic fracturing more precise, efficient and cost-productive.

Canada, on the other hand, with its small population and abundant oil reserves, never had to face the same calculated choice. Canadian energy policy is a function of differing federal and provincial powers, disparity in resource endowments and proximity of the U.S. as a primary export market (Winter 2019 (in press)). At a time when there was a possibility of increasing its security of market access, opposition to oil development centered on Canada and, in particular, on the growing oil sands production and the pipeline projects that were supposed to move the product to global markets. This is the tale of two countries' energy policies since the fracking revolution a decade ago.

The Evolution of the Continental Energy Market

The Canadian and American oil and gas industries share a fascinating history and one that is, for the most part, continental. The Canadian oil story began with a discovery in the 1850s near Sarnia, Ontario. In 1880, 16 refiners in southwestern Ontario were able

to band together as the Imperial Oil Company, Limited, which still exists today. Discoveries followed in the west, and the modern western Canadian petroleum industry began with the discovery of the Turner Valley oil field south of Calgary in 1914 by Bill Herron, who created the Calgary Petroleum Products Company and secured all the land in the vicinity of the first Turner Valley find (Breen 1984). However, in a pattern that continues to this day, it soon became obvious that the financial capital required to develop the Calgary Oil Field exceeded western Canada's funding capabilities. Capital-starved Canadian entrepreneurs struggled to attract the interest of eastern Canadian and British financiers in an effort to counter the growing influence of Standard Oil of New Jersey and its Canadian proxy, Imperial Oil Limited (Breen 1984).

By the mid-1940s and the historic Leduc oil discovery in 1947, the Canadian oil and gas industry represented a healthy mixture of Canadian and American enterprises. Throughout the 1950s and 1960s, the capital base and managerial talent of the industry continued to evolve in a North American context: capital, drilling technology and people flowed relatively freely between Calgary, Oklahoma City, Houston and Dallas. When the Canada-United States free trade debate erupted in the late 1980s, it was western Canadians generally, and Albertans specifically, who were among the most ardent supporters of continental integration (Prentice and Rioux 2017).

Canada Goes It Alone—Pierre Trudeau's National Energy Program

Friction between Canada and the US over energy policy emerged as early as March 1969, when newly elected Republican President Richard Nixon hosted Prime Minister Pierre Trudeau in Washington. In that first meeting, Nixon eventually tabled a proposal that the two countries move toward a continental oil policy. Rapid growth in America's oil consumption had, since the 1950s, exceeding its production, with Canada emerging as a significant and growing supplier to make up the difference. Between 1960 and

1975, total American oil and natural gas imports increased from 23 percent to 39 percent of US consumption. By 1967, Canadian oil exports to the United States exceeded those from the Middle East and had tripled to 18.7 percent of US demand (Thompson and Randall 2002, 256).

Trudeau was unenthusiastic about Nixon's request for a continental energy policy, and between 1970 and 1974 he went even further, promulgating a number of nationalistic measures with energy implications that seriously alarmed the US administration. In 1974, for example, the Canadian government created the Foreign Investment Review Agency (FIRA) to screen proposed foreign direct investments in Canada, including those of American energy companies. The Trudeau government also created Petro-Canada, a publicly owned national energy company. Immediately after the July 1974 federal election, Prime Minister Trudeau announced his government's intent to aggressively pursue Canada's own energy self-sufficiency by imposing an embargo on oil exports to the United States. The Pierre Trudeau government did eventually relent on the proposed embargo but imposed a federal tax increase on oil exports and a border price increase on natural gas exports to the United States.

It is interesting to note, in light of the recent debate surrounding the Keystone XL Pipeline, that as far back as 1969 the Nixon administration attached special importance to the Canadian oil sands as a secure and dependable source of energy for the United States. The advantages afforded by Canada were seen to be compelling: Canada was viewed as a politically stable ally, already deeply integrated economically with the United States and able to transport its oil into the American market through pipelines, which would be less vulnerable to attack or disruption. Nixon's national energy policy therefore assigned particular importance to Canadian oil. In a series of

policy speeches leading up to the energy policy, increasing imports from Canada figured prominently.[5]

The tension between Canada and the United States over energy policy between 1969 and 1980 improved slightly during the first years of President Jimmy Carter's term. However, after the re-election of the Liberal government in 1980, Prime Minister Pierre Trudeau again moved aggressively, enacting his National Energy Program (NEP). To this day, the NEP remains, rather anachronistically, highly divisive in western Canada. It still fosters ongoing resentment of Canada's Liberal Party in western Canada and arguably contributed to an emerging crisis in Canadian national unity. It also severely strained Canada-US relations.

All told, it would be hard to envision a suite of policy measures more offensive to western Canadians or, as it turned out, to the new Reagan administration in the United States. For Americans, continental energy security remained a pre-eminent concern throughout the 1980s. Viewed through that lens, the measures put forward by the Trudeau government were worrisome indeed. The Reagan administration formally protested the NEP, and a chill settled in over Canada-US relations until the eventual election of the Progressive Conservative government of Prime Minister Brian Mulroney in 1984.

Continental Integration—the Canada-US Free Trade Agreement

The Canada-United States Free Trade Agreement (CUSFTA) effectively achieved Nixon's ambitions of a continental oil policy and reflected a clear symmetry of continental interests. The Canadian energy industry was able to consolidate and expand its market access into the United States, and the United States was able to establish

[5] See for example section 4 ("Imports from Canada") in Nixon (1971).

guaranteed access to Canadian oil and natural gas at market prices. Moreover, from a US perspective, the United States was able to secure an important concession from Canada, effectively ensuring that, in times of constrained supply, Canadian suppliers were compelled to maintain exports to the United States at a level that was proportionate to "Canadian total export shipments of that commodity in relation to total Canadian supply" (Thompson and Randall 2002, 273). Concurrently, the egregious provisions of Canada's National Energy Program were repealed. What Canada obtained was full and unrestricted access to the world's largest energy marketplace, at a time when increasing US consumption and faltering American domestic supply required massive increases in American imports. As a result, Canada's major export pipelines, with one exception, supply the U.S. Midwest and Gulf Coasts that are the U.S. major refining centers (Table 1).

Table 1: Major Western Canadian Crude Oil Pipeline Takeaway Capacity

Pipeline	Nameplate Capacity (thousand barrels per day)	Estimated Export Capacity (thousand barrels per day)	In-Service Date	Origination Point	Destination
Enbridge Mainline	2,851	2,307	1950	Edmonton, Alberta	U.S. Midwest & Ontario
Kinder Morgan Trans Mountain	300	270	1953	Edmonton, Alberta	West Coast
Enbridge Express	280	250	1997	Hardisty, Alberta	U.S. Midwest
TransCanada Keystone	591	561	2010	Hardisty, Alberta	U.S. Midwest & Gulf Coast
Rangeland/Milk River	143	107	1962, 1970	Edmonton & Hardisty, Alberta	U.S. Rocky Mountain & Gulf Coast
Total	**3,935**	**3,495**			

Sources: Canada Energy Regulator (n.d.-a); Plains All American Pipeline LP (n.d.); National Energy Board (2016b); Canadian Association of Petroleum Producers (2019).

Note: The Enbridge mainline operates at less than full capacity due to downstream constraints. The Enbridge Mainline and Trans Mountain also carry intra-Canada trade and refined petroleum products, reducing their effective capacity to export crude oil.

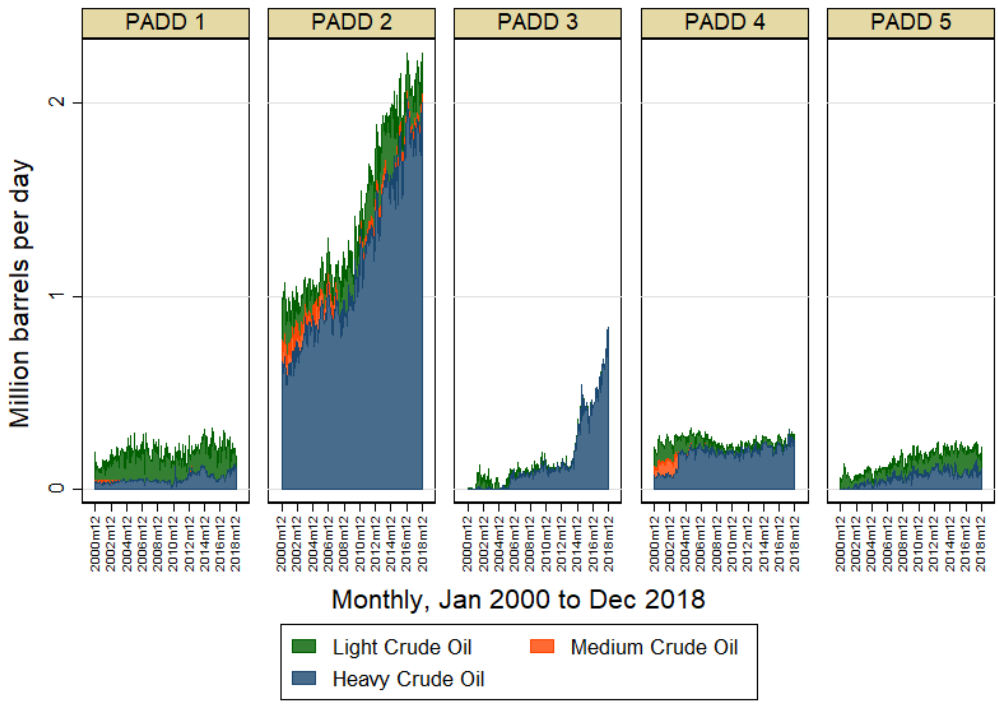
The Fracking Revolution and Keystone XL

President Barack Obama was sworn in as the 44th president of the United States in January 2009. It was soon clear by February 2009 that the new US administration's views on energy, oil, climate change and continental integration had changed irrevocably, as had the forward agenda for Canada-US relations. Working together as North American partners was of less interest to the Obama administration than it had been to its predecessors, and it more narrowly focused on its domestic challenges with its climate change agenda. It was also clear that the new administration didn't see Canada as a helpful ally on climate change; but while Canada's climate change positioning was changing between 2006 and 2008, so, too, was America's, as illustrated by the defeat of the Waxman-Markey climate change legislation in Congress. This was a landmark, comprehensive bill, supported by President Obama, which would have established an economy-wide cap-and-trade system to limit American GHG emissions. Although it passed the House of Representatives with the slimmest of margins, it never made it through the Senate. Thus, President Obama was unable to pass any of his landmark environmental legislation, even when the Democrats controlled the Senate (Prentice and Rioux 2017).

Until the arrival of President Obama, every U.S. president since Richard Nixon had advocated the incorporation of Canada's energy resources, including the Canadian oil sands, into North America's energy marketplace. Indeed, that was one of the main reasons the two countries signed the Canada-US Free Trade Agreement and, a few years later, the North American Free Trade Agreement (NAFTA). It should not be forgotten that the US negotiators had made energy and the oil sands a priority in the free trade negotiations in the 1980s. What made the difference?

The shale revolution had a transformative effect on energy markets in Canada and the United States, and fundamentally changed global oil markets. Crude oil markets saw the addition of over five million barrels per day of production from the United States, a prolonged depression in global oil prices, and a change in the geopolitics of crude oil markets. Moreover, the shale revolution also fundamentally changed the energy supply relationship between Canada and the US. Historically, most Canadian crude oil exports went to the US Midwest (Figure 3); changes in US crude flows as a result of the shale revolution affected both the value of Canadian crude oil and the volumes exported. Figure 4 shows crude oil sources for the five U.S. Petroleum Administration for Defense Districts (PADDs): PADD 1 is the East Coast, PADD 2 the Midwest, PADD 3 the Gulf Coast, PADD 4 the Rocky Mountain Region, and PADD 5 the West Coast.

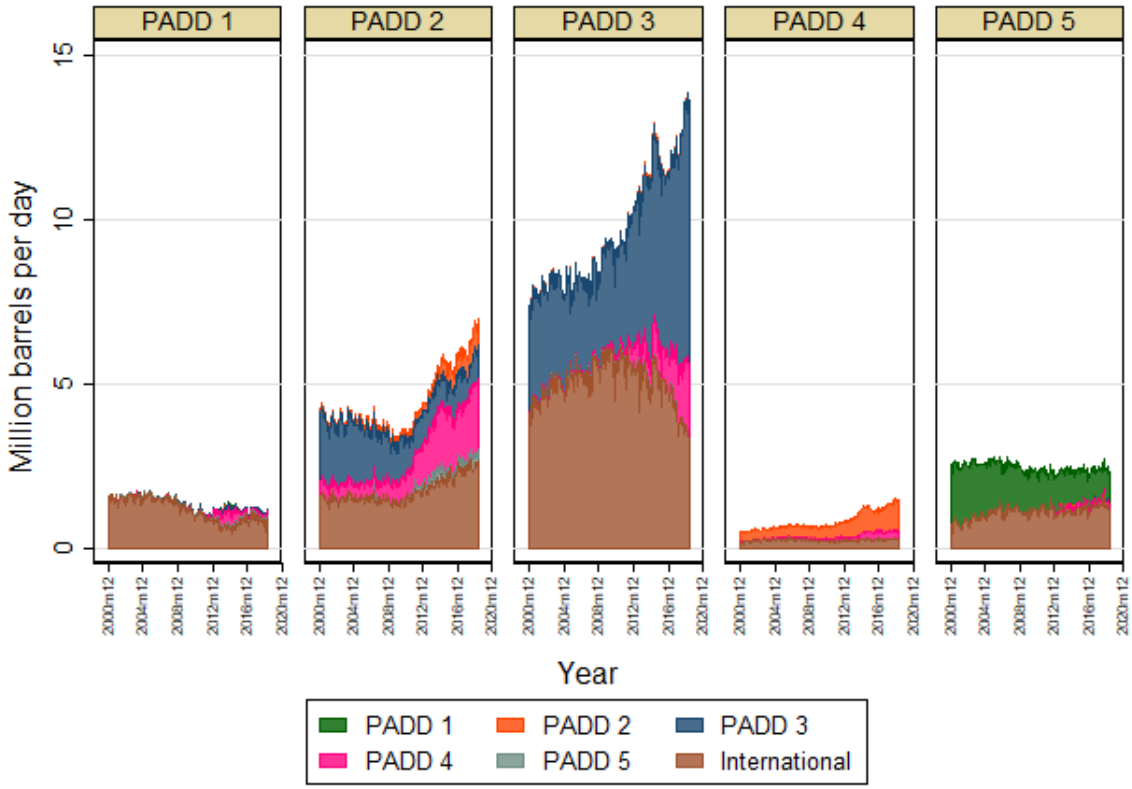
Figure 3: Canadian Crude Oil Exports to the U.S. by Destination and Grade



Source: Canada Energy Regulator (n.d.-c).

As seen in Figure 4, dominant sources of crude oil in the US were imports with flows from PADD 4 (Gulf Coast) north into PADD 2 (Midwest). Beginning in 2008, domestic production increases in PADDs 2 and 3 become an important share of crude supply. We see a decline in flows from PADD 3 to PADD 2, an increase in flows from PADD 2 to PADD 3, and a decline in imports into PADD 3 (Figure 4, Figure 5). As PADD 2 is the region most Canadian exports go to, the region quickly became oversupplied by mid-2010, prompting increased Canadian exports to PADD 3 and to a lesser extent the east and west coasts (PADDs 1 and 5).

Figure 4: U.S. Crude Oil Source by Region

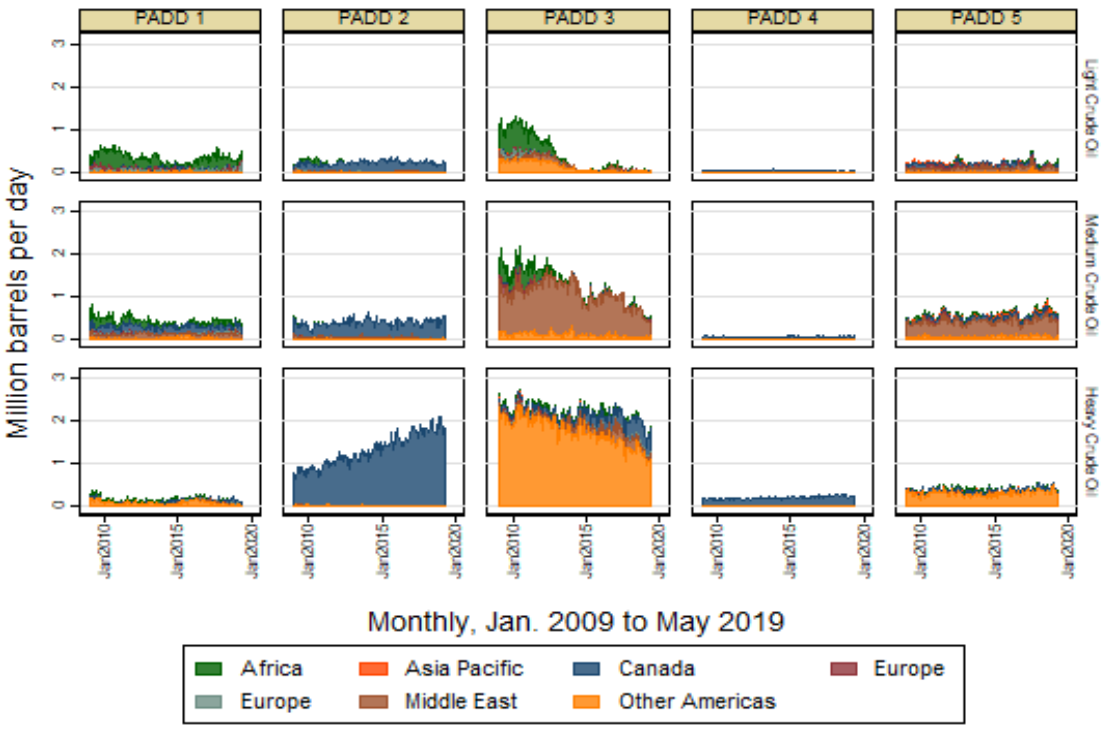


Source: U.S. Energy Information Administration (2019b, 2019e).

Note: Plots gross crude flows. Includes within-PADD crude oil production. For example, PADD-2-sourced crude is production within PADD 2.

While Canada also saw increases in tight and shale production, these were an order of magnitude smaller than total production (National Energy Board 2018b), which is dominated by the oil sands. Steady increases in oil sands production prompted a series of new pipeline proposals, aimed at increasing export capacity to the U.S. and diversifying Canada's export markets (Table 2). None of the five proposals have proceeded smoothly, in part because of an increasingly difficult relationship with the U.S., and in part because of internal Canadian strife over Canada's future as a hydrocarbon producer as it simultaneously enacts policies to meet Paris Accord commitments. As a result, Canadian oil production has become increasingly market-constrained, with production outstripping takeaway capacity in 2012 (Figure 6), and prompting increasing exports via rail (Figure 7).

Figure 5: U.S. Crude Oil Imports by Region and Grade



Source: U.S. Energy Information Administration (2019a).

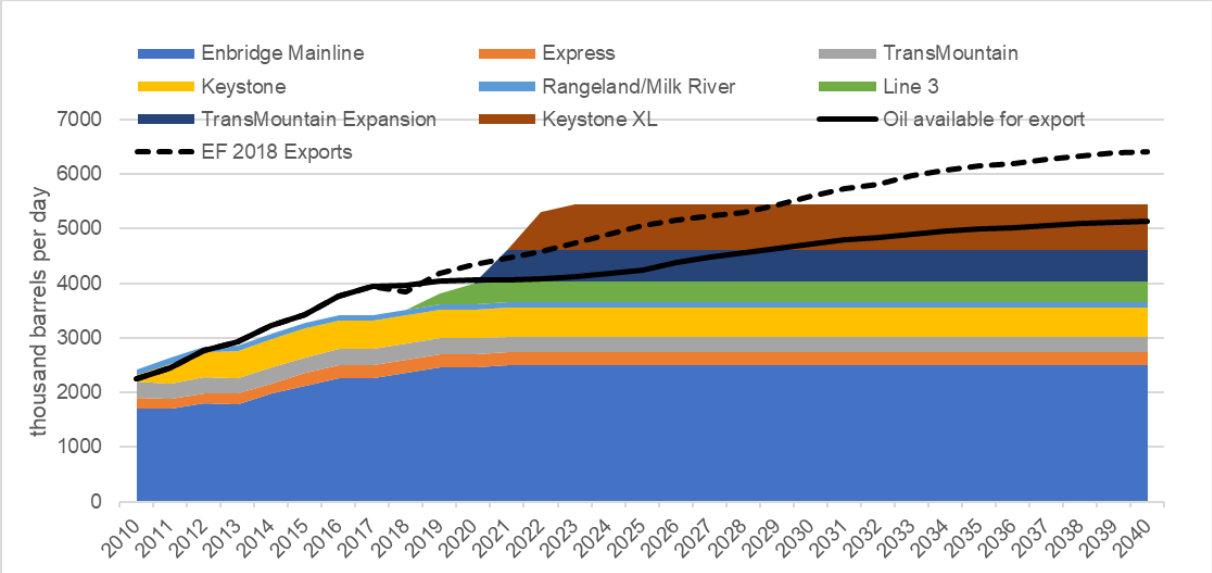
Table 2: Proposed Major Additions to Western Canadian Pipeline Takeaway Capacity

Proposed Pipeline	Capacity (thousand bpd)	Application Submitted	Initial Proposed In-Service Date	Current Status and Expected In-Service Date	Origin	Destination
Keystone XL	830	2009	Late 2012	Approved in Canada in 2010. U.S. permit issued in 2019. IS: 2020+	Hardisty	Cushing, Oklahoma & U.S. Gulf Coast
Northern Gateway	525	2010	Q4 2016	Denied in 2016.	Edmonton	West Coast
Trans Mountain (Expansion)	590	2013	Late 2017	Approved in 2016. IS: 2020+	Edmonton	West Coast
Line 3 Replacement	370	2014	Late 2017	Approved in 2016. IS: 2H 2020	Edmonton	Superior, Wisconsin
Energy East	1,100	2014	Q4 2021	Application withdrawn in 2017.	Hardisty	East Coast
Total	3,415					

Source: Enbridge Pipelines Inc. (n.d., 2014); Enbridge Northern Gateway LP (2010); Energy East Pipeline Ltd. (2016); Canada Energy Regulator (2019a, n.d.-f, n.d.-d); Canadian Association of Petroleum Producers (2019).

Note: Expected in-service date as of August 2019.

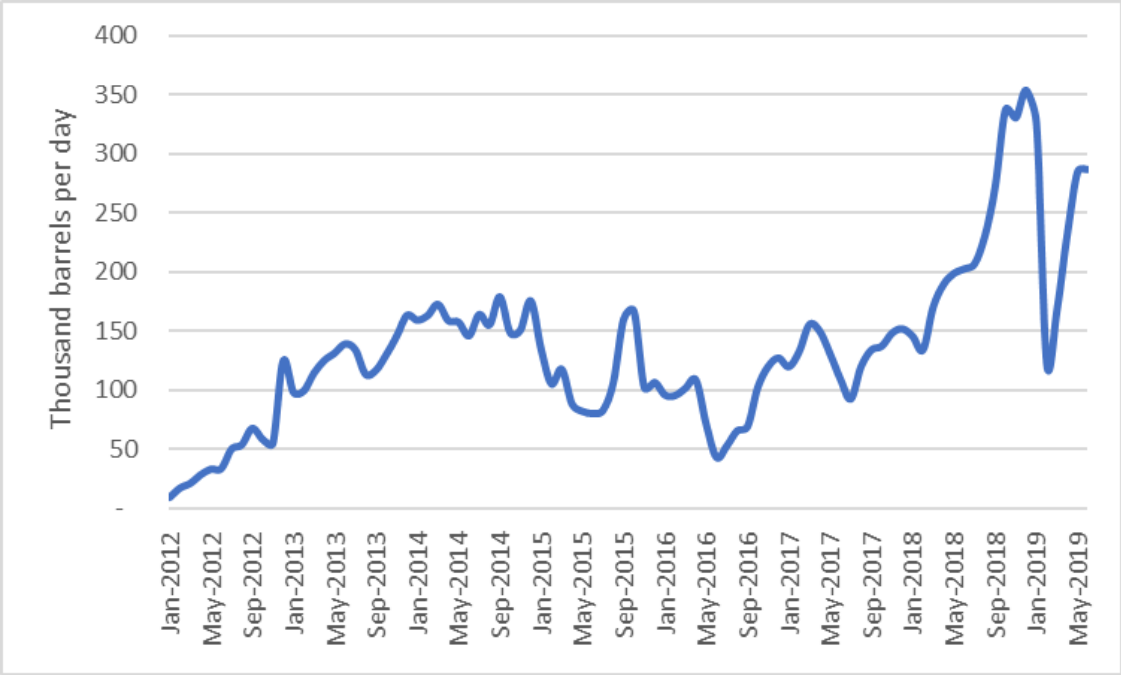
Figure 6: Canadian Export Pipeline Capacity and Forecast Oil Exports, 2010 to 2040



Source: National Energy Board (2016a, 2018a).

Note: Oil export forecasts based on Reference Scenario from the NEB's *Energy Futures* 2016 and 2018 reports. Oil available for export is available supply less domestic use.

Figure 7: Canadian Crude Oil Exports by Rail



Source: Canada Energy Regulator (n.d.-b).

The Saga of Keystone XL

The Keystone XL pipeline was designed to satisfy the demand for heavier crudes at US Gulf Coast refineries, keeping them operating at optimal efficiency by provisioning them with the types of crude oil they were designed to process. From the year 2000 onward, as Canadian oil production increased, US imports of heavy crudes from Venezuela and Mexico were declining, and US refineries on the Gulf Coast in Texas were designed to process those heavy crudes. The rising production of Canadian heavy oil was a good replacement for the declining supply of oil from Venezuela and Mexico.

The formal application for a Presidential Permit for a major expansion to the pipeline network carrying bitumen from Alberta to Texas, dubbed Keystone XL, was filed in September 2008. Unhappily perhaps, the application for the Presidential Permit coincided almost precisely with the arrival of new US President Obama who had campaigned on the importance of acting on climate change. The State Department

would review the Keystone XL application for the next seven years, although it really amounted to an expansion and realignment of the original Keystone I Pipeline between Hardisty, Alberta and Steele City, Nebraska; in other words, the Keystone XL project was an expansion of an existing pipeline. TransCanada already owned and operated 2,639 miles of interconnected oil pipelines that crossed the US on a north-south axis and that network, described as the Keystone Pipeline, already ran from Alberta to the US Gulf Coast in four interconnections.[6]

In March 2010 the Canadian National Energy Board issued its recommended approval, and by April 2010 the US State Department issued a Draft Environmental Impact Statement which concluded, among other things, that the incremental GHG emissions from the project would be 'minor'. However, the broader political environment began to shift within weeks: in late April 2010, Americans witnessed the explosion of the Deepwater Horizon oil rig in the Gulf of Mexico, together with Enbridge's Line 6B spill of 900,000 barrels of diluted bitumen into the Kalamazoo River in Michigan in July. The two incidents, taken together with TransCanada's difficult landowner negotiations in Nebraska, elevated public awareness and opposition to the crude oil pipeline designed to bring in heavy crude oil from Canada (Prentice and Rioux 2017).

The rest of the timeline for Keystone XL between 2010 and 2015 was about

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[6] These are: (1) the 'original' Keystone I Pipeline, running from Hardisty, Alberta to Steele City, Nebraska; (2) the Cushing Extension Pipeline which runs from Steele City to Cushing, Oklahoma; (3) the Gulf Coast Pipeline which runs from Cushing to Nederland, TX; and (4) the Houston Lateral which ran from Nederland to Harry County, near Houston, Texas. See Canada Energy Regulator (2019b).

delay, new environmental assessments, lawsuits and, ultimately, the rejection of the required Presidential Permit in November 2015. Notably, President Obama used both climate change and US energy security as rationale for denying the permit (Obama 2015). Although newly elected US President Trump signed a presidential memorandum in January 2017 enabling the U.S. government to reconsider a new Keystone XL application, the pipeline is still mired in judicial review in Montana and, as of August 2019, construction has not yet begun (Healing 2019).

US Expands Oil and Gas Production

While the Keystone XL saga unfolded, the US was passing legislation specifically designed to increased domestic oil and gas production. This, coupled with the development of multi-stage fracking and horizontal drilling in rich shale formations, did in fact lead to a huge upswing in oil production and the concomitant expansion of its domestic pipeline capacity — as demonstrated in the previous figures — and an improved energy security position for the US.

Starting with the G.W. Bush-era's *Energy Policy Act of 2005* — which was "[s]purred by rising energy prices and growing dependence on foreign oil, the new energy law was shaped by competing concerns about energy security, environmental quality, and economic growth" (Congressional Research Service 2006). Soon afterwards, the *Energy Independence and Security Act of 2007* was signed into law, and in July 2008 President Bush lifted the executive ban on offshore drilling, requested that Congress follow suit to allow for more domestic production (CBS News 2008).

President Obama, while ambivalent and ultimately opposed to the Keystone XL pipeline, was not immune to promoting US energy security by ramping up domestic oil and gas production. He issued his "Blueprint for a Secure Energy Future" in 2011, which expressly encourages domestic "exploration, development, and production (…)

of new frontiers of production and of new ways to safely make use of domestic assets like our vast reserves of natural gas" (The White House 2011). The policy worked so well that, by December 2015, Obama agreed with a Congressional motion that lifted the ban on US exports of crude oil which had been in effect since the 1973 Arab oil embargo (Harder and Cook 2015). The large increase in domestic oil production had the effect of depressing oil prices, so the measure was designed to correct a disequilibrium in the market — but would never had passed had the US not felt "energy secure" enough to allow it.

In support of this increased domestic production, US companies added 48,000 miles (77,000 km) of new pipeline capacity since 2010 (U.S. Energy Information Administration 2019d). The EIA also confirms that "[r]ising domestic crude oil production has led to several changes in Gulf Coast crude oil supply and demand patterns, creating a need for more pipeline capacity" (U.S. Energy Information Administration 2019c).

In summary, the brief discussion above demonstrates that President Obama opposed the Canadian-led Keystone XL pipeline for domestic political reasons in support of his environmental agenda. More importantly, the strategic imperative of increasing US energy security meant that US policies were otherwise generally geared towards (1) increasing oil and gas production; (2) supporting the resulting pipeline construction to move incremental production to its intended markets; and (3) enabling an economic 'safety valve' to correct for price and geographical distortions between heavy and light crudes by lifting the ban on crude oil exports.

Canadian Policy Paralysis

The five proposed pipelines described in Table 2 above were controversial in Canada,

and have had a beyond-the-usual journey through regulatory processes — the saga of Keystone XL described above is but one example of policy and regulatory uncertainty affecting energy infrastructure. In Canada specifically, increased concern about climate change and the environmental impacts of oil sands development translated into increased scrutiny of regulatory approvals of pipelines. This was exacerbated by the politicization of regulatory processes. Politicization came in two forms; first, statements by politicians for or against pipelines, and regarding public trust in the regulator. Second, legislative reform of federal regulatory processes in 2012 and 2019 brought the issue of regulatory processes and approvals into the public eye. On the first, the conservative government under Stephen Harper was aggressively pro-pipeline at a time when concern about the environment was increasing. In turn, Liberals under Justin Trudeau repeatedly made the argument Canadians had lost trust in the regulator.

The change in Canadian government from Conservative to Liberal in 2015 led to better alignment with the US on climate policies, but also led to increasing domestic uncertainty about the future of oil and gas development and market access. Specifically, legislation banning oil tankers and Arctic drilling and denying a pipeline permit certainly suggests the Liberal government was less pro-development than its predecessor. The modernization of federal energy regulation and impact assessment is a policy direction that, while not explicitly anti oil and gas, did introduce uncertainty for Canadian industry. At a time when market access was becoming an increasing concern for Canadian producers, politicization and policy change created further uncertainty.

Moreover, adding to the complexity of policy and regulation of pipelines and oil and gas development is the continued failure of Canadian governments to adequately address and protect the rights of Indigenous Peoples. Discussing this issue is beyond the scope of this paper, but we note that this is a structural problem in Canada, frequently

addressed through the courts. Indigenous groups' court cases about governments' failure to fulfill the duty to consult have also contributed to pipeline delays in Canada.

Conclusion

In summary, we argue that US energy policy with regard to Canada from the Nixon to the G.W. Bush administrations was focussed on achieving a steady, reliable and less risky source of oil to reduce its dependence on more risky suppliers. In those years, the hurdles in achieving an integrated oil market could be 'blamed' on the National Energy Policy of former Prime Minister P.E. Trudeau. At the same time, the US was keen on expanding its own sources of oil production to make it more energy independent. For the US, the shale revolution of the last decade was quite fortuitous as it dovetailed with successive laws and presidential policies on securing more domestic production. With all this extra oil, pipeline construction proceeded apace to ship it where needed. However, the Obama Administration was the first to differ on tradition U.S. policy of expanding Canadian oil imports, by opposing the Keystone XL pipeline. In some ways, this opposition to the pipeline — although couched in environmental policy terms — was also an easier decision thanks to the growing supply of domestic oil resulting from the shale revolution.

For Canada, the cumulative effects of falling oil and natural gas prices and increasing US production at the same time as the production-constraining policies described above have resulted in almost no new major pipeline infrastructure being built in the past decade, and a foreign capital "exodus" from Canada's oil industry since 2015 (Forrest 2019; Orland 2019). The changing relationship with the United States has had a substantial impact on Canadian policy and energy markets. While the election of President Trump in 2016 resulted in some movement forward for Keystone XL, political risk remains with the upcoming 2020 presidential election (Nickel 2019).

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