

## **CHAPTER III**

### **CANADA'S CONTROVERSIAL POLICY IN OIL AND GAS INDUSTRY**

This chapter discusses the economy of Canada particularly on its economic dependence on oil and gas sector. Chapter II explores the pipeline network system in Canada and examines its importance for Canada's oil and gas industries and thus for its national interest.

#### **A. Canadian Economic Outlook**

According to the International Monetary Fund (IMF), Canada is one of the highly developed economies in the world having to rank 17<sup>th</sup> largest by its GDP based on PPP valuation and 10<sup>th</sup> largest GDP by nominal with \$1.7 billion dollars in 2017 (International Monetary Fund, 2017). Canada resembles the US in its market-oriented economic system, the pattern of production, and high living standards. Since World War II, the impressive growth of the manufacturing, mining, and service sectors has transformed the nation from a largely rural economy into one primarily industrial and urban (Index Mundi, 2017). Canada produces commodities like automobiles, forest products, manufactured goods, minerals, and oil. Its leading export market is the United States. Trade is important to Canada's economy; the value of exports and imports taken together equals 65 percent of GDP. The average applied tariff rate is 0.8 percent (The Heritage Foundation, 2018).

Canada is the second largest country in the world in terms of land territory – behind Russia and ahead of the US. The country has abundant natural resources such as mineral, forest and water-based resources such as iron ore, nickel, zinc, copper, gold, lead, rare earth elements, molybdenum, potash, diamonds, silver, fish, timber, wildlife, coal, petroleum, natural gas, and hydropower. Historically, fishing and forestry were once major industries in Canada. Despite the fact that these industries still hold a level of importance to Canada's

economy, mineral and energy resources have become the leading source of income for the nation from its natural resource reserves (Economy Watch, 2010). Canada has 17.8% of the world's oil supply, which is the highest after Saudi Arabia. It also has the world's second-largest reserves of uranium and is the third-largest timber producer worldwide. It also has large reserves of natural gas and phosphate (Anthony, 2016).

## **B. Oil and Gas Industry in Canada**

The sector of oil and gas are one of the most critical sources of energy of the world and is projected to remain as the source of 50% of the world's energy by 2013 by the International Energy Agency. Canada is ranked as the fifth largest producer of natural gas and the sixth-largest producer of crude oil in the world with abundant oil and natural gas reserves all over the country. Oil and natural gas in Canada are used both for power generation and heat source. Both oil and natural gas are a crucial energy source for consumers and business in Canada. Natural gas is used in the production of fertilizers and plays a critical role in food production. They are also vital especially in extracting oil from the oil sands (Natural Resources Canada, 2011).

The oil and natural gas industry in Canada are active in 12 of the provinces and territories including Alberta – the largest oil and natural gas producer in Canada and has abundant with oil sands, British Columbia – second largest natural gas producer, Manitoba, New Brunswick, Northern Canada, Newfoundland and Labrador, Nova Scotia, Ontario – supplier for Canada's oil sands industry, Quebec, Prince Edward Island and Saskatchewan – Canada's second largest producer of oil (Canadian Association of Petroleum Producers, 2018).

Oil and gas are critical to Canada's economy as the industry is the single largest private sector investor forecast to invest approximately \$45 billion in 2017. Canada's oil sector

remains an important source of supply for global markets on energy. In 2014, 97% of Canadian crude oil exports went to the U.S. and 3% went to Europe and Asia. On this, Canada becomes the largest supplier of crude oil to the U.S. which accounts for 39% of U.S. crude oil imports (Natural Resources Canada, 2011). Alberta Energy Regulator and Canadian Association of Petroleum Producers (2015) reported in the Oil and Gas Journal, that by the end of 2014, Canada ranked third in of world proved reserves with 10.3% percent share of total oil slightly below Venezuela and Saudi Arabia who are at 18% and 16.1% (Canadian Government, 2017). Canada's proven crude oil reserves are estimated to be 172.5 billion barrels at the year-end of 2013 and proven natural gas reserves to be 71 trillion cubic feet in 2012, making the country as one of the world's prime location for investment in the oil and gas sector. In 2013, Natural Resources Canada reported in their Energy Markets Fact Book, that Canada has an average production of 3.5 million barrels of crude oil and 13.7 billion cubic feet of natural gas per day (Natural Resources Canada, 2011). Approximately 41% the primary energy produced in Canada was exported in 2013 mainly to the U.S. It also has exported 75% of its crude oil production and 52% of its natural gas in 2013 worldwide (Gomes, 2015).

### *1. Canada's Oil Resources and Reserves*

Canada is endowed with abundant energy resources particularly oil, natural gas, and hydroelectric energy potentials.

#### *a) Natural Gas in Canada*

Natural gas naturally occurring hydrocarbon that consists of methane and small amounts of ethane, propane, butane, and pentanes. Natural gas can be classified into three from its source, including onshore, shale and offshore gas. Onshore natural gas is found in multiple, relatively small, porous zones in various naturally occurring rock formations such as carbonates, sandstones, and siltstones. Today, through technological breakthroughs the onshore gas is produced through horizontal drilling and hydraulic fracturing from

difficult reservoirs such as coal bed methane. Shale gas is natural gas found in very fine-grained sedimentary rock. Usually, the gas is tightly locked in small spaces within the rock which requires advanced technology to drill (Canadian Association of Petroleum Producers, 2018).

Canada is one of the largest producers in the world for natural gas. In 2017, under the BP Statistical Review of World Energy, Canada is ranked 5<sup>th</sup> in the world in terms of its natural gas production producing 4.3% of world production ranking behind the US (21.1%), Russia (16.3%), Iran (5.7%), and Qatar (5.1%). Its annual production of the natural gas is approximately 15.4 billion cubic feet per day (bcfpd) in 2016, which is slightly above its production in 2015, which is about 14.4 Bcfpd (Doluweera, Kralovic, & Millington, 2017). Since it was first discovered in 1859 in New Brunswick, natural gas has been a part of Canada's energy mix. One-third of Canada's entire energy needs are met by natural gas. The natural gas in Canada can be found in most of its federal provinces and territories including British Columbia, Alberta, Saskatchewan, Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador, the Northwest Territories and Yukon (Canadian Association of Petroleum Producers, 2018). The natural gas in Canada is exported mainly to the U.S. through an integrated pipeline network. On natural gas, Canada is ranked 4<sup>th</sup> globally in which its natural gas exports account 7% of the world's total exports behind Russia (19%), Qatar (11%), and Norway (11%) (Doluweera, Kralovic, & Millington, 2017).

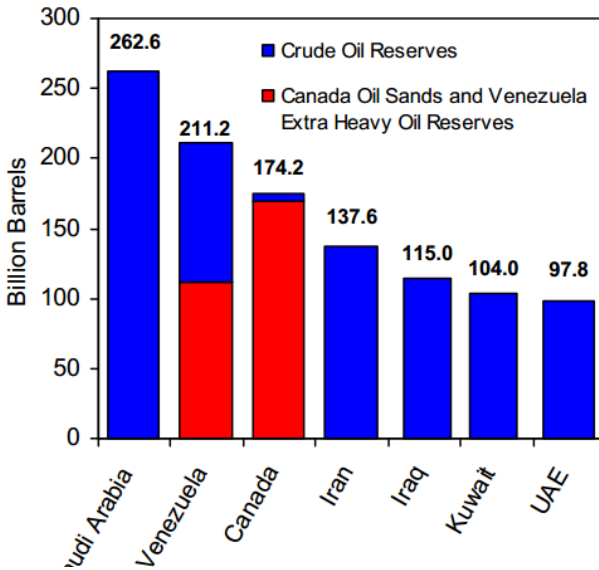
#### b) Canada's Crude Oil

In 2016, it is estimated that the total world proved oil reserves are 1,706.7 billion barrels and Canada is ranked third with approximately 10% of the world's share of proved reserves with 174.2 billion barrels. Of its proved oil reserves, 97% of the Canadian crude oil is derived from its oil sands (Doluweera, Kralovic, & Millington, 2017). As seen from the graphic 3.1 in the following page, it can be seen how Canada

and Venezuela’s crude oil reserves consist primarily of oil sands and heavy oil with Canada’s oil sands accounting for

### Graphic 1.3.1 World’s Top Proved Oil Reserves

approximately 169 billion barrels (Canadian Association of Petroleum Producers, 2018).



**Source:** Oil and Gas Journal, December 6, 2010 from <http://www.ogj.com/articles/print/volume-108/issue-46.html> Retrieved February 9<sup>th</sup> 2018

“Oil sands are geologic formations that contain a mixture of thick, heavy oil, water, and sand. The heavy oil is called bitumen, which is defined as oil that is too heavy or thick to flow or be pumped without being diluted or heated” (American Petroleum Institute, 2011). Canada’s oil sands are found in three main areas including Athabasca, Peace River, and Cold Lake. 10% of Canada’s discovered bitumen resources are considered to be proved where proved oil

reserves are economically recoverable with a high degree of certainty by using current advanced technology. Canada's proved oil sands reserves are at 169.9 billion barrels (Natural Resources Canada, 2011).

Other than oil sands, Canada's crude oil also consists of conventional oil in which its reserves are spread all over Canada's provinces and territories with 4.3 billion barrels in total. Thirty-five percent of Canada's conventional oil reserves are in Alberta and sixty-one percent are from Western Canadian provinces of Alberta, British Columbia, Saskatchewan, and Manitoba collectively. The remaining proved conventional oil reserves are located in Ontario, the Mackenzie Area and the Mainland Territories (Natural Resources Canada, 2011).

### **C. National Energy Board (NEB)**

National Energy Board (NEB) is Canada's independent federal agency established in 1959 purposed to promote safety and security, environmental protection and efficient energy infrastructure and markets in the Canadian public interest within the mandate set in the regulations of pipelines, energy development and trade in Canada (National Energy Board, 2018).

The NEB's decisions are all enforceable in law as it has quasi-judicial powers having the rights and privileges received from Canada's superior court. Its main responsibilities include regulating the construction and operation of oil and gas pipelines within Canada and across the border (interprovincial and international). The NEB has rights to publish gradual assessments on pipeline projects construction and operation. It also has the mandate to regulate the exploration and development of oil and gas in Canada. Currently, the NEB regulates over 840,000 pipelines all over Canada (National Energy Board Canada, 2018).

#### *1. NEB's Environmental Assessment*

In making decisions, the environmental considerations are always one of the top priorities of NEB.

NEB's responsibilities particularly on ensuring environmental protection begin from the construction of pipelines, its operations until its abandonment. NEB is supported with 50 environmental, socio-economic, lands and engagement specialists and these specialists help conduct the environmental and socio-economic assessments, ecological assessments reviews the environmental management system and complaint resolution (National Energy Board, 2018).

## 2. *Environmental Protection and Safety*

The environmental protection doesn't stop at the conduct of environmental assessment, the NEB continues to ensure ecological security even after the project is approved. The NEB anticipates that the companies comply with their binding conditions, which include the environmental protection during the planning, construction, operation, and abandonment of the energy projects. The NEB has the responsibility to ensure that these companies meet the binding conditions particularly on the safety of the employees, public, and environment. In partnership with the Canadian Standards Association (CSA), the NEB establish safety measurements and technical regulations for pipelines that regulated under the federal jurisdiction. To affirm that the design, wellbeing and ecological perquisites are met, the NEB reviews and examines the development and activity of the pipelines (National Energy Board, 2018).

In the case of incidents, the NEB works along with the Transportation Safety Board (TSB) to investigate incidents. The investigation conducted aim to determine if the regulations that have been followed or may be revised. It explores the cause and contributing factors of the incidents. NEB also monitors activities by third parties or outsiders near pipelines to assure that the surrounding communities comply with existing regulations. If non-compliance is detected such as violation of a regulation or an unsafe condition, the NEB will demand immediate correction and assessment to investigate the root causes in order for the incident to happen in the near future again. Company's failures to address the

violation will be followed up by NEB's sanction such as suspension of operation. As the initial process of assessment requires the companies to report all related to the project including emergency response, when incidents happen, the companies are expected by the NEB to implement their emergency response plan immediately (National Energy Board, 2018).

#### **D. Pipeline Networks in Canada**

The abundance of Canada's energy particularly natural gas and crude oil is unquestioned. Most of the Canadian petroleum production is exported mainly to the U.S. that makes Canada by far the largest single source of oil imports for the United States. Canada transports its energy through an integrated pipeline system usually referred as energy highways (Froment, 2016). Energy highways are vital for Canada's energy industry as 66% of Canada's energy demand is met by natural gas and crude oil and the supply is transmitted by pipelines (Canadian Energy Pipeline Association, 2017).

The pipeline construction and operation in Canada can be traced to 1853 when Canada successfully constructed 25 kilometers of pipeline transporting natural gas from Petrolia to Sarnia in Ontario. The discovery of abundant oil and gas resources in the west of Canada has accelerated the construction of pipeline network, particularly in the 1950s. The expansion highly contributed to Canada's domestic and international market and prospering Canada's economic growth (Canadian Energy Pipeline Association, 2017). Through its energy highways, Canada is able to transport large quantities of its oil and natural gas for long distance and this has been supporting Canada's economic growth and prosperity. Canada Energy Pipeline Association (CEPA) (2017) estimates that the oil and gas industry contributed approximately \$80 billion every year to Canada's economy which most of these oil and gas are transported by pipelines.

Canada's pipeline network is comprised of four main groups of systems where each plays an integral part in



delivering energy within Canada and also in export markets. The pipeline network includes gathering pipelines, feeder pipelines, transmission pipelines, and distribution pipelines. Gathering pipelines are mainly concentrated in the producing areas of Canadian petroleum and is functioned to move crude oil and natural gas from the wellheads to gas processing facilities and oil batteries. Over 250,000 km of the pipelines are situated in producing provinces of Western Canada mainly Alberta. The feeder pipelines transport the crude oil, natural gas and other gas products like natural gas liquids from processing facilities and storage tanks to transmission pipelines. There are more than 25,000 km feeder pipelines concentrated mainly in western Canada. The transmission pipelines are the major conduits of the pipeline network which transports the oil and gas within provinces, across provinces and international boundaries. There are 115,000 kilometers of transmission pipelines in Canada, which is three times the length of Canada's national highway system. The distribution pipelines are the pipelines that distribute the natural gas to homes, businesses, and industries. There are over 450,000 kilometers of distribution pipelines in Canada (Canadian Energy Pipeline Association, 2017).

The energy highways in Canada are strictly regulated by the National Energy Board (NEB) of Canada particularly pipelines that cross provincial or international boundaries. Pipelines within the province are under the jurisdiction of the provincial regulator unless deemed under federal authority. For example, pipelines within Alberta are regulated by Alberta Energy Regulator. Overall, there are over 840,000 kilometers of pipelines in Canada in which 73,000 kilometers of the pipelines are regulated by the federal government, which are mostly the transmission pipelines (Natural Resources Canada, 2016). The design, construction, and its operation are also strictly regulated and guided by a comprehensive standard under the Canadian Standards Association (CSA). The CSA provides standardization in the design, construction, its operation and maintenance (Natural Resources Canada, 2016).

Canada has a complex regulatory process before a pipeline can be built. The project shall apply for the approval of either the NEB or the provincial regulator. Every proposed pipeline project must have detailed information on the environmental assessment of the proposed pipeline project, safety, commercial and engineering elements. Environmental assessment includes its further implications to the environment such as the soil, vegetation, land, and species surrounding the location of the proposed pipeline project. The NEB and the provincial regulator's approval are determined by examining and reviewing the economic, technical, and financial feasibility and its environmental and socio-economic impact of the project. The NEB and the provincial regulator also have the authority to audit and inspect the construction and operation of the pipeline to ensure that the requirements on engineering, safety, and environment are met. Once the project is approved, the NEB and provincial regulator still monitor the project to ensure that they are operated safely and the surrounding environment is protected. In particular, the regulator has specific tools in order to monitor pipeline project constructions and operations including project audits, on-site inspections, compliance meetings, emergency response exercise evaluation and incident investigations. In cases where pipeline projects are not meeting the compliance standards of the regulator, regulators will employ several enforcement tactics so that the companies comply and also be deterred to repeat the offenses. The enforcement includes non-compliance notices, financial penalties and potential prosecution by the Office of the Attorney General of Canada proposed by the NEB (Canadian Energy Pipeline Association, 2017).

The International Energy Agency in its 2016 World Energy Outlook report predicted that world energy consumption will rise by 31% by 2040 which includes 12% rise in oil consumption and 49% growth in natural gas (International Energy Agency, 2016). With the projected growing demands of oil and natural gas, development of pipeline constructions are very critical in order to supply the

growing global needs as well as its domestic market (Pipeline Contractors Association of Canada, 2017).

### **E. Canada's Pipeline Safety Act**

As pipelines are one of the most vital elements that run the oil and gas sector in Canada, the government highly ensures that the oil and gas transportation system is regulated strictly. On June 2016, Canada introduced the Pipeline Safety Act (Bill C-4) which strengthens Canada's pipeline safety system particularly on prevention, preparedness and response and liability and compensation.

Under the Pipeline Safety Act, the NEB requires companies that operate pipelines to prevent and manage the potentially dangerous conditions with their pipelines. Pipelines must be designed with safety, security, emergency, integrity management and environmental protection programs that are also under the monitor of NEB. The breakthrough from the Pipeline Safety Act is the "*polluter pays*" principle. The principle requires the companies to be financially responsible for any costs from the construction of the pipeline until the projects are finished including for any costs or damages they cause. The Act introduces absolute liability whereby companies should pay \$1 billion for costs and damages (Natural Resources Canada, 2016).

On the preparedness and response point, the NEB and the provincial regulators, according to this Act shall be notified immediately when an incident occurs. This will allow the NEB and regulators to exercise its authority to protect the public, workers, property and the environment. Under this Act, companies can be issued to respond, cleanup or even be fined or prosecuted for the violations conducted. The fine ranges from \$1000,000 to \$1 million and penalties including imprisonment. With the Act enforced since 2016, companies operating a pipeline or constructing pipeline projects are required to hold a minimum level of financial resources to ensure that they can quickly respond when an incident occurs (Natural Resources Canada, 2016).

The Act was introduced by the Canadian government as its commitment to protect Canadians and the environment. It is also intended to restore public confidence in Canadian government's effort on an environmental assessment of its pipeline system.

## **F. Controversial Approved Pipeline Projects in Canada**

The pipelines in Canada are constructed by companies and these companies that own and operate both interprovincial or international pipelines are regulated by the National Energy Board (NEB) of Canada. The NEB classifies the pipeline companies into two groups including Group 1 companies – those with more extensive systems and are subject to a greater degree of regulatory oversight, and Group 2 companies – smaller companies that are a subject lighter degree of regulatory oversight. Currently, there are 13 Group 1 companies and over 80 Group 2 companies in Canada (National Energy Board Canada, 2017). In November 2016, Canada under Justin Trudeau administration announced that it has approved two major contentious pipeline projects despite continuous criticisms from an environmental group and indigenous communities. Kinder Morgan Inc. and Enbridge Inc. propose these three contentious projects.

### *1. Kinder Morgan's Trans Mountain Expansion Project (TMX)*

Kinder Morgan Canada is a company that operates various pipeline system and terminal facilities all around Canada. It is originally a U.S. energy transmission company which its headquarter is located in Texas. Kinder Morgan owns and operates approximately 80,000 miles of pipelines with the company asset \$94 billion (Conversation for Responsible Economic Development, 2016). Among all its pipeline systems, Kinder Morgan operates the Trans Mountain pipeline. The Trans Mountain pipeline (TMX) has operated since 1953 and is the only pipeline in North America that transmit both crude oil and refined petroleum products in

Canada to the west coast. The TMX originates at Edmonton terminal in an industrial area of Sherwood Park, Alberta (Kinder Morgan, 2014). The TMX transport 300,000 barrels per day. The TMX Expansion Project will increase the pipeline's capacity from the current capacity to 890,000 barrels per day. The project will create a new building pipeline along with the existing TMX route between Alberta and British Columbia (Kinder Morgan, 2014).

The Canadian government has approved the pipeline project in November 2016 that is subject to 157 legally binding conditions under the NEB before and during the construction as well as during its operation. These conditions include its engineering requirements, safety, emergency preparedness, air emission and greenhouse gas emission conditions (Natural Resources Canada, 2017). The expansion project has begun its construction since September 2017 and is expected to complete in 2019.

The expansion project will add approximately 980 km of new pipeline and reactivate 193 km of existing pipeline. Twelve new pump stations and nineteen new tanks will be added to support the expanded pipeline. The new pipeline will parallel the existing pipeline and will triple Canadian energy resources to international market beyond the United States. It would open the possibility of exports to the Asian market from Canada's oil sands (Kinder Morgan, 2014).

## *2. Enbridge's Line 3 Replacement Project*

Enbridge Inc. is one of the companies that transport Canadian energy resources in North America for more than 65 years by delivering over 2 million barrels of crude oil every day. The headquarters are in Calgary, Alberta and Houston, Texas. Enbridge Inc. operates the world's longest crude oil and liquids transportation system. One of the pipelines constructed by Enbridge is Line 3 whose construction dates back to 1960s and has operated since 1968. Line 3 is a 34-inch diameter, a 1,097-mile long pipeline that stretches from Alberta, Canada to Superior, Wisconsin, United States. Line 3 has played an important role in transporting crude oil to

Minnesota, Wisconsin and other North American refineries (Enbridge Inc., 2017).

On November 2014, Enbridge Inc. applied to replace 1067 km of three pipelines with 1096 km new pipeline. In the same month two years later, Prime Minister Justin Trudeau announced along with the approval of Kinder Morgan's Trans Mountain Expansion project, that Enbridge's Line 3 Replacement project has received the green light from its government. The new replacement project is subject to 37 binding conditions under the authority of NEB that includes safety, engineering, and environmental required conditions. The existing Line 3 pipeline is 48 years old and is one of the six crude oil pipelines that constitute Enbridge oil mainline system. Its replacement will replace the 48 years old pipeline with a brand new pipeline along with the installation of 55 new remotely operated valves, 18 new pump stations and construction of three new oil storage tanks at Alberta along with interconnections at facilities. The replacement project will increase the capacity of the original pipeline into 760,000 barrels of oil per day (National Energy Board Canada, 2018). In 2018 the existing pipeline will be taken out of service and the replacement pipeline will be placed into service (Enbridge Inc., 2017).

The above contentious pipeline projects approved by Canadian government will be the main subject discussed in the following chapter. Canada's decisions for these projects will be analyzed particularly its approval rationation.