Canadian Energy Industry

An Industry Pumped Dry

The Canadian Energy Sector is one of the most important sector in the nation's economy. It has been an important driver of industrial growth over the past century, providing fuel to power the rest of the economy. It provides employment to almost 16 million people. The nominal GDP of Canada is made up of $168 billion, or 8.1%, by the energy market. The oil and gas industry in Canada, which produces gasoline, diesel, aviation fuels, and other petroleum products, provides a significant amount of the country's energy.

The industry report by the Waterloo Chapter covers an overview of the industry and its drivers. Furthermore, key macro-economic events that have made a significant impact on the industry are covered, followed by a future-prospect analysis of the energy sector.

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Canadian Energy Overview

Canada's proven oil reserves account for approximately 10% of the global resource, a share greater than all countries excluding Venezuela and Saudi Arabia. The Canadian energy market accounts for 8.1% or $168 billion of the country's nominal GDP. A large portion of Canada's energy comes from its oil and gas segment, which produces gasoline, diesel, aviation fuels, and other petroleum products.

Companies in the oil and gas industry are usually divided into one of three groups, upstream, downstream, and midstream. Upstream is conducted by companies who identify, extract, or produce raw materials. Downstream companies are closer to the end-user or consumer, in other words, it involves post-production activities such as refinement. Midstream is the connecting link and includes transportation and storage services. Some companies are considered "integrated" because, as the name suggests, they combine the functions of two or three of these streams.

Fuel use has rebounded from the 2020 pandemic-induced slump and is set to exceed 2019 levels this year even as prices hit record highs. But high prices have eaten into growth projections for 2022 and fed into expectations for slower growth in 2023. The outlook for 2023 suggests a strain on supplies could persist as growth in non-OPEC output, which has been hit by Russian losses, is expected to lag the rise in demand. Demand is expected to rise by 2.7 million barrels per day (bpd), or 2.7%, in 2023.

Key Players and Regions

Canadian energy production is centered in western Canada, which accounted for about 95% of total production in 2020. The remaining 5% was produced mostly in Newfoundland and Labrador. Alberta, Saskatchewan, and Newfoundland produce 96% of Canada's oil reserves. These three are also the only provinces that produce heavy oil.

Unlike other major oil-producing countries (i.e., China, Saudi Arabia, etc.), there is no state-owned oil producing company in Canada. The four largest Canadian extraction companies include; Suncor, Canadian Natural Resources Limited, Imperial Oil, and Cenovus. These companies are responsible for over half of Canada's crude oil production.

The provincial Crown owns 81% of the mineral rights in Alberta (approximately 53.7 hectares of land), including roughly 97% of all oil sand rights.

Company	Involvement	Market Cap	Revenue
Suncor Energy	Integrated	$57.04	$41,133
CNRL	Upstream	$80.59	$32,854
Imperial Oil	Integrated	$37.48	$35,580
Cenovus	Integrated	$47.01	$48,811

Market Cap ($B)
Revenue ($ Thousands)

Source(s): Natural Resources Canada, Annual Reports

Industry Overview

WCS vs WTI

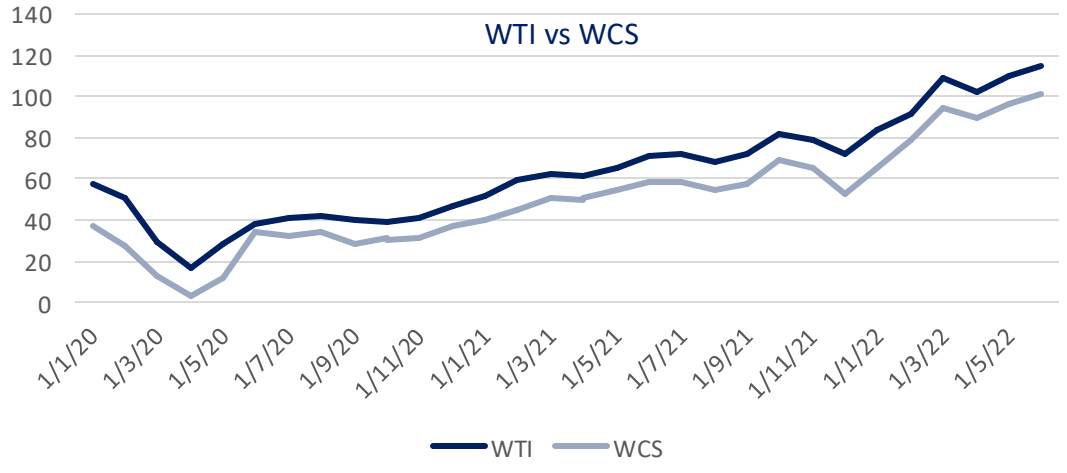
Western Canadian Select (WCS) is the benchmark price for Canadian crude blends. WCS's blend is classified as "heavy" and "sour". To explain, a heavy oil is a form of crude oil that is more viscous (thick) and dense and sour oil is crude oil containing a high amount of the impurity sulfur. Next, "light" crude oil is liquid petroleum that has a low density and flows freely at room temperature. Finally, "sweet" oil contains very low amounts of sulfur. Lighter and sweeter oils generally receive higher prices because they are easier to produce WCS is priced at a discount to West Texas Intermediate (WTI), the North American benchmark for crude oil. WTI's blend is more ideal for refining compared to WCS. Canada only has the capacity to refine roughly 40% of its own oil production. Most of Canadian oil is sent to U.S. refineries, incurring transport cost. Furthermore, since almost all o f Canada's oil is landlocked in Alberta, Canada relies on the U.S. as a major export market for its oil. Canada's economy lost up to $15.6 billion in 2018 because of the massive discounts on Canadian heavy oil, reported Scotiabank.

Regulatory Environment

Canada's oil and natural gas industry operates in one of the world's most stringent regulatory environments, with federal, provincial and territorial regulations. Major energy products are reviewed by the Canada Energy Regulator.

Competing Interests

Competing interest from the Canadian government, investors, environmental groups, etc. make it difficult for oil related projects to proceed quickly. The federal government has the ultimate authority to enact project approvals. However, federal involvement is rare, as jurisdictional disputes with provincial and municipal governments as well as constitutional laws make it challenging for the federal government to have a direct role in projects. The historical tendency of the Canadian government to limit crown involvement in oil related projects (i.e.. Kinder Morgan Trans Mountain Pipeline) creates an opportunity for interest groups to slow projects down by way of the Canadian judicial system.



Source(s): Natural Resources Canada, Alberta Economic Dashboard

Industry Drivers

The Industry

The Energy sector has the world's most valuable commodities, even in today's highly technological world. Energy is widely used in all industries and is an important driver of economy. For instance, despite the recent sky-high popularity of electric cars, oil and gas still power the majority of transportation. Other sectors that are highly dependent on energy include industrial production and manufacturing, residential services, electric power production and many more. Given the importance and high dependency of the world on energy, many factors drive the prices for the sector.

Government Policies & Regulations

Given the importance of energy in the global economy and stability, the sector is closely watched by the governments and policies are in place to ensure the economy develops in a stable manner and the interests of individual countries are protected. Therefore, policies in place by governments play a key role in prices of energy and the amount available for trade and consumption. The major policies and agreements that impact the industry are the Organization of Petroleum Exporting Countries (OPEC), The International Energy Agency, World Petroleum Council, World Energy Council and more. These organizations determine and have significant control over prices and production levels for the energy sector. Example, OPEC which consists of the United States, Russia and Saudi Arabia and other petroleum producing countries influence oil prices by limiting the supply of oil.

Supply & Demand

Supply and demand for energy are inelastic. Supply is inelastic because the energy sector is composed of natural and thus limited nonrenewable natural resources like oil & gas, and petroleum. The cost of extracting and making these resources available for use is also high making the resources less available. The energy demand is inelastic because the global economy is highly dependent on it. Effectively, demand is not very responsive to high or low prices and remains constant. There may be minimal changes in demand when prices move; however, the changes are short-term and do not have a long-term effect. In the long run, consumers adapt to the prices and manage their consumption accordingly. Given the inelasticity of supply and demand for energy, the price swings in the industry are dramatic and often impact the global economy. For example, high oil prices may slow down the development of the global economy and result in recessions while a decrease in oil prices can fuel economical development. Lastly, the inelasticity of supply and demand for energy and the significant dependence of the global economy on energy are the main drivers of the industry. The energy demand is not to decline over the next few decades, fueling further growth in the sector.

Technology

Technological innovations can also influence crude oil supply by affecting production volumes and costs. For example, the development in hydraulic fracturing technology has significantly increased the supply of crude oil extracted from rock making the U.S. a net exporter of crude oil and related products for the first time since the 1940s in 2018. Overall, technology has cut costs and made energy extraction and production processes much faster. With the help of technology, energy production, exploitation and transportation are no longer significant costs of the energy companies which allows them to invest more in their business and encourages growth.

COVID Came To The Play

With the rapid spread of COVID pandemic at the beginning of 2020, governments successively started stay-at-home orders. Therefore, global demand and supply were considerably influenced, followed by a dramatic drop of almost all the activities that requires oil. Such sudden decrease in oil demand led to a huge imbalance between oil's own demand and supply.

As lockdowns lasted, it formed **a vicious circle**. Because oil demand was becoming lower, as well as the continuous uncertainty of this historically new pandemic, oil price plunged. This made suppliers less willing to sell oil on that market, accumulating more and more oil storage. Such increase in oil supply not only cut its price more, but also increased storage costs. For instance, in around March 2020, the average price of barrels was even higher than that of oil itself. Due to this unaffordable supply expense and pessimistic expectations, the market fell into a panic dump of oil commodities, further pushing down the demand and thus price of oil.

But this circle itself was not enough to sink oil price to a negative number……

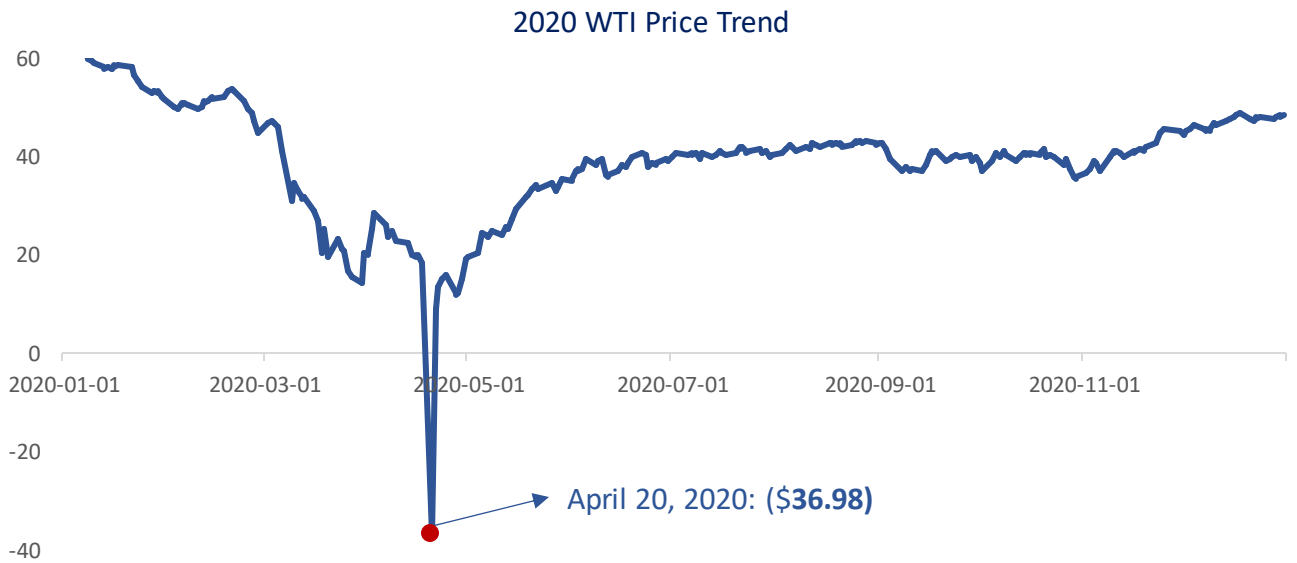
Oil War: Saudi Arabia VS Russia

Talking about global oil supply, it would be unprofessional not to mention OPEC, in which 80.4% of the world's proven oil reserves are located, whose leader is Saudi Arabia. In 2016, another 10 countries, whose leader was Russia, allied with OPEC to form OPEC+ in order to manage the price after U.S. shale oil joined the field in 2014.

After the outbreak of COVID pandemic, Saudi Arabia and Russia quickly came to table in order to protect the oil price by limiting oil production. By January 2020, OPEC+ had cut oil production by 2.1 million barrels per day (bpd). In March, OPEC proposed an additional production cut of 1.5 million bpd through the second quarter, which drove Russia to reject and marked the end of this partnership.

Russia leaving the table peaked bearish emotions of oil market. Excessive supply with little demand and limited storage triggered suppliers to lower price again and again just to sell oil out.

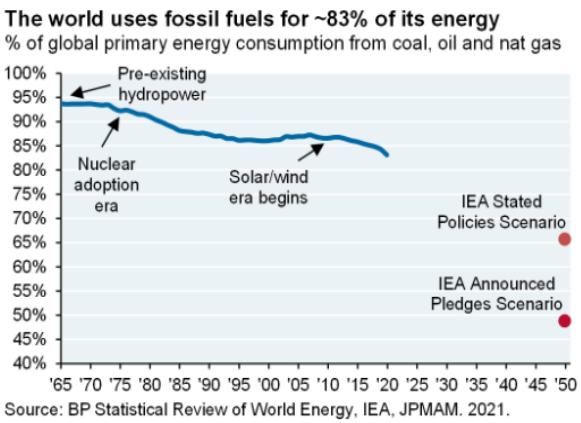
Eventually, WTI reached the historical low on April 20, 2020, at **($36.98) per barrel**.



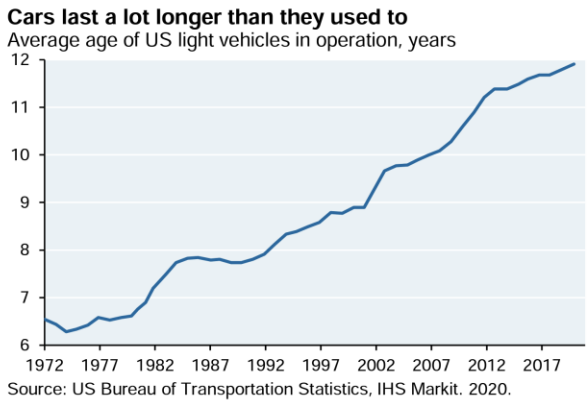
Source(s): Federal Reserve Economic Data

Is Electrification a Threat to Fossil Fuels?

Electrification is at the center of many deep decarbonization plans. Nevertheless, over the last 20 years, electricity as a share of energy use rose by just 2%-3% in most countries. A few countries have reached 25%-30% electrification, but they are very small countries with abundant hydro- or geothermal power, and/or they are highly reliant on the outside world. Larger countries' electrification is still less than 20% of energy use.



During the last few years, the rise of electric vehicle (EV) has been seen as one of the most threatening factor against fossil fuels.
However, even though in 2021 EVs took up almost 9% of global vehicle sales, only 1.5% of vehicles on the road were EVs. This is because longer useful life of today's automobiles limits the pace of EV adoption absent aggressive subsidies and incentives to switch.



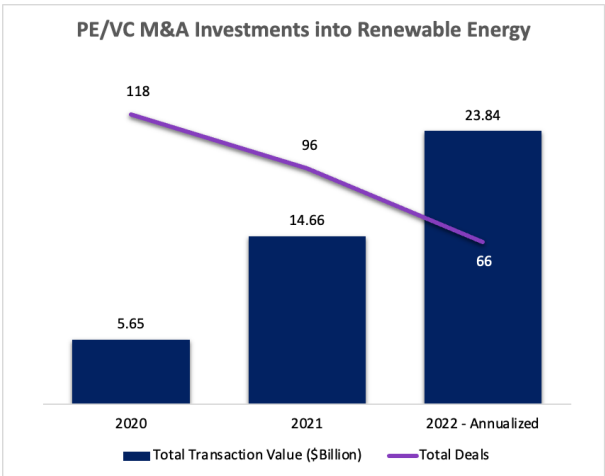
Russia's Invasion Against Ukraine

The war itself boosted demand of fossil fuels, especially oil and gas (O&G). The following international sanctions against Russia in turn cut the global supply of O&G since other countries are losing Top1 gas exporter and Top3 crude producer. Such geopolitical uncertainties have driven O&G prices to their highest levels in nearly a decade and forcing many countries to reconsider their energy supplies.

Renewable Energy Commitments

In order to slow down and even eliminate global warming, nations and companies on the globe have successively announced their long-term decarbonization plans and net-zero goals.

Take Australia as an example, its new Prime Minister Anthony Albanese vowed to make the nation a "renewable superpower" after coming to the office.



The global decarbonization wave, sustainable business models, and massive political supports have attracted increasing attention from investors. Even though 2022 has been quite unfriendly to equity markets, renewable investments in the first half year achieved new record high. The biggest transaction so far would be KKR's planned $5.8B acquisition of ContourGlobal.

ESG – Based Investing

The oil and gas industry is currently booming, represented by the Energy Select Sector SPDR ETF (XLE) which is up by 59.8% over the past year. It has been a turbulent year for ESG investing with many now questioning its legitimacy. Despite the industry seeming to thrive financially due to tailwinds of soaring oil prices, M&A activity grew by only 18% and CAPEX grew by only 17% in 2021; therefore, O&G companies still are mindful of the future struggles they will face to borrow capital from investors. The net value of private equity investments in the O&G industry plummeted by 60% from 2014 to 2021, with PE divesting into renewables. O&G has significantly lost its former growth prospects due to rigs producing lower volumes of oil, and many external industries becoming less reliant on the need for O&G in their operations. The O&G industry is also facing downward pressure from governments who are implementing new legislation and taxes that are crippling business practices and profits. Finally, investments in renewables are becoming more lucrative due to their more cost-competitive nature.

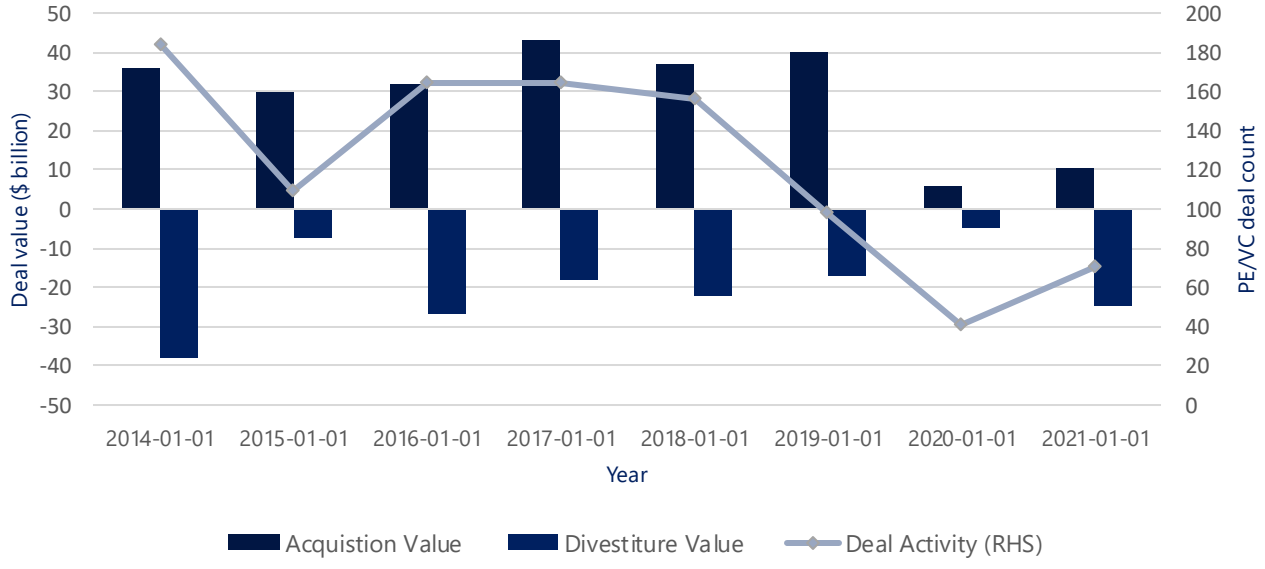
Electric Vehicle Surge

The O&G industry is heavily dependent on the automobile industry with two-thirds of every barrel of oil going toward the transportation industry. There has been an obvious shift in the automobile sector with manufacturers setting dates to completely electrify their lineups and governments imposing laws to set that all new cars sold must be electric. Ergo, this will be extremely disruptive on the O&G demand as every 1 million new electric vehicles will displace approximately 50,000 barrels of oil consumption.

Net-Zero

We are in the midst of an energy transitions, with governments and corporations pledging to go net-zero by 2050. The Paris Agreement is a major catalyst to a net-zero future with 44 nations, promising to drastically cut greenhouse gas emissions by shifting to renewable energy solutions. Canada has pledged millions of dollars towards scaling proven renewable energy technologies such as solar and wind farms. Governments are also becoming more stringent on carbon and emission policies, with stricter regulations and heavier taxes being put in place.

M&A by PE and VC players in O&G industry (2014-2021)



Source(s): Deloitte

Alternatives to Oil and Gas

Solar

Solar is currently the fastest growing renewable alternative due to the rapid advancements in technology and decreasing costs to produce panels. However, major downsides to solar include that scarcity of current materials, inefficiency of energy generation and the high barriers of entries to set up solar farms (i.e. permits, initial cost).

Wind

Wind farms have made a splash in North America, becoming one of the highest electricity producing forms of renewable energy. This is largely in part to major technological advancements of turbine designs that has resulted in it being the most efficient energy solution, costing $0.01/KWh. Downside are similar to that of solar as the barriers of entry to set up a wind farm are high.

Hydrogen

There is increasing interest in hydrogen energy technologies and more research and development is being made towards advancements for this technology. Hydrogen energy is extremely plentiful as there are multiple processes in which it can be produced; however, many of the processes produce carbon dioxide in the process. Moreover, with current technologies it is extremely costly to produce.

Industry Changes

The horizon for the O&G industry appears vain due to the shifts against the industry spurred by a rise in ESG awareness and causing rapid change in the energy sector. However, O&G companies are aware of the headwinds brought on by the trend and are actively making changes to their business models to be more mindful of their impacts.

Newly found higher oil prices are enabling companies to make significant investments towards net-zero commitments; Oil Sands Pathways to Net Zero alliance is comprised of 5 Canadian O&G giants pledging to go completely net-zero by 2025. Investments are being made in technologies that will drastically slash emissions. The primary plan to slash emissions is to collect and store CO2 emissions underground using a carbon capturing facility, with the proposed idea expecting to reduce 8.5 million tonnes of carbon emissions annually by 2030. Moreover, O&G companies are diversifying into decarbonized energy opportunities, divesting over $10 billion in the last 4 years.

These adaptations ultimately will enable the industry to continue to have access to capital from investors as they will be up-to-par with current ESG sentiments. It will further provide them with forward-looking business models, anticipating future government ESG legislation and trends concerning O&G from external industries. Ergo, the prospects of the O&G industry despite seeming bleak are well equipped to thrive in a rapidly changing environment.

Conclusion

To conclude, although the energy sector is skewing away from its traditional sources such as oil and gas, with a growing popularity with its alternatives, the industry as an overall is here stay as an ever-green backbone for not only the Canadian, but also the global economy.