



CANADIAN ENERGY REPORT

WE'RE GOING TO NEED A BIGGER BARREL

In the past 12 months, the market has seen the price of West Texas Intermediate (WTI) crude fall over 80%. By late March, a barrel of Western Canadian Select (WCS) crude was worth less than a Frappuccino, and in April, prices hit negative territory for the first time in history. Simultaneous demand and supply shocks stand to have lasting effects on the already fragile Canadian energy market.

This report examines how global events that have transpired over the course of 2020 are reshaping the Canadian oil & gas industry.

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Long-Term Outlook for Canadian Energy Sector

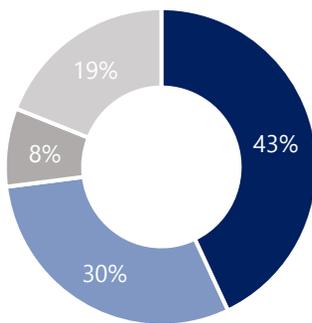
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Industry Overview

Canadian Energy Overview

Canada's proven oil reserves account for 10% of the global total, a share greater than all countries except Saudi Arabia and Venezuela. The Canadian energy market accounts for approximately 11.1% of the country's GDP, representing \$230 billion in output.⁽¹⁾ Most of Canada's energy comes from its oil & gas segment, which produces gasoline, diesel, aviation fuels, and other petroleum products.

Canadian Sales of Petroleum Products



■ Gasoline ■ Diesel ■ Aviation Fuels ■ Other

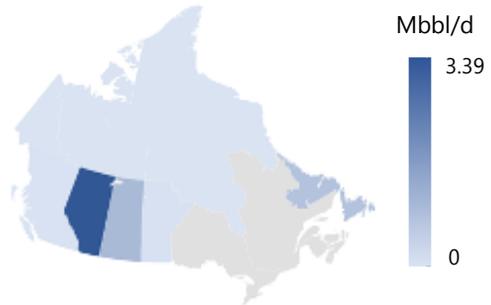
Source: Natural Resources Canada

Companies in the oil & gas industry are typically segmented into three categories: Upstream, Midstream, and Downstream. Upstream is focused on the exploration and extraction of oil. Downstream involves post-production activities such as refinement. In the center of the spectrum, Midstream is the connecting link, providing oil infrastructure like pipelines and storage. Companies that engage in two or all three of these functions are classified as "integrated".

Recently, growth prospects in Canada's oil market have slowed due to the impacts of the COVID-19 pandemic. Oil companies have been met with plummeting oil prices and pipeline shortages, causing significant losses and cuts to capital expenditures. It is estimated that crude oil production could decline as much as 1.7 million barrels per day (Mbbbl/d) in Canada, a reduction equal to one-third of the national total.⁽²⁾

Key Players and Regions

The oil sands of Alberta and Saskatchewan account for 96% of Canada's oil reserves, with the remainder located primarily in large deposits off the coast of Atlantic Canada.



Source: Canadian Association of Petroleum Producers

Unlike other major oil-producing countries, there is no state-owned oil company in Canada, as is the case in Saudi Arabia (Saudi Aramco), China (China National Petroleum Company) and other oil rich countries. The five largest Canadian extraction companies (Suncor, Canadian Natural Resources Limited, Imperial Oil, Cenovus, and Husky) are responsible for over half of crude oil production in Canada. Outlined below is more information on some of the largest players in the Canadian oil & gas industry.

The provincial Crown is the owner of approximately 81% of the mineral rights in Alberta, including approximately 97% of all oil sands rights.

Company	Involvement	Market Cap	Revenue
Suncor Energy	Integrated	\$36.86	\$39,866
CNRL	Upstream	\$25.80	\$24,394
Imperial Oil	Integrated	\$16.13	\$34,002
Cenovus	Integrated	\$5.78	\$21,353
Husky	Integrated	\$4.21	\$20,306

Market Capitalization in billions CAD as of 5/1/2020
Revenue FY2019 (000's CAD)

Source: Annual Reports

Industry Overview

WCS vs WTI

WCS is Canada's crude oil benchmark from the Alberta oil sands. WCS's blend is classified as "heavy" and "sour". Put simply, a heavy oil is thick and dense, while a sour oil has a high sulfur content. A "light" oil has a low density, which allows it to flow into wells and pipelines smoother, while a "sweet" oil contains a low sulfur content. Lighter and sweeter oils generally receive higher prices because they are easier and cheaper to process. Additionally, most finished petroleum products like gasoline have sulfur content limits because of the pollutants it emits when burned (sulfur oxides). As a result, sour oils must be refined further.

WCS is priced at a discount to WTI, which is the North American benchmark for crude oil. Since WTI's blend is light and sweet, it's less expensive to refine compared to WCS. Another factor causing the price differential is Canada's lack of infrastructure surrounding oil. Canada only has capacity to refine approximately 40% of its own oil production. The majority of Canadian oil is sent to U.S. refineries, incurring additional transportation costs. Furthermore, since almost all of Canada's oil is landlocked in Alberta with no direct pipelines to global oil markets, Canada heavily relies on the U.S. as its only major export market for oil. In 2018, 84% of Canadian crude oil production was exported to the U.S.⁽¹⁾

Regulatory Environment

Canada's oil & gas industry operates in one of the world's most stringent regulatory environments, with federal, provincial, and territorial regulations. Major energy projects are reviewed by the Canada Energy Regulator, the Canadian Environmental Assessment Act, and affected Indigenous groups.

Competing Interests

Competing interests from governments and groups across the country 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 (e.g. the Kinder Morgan Trans Mountain Pipeline) creates an opportunity for interest groups to slow projects down by way of the Canadian judicial system.

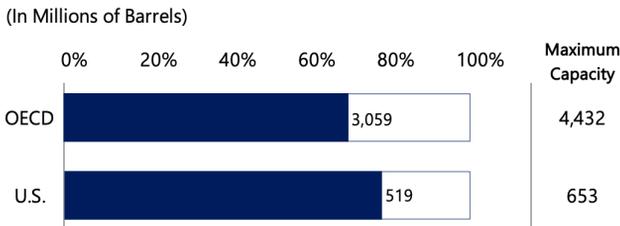


Global Oil Supply Trends

Global Oil Inventories and Oil Storage Crisis

Saudi Arabia's initiation of a price war with Russia in response to the latter's refusal to reduce oil production prompted the two countries to ramp up production and cut prices in hopes of capturing more market share. The increased production led to an over supply and a lack of storage capacity. With the inventories increasing, the situation has developed serious implications for the Canadian energy sector and the broader world.

Crude Oil Storage Reaching Capacity



Storage capacity cannot be filled completely to 100%. Some must remain available for routine operations, such tank-to-tank transfers, blending, and the like.

Source: U.S. Energy Information Administration

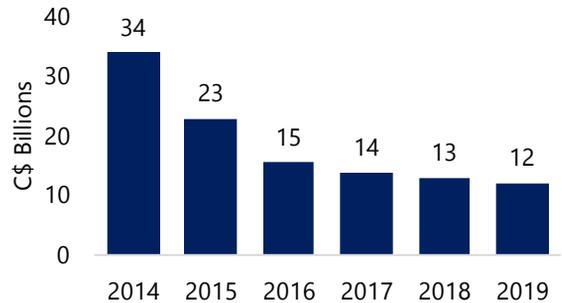
Implications on Canada

Strain On Government Finances

The declining oil prices will serve as a significant strain on Canada's finances. Due to oil's current spiral and the COVID-19 pandemic, it is difficult to isolate the impact of falling oil prices on Canada's budgetary deficit. Yves Giroux, the Parliamentary Budget Officer, estimates that it could contribute a deficit of \$7 to \$10 billion.⁽³⁾ This, in turn, raises the question, "Can the government even afford it?" So long as interest rates remain low and the world returns to normalcy or near normalcy in the next six months, the answer might be yes. If the return to normalcy continues to elude Canada,

undoubtedly the additional financial burden will be alarmingly unsustainable, propelling general government debt to around 100% of GDP.⁽⁴⁾ Additionally, owing to the uncertainty accompanying the lower price oil environment, capital investment in oil sands are expected to decline. These investments have already been declining in recent years due to pipeline delays and regulatory issues, yet oil's current spiral and the COVID-19 pandemic will continue to make the aforesaid predicament even worse. This, in turn, impacts Canada's GDP due to lack of business investment.

Capital Investment in Oil Sands



Source: Canadian Association of Petroleum Producers (CAPP)

Reduction in Employment Levels

The economy lost 1,993,800 net jobs in April, with the unemployment rate rising to 13%. This was the largest loss of jobs in a single month since record-keeping began in 1976.⁽⁵⁾ The plummeting oil prices will add to Canada's unemployment woes. This is particularly true for regional unemployment, with Alberta and Newfoundland and Labrador being exceptionally vulnerable to a downturn in oil pricing.

Depreciation of the Canadian Dollar

There is a strong correlation between the value of the Canadian dollar and the price of oil. When the price of oil rises, the value of the Canadian dollar tends to also rise relative to that of the U.S. dollar. As such, the declining oil prices will lead to

Global Oil Supply Trends

a depreciation in the value of the Canadian dollar. This can lead to imports becoming more expensive for Canadians, which will make many individuals feel worse off. It can also unnerve international investors, since they will be less willing to hold government debt as the devaluation will reduce the real value of their holdings.

Implications on Broader World

Budget Imbalances

The declining oil prices will deal a significant blow to oil-producing countries. This includes Saudi Arabia and other Middle Eastern producers who need oil to be at \$70 to \$90 a barrel to keep budgets balanced.⁽⁶⁾ This is not inclusive to only Middle Eastern producers. The U.S., for example, needs oil to be at \$40 a barrel to keep a balanced budget, while Canada needs it to be at \$45 a barrel – all targets far above oil prices as of late.⁽⁷⁾

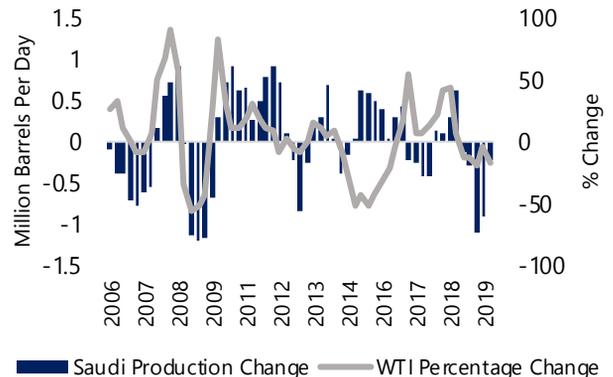
Stock Market Heightened Volatility

Oil's current spiral is not only impacting countries but is also hurting major investors' portfolios and individual investors alike. Investors use the price of oil as a recession barometer, since economic growth is closely tied to fuel demand. On March 9th, following news regarding the Saudi Arabia–Russia price war, combined with panic over the COVID-19 pandemic, the Dow Jones index fell over 2,000 points (or 7.8%), becoming the largest single day point drop in its history.⁽⁸⁾

OPEC's Influence on Global Oil Prices

Under normal market conditions, OPEC+ (OPEC and non-OPEC allies) has significant influence over oil prices, controlling over 50% of oil supplies and 90% of oil reserves. Saudi Arabia, along with other OPEC+ nations, maintain their power over oil prices not only due to their dominant position in the oil market, but also due to their extreme cost-efficiency and lack of economically feasible alternatives in the global energy sector.

Changes in Saudi Arabia Crude Oil Production and WTI Crude Oil Prices



Source: U.S. Energy Information Administration

The current economic climate has posed a historically massive demand-shock for the oil market. In order to artificially manipulate oil prices with today's steep decline in demand, production would need to be reduced to almost zero. Generally, no country wants to reduce its output because of the effects it will have on their oil revenues. Henceforth, the production cuts of approximately 20% of global daily oil supply are gravely ineffective and far from what is necessary to counteract the demand shock. Even if oil production was to be reduced to almost zero, the existing near-full capacity oil inventories ensure that the supply of oil will still exceed demand.

This raises the question: "Is it too late to artificially manipulate oil prices?" It suggests that despite OPEC+'s efforts, free-market allocation is soon to take effect. Using basic economic principles, a reduction in demand should result in a reduction in price, forcing inefficient suppliers who cannot supply profitably at this price out of the market, eventually raising the price to equilibrium. On the one hand, as inefficient producers leave the market, it will leave only the most efficient producers. On the other hand, market power for the remaining producers would soar, potentially leading to exploitative oil prices for consumers.

Global Oil Demand Trends

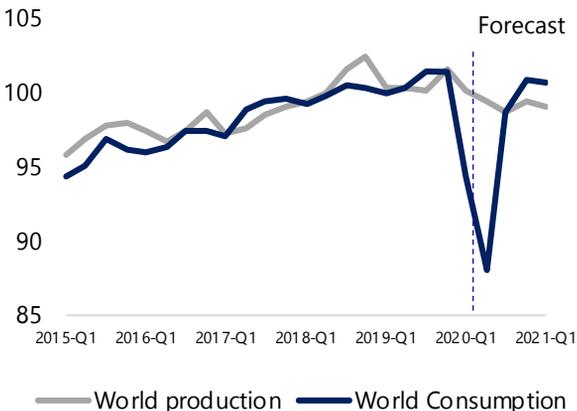
Global COVID-19 Containment Measures

The arrival of COVID-19 strained an already challenged oil market. Demand growth in 2019 had stagnated compared to years past, which can be partially attributed to increases in vehicle fuel efficiency. Additionally, the regulations such as International Maritime Organization (IMO) 2020 fuel guidelines introduced significantly tightened specifications in the marine sector, which is responsible for half of oil fuel demand.⁽⁷⁾

The plunging demand for oil brought on by the COVID-19 pandemic has put the energy industry in survival mode, as containment measures worldwide have brought mobility to a halt. Social distancing has been a tremendous contributing factor in oil's current spiral as energy consumers are unable to take advantage of low prices. Gas prices across Canada have hit 15-year lows, and WCS fell by over 75% from the start of 2020. In the Airline Sector, representing 13% of oil use for global transportation, Airlines for America announced in April that U.S. airlines had idled more than 3,100 planes, more than 51% of their fleet with similar shocks seen in Canada.^(9,10) As a result of the decrease in transportation, in April, demand has decreased by 29mb/d compared to last year, down to a level last seen in 1995.⁽¹¹⁾

World Liquid Fuels Production and Consumption

(In Millions of Barrels)



Source: U.S Energy Information Administration

Negative Oil Prices

On April 20th, WTI traded on the New York Mercantile Exchange in negative territory. Low liquidity and significant shortages in storage capacity caused WTI May futures to trade as low as -\$40.32 USD per barrel.⁽¹²⁾ This is because market participants owning these futures after the expiration date of April 21st were required to take physical delivery of WTI crude. Costly and scarce storage incentivized market participants to close their positions, with some contracts being sold at negative prices.

Many traders in the futures market look to profit from price fluctuations rather than purchasing the underlying commodity. As such, the phenomenon of negative oil prices is largely confined to the financial markets rather than physical markets. Even so, the occurrence of oil futures being negative priced increased the urgency for large producers and governments to react. Shell Corporation cut their dividend for the first time since World War II, and other large energy companies continue to cut planned capital expenditure for 2020. The U.S government is also expected to take significant action to influence oil prices through limiting crude imports, and potentially filling their Strategic Petroleum Reserve (SPR).

Canadian Oil Production

The Canadian energy industry is heavily reliant on U.S demand, which has fallen significantly as a result of the widespread containment measures. This has caused WCS crude to fall to prices of under \$10 per barrel, making the transportation more expensive than the actual commodity. Action from the U.S government to influence oil prices would limit the ability for Canadian energy companies to benefit in the short-term from increased American demand once containment measures ease.

Global Oil Demand Trends

Renewable Energy Landscape

Entering 2020, the Renewable Energy Industry was poised to begin a new growth phase. In 2018, renewables made up over 17% of net U.S. electricity generation and, last year in April, was the first time renewable energy outpaced coal by providing 23% of US power generation, compared to coal's 20% share.^(13,14) The International Energy Agency (IEA) forecasted that 2020 would be a record year for renewable energy additions, as global solar PV and wind installations were predicted to outpace 2018 installations in 2019. Renewable policies from China, the European Union, and India were expected to drive this expansion.

Canadian Landscape

Canada is ranked 7th in the world production of renewable energy, providing 3% of the total renewable energy produced globally. In 2019, 17.3% of the Canadian total primary energy supply came from renewable energy sources and they accounted for 67.6% of its electricity production. Most of the renewable energy produced in Canada comes from hydroelectric power and biomass, accounting for 68% and 23% respectively. As a matter of fact, Canada is the second largest producer of hydroelectric power in the world. Currently, wind and solar energy are the fastest growing sources of electricity in Canada representing approximately 5% of the renewable energy produced.⁽¹⁾

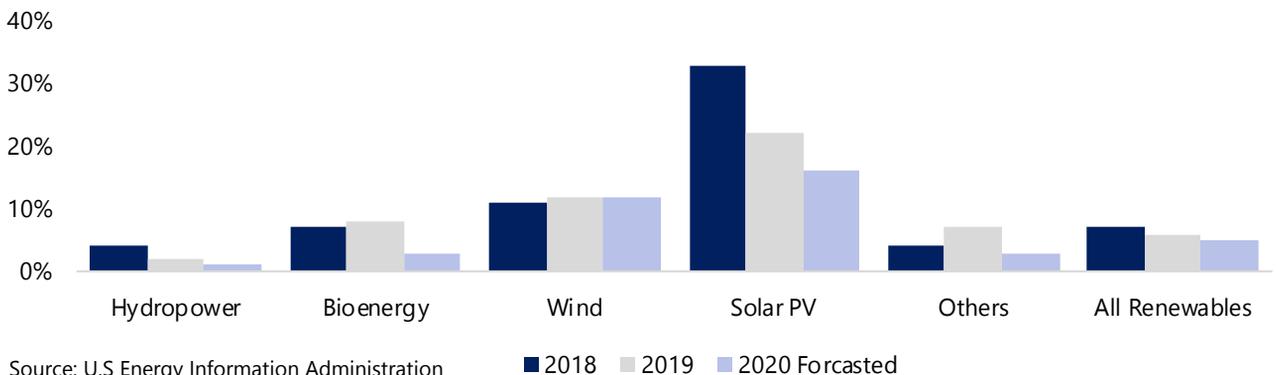
COVID-19 Crisis and Renewable Sources

It is unclear how disruptions in global energy markets stand to affect the renewables industry in the long term. In recent years, renewable energy sources have become increasingly competitive due to falling production costs as well as strong policy support from governments. Demand shocks as a result of containment measures will challenge the resilience of renewable energy markets. There are three main challenges facing the renewable energy industry as a direct result of the COVID-19 pandemic:

1. Disruption of supply chains affecting the completion of projects and the delivery of materials from Asian manufacturers.
2. Continuity of the government incentive programs that have driven growth in the industry.
3. Magnitude of reduction in investment from governments and corporations.

Furthermore, as the opportunity cost for renewable energy has increased due to low oil prices, demand for renewable sources might be affected negatively. This is because one of the main selling points for using renewable energy is the low-cost source of energy however, that advantage is now less significant.

Global Annual Growth for Renewable Energy



Short-Term Outlook for Canadian Energy Sector

Comparison to Previous Economic Downturns

2008 Financial Crisis

Oil prices plummeted from \$144.29 in July 2008 to \$33.87 five months later. Similar to its response to the 2020 oil price spiral, OPEC cut production by 16% in eight months to stabilize oil prices, led primarily by Saudi Arabia.⁽¹⁵⁾ However, Russia and Iran continued to pump oil, capturing market share at Saudi Arabia's expense. Saudi Arabia bore the majority of the burden in 2008 to raise prices only for other members to benefit. Now, Saudi Arabia understands the importance of maintaining market share over short-term cash flow and, as such, will likely be reluctant to bear the burden of cutting production as it previously has done. To make matters even more complicated, the U.S. and other countries are bigger players in global oil markets today. Therefore, it is not simply up to OPEC to cut oil output as it was in 2008 due to the multitude of other key players who are not on the same page about production levels and prices.

In 2008, oil consumption fell by 1.2%, before coming back to parity in 2010.⁽¹⁵⁾ This time around, however, oil consumption is likely to take longer to recover, since consumption patterns are extremely uncertain depending on coronavirus lockdown measures worldwide. It gets worse the longer it takes for countries to ease lockdown measures, since the upside potential for oil prices will be stifled by high inventories. This does not even take into account that restrictions on border openings and travel alerts will likely be removed last, meaning people will be slow to fly, take trains, or even drive.

The situation, however, is not all doom and gloom. Oil prices are recovering faster and faster with each decline. It took 126 days for prices to recover to \$50 per barrel during the 2008 downcycle, while it took just 89 days for prices to recover to \$50 a barrel in 2016 from even lower lows.⁽¹⁵⁾

Short-Term Outlook

Government Intervention

In May, the Canadian federal government announced the Large Employer Emergency Financing Facility (LEEFF) aimed to provide bridge financing for large companies to support jobs nationwide. To use the emergency support program, energy companies adhere to certain rules and regulations, including the following:⁽¹⁶⁾

- Adhere to strict limits for dividends, share buybacks, and executive pay;
- Commit to respect collective bargaining agreements and protect workers' pensions; and
- Commitment to publish annual climate-related disclosure.

Managing Stressed Balance Sheets

The deployment of the LEEFF program is a strong step in supporting an industry that has been facing significant challenges, even prior to the pandemic. However, even with this aid, energy companies will have to prepare for periods of time with low demand and manage their liabilities. Canada's Top 4 oil producers sport a debt-to-total equity of 49%, compared with 28% for the Top 3 U.S. producers.⁽¹⁷⁾

Texas energy producer Occidental Petroleum Corporation is looking to lesson a \$40B debt load and are considering significant assets sales including the sale of their chemical business which accounts for roughly 20% of their sales.⁽¹⁸⁾ Canadian companies including Husky have been prompted to decrease their dividend by 90% and cut capital expenditure by 50%.⁽¹⁹⁾

Companies who can maintain liquidity, such as Tapsone Energy, can consolidate assets at low prices through M&A activity.⁽¹⁸⁾

Long-Term Outlook for Canadian Energy Sector

Trend Towards Alternate Energy Sources

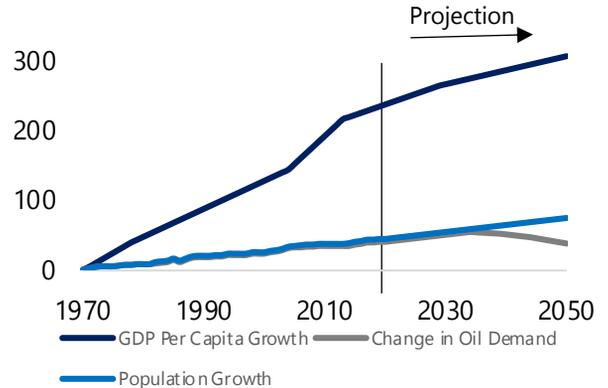
The mix of energy sources that Canadians use continues to change, increasingly gravitating towards the use of various forms of renewable energy. 17.3% of Canada's energy comes from renewables, as opposed to 10.2% for OECD countries and 13.6% for the broader world.⁽¹⁾ With over 170 countries committing to energy targets since 2016 and 150 countries having policies that support renewable energy, the growing effort to curb fossil fuel dependency continues to transform the global energy sector — and will expectedly continue to do so for many years to come.⁽²⁰⁾

The energy future of Canada will depend partly on its ability to remain competitive by relying on renewable power sources. This will require a combination of interventions on the Canadian government's part, such as the use of more favourable legislation and feed-in-tariff (FIT) where available and the provision of enhanced tax incentives on technology development. This will also require increased collaboration between the key stakeholders, including but not limited to, the Canadian government, corporations, and consumers themselves. In doing so, efficiency is increased, and technological development is hastened by pooling resources and nurturing ideas.

This, however, is not to say that the use of traditional sources like coal, oil, and gas will become obsolete anytime soon. There are still no economically feasible alternatives in the global energy sector today and it is unlikely that new energy developments will occur during the COVID-19 pandemic or immediately thereafter. That being said, it would be imprudent to disregard the growing role of renewable energy moving into the future of the Canadian energy system. The current volatility in oil prices (which has become much more common in recent years), coupled with climate change concerns, only punctuates the need for a new direction.

Drivers of Long-Term Growth

Historically, there have been two primary drivers of global oil demand: i) Population and ii) Per Capita GDP Growth.



Growing Worldwide Population

It is estimated population growth leads to an approximately 1:1 increase in energy demand. The United Nations' (UN) estimates place the world population growing to 9.8 billion by 2050, a net increase of 2 billion people, while the rate of global population growth is expected to decline from 1.1% in 2018 to 0.6% by 2050.⁽²¹⁾ Developed countries tend to have lower birth rates. As East Asia and African countries continue to develop, population growth is slated to stabilize, attributable to a projected decrease in oil demand growth.

Enrichment of the Developing world

Unlike a ballooning population, the influence of increasing worldwide per-capita GDP on oil demand is non-linear. It has been stronger in countries with lower incomes, where growth tends to be more energy-intensive, and weaker in countries with higher per capita GDP owing to a larger dependence on the service economy and greater means to invest in energy efficiency. The International Monetary Fund's (IMF) estimates place seven African and nine East Asian economies at enjoying north of 6% real GDP growth in 2019.⁽²²⁾ This implies increasing demand, courtesy of low income-energy intensive development.