

## The Global Energy Transition: Challenges and Opportunities

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The past year has been a year of upheaval for the world's oil industry. With the onset of the pandemic about a year ago, Covid-19 "demand destruction" resulted in global oil demand plummeting from 101 million bopd (barrels of oil per day) to 94 million bopd. Prices dropped from US\$60 per barrel to as low as zero last April and now have recovered to about \$65 per barrel. A year ago, the world was already seriously discussing the need to transition to a zero-carbon economy. During this past year, an increasing number of sovereign funds, banks and institutional investors announced their intentions to divest themselves of their investments in oil and gas companies. The election of President Joe Biden has had huge impact on the oil & gas industry with the Biden administration's immediate announcement of their intent for the USA to rejoin the Paris Climate Accord.

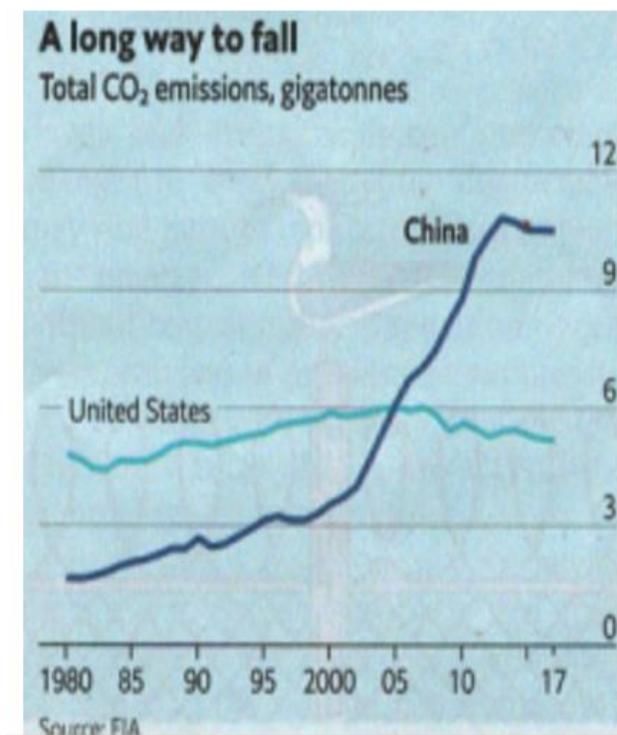


Fig. 1 China's and the USA's CO<sub>2</sub> Emissions, 1980 – 2019  
From EIA (Energy Information Administration)  
Published in The Economist, September 26, 2020

A few of the major international oil companies including BP and Total have decided that rather being part of the “carbon problem” they wish to be part of the carbon-free solution and are rapidly transitioning away from being oil companies to energy companies. Natural gas is the cleanest burning of the hydrocarbons and is increasingly viewed as a “bridge fuel” need to transition to a carbon-zero economy. Thus, in the next decade we can expect to see much more gas-focused activity in the oil industry.

Despite the global economic turmoil in the past year, the availability of oil to fuel the world’s economies remains critically important. Agencies such as the International Energy Agency (IEA) still forecast oil consumption to increase to 101 million bopd by 2025 and then gradually start to diminish. In the meantime, global consumption of gas remains extremely strong. The import of LNG by the Asian economies is skyrocketing due to continued strong economic growth in countries such as China and India. Also, China is sharply increasing its imports of LNG for electricity generation as it transitions away from its dependence on highly polluting coal-fired power stations.

According to the international consultancy of Wood Mackenzie, this year of 2021 is to be the defining year for the natural gas and liquified natural gas (LNG) industry as decarbonizing natural gas will become a strategic priority in the oil industry. Shell’s CEO recently stated that they expect global demand for LNG to double by 2040. I am in full agreement with an article in the SPE Journal of Technology, May 2020 (A. Sewell) stating “A rapid pivot to gas is essential. There is no alternative that can provide cleaner energy at the volume required to sustain a growing world population with an increasing per capita energy demand”.

## **Opportunities for Geoscientists**

For geoscientists, both geologists and geophysicists, all of this turmoil also creates opportunities. Exploration and development of gas, domestically and internationally will remain strong for at least the next couple of decades in order to satisfy the global demand for gas. Accordingly, the need for geoscientists will remain and could increase for exploration and development of gas.

The expertise of geoscientists will be much needed as sharply increased activity will occur within the area of CCUS – Carbon Capture, Utilization and Storage. Geoscientists will also be involved in the development of geothermal projects worldwide. The energy transition is also causing sharply increased demand for commodities such as helium and lithium, both of which need the expertise of geoscientists for their exploration and development. Accordingly, it is my view that geoscientists will have an increasingly important role to play as the world transitions to a carbon-neutral and sustainable energy future.

These opportunities will not be restricted to just Canada. Indeed, many opportunities may become available for geoscientists who are prepared to leave the comforts of home and work anywhere in the world. This author has been involved in the energy industry for five decades

since graduating from the University of Alberta in 1971. His employment included thirty years living and working in Indonesia, Nigeria and Angola. His advice to geoscientists is to go anywhere in the world where the job opportunities exist. For geoscientists who are energetic, flexible and adaptive, this author envisions a forthcoming world of opportunities which will evolve as part of the energy transition.

**Select Slides Included in This Presentation**

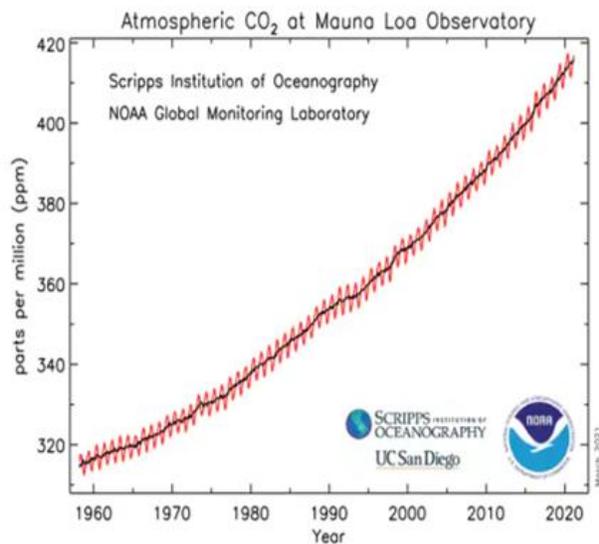


Fig. 2 Atmospheric CO<sub>2</sub> at Muana Lua Observatory, Covering past 60 years from 1960 to 2020

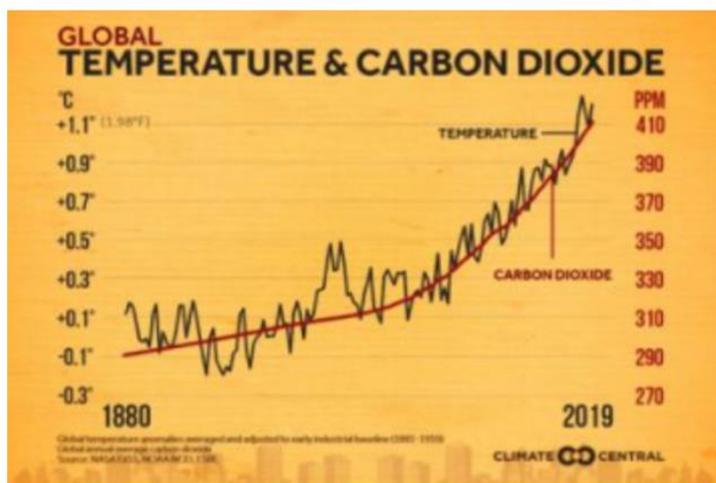
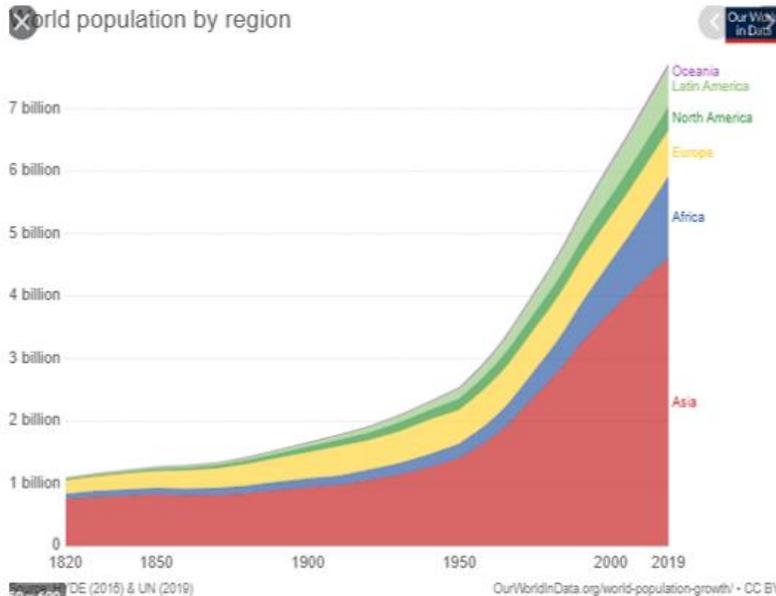


Fig. 3 Global Temperature and Carbon Dioxide 1880 – 2019



In 1958 the world had 2 billion people. In 2021 the world had almost 8 billion people. This is an increase of 6 billion people in 63 years. *This is not sustainable.*

## Clean Energy vs. Traditional Energy ETFs



This graph shows how investments in Clean Energy has hugely outperformed Traditional Energy stocks. This is a reflection of the investment by banks, institutional investors, pension funds and sovereign funds into clean energy.

