

# The Critical Role of Natural Gas in the Global Energy Transition

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## Introduction

The world is faced with highly complicated and sometimes bewildering choices of energy consumption and needing to deal at the same time with:

- 1.) Continued population growth, continued economic growth and the corresponding increasing need for energy.
- 2.) Increasing CO<sub>2</sub> in the earth's atmosphere.
- 3.) Society's determination to decarbonize and lower the earth's CO<sub>2</sub> content.
- 4.) The Russia – Ukraine war is forcing governments worldwide to re-examine their dependence on domestic and imported energy, especially oil and natural gas.
- 5.) Widespread escalating concerns over energy security after Russia's invasion of Ukraine is turning investors' interest in renewables. "The sun shines on all countries, the wind blows on all countries – so they get much more sovereign around that" (Bai, J., 01/03/2022).

This presentation provides the basis of my view that natural gas will be of critical importance in the energy transition.

Undeniably natural gas is a fossil fuel. However, due to gas being the cleanest burning of the fossil fuels and due to its global availability, my view is that a world-wide gas boom is happening which will assist in flattening and then dampening the curve of atmospheric CO<sub>2</sub>. Figure 1 highlights the major gas producing countries and also their levels of gas production in 2020.

The burning of coal provides major supplies of electricity especially in countries like China, USA, Australia and Poland. The increased availability of gas is an incentive for countries to pivot from coal burning electricity plants to gas fired plants with a corresponding major reduction in CO<sub>2</sub>.

A predicted gas boom will also happen since major gas resources are available worldwide but they have been under-explored and under-developed. Sharply increased gas prices in the past year (Figure 2) have provided a huge incentive to explore for and develop gas resources. Natural gas thus will become the key "bridging fuel" or the "transition fuel" during the energy transition. Figure 1 highlights the world's largest gas producing countries.

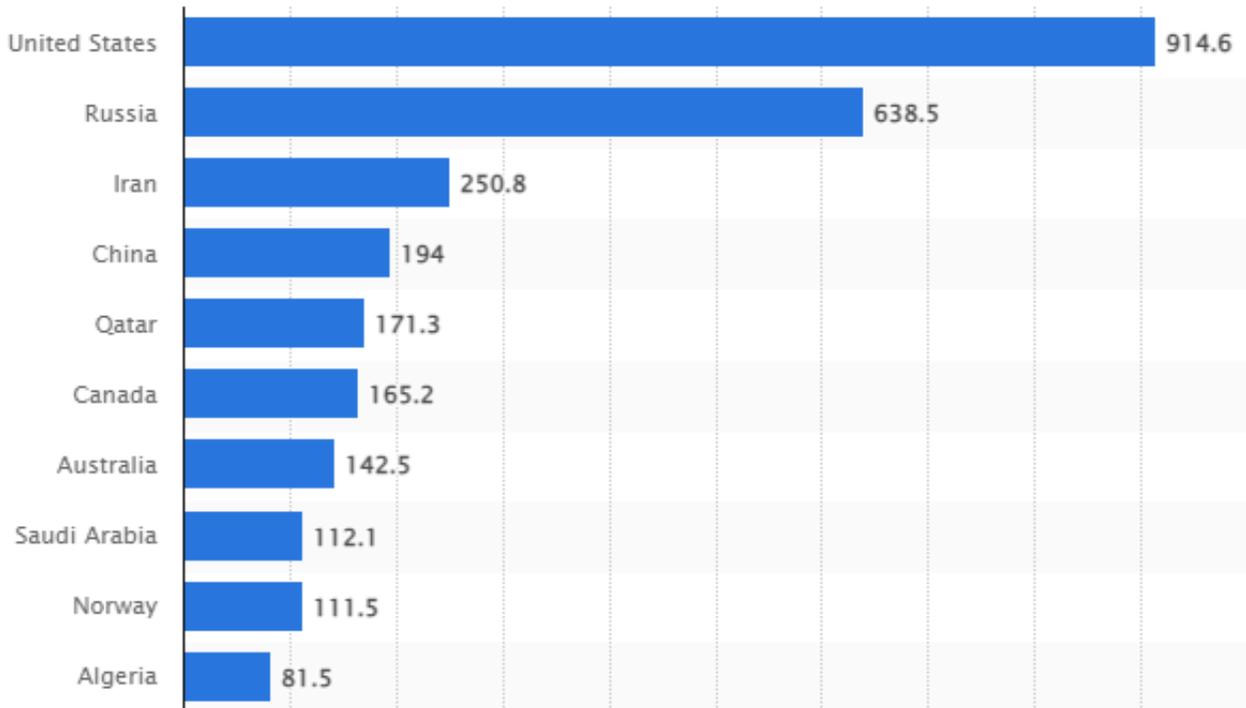


Figure 1. World's Top Ten natural gas producers. Gas in billions of cubic meters. Excludes gas flared or recycled. From Statista, 2022.

Although there is a worldwide focus now on the energy transition, it is very important for governments and policy makers to realize that the world is still highly dependent on oil. This summary is provided based on current data. Indeed, before the Covid-19 pandemic struck in 2020, the world was consuming close to a near-record of 100 million barrels of oil per day. Now due to the post-Covid-19 economic recovery, oil consumption has resumed almost back to record high rates of consumption.

World's Top Ten Oil Producers -current oil production rates

1. USA 11.2 Millions barrels oil per day (MMbopd)
2. Russia 10.3
3. Saudi Arabia 10.0
4. Canada 4.4
5. Iraq 4.4
6. China 4.0
7. Brazil 3.0
8. UAE 2.6
9. Kuwait 2.5
10. Iran 2.4

The USA is the world's largest consumer of oil at a rate of 17.2 MMBopd. To meet its consumption requirements, the USA imports 6.0 MMBopd. China is the world's second largest oil consumer at 14.1 MMBopd which has resulted in China needing to import oil at a rate of 10.0 MMBopd.

## Energy Politics

On February 10, 2022 in a major speech to the European Union (EU) the president of the EU, Ursula von der Leyen urged for a faster energy transition and a shift in LNG in response to Russian gas cuts. She said that the EU's master plan for reaching climate neutrality by 2050, called the European Green Deal, remains the most effective insurance against future increase in energy prices (Upstream, 14/02/2022). Due to Europe's reliance on Russia for 40% of its imported gas and due to constraints on the availability of Russia's gas, spot prices moved above \$2,000 per 1000 cubic meters in December, triggering a leap in electricity costs across western Europe.

Von der Leyen said "every kilowatt hour of electricity that Europe generates from the sun, wind, hydropower and biomass makes us more independent from Russian gas and other energy imports. We have to accelerate the deployment of renewables everywhere in Europe". In the short term, von der Leyen said that the EU members "could do much more" in reducing their dependence on Russian pipeline gas including sourcing alternative supplies of natural gas. She stated:

- "We can jointly procure gas to be a more significant player on the international markets"
- "We can better use and expand our gas storage facilities across Europe. We can build up strategic gas reserves – like we have in place for oil"
- "Today we have more than 20 large Liquefied Natural Gas (LNG) facilities at European ports and Europe's gas infrastructure is deeply interconnected. We are actively engaging with LNG producing partner countries like the US, Norway, Algeria, Azerbaijan and Qatar"

Politicians, energy analysts and oil industry analysts worldwide have been asking the following questions:

- With reference to Upstream, 09/02/2022, the Ukraine crisis has raised urgent questions about Europe's reliance on Russian gas. Is it wise to source 40% of gas supplies from one country, especially one with domestic upheaval and territorial ambition?
- Has the threat of gas shortages as a political weapon opened the way for more sustainable LNG exports to Europe?
- Will the volatile nature of oil and gas prices speed up the use of renewables and raise their value to national security?
- In the UK, soaring gas prices have intensified the debate on energy. The British are asking if their country should continue to invest in high cost and sometimes unreliable renewables? Or should the UK import more LNG from Qatar which is UK's main supplier of LNG?

- Will soaring gas prices accelerate gas exploration and production in Europe in nearby places like Norway? However, Europe's ability to import LNG will also spur more gas exploration and production in areas further away like the Middle East, Africa and North America?
- Already the USA is the world's largest exporter of LNG. Does the USA have sufficient gas reserves to continue to expand its exports of LNG?
- USA President Joe Biden has promised more LNG exports to Europe. But should not Biden prioritize supplies to American households that also face soaring prices?
- Currently Canada produces no LNG and has under construction the C\$40 billion Shell-operated LNG plant near Kitimat, BC. Should more LNG plants be built along Canada's West Coast?

### **Global Natural Gas Shortages, 2021 to Present Day**

Natural gas prices have increased dramatically in the past year. Figure 1 shows a 3.5-fold increase in gas prices in Europe and East Asia. Gas prices have also almost doubled in the USA.

Natural gas shortages worldwide are due to a variety of issues including:

- 1.) The oil price collapse in 2014 – 2015 resulted in a dramatic cessation in exploration and development of oil and especially gas. Hence, gas is now in short supply.
- 2.) The current global concerns about global warming and record temperatures experienced worldwide in the last few years has resulted in a backlash against oil and gas activities. Many pension funds, sovereign funds and institutional lenders have divested their shares in oil and gas companies. Hence this has made it more difficult for these companies to raise capital for oil and gas exploration and development. This has also led to the current energy crisis.
- 3.) We live in a global village and the impact of economic activities in one part of the world can directly impact on other parts of the world. Economists have under-estimated the rate of economic growth in Asia in the past five years and its impact on the need for energy.



of years. These reservoirs can be equally capable of sequestering CO<sub>2</sub>. Accordingly, my view is that the geologists, geophysicists, reservoir engineers and energy economists who were involved in previous exploration and development of oil and gas, those skill sets will also be increasingly needed in further exploration and development of natural gas and defining and developing reservoirs for CO<sub>2</sub> storage.

The ongoing war by Russia on Ukraine highlights the danger of the world's dependence on a single country for energy supplies - specifically Russia producing 17% of the world's oil and 13% of its natural gas. Amazingly, at the time of revising this abstract on 05/03/2022, the USA was importing 700,000 barrels of oil per day from Russia which amounts to over 10% of the USA's oil imports.

### **Concluding Statement**

Since the oil price collapse in 2014-2015, Canada's oil industry has been full of doom and gloom. However, due to the urgent need for the world's economies to decarbonize, the global need for gas and LNG, and the urgent need for energy independence, I foresee a world of opportunities for Canada's energy industry.