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Crude Oil & Natural Gas During the Russia-Ukraine War

Global Markets & Assets Research Department – March 2022

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1 Introduction

The Ukraine crisis has been causing distress around the world due to numerous political, social, and economic consequences ever since Russia's invasion on the 24th of February 2022. Commodities ranging from agriculture, e.g., wheat to metals, e.g., nickel, aluminium, and gold have been affected. Energy commodities, however, may be facing the largest concerns. Thus, this report will focus on the impact the ongoing crisis is having on commodities such as crude oil and natural gas and aims to provide a potential outlook for the future of such commodities, as well as implications for investors.

2 General Description

Crude Oil

Crude oil is a non-renewable resource that is extracted from the Earth's crust and refined into products such as gasoline, diesel, and asphalt (Chen, 2022). This commodity is a valuable source of energy to any country in the world, with countries such as Kuwait, Libya, and Brunei with above 40% weight on their GDP coming from oil exports (Richter, 2016). On the other hand, among the main importers of oil are China, the US and India with imports between 60 to 180 billion USD each year (Workman, 2022). Such a dependency on oil by countries around the world, and the fact that Russia itself is the world's third-largest oil producer, explains why the price of the commodity is being significantly affected by the Ukraine crisis (Singh, 2022). The numerous sanctions inflicted upon Russia and significant uncertainty regarding the future have led both commodities to experience a rapid and violent surge in prices.

The following graph illustrates the recent price fluctuations of crude oil futures contracts, depicting the extent to which the current geopolitical situation is affecting the commodity.

Figure 1: Crude oil price fluctuations, October 2021 to March 2022
Source: MacroTrends, 2022.

Figure 1 illustrates that crude oil futures have experienced a gradual increase in price since December 2021, presumably due to Russia’s build-up of military operations around Ukraine (Singh, 2022). Nonetheless, the most severe surge in price can be observed from mid-February 2022, when the invasion commenced. Crude oil went from trading for just over 90 USD per barrel to a peak of over 120 USD per barrel at the beginning of March following Russia’s invasion of Ukraine in late February. According to researchers, such a bull run may not necessarily decelerate anytime soon (White, 2022).

The dimensions and implications of this increase in prices become even more clear when taking crude oil futures contracts’ prices of 2021 as reference.

Figure 2: Crude oil price fluctuations, October 2020 and March 2021
Source: MacroTrends, 2022.

Crude oil was trading for a relatively low 65 USD by the end of February 2021. Compared to crude oil's current price, the commodity has risen by almost 100 percent. An exceptionally high percentage for a yearly price fluctuation of a commodity, which further highlights the severe impact the Ukraine crisis is having on the market for this commodity.

Natural Gas

A cleaner alternative fossil fuel to crude oil is natural gas. Europe relies heavily on Russian natural gas for heating homes, electricity generation and to power factories. Natural gas imports to the EU from Russia constitute 38% (Holder, Russell, & Reed, 2022, as cited in Bruegel, 2021). The flow of natural gas throughout Europe is displayed in Figure 3. Figure 4 illustrates the time-varying dependence of several European countries on Russian gas. Inter alia, with countries such as Poland and Lithuania slowly reducing their reliance on Russian gas over recent years.

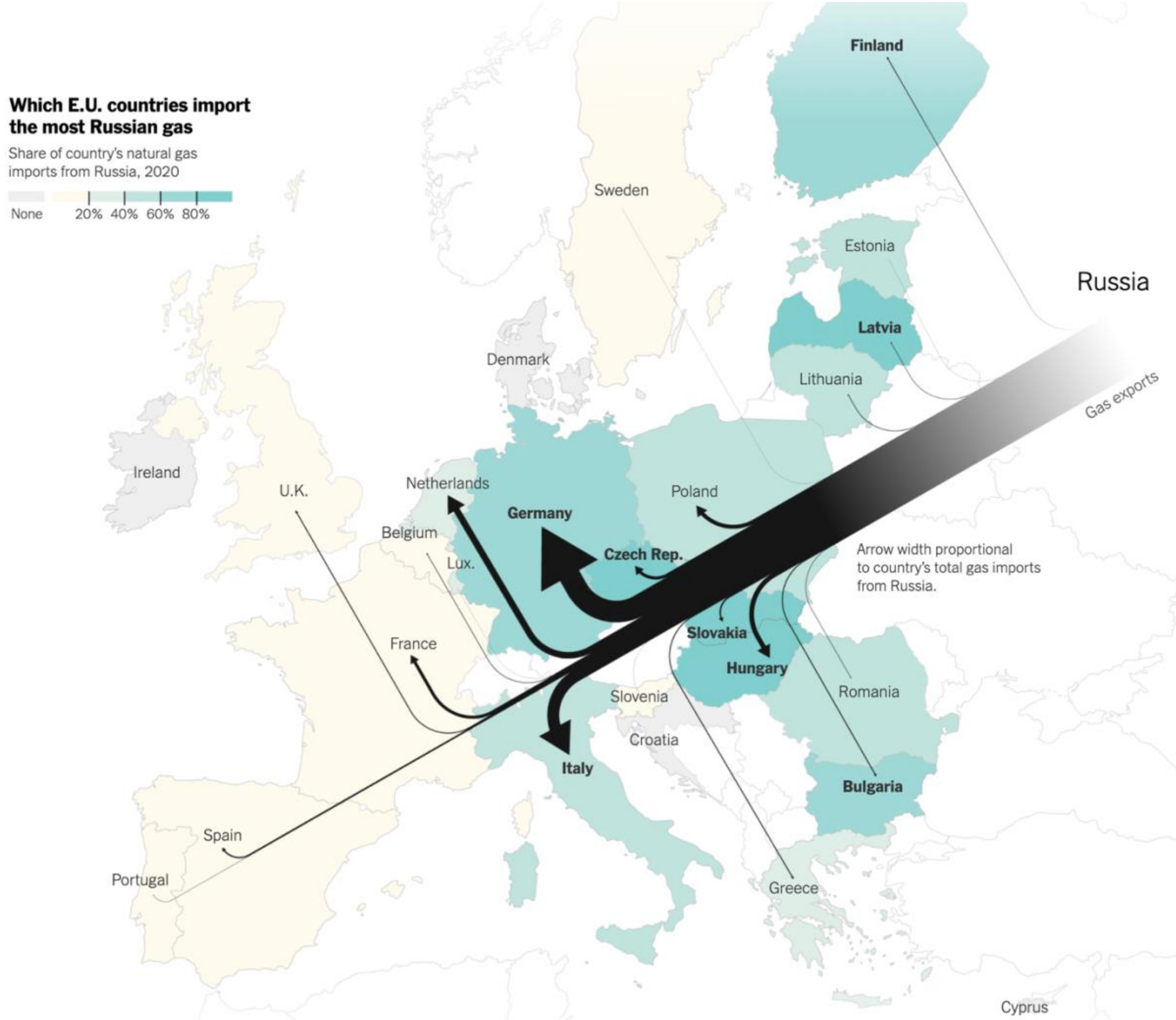

Figure 3: Visualisation of Russian gas flows throughout Europe, 2020

Source: Holder, Russell, & Reed, 2022, as cited in EuroStat and British Department for Business, Energy & Industrial Strategy, 2022.

The same does, however, not hold for other countries, like Germany, where gas imports have still been growing. Germany is Russia’s number one customer, with the Nord Stream pipeline providing a direct pathway for natural gas. Recently, a controversial second pipeline, Nord Stream 2, was completed. Much debate has surrounded the project, with the Russian invasion of Ukraine, finally bringing a halt to all flows through Nord Stream 2.

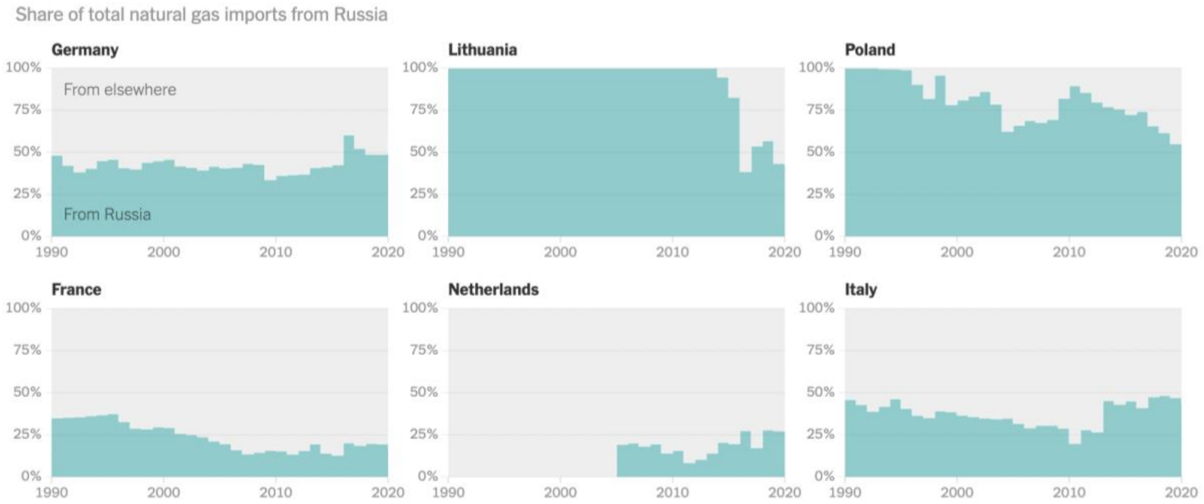

Figure 4: European countries’ dependency on Russian gas over time
Source: Holder, Russell, & Reed, 2022, as cited in EuroStat, 2022.

Figure 5 below displays the network of pipelines throughout Europe. Large pipelines bring gas into Europe from Russia, including the Yamal pipeline through Poland and TurkStream, which supplies both Turkey and Southern Europe with gas. Notably, gas flows through Ukraine have seen considerable decreases in the last 10 years, nonetheless, there are still important routes (Holder, Russell, & Reed, 2022).

Due to their dependence on gas imports from Russia, many countries are working to expand their liquified natural gas network (LNG), with a range of international suppliers.

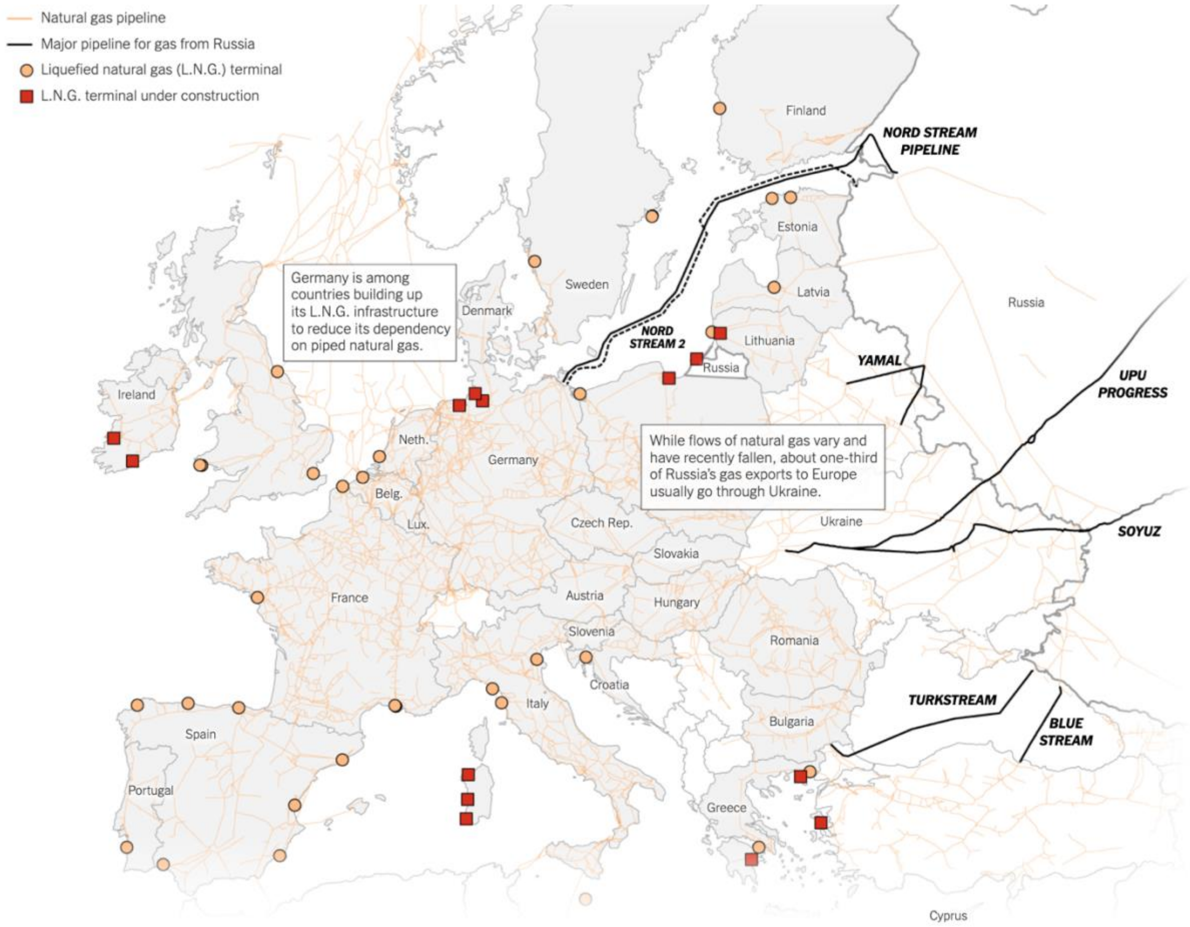

Figure 5: Natural gas pipelines and L.N.G. terminals in Europe

Source: Holder, Russell, & Reed, 2022, as cited in SciGRID & European Network of Transmission System Operators for Gas (ENTSOG), 2022.

"Liquefied natural gas is made by chilling gas to around minus 260 degrees Fahrenheit so that it can be converted into liquid form and loaded more easily onto ships" (Holder, Russell, & Reed, 2022, para. 11). Since it is more stable it can be more easily transported, i.e., over greater distances, including Australia and the United States, thus reducing the reliance on continental sources.

Prior to Russia's invasion of the Ukraine, Russia had already cut gas exports by 23% year-on-year in Q4 of 2021 (Holder, Russell, & Reed, 2022), which pushed the EU to increase its imports of liquefied natural gas, as can be seen in Figure 6.

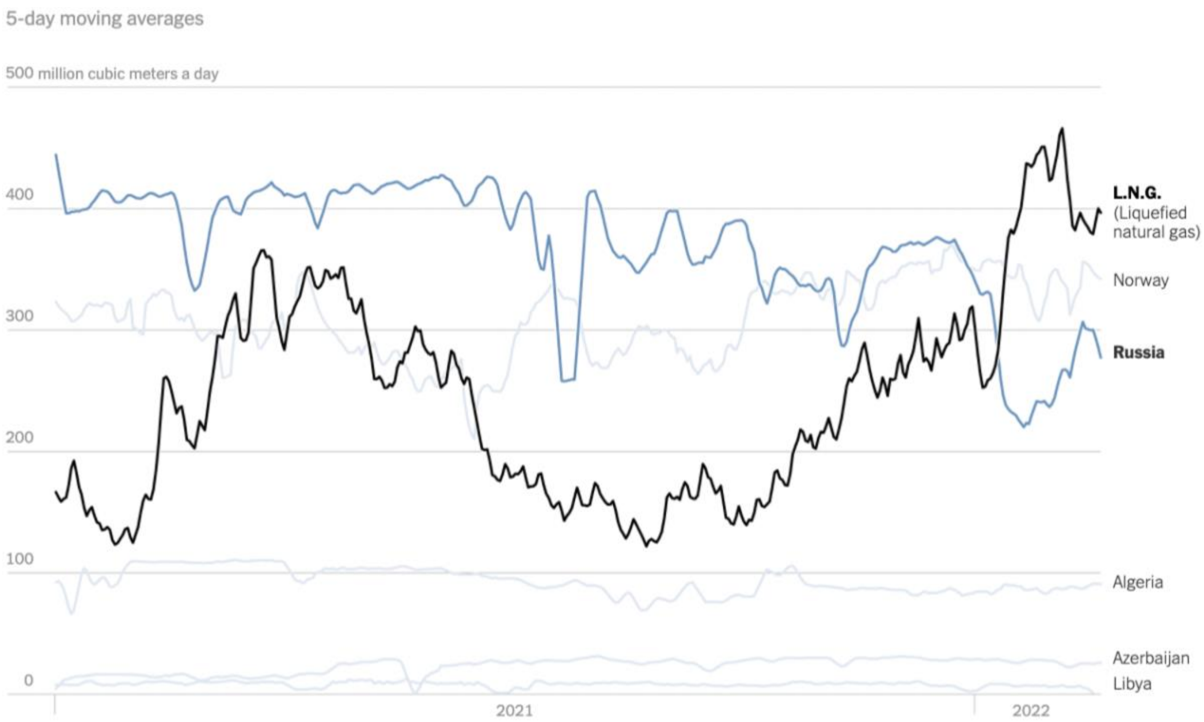

Figure 6: Natural gas imports to Europe by origin

Source: Holder, Russell, & Reed, 2022, as cited in Wood Mackenzie, 2022.

3 Financial Description

Crude Oil

Such a strong rise in prices has had and may continue to have, a severe impact on numerous economies. To illustrate, countries such as India (which imports over 80 percent of its oil) are and will be tremendously affected by such price increases. As the Indian Economic Advisory Council to the Prime Minister Neelkanth Mishra stated, such a price increase in crude oil will also affect other industries due to the commodity's multiple linkages to other markets (Misra, 2022). For instance, demand for cars could be negatively affected due to increased fuel prices, and electricity may also experience a surge in price due to carbon becoming increasingly expensive (Misra, 2022).

Such severe repercussions currently are and will probably continue to affect other countries as well. Unfortunately, India is just an example of the numerous states who are dealing with increased oil prices, followed by consequent disruptions in other industries.

Natural Gas

Gas prices had already been experiencing volatile swings, over the last year, with prices being driven by supply shortages in Europe. This trend has been amplified by the Russian invasion of Ukraine. Figure 7 plots the development of natural gas prices in Europe over recent months, taking Dutch TTF as the benchmark. The situation has somewhat eased after an initial surge, but traders remain on high alert, following the developments and implications of the ongoing conflict, taking into consideration potential supply disruptions and sanctions. After all, Russian gas constitutes a third of Europe's supply (Robertson & Gillespie, 2022).

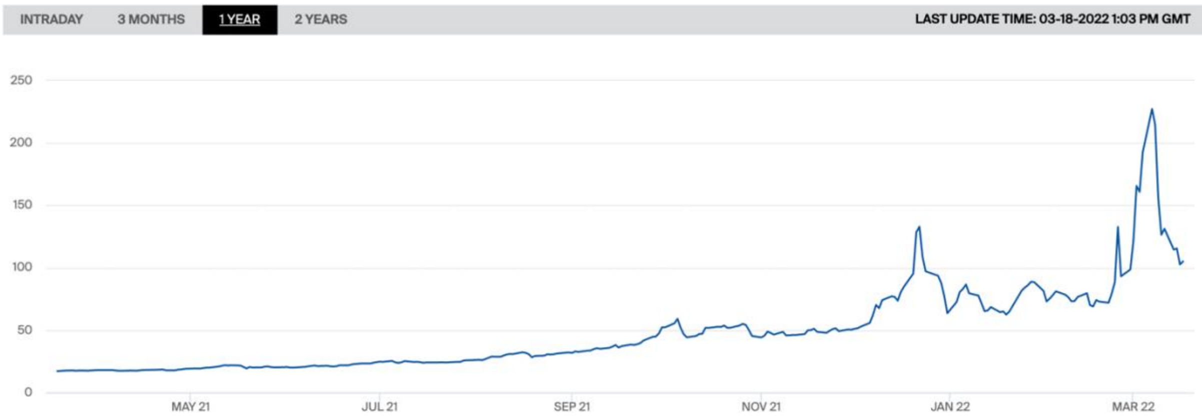

Figure 7: Dutch TTF Gas Futures
Source: ICE, 2022.

Figure 7 illustrates an initial smaller spike on the date of invasion, prices jumping from €88 per MWh on the 23rd to €133 per MWh on the 24th of February. A peak was achieved on the 7th of March at €227 per MWh, with prices having fallen since to €105 per MWh on the 15th.

Thus far, the EU has not imposed a ban on Russian gas exports. Bloomberg reports that gas supplies from Russia through the largest routes, the Nord Stream link, and the transit network, remained stable. However, flows through the Yamal pipeline have been halted and reversed their direction, with gas flowing towards Poland. Figure 5 visualizes these routes. "The reverse of Yamal-Europe flows may mean an increase in withdrawals from gas storage sites in Germany, with many of the recent purchases used by Poland on that route coming from German stockpiles" (Robertson & Gillespie, 2022, para. 6, as cited in Inspired Ener8y Plc, 2022). Figure 8 below illustrates the magnitude of the described reverse flows from Germany to Poland through the Yamal-Europe pipeline.

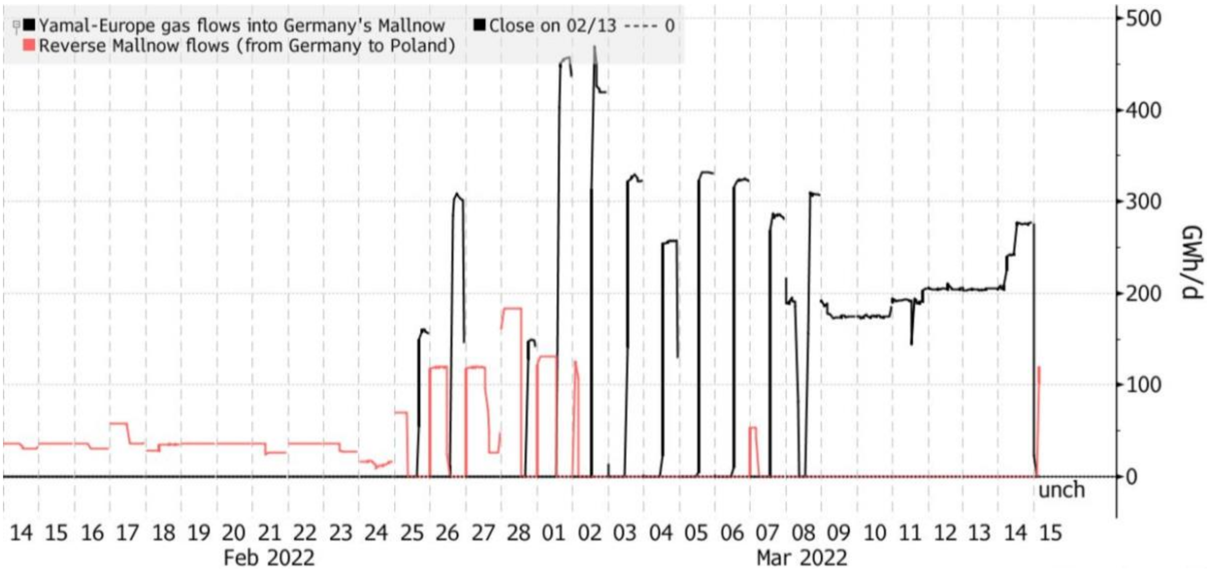

Figure 8: Reversed flows: Russia's Yamal-Europe link pauses supplies to Germany again

Source: Robertson & Gillespie, 2022, as cited in Gascade.

4 Outlook

An important distinction to be made is between the short-term and long-term implications Russia's invasion of the Ukraine may have. It should also be noted that predicting how the conflict will develop, i.e., how it will affect the market for commodities in the future would be highly uncertain. Thus, the following outlook may be somewhat limited, but should nonetheless provide insight into some short- and long-term implications.

Short term

In the short term, prices of crude oil and natural gas will likely remain volatile, as new events and sanctions in the Russia-Ukraine war unfold. Notably, China recently resold U.S. liquified natural gas (LNG) shipments to Europe, while buyers are stocking up in fear of concerns over future supplies (Robertson & Gillespie, 2022). However, even though the conflict is ongoing prices for both commodities have fallen considerably from their peaks. This may also be driven by rising temperatures across Europe and stable LNG imports. Ron Smith, an analyst at BCS Global Markets states that "[g]as markets seemingly are slowly reducing the geopolitical risk premium in European prices as it becomes increasingly apparent that Russian flows are not likely to get interrupted in the near term" (Robertson & Gillespie, 2022, para.

13). Short-term volatile fluctuations in the prices of both commodities might provide investment opportunities. These should, however, be approached with caution, considering the unpredictability of the ongoing conflict.

Long term

As explained throughout the report, it is clear that the Ukraine crisis is currently having devastating effects on numerous economies, as well as heavily disrupting the markets of several commodities such as crude oil and natural gas. Europe's heavy reliance on crude oil and natural gas imports is being highlighted by the ongoing crisis. It raises the question, of how the EU wants to fuel itself in the future, i.e., how quickly it could switch to renewable energy alternatives.

With fossil fuels running short and prices of crude oil and natural gas going through the roof due to the crisis, the European Union seems to have started to seriously invest in renewable alternatives to current sources of energy. With the launch of the new project "REpowerEU", Ursula von der Leyen is planning to enable the EU to fully rely on renewable energy by 2035 (Herculano, 2022). To achieve such an ambitious goal, the president of the European Commission is planning to act on two fronts. Diversifying supplies of natural gas through non-Russian exporters – Russia currently satisfies about 45% of the EU's demand for gas, and rapidly minimizing Europe's reliance on fossil fuels (Herculano, 2022). The latter would be achieved through the implementation of heat pumps, solar rooftops, and green hydrogen (Herculano, 2022). This logically provides long-term investors with a wide range of investment opportunities. Hence, although the future of crude oil and gas looks incredibly uncertain, Europe is attempting to finally end their dependence on such commodities.

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