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Is the EU facing the perfect energy and geopolitical storm?

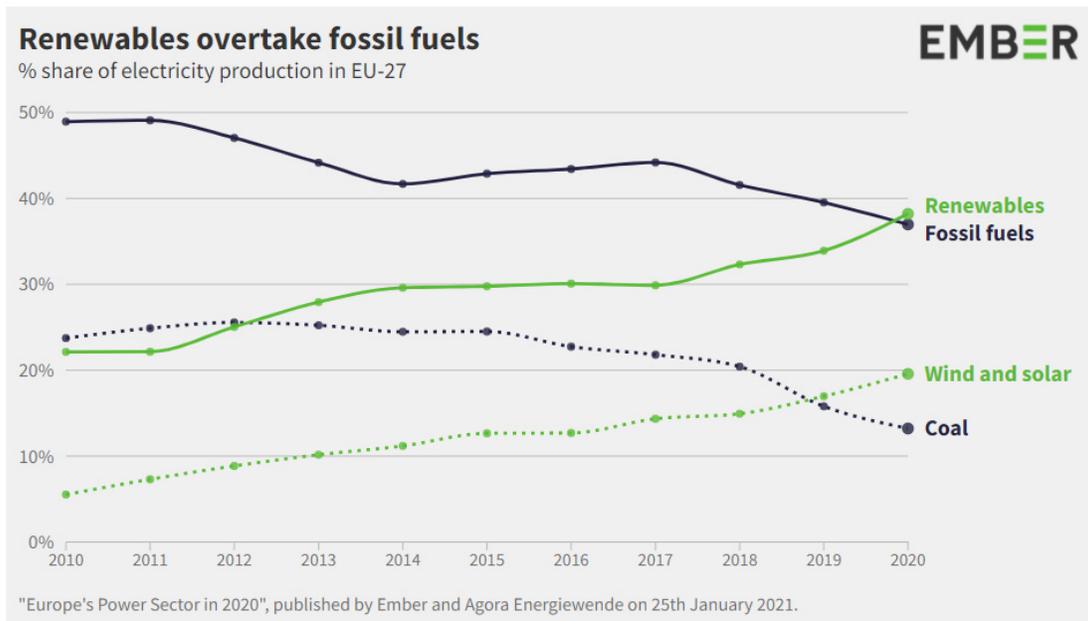
By Angelo Katsoras

The European Union (EU) is in the midst of an energy and geopolitical crisis. On the energy front, its transition to a green economy has been complicated by the challenge of tight markets, including a supply crunch for natural gas and lower output from renewable sources such as wind.

On the geopolitical front, a crisis is brewing as Russia builds up troops at the border with Ukraine. Russia is leveraging its strong military and its energy exports to try and rebuild its sphere of influence, further complicating the EU's energy landscape.

The EU's bumpy energy transition

Renewables recently overtook fossil fuels as the EU's main source of electricity. In 2020, renewables accounted for 38% of the EU's power generation, versus 37% for fossil fuels.¹



One of the main challenges of transitioning to alternative energies is intermittency. Simply put, wind cannot generate power when it stops blowing and the sun cannot generate energy when it does not shine. This forces countries to maintain a backup of fossil-fuel generated capacity.

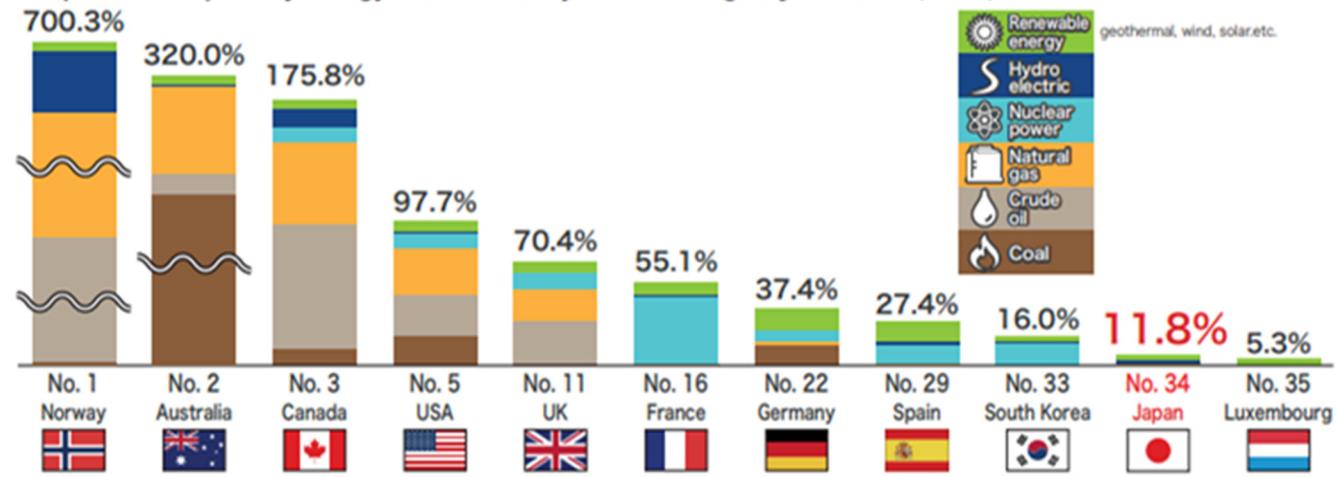
While progress is being made, it will likely be many years before we acquire the ability to store significant amounts of energy in large batteries in an economically viable manner.

These challenges are compounded by the EU's heavy reliance on energy imports. In 2019, the EU relied on imports to meet 61% of its energy requirements, up from 56% in 2000.² In comparison, the United States is almost 100% self-sufficient in energy. Energy self-sufficiency is defined as net energy imports (imports minus exports) divided by domestic energy consumption.

¹ "Landmark moment as EU renewables overtake fossil fuels," EMBER, January 25, 2021

² "From where we import energy," Eurostat, 2021

Comparisons of primary energy self-sufficiency ratios among major nations (2018)

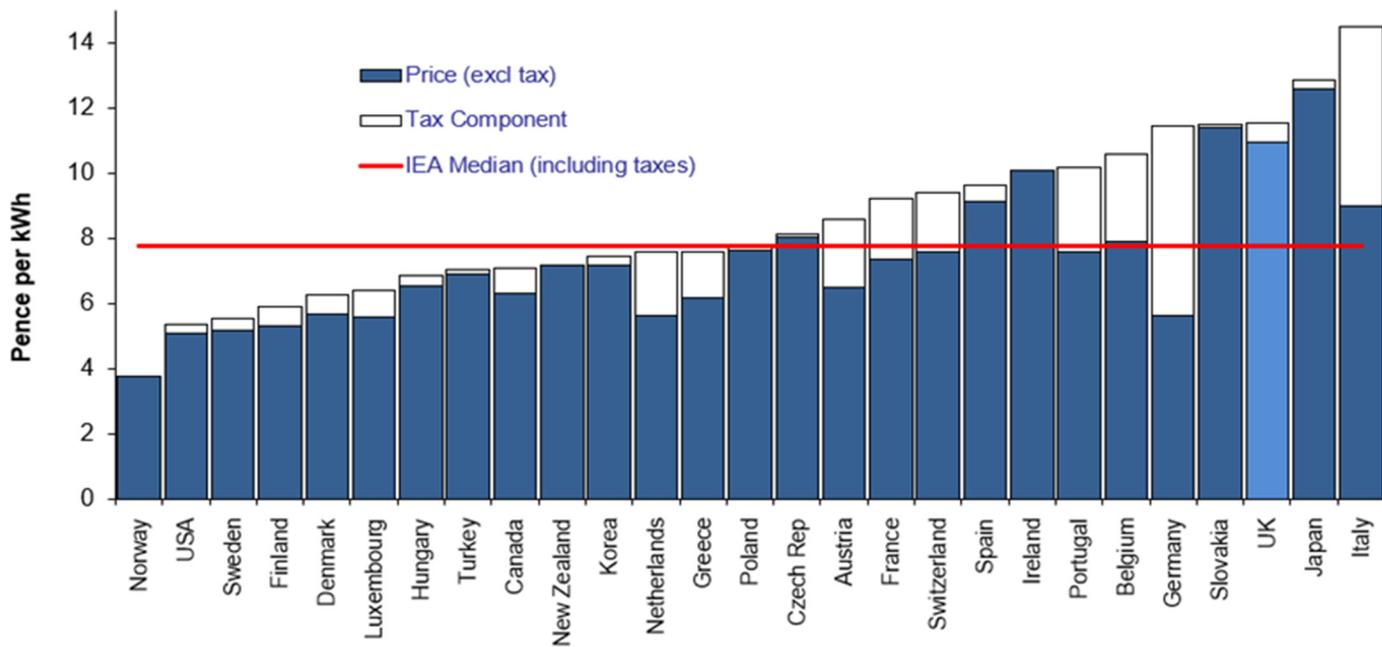


Source: Estimates for 2018 from IEA "World Energy Balances 2019", except for data for Japan, which are confirmed values of FY 2018, derived from "Comprehensive energy statistics of Japan", Agency for Natural Resources and Energy. * The ranks in the table are those of the 35 OECD member countries.

Source: "Japan's energy 2020," Ministry of Economy, Trade, and Industry (Japan)

The challenge of transitioning to a green economy combined with a heavy reliance on energy imports has resulted in rising electricity costs. Indeed, the following chart highlights that even before the recent spike in electricity prices, most European countries were already paying much higher rates than either Canada or the United States.

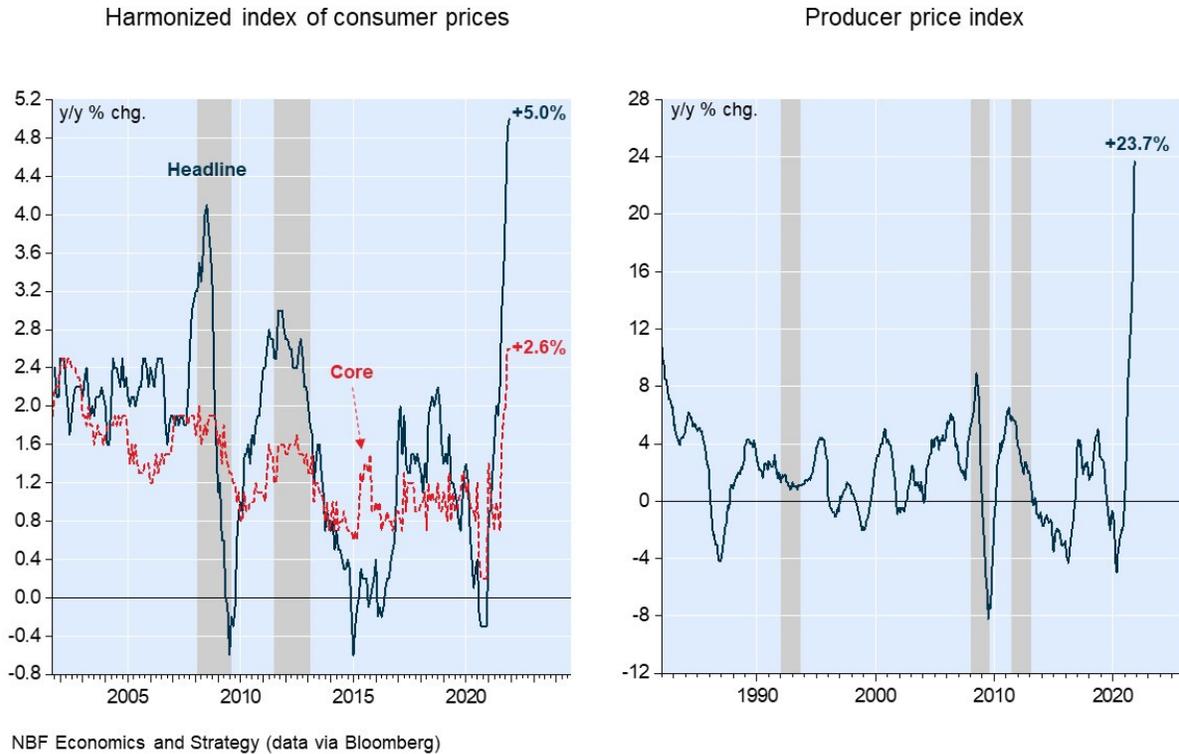
A comparison of industrial electricity prices in 2019



Source: "Department for Business, Energy & Industrial Strategy," UK Government, March 2021 & EIA

The recent spike in energy costs is also reflected in inflation statistics.

Eurozone: Inflation hits new all-time high



All of this has led to accusations that the EU is phasing out fossil fuels before verifying whether renewable energy sources are fully ready to plug the gap.

The additional challenge of declining nuclear power production

Nuclear power has gone from accounting for close to one third of the EU's electricity in 2000 to 24% in 2020.³ Given that many countries have announced further closures, nuclear power's market share will continue to decline. Germany is slated to close its remaining reactors by 2022, Belgium by 2025, and Spain by 2030.

While certain European countries, such as France, recently announced plans to build a new generation of nuclear reactors, even under the best of scenarios it will likely take 10-15 years to get them online. Just six reactors are under construction in Europe. Of these, many are running years behind schedule and significantly over budget. For example, a new nuclear reactor is expected to go online in Finland in 2022. It was originally supposed to be ready by 2009.⁴

All of this has left Europe with an increasingly aging reactor fleet. In 2000, just 2% of Europe's total reactors were more than 30 years old. By 2020, that had risen to 86% thanks in large part to mass closures. This means that Europe not only faces the challenge of replacing nuclear power, it is also vulnerable to involuntary closures of aging reactors owing to wear and tear.⁵ A case in point is the recent detection of cracks on the pipes of a nuclear power plant in France. This prompted the temporary closure of four reactors.⁶

³ "Abandoning Nuclear Power Would Be Europe's Biggest Climate Mistake," Bloomberg, October 28, 2021

⁴ "Finland's long-delayed Olkiluoto 3 reactor to come on stream in Jan," Reuters, December 16, 2021

⁵ "Abandoning Nuclear Power Would Be Europe's Biggest Climate Mistake," Bloomberg, December 3, 2021

⁶ "EDF shares plunge after faults found at French nuclear power reactor," Reuters, December 16, 2021

Natural gas to the rescue

The fossil fuel being called upon to ensure a stable electricity supply is overwhelmingly natural gas. The reasons for this are twofold. First, it is less polluting than either coal or oil. Second, unlike with coal and nuclear power, natural gas-fired plants can vary their output with precision. This makes it the perfect complement to irregular wind and solar power.

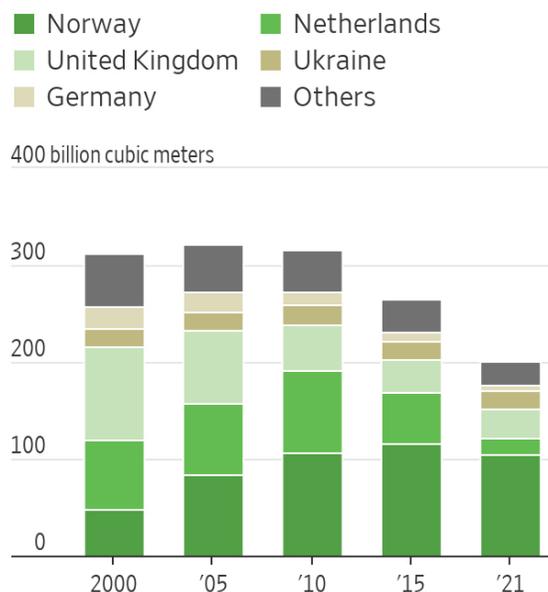
Indeed, although coal generation has been halved since 2015, only half of that has been replaced by wind and solar. Over 40% of coal's decline has been offset by natural gas.

It also important to note that in addition to being used for heating and generating electricity, natural gas is a crucial input in the production of such products as chemicals, aluminum, plastics, and fertilizers. For example, natural gas accounts for 75% to 90% of the cost in producing nitrogen, which is a key ingredient used to make nitrogen-based fertilizers needed to boost the yields of many crops, including corn and wheat.⁷

While Europe still heavily relies on gas, it is producing less

The drop in output is attributable to the three biggest gas producers. In 2020, Dutch and British production were down 75% and 65%, respectively, from their peak of 20 years earlier. Norway's production has declined for the past four consecutive years.⁸

European natural-gas production



Note: Data for 2021 are preliminary.

Source: Rystad Energy

Source: "Europe Is Pumping Less Gas as Demand Rebounds, Leaving a Gap Russia Is Filling," Wall Street Journal, September 22, 2021

One of the main factors driving this decline is the reluctance of utilities to invest in natural gas owing to increasingly ambitious environmental targets. This reluctance has been reinforced by comments made by various high-level EU officials, including European Commission Executive Vice-President Frans Timmermans, who stated last March that there would only be a "marginal role for fossil gas" on the path to net zero emissions by 2050.⁹

While the recent EU proposal to classify natural gas investment as green energy until 2030 could, if approved, increase its use, the short timeline and strict regulatory requirements would likely not encourage a significant rise in the domestic production of natural gas.

⁷ "Fertilizer prices soaring as natural-gas rally adds to 'perfect storm,'" MarketWatch, October 8, 2021 & Rabobank

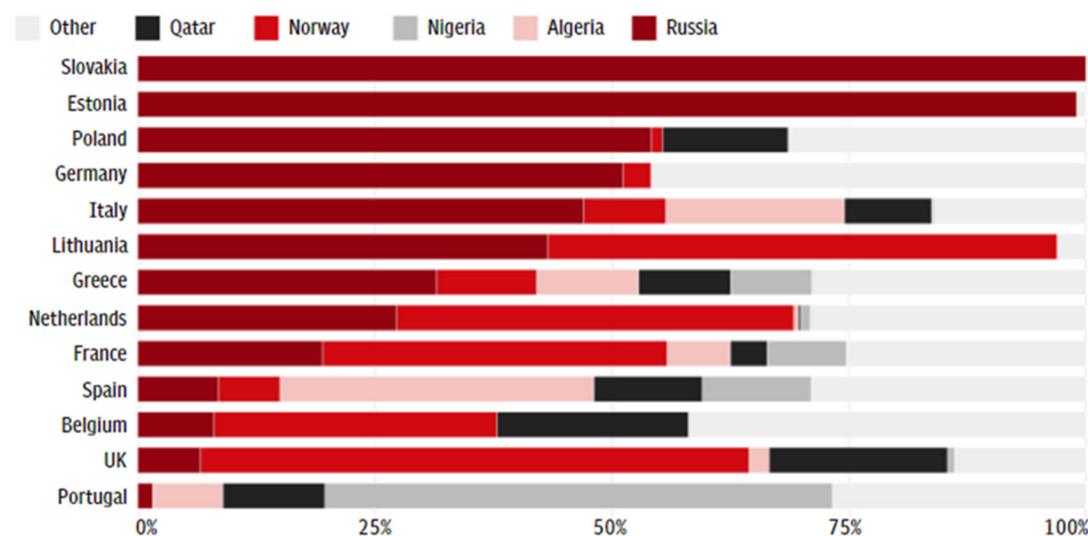
⁸ "Winter Is Coming and Europe Is Running Scarily Low on Gas," Bloomberg, September 19, 2021

⁹ "Analysis: Gas faces existential crisis in climate wary Europe," Reuters, May 14, 2021

In the case of the Netherlands, fear that the extraction of natural gas was causing earthquakes in the Groningen area, once Europe's biggest gas field, has led to the implementation of measures to drastically curtail output. Starting in 2022, production will be allowed only in emergency situations.¹⁰

The end result is that 75% of the EU's natural gas needs are met by imports.¹¹ Russia alone accounted for 43% of the EU's total gas imports in 2020.

Europe is dependent on Russian gas *% of imports in natural gas by country*



Source: "An energy crisis is coming, but I'd rather be in Brexit Britain than the EU," The Telegraph, November 18, 2021

Russia's dominance extends even to gas storage facilities

Gas storage across Europe is currently at about 56% capacity, more than 15% below the 10-year average.¹² Russia's state-owned energy giant owns one quarter of the gas storage capacity in Germany, Austria, and the Netherlands, and has notably kept these facilities filled at significantly lower levels than in previous years.¹³ The Oxford Energy Institute has calculated that the amount of gas sent by Russia to Europe was down 21% from January to November compared with two years earlier.

The geopolitics behind the approval of the Nord Stream pipeline

Few other energy projects embody the EU's energy reliance on Russia more than Nord Stream 2. When operational, the pipeline will have the potential to ship 55 billion cubic metres (bcm) of gas to Germany every year, the equivalent of 15% of the EU's annual gas imports.¹⁴

Critics of the project say that it will not only increase the EU's dependence on Russian gas, it will also strengthen Russia's leverage over Ukraine. This is because Nord Stream 2 will allow Russia to bypass pipelines running through Ukraine, thus depriving the country of billions of dollars in annual transit fees. The project will also strip Ukraine of the ability to threaten to disrupt Russian gas flows to Europe as a deterrent.

While Putin denies using energy as a weapon, he recently said that Russia could increase its gas output to Europe if the pipeline was approved. Nord Stream 2 is completed but cannot be used before it gets approval from German and European regulators, which could take many months.

¹⁰ "Europe Is Pumping Less Gas as Demand Rebounds, Leaving a Gap Russia Is Filling," Wall Street Journal, September 22, 2021, and "Gas shortages: what is driving Europe's energy crisis?" Financial Times, October 11, 2021

¹¹ "Liquefied natural gas," European Commission, June 2020

¹² "Europe Sleepwalked Into An Energy Crisis That Could Last Year," Bloomberg, January 4, 2022

¹³ "Confronting the Kremlin's New Hybrid War in Europe," Project Syndicate, November 18, 2021

¹⁴ "Germany suspends certification of Nord Stream 2 pipeline," Financial Times, November 16, 2021

Intense competition for LNG shipments

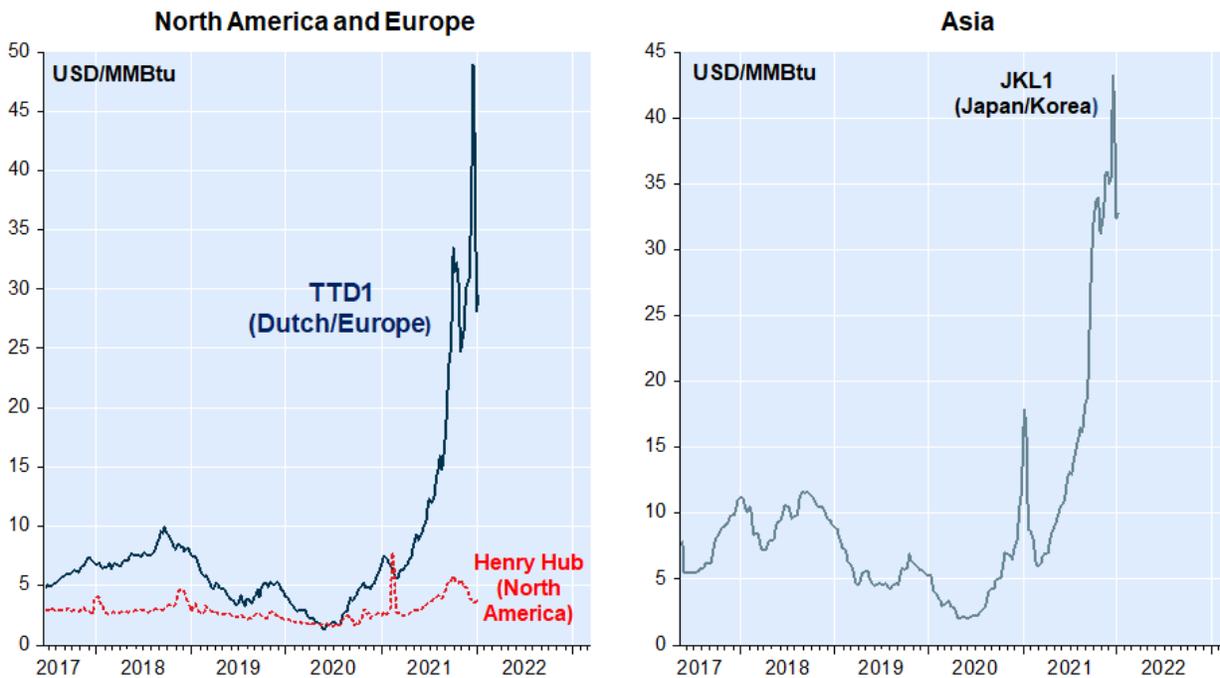
One alternative to Russian gas is importing LNG, which accounted for 25% of the EU's gas imports in 2019.¹⁵ The problem is that both Europe and Asia are competing for the same LNG supply, thus pushing up prices.

Demand for natural gas in Asia, which accounted for 75% of LNG shipments in 2020,¹⁶ increased 50% over the past decade. Consumption has tripled in China, and it will soon surpass Japan as the world's leading LNG buyer.¹⁷ Reasons for the growing demand for natural gas in China include: 1) the view that wind and solar energy is not yet reliable enough to allow for the wholesale transition away from coal; and 2) growing water scarcity. Electricity generated from natural gas consumes half as much water as that generated from coal.¹⁸

On top of all this, demand for natural gas has significantly increased in South America on account of droughts, which have forced countries like Brazil to import LNG to produce electricity normally generated by dams.

Europe and Asia must pay sky-high LNG prices to meet demand

Weekly averages, as of January 5



NBF Economics and Strategy (data via Bloomberg)

Will Russia invade Ukraine?

Seven years after it annexed Crimea and helped rebels take control of a region in eastern Ukraine, Russia is again amassing troops along its border with Ukraine.

It is doing so to obtain the guarantee that Ukraine will never join NATO. Russia's hostility to the alliance dates back to the years following the fall of the Berlin Wall in 1989. Its sphere of influence shrank drastically as former satellite states and Soviet Republics joined NATO and the EU. In an attempt not to lose further ground, Russia has taken a firm stand against Ukraine, too, joining NATO. Some analysts claim that Russia's concern would be similar to America's were Canada to join the alliance of a powerful geopolitical competitor.

¹⁵ "Liquefied natural gas," European Commission, June 2020

¹⁶ "Could Europe manage without Russian gas?" The Economist, October 16, 2021

¹⁷ "Gas shortages: what is driving Europe's energy crisis?" Financial Times, October 11, 2021,

¹⁸ "American supply chains face a dire threat from China's water shortages," The Hill, December 3, 2021

Despite these tensions, we feel that a full-blown Russian military invasion of Ukraine is unlikely for the following reasons:

- The former Soviet Union's failed invasion of Afghanistan in the 1980s, which some people feel played a key role in the collapse of the Communist empire, is a reminder of the potential economic and political costs of engaging in a major ground war.
- When Russia seized Crimea in 2014, its troops entered a part of Ukraine where a majority of citizens were ethnic Russians. That meant a less hostile reaction among the local population. Other areas with less friendly demographics would be much more challenging for Russian troops to occupy over the long term.
- The United States warned that it would impose more severe economic sanctions than it did in 2014. These could include impeding Russia's ability to convert rubles to western currencies and barring Russia from SWIFT, the dominant system for cross-border payments between banks. Given that most of its oil and gas exports are sold in U.S. dollars, the impact on the Russian economy would be very harmful.¹⁹
- A full-blown invasion of Ukraine would lead to a major break in relations with the West, leaving Russia totally dependent on China.
- Germany has warned that the Nord Stream 2 gas pipeline would not go ahead in the event of an invasion of Ukraine. However, the imposition of severe sanctions would leave Europe vulnerable to further cuts in natural gas deliveries at a time when it is already struggling with a tight energy market.
- While they cannot admit it officially, many NATO members do not support defending Ukraine militarily or allowing it to join NATO.

We feel that the most likely scenario is that Russia will continue to destabilize Ukraine via such measures as cyberattacks, military manoeuvres, and continued financial and military support for pro-Russian separatist forces in the eastern border region. The message Russia wishes to convey is that it will continue to destabilize Ukraine as long it remains too closely aligned with the West.

We also think that any chance for a compromise would require military and political neutrality, which means not allowing Ukraine to join either NATO or a Russia-dominated security alliance.



Source: "Air strikes or invasion: what are Putin's military options for Ukraine?," Financial Times, December 30, 2021

¹⁹ "A SWIFT route to economic ruin," The Globe and Mail, December 10, 2021



Conclusion

The EU's dual challenge of transitioning to green energy and confronting a geopolitically assertive Russia leaves it vulnerable on several fronts:

- The EU's energy difficulties could provoke a political backlash against renewables if people feel that the economic cost of the energy transition is too high. We need only recall the Yellow Vest protests in France. A proposed fuel surtax in November 2018 to fund renewables triggered such widespread civil unrest that the government was forced to rescind it.
- High gas and electricity prices are placing European companies at a major competitive disadvantage against their international competitors. The growing trend of automation means that energy prices will play an ever-greater role in the competitiveness of businesses and countries.
- The many years required to build up new energy infrastructure combined with the EU's strong reliance on energy imports leaves it overly exposed to tight energy markets and threats by Russia to cut natural gas deliveries.

Bottomline: While issues such as supply chain challenges have placed many countries at risk of slower growth and higher inflation, i.e., stagflation, the EU is particularly vulnerable to this toxic combination because of its energy supply bottleneck. Unlike past financial crises, there is little the European Central Bank can do to alleviate this challenge.



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