

Jeff Kucharski

EUROPEAN ENERGY SECURITY

An uncertain road ahead amid a triple crisis



April 2023



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Executive summary | *sommaire*

The world is in the midst of three simultaneous crises: an energy crisis, a geopolitical crisis, and a climate crisis. Nowhere is the impact of this triple crisis being felt more acutely than in Europe.

The origin of the current energy crisis did not begin with Russia's invasion of Ukraine; the seeds were sown in policies and trends that were in place long before 2022. The impact of the crisis is being felt particularly acutely in Europe, which is trying to cope with the energy shortage, the climate crisis, and sharply rising prices. Europe's formerly heavy reliance on Russia for a significant proportion of its energy supplies has ended for good. As a result, Europe is radically restructuring its energy supply chains.

This paper focuses on how Europe is being affected by the energy crisis, what policies and steps the European Union (EU) is taking to deal with the situation, and what the implications are for these policies and decisions on European energy security.

The scope of the energy crisis facing Europe is unprecedented. Sanctions on Russian oil, gas, and coal have reduced supplies from Russia to near zero, with severe impacts on heating, industrial manufacturing, and electricity. Wholesale prices of electricity and gas have increased by a factor of 15 compared to early 2021, with severe impacts on households and businesses. Energy supply shortages and high prices threaten the economic sustainability of the region and a major recession in Europe in 2023 seems likely.

The EU's dependency on energy imports, particularly oil, natural gas, and coal, is at the heart of the issue. More than half of the EU's total energy supply comes from imported sources. In 2020, the EU was dependent on imports for about 58 percent of its energy supply while domestic energy sources met the remaining 42 percent. Primary energy production from solid fossil fuels, natural gas, crude oil, and other sources within the EU is relatively minimal. On the other hand, production of energy from nuclear and renewable sources is significant. However, the EU is almost totally reliant on imports of rare earths, materials essential to the manufacture of clean energy technologies. China currently supplies 98 percent of EU demand.

No nation can achieve a responsible energy transition unless it balances climate change goals with economic and energy security considerations and Europe is struggling

to find the right balance. The realities imposed by the war in Ukraine along with high energy prices and impacts on consumers and industrial competitiveness argue for more pragmatism and less idealism. While Europe seems determined to reduce its reliance on imported fossil fuels in the name of energy security, it is still going to remain reliant on fossil fuels for a significant portion of its energy needs for many years to come.



Canada's contribution to Europe's energy security is likely to be rhetorical rather than practical.

Despite its short-term success in managing the energy crisis, Europe continues to demonstrate a preference for idealism over realism in its energy policies. There are real risks to energy policies that target 70-100 percent reliance on variable renewables, including grid instability, susceptibility to extreme weather events, uncertainty around clean energy technological developments, NIMBYism, regulatory hurdles, and others. The idea that European countries can eliminate nuclear power – a reliable source of emissions free electricity – is unfathomable in a situation where the continent will need a diversified portfolio of any and all emissions-free sources of energy to underpin grid stability while achieving its emissions reduction targets.

Unfortunately, despite its ample resources, Canada's contribution to Europe's energy security is likely to be rhetorical rather than practical, at least in the short- to medium-term. While new export projects for oil and LNG will soon come online they will primarily supply the Indo-Pacific region. Canada's supply chains for critical minerals, batteries, and other clean energy technologies will take much more time and are more likely to be aimed at satisfying the North American rather than the European market.

Europe and most of the rest of the world are going to have a multi-decade period over which the traditional hydrocarbon-based system exists alongside a growing clean energy system. Managing this interplay effectively is going to be one of the greatest challenges we face in the 21st century. [MLI](#)

Le monde se retrouve au milieu de trois crises simultanées : une crise énergétique, une crise géopolitique et une crise climatique. C'est en Europe que l'impact de cette triple crise est ressenti le plus intensément.

La crise énergétique actuelle n'a pas débuté avec l'invasion de l'Ukraine par la Russie : le grain a germé dans le sillon des politiques et des tendances en place bien avant 2022. L'Europe est particulièrement sévèrement touchée et a fort à faire pour surmonter les pénuries d'énergie, la crise climatique et la flambée des prix. Son ancienne forte dépendance vis-à-vis de la Russie pour une part importante de son énergie a pris fin pour de bon. Il s'ensuit que l'Europe est en voie de restructurer radicalement ses chaînes d'approvisionnement énergétiques.

Ce document porte essentiellement sur les conséquences de la crise énergétique en Europe, les politiques mises en œuvre par l'Union européenne (UE) pour y faire face et l'impact de ces politiques et décisions sur la sécurité énergétique européenne.

L'ampleur de la crise énergétique en Europe est sans précédent. Les sanctions ont pratiquement réduit à néant l'approvisionnement russe en pétrole, en gaz et en charbon et ont donc maintenant un grave impact sur le chauffage, la fabrication industrielle et l'électricité. Les prix de gros de l'électricité et du gaz sont 15 fois plus élevés qu'au début de l'année 2021, ce qui touche durement les ménages et les entreprises. Les pénuries d'approvisionnement et les prix élevés menacent la viabilité économique de la région et rendent probable la survenue d'une récession majeure en 2023.

“ La contribution du Canada à la sécurité énergétique de l'Europe risque d'être plus rhétorique que pratique.

La dépendance de l'UE à l'égard des importations d'énergie, en particulier de pétrole, de gaz naturel et de charbon, est au cœur du problème. Plus de la moitié de l'approvisionnement énergétique total de l'UE provient de sources importées. En 2020, l'UE dépendait des importations pour environ 58 % de ses besoins, les 42 % restants étant comblés par des sources nationales. La production d'énergie primaire composée des combustibles fossiles solides, du gaz naturel, du pétrole brut et de diverses autres sources est relativement peu élevée. En contrepartie, l'énergie produite à partir de sources nucléaires et renouvelables est importante, et la dépendance aux importations de terres rares – des matériaux essentiels à la fabrication de technologies énergétiques propres – est totale. En effet, la Chine satisfait actuellement 98 % de la demande de l'UE.

Aucune nation ne peut réaliser une transition énergétique responsable à moins d'établir un équilibre entre objectifs climatiques et sécurité économique et énergétique, ce que l'Europe peine à réaliser. Les réalités imposées par la guerre en Ukraine de pair avec l'impact sur les consommateurs et la compétitivité industrielle des prix élevés de l'énergie plaident en faveur d'une approche plus pragmatiste qu'idéaliste. Si l'Europe semble déterminée à réduire sa dépendance aux importations de combustibles fossiles au nom de la sécurité énergétique, elle va quand même continuer de dépendre des combustibles fossiles pour une part importante de ses besoins énergétiques pendant de nombreuses années.

Malgré son succès à gérer la crise à court terme, l'Europe continue de préférer l'idéalisme au réalisme dans ses politiques énergétiques. Les politiques qui proposent une cible allant de 70 à 100 % pour les énergies renouvelables variables comportent des risques réels : instabilité du réseau, vulnérabilité aux phénomènes météorologiques extrêmes, incertitude quant aux avancées technologiques en matière d'énergie propre, syndrome « pas dans ma cour », obstacles réglementaires et bien d'autres. L'idée que les pays européens puissent éliminer l'énergie nucléaire – une source fiable d'électricité sans émissions – est inimaginable dans un contexte où le continent a besoin d'un portefeuille diversifié composé de toutes les sources d'énergie sans émissions pour à la fois soutenir la stabilité du réseau et atteindre ses objectifs de réduction des émissions.

Malheureusement, malgré ses vastes ressources, la contribution du Canada à la sécurité énergétique de l'Europe risque d'être plus rhétorique que pratique, du moins à court et à moyen terme. De nouveaux projets d'exportation de pétrole et de GNL verront bientôt le jour, mais ravitailleront principalement la région indopacifique. Les chaînes canadiennes d'approvisionnement en minerais essentiels, en batteries et en technologies énergétiques propres prendront beaucoup plus de temps à se déployer et seront probablement utilisées pour satisfaire le marché nord-américain plutôt qu'europpéen.

L'Europe et la majeure partie du reste du monde vont devoir compter pendant encore de nombreuses décennies sur la coexistence du système traditionnel basé sur les hydrocarbures et d'un réseau grandissant d'énergie propre. La gestion efficace de cette combinaison sera l'un des plus grands enjeux du 21e siècle. [MLI](#)

Introduction

The world is in the midst of three simultaneous crises: an energy crisis, a geopolitical crisis, and a climate crisis. Great power competition amidst a contested global order, a war in Ukraine, an ongoing pandemic, severe weather events, supply chain disruptions, economic uncertainties, protectionism, nationalism, and political polarization are all conspiring to create complex crises that seem beyond the ability of governments to manage. Nowhere is the impact of this triple crisis being felt more acutely than in Europe.

The origin of the current energy crisis did not begin with the invasion of Ukraine; the seeds were sown in policies and trends that were already in place. Europe's heavy reliance on Russia for a significant proportion of its energy supplies has ended for good. Europe is now in crisis mode as it tries to cope with an energy shortage and sharply rising prices. The Russian invasion of Ukraine has created an unprecedented adjustment in European energy policies and in relations with energy suppliers. As a result, a radical restructuring of European energy supply chains and energy trade is underway which will have profound implications for Europe's energy security, industrial competitiveness, and international relations.

Energy security, a concept largely forgotten about in the lead-up to the war in Ukraine, is now overshadowing climate change as the most urgent global economic policy issue facing Europe and many other countries, at least over the short- to medium-term. Despite impressive increases in renewable power capacity in Europe and elsewhere, the impact of high prices for most power sources will continue to feed inflation and constrain economic growth making energy affordability an important political issue to manage.

It is within this turbulent environment that Europe seeks to stabilize its energy system to avoid a disastrous impact on its economy. Europe is suffering

the consequences of energy policy failures of the past while desperately scrambling to ensure energy security today. Energy supply shortages and price spikes are rapidly making many European industries uncompetitive even as industrial policy makes a strong comeback in the US and elsewhere, threatening to throw developed economies into a competitive race to strengthen their own economies at the expense of others.

The use of the term “crisis” is not meant to be alarmist. It is simply to acknowledge that acute pressures have created damaging instabilities that require urgent attention. Currently, the world is facing any number of crises but the three mentioned in this paper are intimately related and their interactions are complex. Accordingly, these crises cannot be “solved” in any conventional sense of the term. Europe, and other parts of the world, must recognize their vulnerabilities and learn to adapt to them.

The particular focus of this paper is how Europe is being affected by the energy crisis, what policies and steps the European Union (EU) is taking to deal with the situation, and what the implications will be for European energy security. The paper will also discuss geopolitics and climate change policy along with their implications for markets, government policies, international relations, and global energy security.

The context for Europe

The energy crisis that Europe is currently facing is the result of a combination of events currently taking place in the macro-environment and policy decisions that Europe has taken in the past. Added to the mix are complex and overlapping interactions between energy, climate, and geopolitics. These factors make it particularly challenging for Europe to navigate its way out of the energy crisis.

The geopolitical crisis

The confrontation between Russia and the West over Ukraine is Europe’s worst crisis since the end of the Cold War. The crisis is having significant repercussions for international relations, energy security, food security, and the global economy

and creates the potential for second-order effects in other domains. China and the United States are locked into an increasingly contentious rivalry over who will set the rules for the 21st century. Authoritarian regimes in China, Russia, Iran, and elsewhere are threatening the stability of the post-war international rules-based order. Meanwhile, sanctions on Russian energy combined with Europe's efforts to eliminate hydrocarbons from its energy mix are driving Russia to forge closer economic and political ties to China even as the global demand for oil and gas continues to rise.

The energy crisis

The current energy crisis has its origin in the period before the Russian invasion of Ukraine. By the time the pandemic hit in 2019, there was already significant underinvestment in global upstream crude oil production, setting the stage for future supply shortfalls and energy shocks. The current high coal and gas prices are not the result of a single “shock event” on the demand or supply side. Rather, they are a result of a combination of supply and demand factors that have gradually tightened markets over the course of several months and years (Alvarez and Molnar 2021).

In 2021 as economies began to recover from the pandemic lockdowns, energy prices rebounded strongly in response to the increased demand and a weaker-than-expected increase in supply. Thus, many parts of the world experienced an energy price shock – economies recovering from a pandemic-induced recession bounced back at a rate faster than supply could follow. By January 2022, the strong economic recovery combined with heightened demand from a long, cold winter in Europe led to European and Asian natural gas prices rising to about 10 times the previous year's level while international coal prices rose by about five times. It may be no coincidence that the Russian invasion of Ukraine in February 2022 and the subsequent reductions in Russian exports of crude oil, gas, and coal to Europe were perfectly timed to create an energy crisis that deepened to unprecedented proportions.

The climate crisis

At the COP26 summit in Glasgow in November 2021, countries acknowledged that “the world needs to halve emissions over the next decade and reach net zero carbon emissions by the middle of the century if we are to limit global temperature rises to 1.5 degrees” (UN Climate Change Conference UK 2021).

The Intergovernmental Panel on Climate Change (IPCC) estimates that holding the global temperature increase to 1.5°C requires keeping atmospheric CO₂ concentrations to 430 ppm. In 2020 the world reached 412 ppm, up from 400 ppm in 2015. It is therefore likely that we will reach 430 ppm before the end of this decade even while zero-emissions commitments don't take full effect until 2050 or beyond (Hanley 2022).

Countries like China, India, and Russia (three of the four top greenhouse gas (GHG) emitters) continue to build coal power plants and will be increasing their emissions for at least the next two decades. Current climate policies still fall short of what models say is needed over the next decade to achieve the emissions reductions contained in the COP26's nationally determined contributions (NDCs). It is therefore hard to imagine how the world can make even faster and greater reductions to align with a 1.5°C stabilization in global average temperatures (IEA 2022a).

In short, given emissions trends, economic priorities in developing countries, and climate change policy having to compete with a broad range of urgent issues and fiscal pressures, the 1.5°C goal is practically out of reach. While mitigation efforts need to continue, the world will now need to put more effort and investment into climate adaptation as we learn to live with a changing climate and its consequences.

Energy security is now Europe's chief concern

While Europe and its NATO allies continue to support Ukraine in its resistance to Russian aggression, they also seek to ensure stable and affordable supplies of energy while continuing to support the clean energy transition. Yet governments have limited resources and fiscal room to manoeuvre so finding the right balance amongst the competing demands of the triple crises will be extremely challenging. Since energy security is Europe's most urgent and important issue to resolve, at least in the short- to medium-term, it is overshadowing the long-term climate change policy challenge. With the energy crisis threatening the livelihood of both European consumers and industries, the future of the EU economy will depend largely on how its political leaders handle the energy crisis.

Energy sanctions on Russia

Russia was the world's largest fossil fuels exporter in 2021 and more than half of all Russia's crude oil exports and around three-quarters of its gas exports went to Europe. However, in the aftermath of the Russian invasion of Ukraine, energy flows have been disrupted in Europe and global energy markets have been thrown into turmoil.

As a result of the invasion of Ukraine, the EU and many other countries pledged to end or severely cut back their oil and gas imports from Russia.¹ The EU and other countries announced a series of sanctions on Russian energy (European Council 2023; Konig, Ericsson, and Ovidi 2023; Canada, Department of Finance 2022), including:

- On March 15, 2022, the EU introduced sectoral restrictions on exports of equipment, technology, and services for the energy industry as well as restrictions on investment in the Russian energy sector.
- In March 2022, the EU stated that it would cut gas imports from Russia by two-thirds within a year. Subsequently, in June Russia reduced the flows through the Nord Stream 1 gas pipeline to 20 percent capacity (Nord Stream 1 accounted for about 35 percent of Europe's total Russian gas imports in 2021). In September gas flows through Nord Stream 1 were halted entirely in response to the G7 agreement to impose a price cap on Russian oil. Some Russian gas continues to flow through Ukrainian pipelines and to Turkey.
- The EU adopted a fifth package of sanctions in April 2022 prohibiting the purchase, import, or delivery of coal from Russia. The sanctions package came into effect in August after the transition period ended. These sanctions exempt coal shipments from Russia to third countries.
- The EU adopted a sixth package of sanctions in June 2022, prohibiting the purchase, import, or transfer of seaborne crude oil and certain petroleum products from Russia to the EU. The restrictions apply from December 5, 2022, for crude oil and from February 5, 2023, for other refined petroleum products. Since the majority of Russian oil delivered to the EU arrives by sea, these restrictions cover nearly 90 percent of Russian oil imports to Europe.

- Imports of Russian crude oil by pipeline into the EU are exempted. Hungary, the Czech Republic, Slovakia, and Bulgaria are still heavily dependent on Russian pipeline oil and will be allowed to continue imports temporarily until they develop alternative supplies.
- In December 2022, G7 countries including the EU and Australia (the “coalition partners”) agreed to set a price cap on Russian oil at US\$60 per barrel. The price cap applies to seaborne crude oil, petroleum oils, and oils obtained from bituminous minerals that originate in or are exported from Russia.



The EU and many other countries pledged to end or severely cut back their oil and gas imports from Russia.

- The EU prohibited its vessels from transporting Russian crude oil (from December 5, 2022) and petroleum products (from February 5, 2023) to third countries. Then EU and coalition partners also prohibited the provision of technical assistance, brokering services, or financing or financial assistance from Russia. Buyers of Russian oil who do not abide by the price cap will not be able to obtain services, like shippers’ insurance, from companies in any of the coalition countries. This ban doesn’t apply if the crude oil or petroleum products are purchased at or below the oil price cap. The EU and coalition partners will adjust the price cap as appropriate.
- On February 5, 2023, the EU banned all Russian refined oil products including gasoline, diesel, and other products. At the same time, the G7 countries, along with the EU and other allies, instituted a global price cap on Russian refined oil products. Russia is denied access to ships, marine insurers, and services unless the refined oil products are purchased for a price at or below the price cap.

European energy markets

Introduction to the European energy situation

The scope of the energy crisis facing Europe is unprecedented. Sanctions on Russian oil, gas, and coal have reduced supplies from Russia to near zero, with severe impacts on heating, industrial manufacturing, and electricity. Wholesale prices of electricity and gas have increased by a factor of 15 compared to early 2021, with severe impacts on households and businesses. Energy supply shortages and high prices threaten the economic sustainability of the region and a major recession in Europe in 2023 seems likely (Zettelmeyer et. al 2022). Although this is a global crisis, Europe is at the centre of it and natural gas has been the focus of concern over this past winter and beyond.

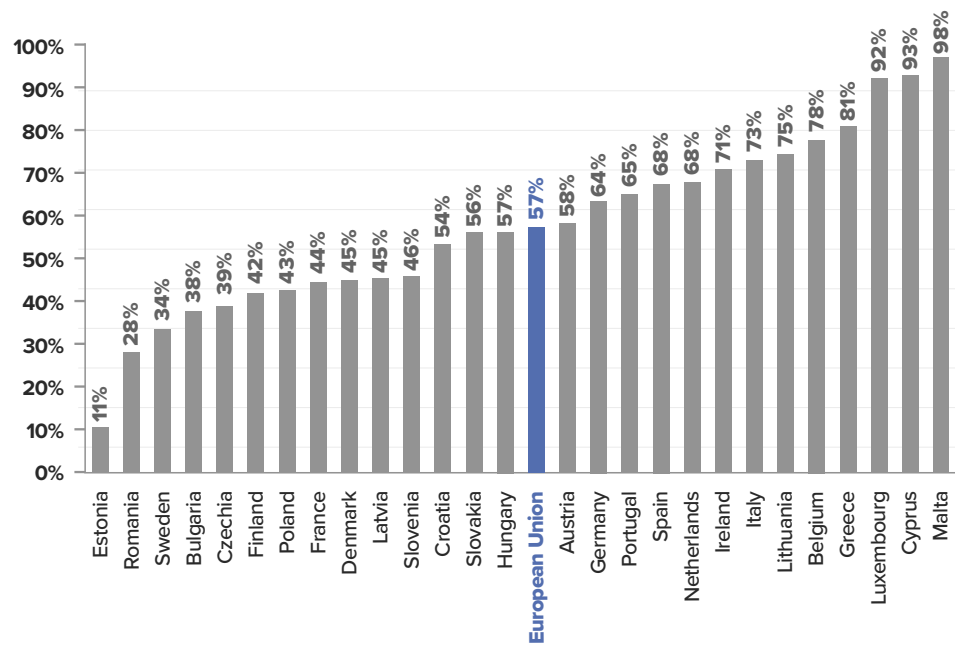
The EU's dependency on energy imports, particularly oil, natural gas and coal, is at the heart of policy concerns over the region's energy security. More than half of the EU's total energy supply comes from imported sources. In 2020, the EU was dependent on imports for about 58 percent of its energy supply while domestic energy sources met the remaining 42 percent, although the situation in different member states varies (Figure 1).

Figure 2 shows the percentage share of EU energy imports by product. Comparing 2021 with the first three quarters of 2022 shows that the energy mix did not change significantly. On a volume (net mass) basis, petroleum oils were by far the largest group of imported energy products (56.0 percent of total EU energy imports in the first three-quarters of 2022), followed by natural gas in its gaseous state (pipeline gas, at 23.7 percent) (Eurostat 2022b).

Primary energy production

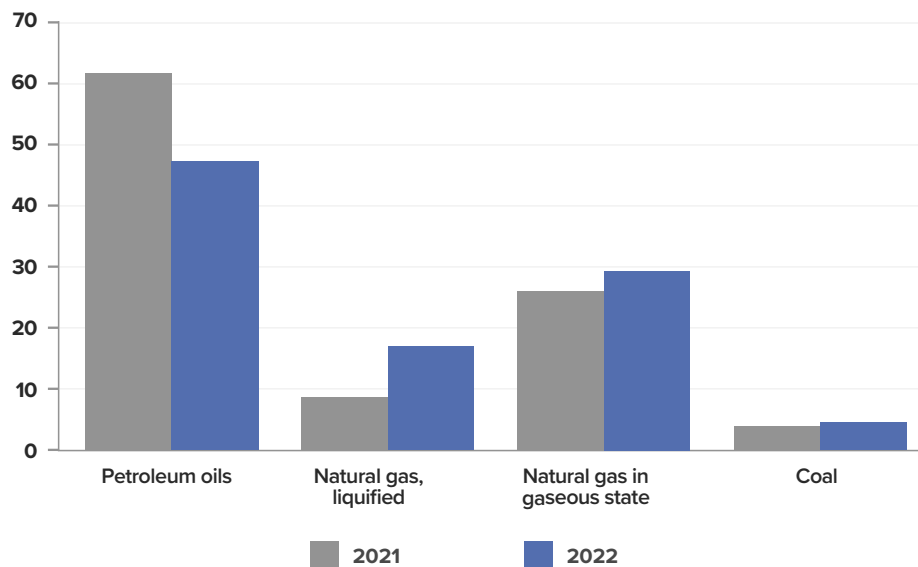
Primary energy production within the EU in 2020 was 7.1 percent lower than a year before, the largest decrease observed to date. In the EU, the general trend for energy production from all energy sources except renewables has been gradually declining, in part due to efforts to decarbonize the energy system while also improving energy efficiency (Figure 3). However, consumption trends changed very little between 2019 and 2021. In 2021, the consumption of hydrocarbon fuels (oil, natural gas, coal) represented 70 percent of total consumption, with renewables and hydro representing 19 percent and nuclear accounting for 11 percent (Figure 4).

FIGURE 1: EU DEPENDENCY ON ENERGY IMPORTS, 2020



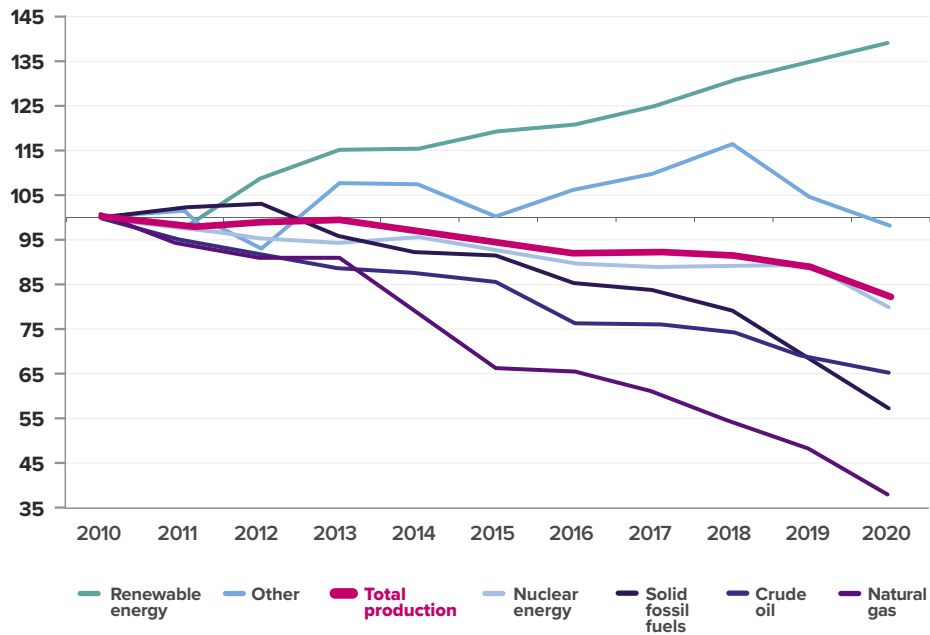
Source: Eurostat 2022a.

FIGURE 2: EU IMPORTS OF ENERGY PRODUCTS, 2021-2022 (PERCENT OF TRADE IN VALUE)



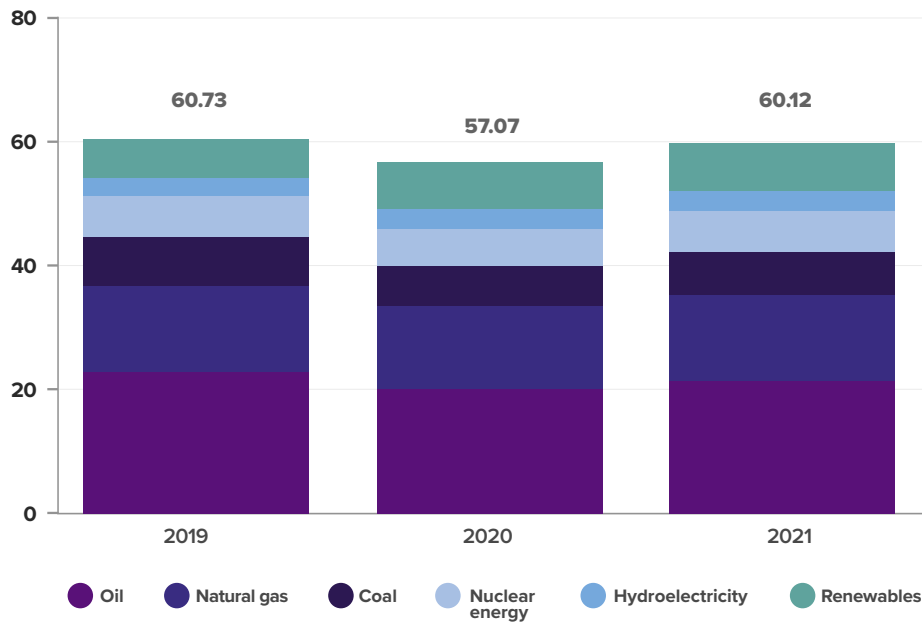
Source: Eurostat 2022b.

FIGURE 3: PRODUCTION OF PRIMARY ENERGY BY FUEL TYPE, EU, 2010-2020
(2010=100 BASED ON TERAJOULES)



Source: Eurostat 2022c

FIGURE 4: CONSUMPTION OF PRIMARY ENERGY IN THE EU, 2019-2021 (PERCENT)



Source: Statista 2023.

Primary energy production from solid fossil fuels, natural gas, crude oil, and other sources within the EU is relatively minimal. On the other hand, production of energy from nuclear and renewable sources is significant. As of August 2022, there were 133 nuclear reactors in operation in Europe with a net output capacity of 125,018 megawatts electric (MWe) (ENS 2022). The share of nuclear energy in primary energy production was highest in France where it accounted for 75.2 percent of total primary energy. In Belgium, nuclear energy represented 62.8 percent and in Slovakia 59.8 percent of total primary energy. In 10 other EU member states the share of nuclear energy in primary production was less than half of the total. There was no nuclear energy production in 14 member states (Eurostat 2022b).



The EU is highly dependent on Russian uranium and nuclear fuel to supply many of its reactors.

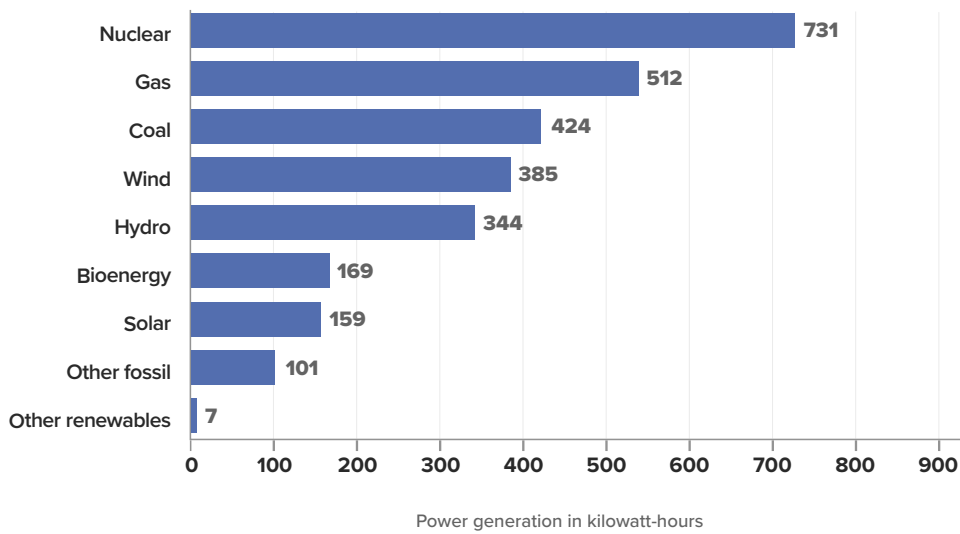
The EU is highly dependent on Russian uranium and nuclear fuel to supply many of its reactors, particularly in Eastern Europe where plants are based on Soviet designs. The European Union purchased about 20 percent of its natural uranium and 26 percent of its enrichment services from Russia in 2020 (Foltynova 2022).

The EU is almost totally reliant on imports of rare earths, materials essential to the manufacture of clean energy technologies. China currently supplies 98 percent of EU demand. Only 1 percent of the raw materials needed to make batteries are sourced from within the EU.

Electricity

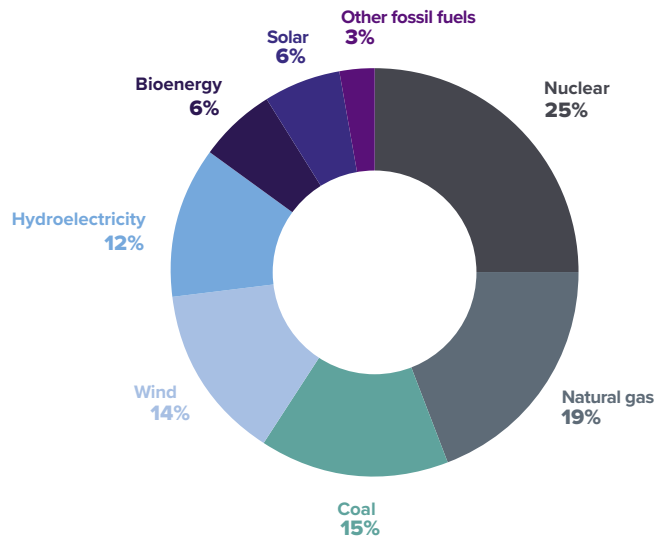
In 2021, the EU generated about 2,865 terawatt-hours of electricity. Nuclear power was the main source of electricity generation representing over 25 percent of power output that year followed by natural gas (19 percent) and coal (15 percent). Renewables of all types represented 37 percent of power generation in 2021 (Figures 5 and 6).

FIGURE 5: ELECTRICITY GENERATION IN THE EUROPEAN UNION IN 2021, BY FUEL (IN TERAWATT-HOURS)



Source: Ember and Statista, 2021.

FIGURE 6: SHARE OF ELECTRICITY GENERATION IN THE EU BY FUEL (PERCENT, 2021)

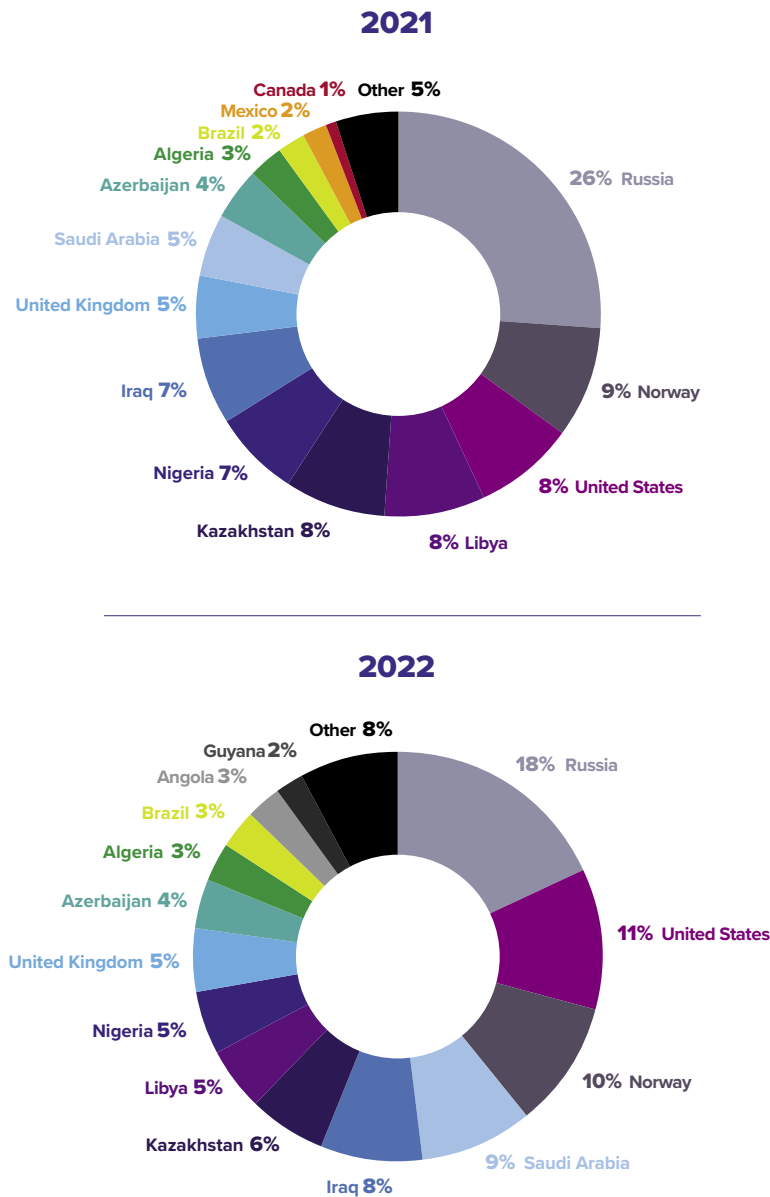


Source: Eurostat and Statista, 2023

Imports

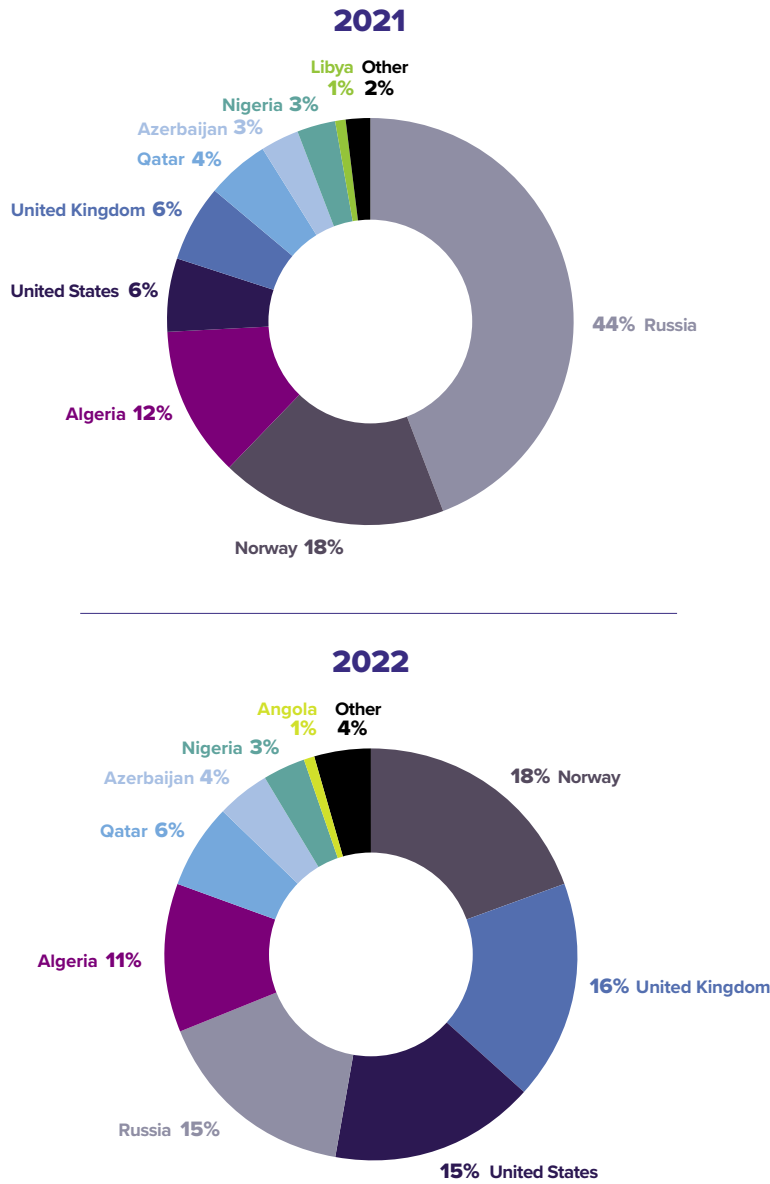
In 2021, Russia was the largest supplier of petroleum oil (25.8 percent) and the largest supplier of natural gas (43.9 percent) to the EU (Figures 7 and 8). Norway was the second largest non-EU supplier of both commodities. By trade value, about 60 percent of the EU's energy imports in the first three quarters of 2022 were petroleum products, followed by natural gas (about a third) and coal (less than 5 percent).

FIGURE 7: EU PETROLEUM IMPORTS BY SOURCE, 2021-22



Source: Eurostat 2023.

FIGURE 8: EU NATURAL GAS IMPORTS BY SOURCE, 2021-22



Source: Eurostat 2023.

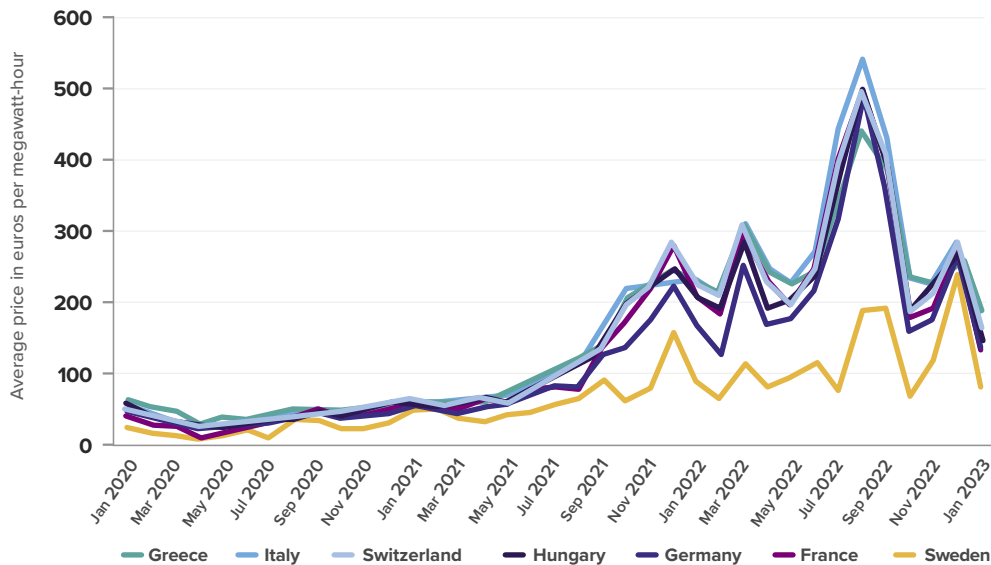
Since the Russian invasion of Ukraine in 2022, the situation has changed dramatically. In the third quarter of 2022, Russia's share of EU energy imports had dropped to 18.3 percent of petroleum oil (and was still largest supplier) and only 15.3 percent of natural gas. As of late 2022, the United States had become the largest supplier of petroleum oil and Norway the largest supplier of natural gas to the EU.

Energy prices

Higher gas and coal prices, combined with rising European carbon prices, have resulted in sharply higher electricity prices in the EU (Figure 9). Prices have been rising since mid-2021 and have been volatile due to changing commodity prices, heat waves that have led to lower water levels and thus lower hydro generation, and cutbacks in nuclear generation. Nuclear generation fell by about 16 percent in the first nine months of 2022 because France shut down more than half of its nuclear plants for maintenance while Germany has been decommissioning its nuclear power plants (although it is now extending the operating life of the three remaining plants until April 2023). Coal prices are at record highs, though this is likely to be temporary and is due to the cut-off of Russian supplies. Coal is more readily available from other sources as a substitute for gas, so it has been used to fill gaps in power generation.

Wind and solar energy have reduced the impact of higher wholesale electricity prices on consumers. Those two sources provided 23 percent of total EU

FIGURE 9: AVERAGE MONTHLY ELECTRICITY WHOLESALE PRICES IN SELECTED COUNTRIES IN THE EU, JANUARY 2020-DECEMBER 2022 (IN EUROS PER MEGAWATT-HOUR)



Source: Ember and Statista, 2023.

electricity generation in the first half of 2022 compared to 20 percent in 2021. Higher shares of wind and solar in electricity generation have put downward pressure on wholesale prices (IEA 2022a).

Meanwhile, global oil demand continues to recover from its 2020 lows, and gasoline prices in many countries are at near record levels. When pandemic lockdowns ended and economies recovered, prices rose quickly in mid-2021. When Russia invaded Ukraine in early 2022, prices again spiked as sanctions were imposed and Russia sought to use energy as a weapon. Energy prices have since declined from their record highs earlier in 2022 amid slowing global growth and concerns about a possible global recession (IEA 2022a). Despite rhetoric about an imminent peak in oil demand, the IEA estimates that global oil demand will rise by almost 2 million barrels a day in 2023 to a record 101.7 million barrels per day. Almost half of this increase will result from China's economic recovery following the lifting of its COVID restrictions (IEA 2023).



Energy prices are likely to remain volatile in 2023 in response to geopolitical and economic events.

In 2022, Europe suffered US\$1 trillion in additional energy costs following Russia's invasion of Ukraine as fuel sources became increasingly stretched and uncertain and the cost of powering the economy soared. Retail electricity prices in the European Union were about 30 percent higher on average for residential consumers in the first half of 2022 compared to the year before. The higher prices were driven mainly by higher fossil fuel prices, which accounted for 70 percent of the increase, but also by rising CO₂ prices,² which accounted for 20 percent of the increase. Moreover, the European Union had reduced nuclear power and hydropower availability, which made up the remainder (nearly 10 percent) of the increase. Rising energy costs have driven up the cost of other goods and services, contributing to inflation. The EU expects the energy crisis to continue into next year with prices expected to cause further stress on industry and households. Energy prices are likely to remain volatile in 2023 in response to geopolitical and economic events. Additional supply disruptions

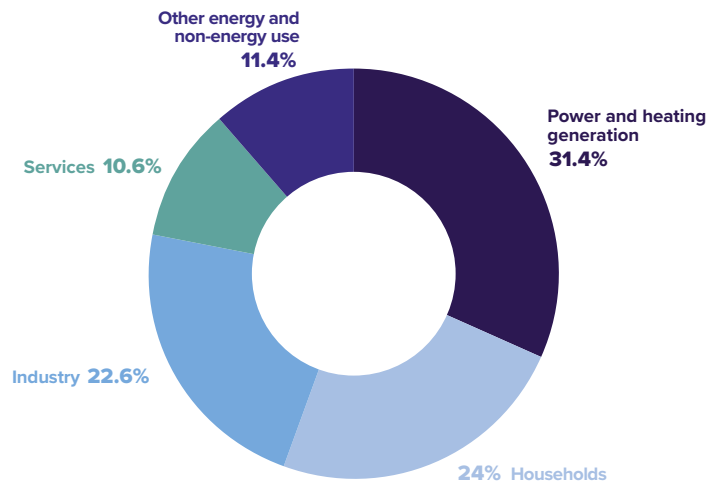
are a key risk, particularly for crude oil and natural gas, while global spare production capacity buffers are limited (IEA 2022a; Mazneva and Shiryaevskaya 2022).

Natural gas

Natural gas is an important component in Europe's energy mix (Figure 10). In 2021, the 27 EU countries consumed 412 billion cubic metres (bcm) of gas, mainly for power generation, household heating, and industrial processes. Nearly 40 percent of this supply, some 155 bcm, came from Russia. Over 30 percent of households in the EU use gas to heat their homes (European Council 2022a).

The primary cause of the massive increase in European gas prices has been the reduction of Russian supplies. At the beginning of the Ukraine crisis, Europe had a longer-term goal of reducing reliance on Russian gas by two-thirds. However, Russia itself exceeded that target when it essentially shut off gas exports to Europe in response to European sanctions. Liquefied natural gas (LNG) is currently the only viable replacement option to fill the gap created by the loss of Russian pipeline gas. As a result, the cost of LNG has more than

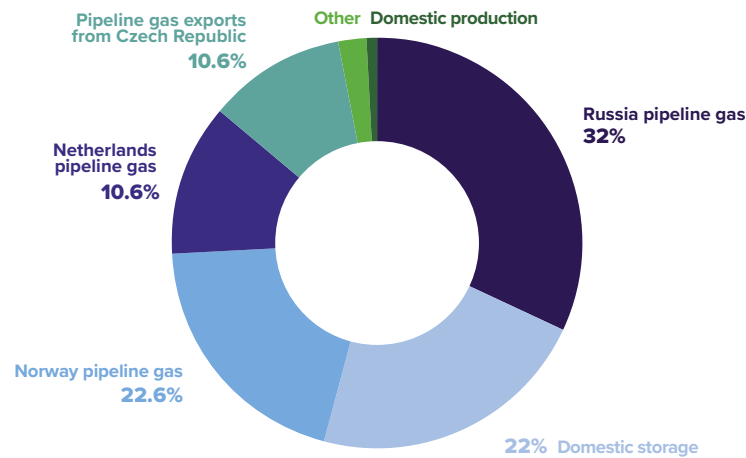
FIGURE 10: GAS CONSUMPTION IN THE EU, 2021



Note: Households includes gas used in private dwellings (e.g., for heating and cooking). Power and heating generation includes power plants and central heating units.

Source: Eurostat 2021.

FIGURE 11: GERMAN GAS SUPPLY BY SOURCE, DECEMBER 2021



Source: Eckert, V et al. 2022

doubled since Russia's February invasion of Ukraine (Zettelmeyer, Tagliapietra, Zachmann, and Heussaff 2022).

In 2021, the EU depended on imports for 83 percent of its natural gas, most of it via pipeline. Germany alone is one of the world's biggest gas importers and sources about 95 percent of its consumption from abroad. Before the Russian invasion of Ukraine in 2021, Russia was Germany's largest source of gas, followed by Norway, the Netherlands, and the Czech Republic (Figure 11). About one quarter of Germany's energy demand was covered by natural gas in 2022, the second most important energy source in the mix after oil. Yet until just recently, Germany did not have its own regasification terminals for LNG and imports had to enter the country by pipeline and by road from neighbouring countries like Belgium and the Netherlands.

Since Russia's invasion of Ukraine, EU gas imports from Russia have been significantly reduced. In January 2021, Russia accounted for about 54 percent of EU gas imports but by August 2022, its import share had fallen to about 17 percent. This has mainly been compensated for by a sharp increase in imports of LNG from other countries (Figure 12). The EU has approached Norway, Algeria, Qatar, the United States, Canada, and other countries to try to secure additional gas supplies (European Council 2022a).

FIGURE 12. EUROPEAN GAS IMPORTS, 2021-22 (MILLIONS OF CUBIC METRES)



Note: Others includes Norway, Algeria, UK and LNG.

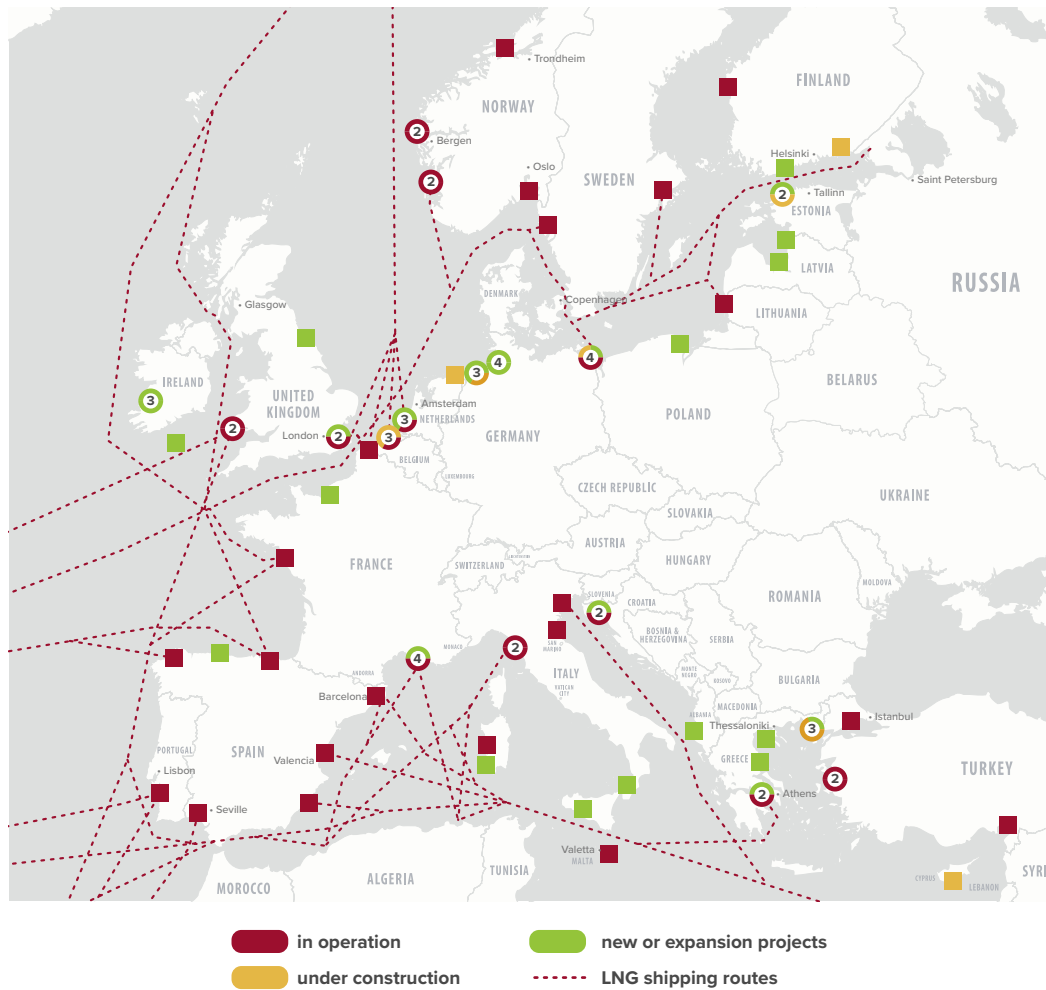
Source: Bruegel Datasets 2022.

The EU is the largest LNG importer in the world, importing over 65 bcm of LNG in the first half of 2022. Within the EU, France was the largest LNG importer, ahead of Spain and Belgium. In 2021, most of Europe’s supply of LNG originated in the United States, Qatar, and Russia. Altogether, these three countries accounted for almost 70 percent of Europe’s total LNG imports.

While Russian exports of coal, oil, and pipeline natural gas to Europe have fallen sharply since its invasion of Ukraine, what is less well known is that imports of Russian LNG have actually risen. Imports of Russian LNG into Europe and the United Kingdom rose by nearly 20 percent between March and October 2022, compared to the same period in 2021 (Cooban 2022). Russia has been increasing its sea-borne LNG exports, mostly from the Novatek-led Yamal LNG plant in the Arctic (EnergyNow 2022). In the first half of 2022, the United States was the largest LNG supplier to the EU, representing almost 50 percent of total imports. LNG imports from the US have more than doubled year-on-year (European Council 2022b).

Building new LNG receiving terminals has become critically important given the EU’s plan to reduce dependence on Russian gas imports. The EU has

FIGURE 13: LNG IMPORT TERMINALS IN EUROPE, 2022



Source: Global Energy Monitor 2022.

significant LNG import capacity (around 157 bcm per year) which is enough to meet around 40 percent of total gas demand. However, access to LNG infrastructure is uneven across the EU. As a result, EU member states are further developing their LNG infrastructure. A number of planned investments are to be treated as EU projects of common interest, which benefit from streamlined procedures and, in some cases, co-financing through the Connecting Europe Facility.

As of October 2022, there were 68 LNG import terminal projects in Europe, 32 of which were operational, 27 were proposed new or expansion projects, seven were under construction, and two were not operational (Figure 13) (Global Energy Monitor 2022).

LNG import capacity in the EU and the UK will expand by 34 percent, or 6.8 billion cubic feet per day (Bcf/d), by 2024 compared with 2021. Expansions of import or regasification capacity will total 5.3 Bcf/d by the end of 2023 and grow further by an additional 1.5 Bcf/d by the end of 2024. Many of the new regasification projects in Europe are being developed by chartering floating storage and regasification units (FSRUs) and by building pipelines to transport regasified gas to connecting pipelines onshore (EIA 2022). For example, Germany is developing six new FSRU terminals that will potentially cover one-third of Germany's annual gas needs.³ The first FSRU was installed in Wilhelmshaven on December 17, 2022 (Eckert 2022).

“*European homes and businesses will continue to be dependent on natural gas for at least the next decade.*”

The EU has also committed to investing in pipeline upgrades and even building new pipelines to facilitate the movement of natural gas. It is investing in the Southern Gas Corridor pipeline to import Azeri gas, while some existing pipelines (such as those connecting Algeria to Spain) might require increased capacity to accommodate rising imports. In addition, there is a new pipeline interconnector between Greece and Bulgaria and plans to expand Croatia's Adria pipeline and build a new pipeline between Barcelona and Marseille (Bellamy 2022).

Analysts expect that European homes and businesses will continue to be dependent on natural gas for at least the next decade. Therefore, the search is on for alternative supplies. Norway overtook Russia as Europe's largest pipeline gas supplier after increasing output by 8 percent over 2021. Norway also opened a new pipeline to Poland in October 2022. Denmark, the Netherlands, and the United Kingdom are also increasing production and have approved new gas projects. However, analysts say there is a limit to this strategy, as supplies in the North Sea are running out (Jedrych 2022).

European energy policy responses

The European Union's policy responses to the energy crisis can be viewed in the context of its overall economic, energy, and climate policy stance as expressed through the European “Green Deal.” The Green Deal is the region’s main growth strategy, designed to transition the EU economy to a “sustainable economic model.” Approved in 2020, the prime objective of the EU Green Deal is to make Europe the first climate-neutral continent by 2050. Funding mechanisms are in place to facilitate this, totalling over €1 trillion. This investment is intended to fund the delivery of policy reforms needed to spur economic growth and achieve climate neutrality.

Response to high energy prices

On October 6, 2022, in response to high energy prices that were driving inflation and hurting the European economy, the European Commission adopted several emergency measures to mitigate the impact of high electricity prices on consumers while not impairing future investment in low-emissions technologies. Those measures included a levy on the profits of businesses in the crude petroleum, natural gas, coal, and refinery sectors, a requirement to reduce electricity consumption by 5 percent in peak hours, and a measure to reduce electricity prices for households and small- and medium-size enterprises (European Council 2022c).

On December 19, 2022, the EU agreed to set a price cap on natural gas in order to lower gas prices that were fueling record inflation. The cap took effect on February 15 and, once activated, will remain in place for at least 20 working days and apply to all EU gas-trading hubs (Mazneva and Shiryaevskaya 2022).

REPowerEU plan

The European Commission proposed the REPowerEU Plan on May 18, 2022, in response to the disruptions in global energy markets caused by Russia’s invasion of Ukraine. The plan hopes to achieve two goals: eliminating the need for Russian fossil fuels, and reducing net GHG emissions by at least 55 percent by 2030 in order to achieve climate neutrality by 2050.

The plan covers four main areas: improving energy efficiency and savings, diversifying energy supplies, accelerating the roll-out of renewable energy

sources, and making energy investments and reforms. However, it will be up to individual EU member countries to implement specific elements of the plan at a national level and to coordinate among other EU countries. Therefore, achieving the goals of the plan depend on the extent to which countries actually carry out its proposed measures.

The EU views energy savings as the quickest and cheapest way to address the current energy crisis. Savings can be achieved by reducing household and industry energy consumption and through higher energy efficiency measures, including in buildings and transport. The EU Commission has proposed a 13 percent increase to the binding target in the Energy Efficiency Directive.



The EU has been working with various international partners to diversify supplies of LNG.

With regard to diversification of supply, the EU has been working with various international partners to diversify supplies of LNG and has managed to secure record levels of LNG imports and higher pipeline gas deliveries. The EU Energy Platform hopes to enable EU countries to better coordinate joint gas purchasing and setting up a new trading benchmark for LNG, aimed at helping secure enough gas to prevent another energy crisis in the 2023-24 winter. For this purpose, EU states are forming a purchasing “club” that will negotiate and contract gas purchases on behalf of participating member states and work on building long-term energy cooperation with suppliers, including cooperation on hydrogen and other green technologies. The EU will try to coordinate this move with its other partners in the G7 (Mazneva and Shiryayevskaya 2022; European Commission 2022a).

The plan calls for a massive scaling-up and speeding-up of renewable energy in power generation, industry, buildings, and transport. The plan sets an objective to increase the target for energy from renewable sources from 40 to 45 percent by 2030. The EU foresees investing more than US\$210 billion in

the plan by 2027. The Commission set a target of over 320 GW of new solar photovoltaic capacity by 2025 (which is double today's level), and almost 600 GW by 2030. The plan relies on speeding up the permitting process for renewables, which has been a hindrance to faster deployment of wind and solar.

The EU sees renewable hydrogen as key to replacing natural gas, coal, and oil in hard-to-decarbonize industries and transport. REPowerEU sets a target of 10 million tonnes of domestic renewable hydrogen production and 10 million tonnes of renewable hydrogen imports by 2030. Therefore, accelerated efforts are to be undertaken to deploy hydrogen infrastructure for producing, importing, and transporting 20 million tonnes of hydrogen by 2030. Most new gas plants built in Europe also need to be hydrogen-compatible. To facilitate imports, three major hydrogen import corridors will be developed in the Mediterranean, the North Sea area and, when conditions allow, in Ukraine (European Commission 2022b).

Bioenergy makes up 60 percent of the renewable energy in the EU. It is a domestically available and stable energy source, but sustainable sourcing is key. Current estimates show a moderate but steady increase of biomass use until 2030 (European Commission 2022c).

There is little mention of energy storage or grid-level battery storage in the plan. The plan only states that the EU will “promote the development of electricity storage capacities... and proposes to consider storage assets as being in the overriding public interest and facilitate permitting for their deployment.” Yet it mentions no specific strategy, targets, or financial supports for energy storage. Calculations indicate that energy storage deployment needs to increase by at least 14-fold by 2030 to achieve EU decarbonization targets and energy security (European Association for Storage of Energy 2022). In December 2022, the EU amended the plan to include energy storage in accelerated permitting. However, the absence of an energy storage strategy is a missed opportunity that could jeopardize EU objectives.

Proponents of the REPowerEU plan say that these measures taken together can replace some two-thirds of the energy previously supplied by Russia. Still, the IEA forecasts that although the EU will be able to dramatically expand its use of renewables by 2030, it will fall significantly short of the RePowerEU goal due to challenges in boosting renewable capacity (Jedrych 2022).

Net-Zero Industry Act

In response to concerns about European competitiveness in the face of industrial policies such as the US *Inflation Reduction Act*, the European Commission announced the release of the “*Net-Zero Industry Act*,” a new regulation aimed at supporting Europe’s green industry. Announced on March 16, 2023, the Act aims to ensure that at least 40 percent of EU demand for clean technologies is made domestically by 2030. The proposal sets out targets for technologies deemed necessary to decarbonize the bloc’s economy. The final text is ambiguous on the issue of nuclear power and it is not included in a list of “strategic net-zero technologies” that can benefit from faster permitting and easier access to funding. Seven EU states including Germany, Spain and Denmark were opposed to efforts by France to include nuclear energy as part of EU renewable energy targets (CarbonBrief 2023).

Critical minerals and rare earths

The EU sees access to critical minerals as essential to its ambition to become the “first climate neutral continent.” The European Raw Materials Alliance (ERMA) has called for €1.7 billion of investment into projects to kick-start a regional mine-to-magnet processing industry. To ensure a sufficient supply of lithium and rare earths, the EU is considering ratifying trade agreements with Chile, Mexico, and New Zealand, as well as looking to advance talks with partner countries including India, Australia, and Canada. The EU estimates that demand for rare earths will increase five-fold by 2030. The EU has proposed new legislation, the *Critical Raw Materials Act*, to help increase the supplies of critical minerals and rare earths from friendly countries and to reduce its dependency on China (Mining Technology 2022). On March 16, 2023 the EU announced plans to boost production of critical minerals with the aim of reducing its dependence on countries such as China. The EU is aiming for at least 10 percent of critical mineral consumption to be locally produced by the end of the decade and will introduce targets for their recycling and processing (De Beaurepaire 2023).

Will Europe's energy policies achieve their goals?

The EU has taken unprecedented steps to find alternatives to Russian energy in the fallout of the war in Ukraine. Since September 2022, European governments have earmarked more than €700 billion (US\$743 billion) in energy subsidies to ease the pain for families and businesses facing record energy prices (Abnet 2022). In electricity markets, the current capacity of wind and solar generation cannot make up for the loss of Russian gas supplies, so Germany and several other European countries have had to revert to coal-fired power plants to fill the gap, slowing efforts to lower emissions. While Europe may be able to get through this winter with its gas storage capacity full and thanks to a generally warmer winter, it will likely still face huge challenges in the winters of 2023 and 2024.

Supply-side factors may provide some relief from high wholesale electricity prices in the future. Nuclear power generation should improve significantly as a result of France's intention to restart all its reactors this winter. The outlook for fossil fuel prices is somewhat mixed; they may move lower in the medium-term as market tightness moderates but increased demand from China following the abandonment of the "zero-COVID" policy could bring prices up again. Wind and solar energy are set to expand significantly over the course of 2023, with a nearly 10 percent increase, and they expected to grow steadily on an annual basis afterwards (IEA 2022a).

The EU's green deal anticipates that renewables will supply over 70 percent of all electricity by 2050 and that fossil fuels will be phased out. The commitment to renewables in Germany is such that many hope that someday the country will be 100 percent powered with renewables. And REPowerEU plans on doubling down on support for renewables in the race to achieve net zero. The EU believes these policies will enhance energy security by decreasing Europe's reliance on fossil fuels. In the meantime, Germany continues to rely on lignite (the dirtiest form of coal) even while it is trying to phase out its nuclear power plants. Until renewables are able to replace other electricity generation sources, Germany will remain reliant on coal and, even more so, on natural gas.

It is fair to ask if the REPowerEU plan's heavy reliance on variable renewables in the electricity mix is prudent and whether it might create new

risks to Europe's energy security. Analysts estimate that it will require US\$3.8 trillion of investment, mostly in wind and solar projects, to achieve the plan's policy goals. The actual cost is likely to be much more. Further, these plans rely on some questionable assumptions: first, that such a vast infrastructure can be financed sustainably; second, that projects can overcome regulatory constraints and be built at such rapid speed; third, that an electricity grid powered mostly by variable renewables can remain stable and reliable; and fourth, that there will be enough critical minerals and rare earths available to produce the quantity of wind turbines, solar assemblies, and batteries that such a plan will need.

“ *A “nuclear renaissance” seems unlikely unless other measures to reduce emissions fall short.* ”

Grid stability and reasonable power costs are critical to maintaining industrial competitiveness. Electricity grids composed of a high percentage of variable renewables are inherently less stable because of the intermittency of wind and solar power. The efficiency of variable renewables is affected by weather conditions, such as occurred in 2021 when wind generation in the EU fell by 3 percent due to unusually long periods with little wind (IEA 2022d). And since wind and solar power are intermittent, they require utility-scale battery storage (currently lacking in the EU) and/or adequate backup power from a more reliable source, whether natural gas, coal, hydro, or nuclear. Yet the EU plans to eliminate fossil fuels and significantly reduce nuclear power – a source of clean, domestic power.

The role of nuclear power in the EU is controversial and divisive, despite the fact that nuclear power is emissions free and provided almost 31 percent of Europe's primary energy in 2020. Opponents of nuclear power cite concerns over nuclear waste, safety, and reliability – highlighted recently by the closures of half of France's nuclear reactors for maintenance. Given the divided opinion over nuclear power, a “nuclear renaissance” seems unlikely unless other measures to reduce emissions fall short. The current situation has reinforced some trends

among countries that are interested in or committed to nuclear energy such as France, Poland, Latvia, and Sweden. Germany, which had long been one of the most prominent anti-nuclear voices in the EU, made the biggest shift when its leaders were forced to backtrack on their nuclear phaseout plan and instead extend the operating life of its three remaining reactors – at least for the short-term. Belgium announced plans to extend the lifespan of two reactors by 10 years and the Netherlands will also slow its phase-outs.

Yet, if Europe wishes to pursue a diversified portfolio of energy sources to improve resilience and meet Europe’s aggressive emissions targets, it is difficult to see how that can be achieved without significant reliance on nuclear power. Nonetheless, production of nuclear energy in the EU continues to decline and in France, many plants are reaching the end of their life, although there are now plans to extend their use. Meanwhile, Europe needs to expand its own nuclear fuel enrichment capacity in order to reduce reliance on Russian imports. The US Department of Energy is investing in US enrichment projects and Euratom – the European Atomic Energy Community – is also looking at options for the continent, even as consensus on long-term support for nuclear power in Europe appears unattainable.

The EU may view high fuel prices as an impetus to accelerate its clean energy transition, as demonstrated in the European Union’s REPowerEU Plan. However, high energy prices in combination with other factors could also cause a deep recession, which would lower demand, increase unemployment, and lead to more calls for subsidies and programs to offset negative social impacts. Any number of these non-energy pressures would compete for the limited fiscal room that the EU has to allocate to clean energy and climate change initiatives.

The EU instituted a temporary windfall tax in September 2022, saying that fossil fuel producers will be required to return 33 percent of their “surplus profits” (Abnett and Baczynska 2022). The European Commission’s vice-president, Frans Timmermans, rationalized this by saying that the era of cheap fossil fuels is over and that the EU needs to move to “cheap, clean and homegrown renewables.” Yet it is not clear how taxing fossil fuel producers will help stabilize Europe’s energy security situation or hasten the clean energy transition. In fact, it could have the opposite effect. Tax increases could result in less capital available for future investments in all types of energy projects at a time when Europe needs more energy, not less. Companies such as Shell and Equinor are re-evaluating their investment plans after Britain announced it would raise tax-

es on energy producers from 25 to 35 percent, bringing the total tax burden on the oil and gas sector to 75 percent. Such moves risk jeopardizing investment and could result in lower production and reduced energy supply in Europe, driving prices higher and adding to concentration of oil supplies in the Middle East and elsewhere (Timmins 2022; Bousso 2022).

While a strong case can be made for European emergency interventions to alleviate some of the extreme consequences of the energy crisis, new demands on Europe's fiscal purse are looming. Europe has been generous with energy subsidies, allocating €758 billion since September 2021 to protect consumers from the rising energy costs (Sgaravatti, Giovanni et al. 2023). High levels of subsidies and various emergency measures threaten to distort the functioning of markets and the efficient allocation of capital and could impede more effective responses to the energy crisis.



Regional economic competition and near-shoring/friend-shoring trends are driving new industrial policies.

The most worrisome impact of the high cost of energy is on Europe's industrial sector, which may not be able to survive two or three years of very high natural gas and electricity prices. Currently, rising power prices are already having an impact on operations of electricity-intensive industries and an increasing number of companies are failing as a result. The German chemicals company BASF announced it will cut 2600 jobs as the German economy braces for a recession triggered by the energy crisis (Jolly 2023).

This situation is likely to continue for the next two to three years because LNG supplies will remain limited and other sources of energy cannot be ramped up sufficiently to fill the gap caused by the removal of Russian coal, oil, and gas. This means that demand will need to be curtailed. Meanwhile, regional economic competition and near-shoring/friend-shoring trends are driving new industrial policies. The misnamed *Inflation Reduction Act* in the United States proposes a wide range of investments to create new supply chains for strategic

goods as well as for clean energy technologies. Industrial policies with subsidies in North America combined with already high energy prices in Europe creates a real risk of deindustrialization in Europe as companies seek lower-cost and more competitive locations for manufacturing.

The EU's ambitious targets for renewable power mean that the demand for rare earths and critical minerals required for the manufacture of the infrastructure that produces that power may far exceed their supply, especially if Europe and other western countries wish to reduce their dependence on China's near monopoly over these products. Beyond the challenging regulatory, permitting, and grid stability issues surrounding variable renewables, building vast numbers of wind and solar farms in Europe is not without opposition, as rising NIMBYism in Europe testifies.

A major hurdle currently facing the EU is regulatory constraints. The European approach to the energy transition has principally been through regulation, in contrast with the approach in the United States that focuses more on providing incentives. The EU approach is also too prescriptive as it gives preference to certain clean energy technologies over others. The EU plan would be better if it were technology neutral and incentive based; it should establish a vision and some broad targets and then let the private sector and markets determine the best way to meet the goals. As it is, the system is too burdened with regulation and bureaucracy and risks losing out to the incentives-based system being built in the US through the *Inflation Reduction Act*.

All this suggests that it is highly unlikely there will be a smooth path by which Europe can achieve net zero by 2050, let alone whether such a path is even possible while maintaining a stable, secure, and affordable energy system that sustains European industrial competitiveness. There is a real risk that the EU becomes an unattractive place to invest and do business, and gradually deindustrializes. European companies are already looking to relocate their operations to North America because of its structural and policy advantages (e.g., lower energy costs, lower labour and input costs, a lower regulatory burden, etc.).

Outlook for European energy security

No nation can achieve a responsible energy transition unless it balances climate change goals with economic and energy security considerations. Europe is struggling to find the right balance in the midst of an energy crisis. The realities imposed by the war in Ukraine along with high energy prices and impacts on consumers and industrial competitiveness argue for more pragmatism and less idealism than European energy policy has seen heretofore.

The EU needs to take steps to improve its energy security in both the short- and long-term. In the short-term, it will need to maximize its domestic energy supply through increased efforts by individual EU countries such as the Netherlands (by raising gas output) and Germany (by extending the operational life of its nuclear power plants that were set to be decommissioned). It will also need to expand imports of natural gas from friendly neighbouring countries and especially increase its imports of LNG.

The EU has managed surprisingly well in sourcing enough gas from alternative sources to manage adequately through the 2022-23 winter season. Significantly, Europe has started importing large amounts of LNG. Investments in new and enhanced LNG terminals and pipelines will help diversify the EU's sources of natural gas, providing Europe's energy system with greater resilience.

There remain concerns among some that such investments may lock-in hydrocarbon infrastructure and inhibit the transition to clean energy. The EU response to this has been that gas infrastructure can be repurposed or converted for hydrogen. Whether this is economically or technically feasible is an open question, but these investments are probably the best response the EU can make under the circumstances and will provide an added level of flexibility to the European energy system in any case.

While many European countries have expanded their support mechanisms for renewables in order to increase renewables capacity, the EU is still well short of the renewables goals in the recently released REPowerEU Plan. This includes eliminating the need for Russian fossil fuels, and reducing net GHG emissions by at least a 55 percent by 2030 and achieving climate neutrality by 2050. According to the International Energy Agency's (IEA) analysis of the plan, the share of renewables in electricity will reach about 53 percent by 2027 (from almost 40 percent in 2022), well below the 69 percent share the Eu-

European Commission estimates is needed in 2030 to support the REPowerEU plan. The IEA suggests that EU governments minimize policy uncertainty, simplify permitting procedures, and accelerate transmission and distribution network upgrades to help boost the share of renewables (IEA 2022b).

In the transition, European energy policy must be flexible, acknowledge the economic and social costs of various policy choices, and consider the stability and resilience of the energy system in order to avoid disruptions and shocks. Energy policies focused solely on increasing variable renewables in the energy system entail a much higher risk to the stability of the energy system than policies that employ a diversified portfolio of energy sources.

To achieve climate and energy security goals, policies should include all low-emissions sources – including nuclear power and fossil fuels with carbon capture and sequestration – rather than favouring only wind and solar. Energy system resiliency requires diverse energy sources so that economic and supply shocks affecting one or more sources do not destabilize the system during the transition (Kucharski and Exner-Pirot 2022).

While the REPowerEU plan includes aggressive targets for increasing renewables capacity, renewables cannot fully meet electricity generation demand at this time, nor in the medium-term either, as already pointed out. Bureaucratic red tape, slow and burdensome regulatory and permitting systems, and NIMBYism mean that capacity additions in Europe will be limited into 2023 and beyond unless these issues are resolved soon.

While Europe seems determined to reduce its reliance on imported fossil fuels in the name of energy security, it is still going to remain reliant on fossil fuels for a significant portion of its energy needs for many years to come. Gas provides an important degree of flexibility to electricity generation in particular, especially given the rising proportion of variable renewables in the European electricity grid and the slow pace and lack of support for grid-level battery storage. Eventually hydrogen may be able to replace a portion of natural gas in grid storage and in the hard-to-abate sector, but that remains many years away from realization. All the IEA's scenarios foresee an important role for natural gas well beyond 2030.

A strong and vocal global lobby criticizes natural gas as a transition fuel and opposes the financing or construction of natural gas infrastructure, including LNG import capacity. This lobby is particularly strong in Europe. Its argument is that the EU's current LNG capacity is already excessive and expanding

it further is incompatible with the European Climate Law's requirement that natural gas consumption be reduced by 2030, and at odds with the IEA's Net Zero by 2050 scenario. However, these arguments are unrealistic. Renewable capacity additions are unlikely to reach the ambitious REPowerEU targets set for 2030, especially given slow and cumbersome permitting processes. They also fail to recognize the important role gas plays in providing flexibility to Europe's energy system, the significant gap that exists between the supply and demand for natural gas in the EU, the unevenness of LNG import capacity across the region, and the need for gas to continue to support European households and industry.



Renewable capacity additions are unlikely to reach the ambitious REPowerEU targets set for 2030.

The European Union made significant progress in reducing Europe's reliance on Russian natural gas supplies in 2022, but the outlook for 2023 and beyond is mixed. The EU successfully filled gas stockpiles to 96 percent full in November 2022, thereby helping to ensure sufficient winter supplies. EU countries also reduced their use of gas during the relatively mild winter. Thus, while the region managed to find enough gas to replace a large portion of Russian supplies in 2022-23, most international organizations, including the International Monetary Fund (IMF) and the OECD, warn that the real battle will be in the autumn and winter of 2023, when Russian natural gas supply will be even more limited and competition from China heats up as its economy recovers (Bove 2022).

According to some experts, Europe will have to reduce its gas demand by roughly 10 percent through efficiency and conservation initiatives to ensure it can manage through the 2023-24 winter, assuming it can maintain LNG supplies (DiChristopher 2022). Sustained high oil and gas prices will have further negative impacts on European industries. According to the IEA, the EU faces a potential shortfall of almost 30 billion cubic metres of natural gas in 2023, but

stronger efforts to improve energy efficiency, deploy renewables, install heat pumps, promote energy savings, and increase gas supplies can help alleviate the pressure (IEA 2022c).

Investments in clean energy – including energy efficiency, renewables, electrification, carbon capture and storage, and a range of clean fuels – will be essential to securing Europe’s energy and climate future. However, there is a considerable lag between investment decisions and when projects are actually started up. The IEA says that global investments in clean energy and energy efficiency have not been sufficient to put Europe on a path to achieve its climate goals. Confronted with competing fiscal pressures such as pandemic recovery programs, rampant inflation, high energy prices, public infrastructure investments, new industrial policy initiatives, and a looming recession, is Europe prepared to spend the massive and unprecedented costs necessary to speed up the energy transition? This will remain a question for Europe into 2023 and beyond, and the answers will have consequences for the speed of the transition and the impact on energy security.

The EU should increase its resilience to future energy shocks by preserving more fuel diversity and proportionality in Europe’s energy mix, for example, by reversing the decline in nuclear power generation and expanding the use of CCUS for natural gas. Europe must find the right balance among ensuring energy security, addressing climate change, and preserving fiscal sustainability if it hopes to sustain broad public support for these policies.

Energy security and geopolitics

As energy systems have become more complex, the issues arising from the role of energy have increased in number and complexity. Energy supply disruptions, the increasing demand and competition for energy resources, high prices, and the effects of climate change are at the root of energy security’s increasing importance. Geopolitics plays a significant role as well, currently exemplified by Russia’s use of energy as an economic and political weapon and by its destruction of energy infrastructure in Ukraine and elsewhere.

As a result of its aggression against Ukraine, Russia has effectively been “decoupled” from the rest of the world economically, politically, and culturally. Late in 2022 at a foreign ministers’ meeting, NATO agreed to further reduce dependencies on Russia and other authoritarian regimes, including China. As Ukraine’s foreign minister Kuleba said at the meeting, “this is probably the first NATO meeting where issues of energy security are as important as issues of hard security” (NATO 2022).

Energy source diversification is a key element in reducing dependencies and building resilience in energy systems. While the EU was successful in replacing much of its Russian pipeline gas imports with supplies from friendly countries in 2022, it has been unable to wean itself off Russian LNG, the deliveries of which are actually rising. This exemplifies the reality of stiff global competition for LNG cargoes – an issue that could worsen should China’s economy rebound strongly. Since Russian LNG represented about 15 percent of Europe’s total LNG supply from January to October 2022, these supplies will need to be sustained in 2023 if Europe hopes to survive the 2023-2024 winter, according to analysts (Robinson 2022). This will remain an important future geopolitical vulnerability for Europe.

While Europe has moved decisively away from relying on Russia for its gas supplies, it is still almost totally reliant on China for virtually all of the rare earths it needs for the clean energy transition. Competition for critical minerals can be expected to intensify as countries seek to meet their climate change commitments. Yet current reserves and supplies are limited for some key minerals and in many countries their extraction and processing are fraught with environmental hazards. The supply chains for clean energy technologies, alternative fuels, uranium, and critical minerals will become increasingly important to secure if strategic competition and international rivalries continue to intensify (Kucharski 2022).

Many believe that removing hydrocarbons from energy systems and replacing them with domestic renewable energy will not only lower carbon emissions but also reduce geopolitical threats and therefore improve energy security. This may be true in a limited sense if one defines energy security too narrowly. However, beyond conventional sources like hydrocarbons and renewables, energy systems are increasingly composed of a range of alternative energy sources and minerals, including hydrogen, ammonia, critical minerals, and rare earths, each of which come with their own risks. Threats to the stability of energy

systems is growing along with the risks from cyber and physical attacks against energy infrastructure. Given the foregoing and faced with a wide variety of threats and risks, the concept of energy security must be interpreted in a broader, more inclusive way. As hydrocarbon use declines and more localized sources of energy increase, energy system vulnerabilities are likely to evolve in new ways rather than disappear entirely, so building resilience and adaptability into energy systems and supply chains must become a more urgent focus of energy security policy in Europe and elsewhere.

Geopolitical threats and vulnerabilities

There are any number of geopolitical threats to energy systems including embargoes, wars, terrorism, disruptions to sea lanes, and the exercise of market power in countries where energy is subject to political control.

Energy systems have evolved to where countries and whole regions are increasingly interlinked through electricity grids and land, air, and seaborne supply chains. Along with expanding connectivity and automation and an increasing number of connected devices and distributed energy resources, energy systems are increasingly vulnerable to physical and cyber-attacks, making energy security an evolving concern.

Physical and cyber-attacks on electricity systems have been documented in recent years. This includes attacks on the power grid in Ukraine in 2015, 2016, and during the ongoing war, as well as recent physical attacks on European pipelines and electricity grid infrastructure in the United States. Ukraine's Zaporizhzhia nuclear power plant, which is under Russian control, has come under fire several times during the war, risking a major nuclear disaster. In addition, the plant itself was left without electricity due to bombings, and as a result had to resort to diesel generators to sustain critical cooling systems. The decision by Russia to target and destroy Ukrainian energy infrastructure must be seen as an escalation of a long-standing Russian policy to use energy as a weapon and tool of coercion. But the scale of the attacks in Ukraine and the possibility that this type of hybrid warfare against energy infrastructure by Russia and other actors might spread beyond Ukraine is very real.

On September 26, 2022, the Nord Stream pipelines were sabotaged, putting Nord Stream 2 completely out of commission but leaving one of the twinned Nord Stream 1 pipelines intact. The attack on the pipelines occurred one day after Poland and Norway opened the Baltic pipeline that will take

North Sea gas from Norway to Poland. The Baltic pipeline creates an alternative supply of gas for Europe from a friendly western ally rather than from Russia as the Nord Stream pipelines do. No evidence has yet surfaced as to who perpetrated the sabotage, but many observers strongly suspect Russia; it is possible that Russia sabotaged its own infrastructure, either out of spite or as a warning to the West that pipelines – indeed, all energy infrastructure – are potentially vulnerable to attack (Scisłowska, Olsen, and Keyton 2022).



Parts of Europe remain at risk from the Russian weaponization of energy supplies.

Russia's attacks on Ukraine's electricity infrastructure have put about 50 percent of the country's grid out of commission. The Ukraine conflict has also led to oil, gas, and commodities infrastructure being targeted in the Black Sea area. Cyber-attacks on energy infrastructure may become more prevalent as part of increased tensions and the use of hybrid warfare. According to a recent report, a total of 45 cybersecurity incidents worldwide targeting energy and commodities infrastructure have taken place since 2017. Thirteen of those incidents took place in the first three quarters of 2022, making it a record year for cyber security incidents targeting the energy sector (S&P Global Commodity Insights Undated; Gupte 2022). European countries are far from immune to potential attacks. Lithuania's state-owned energy group Ignitis, Ukraine's state nuclear power company Energoatom and Greece's largest natural gas supplier DESFA were among the companies hit by cyber attacks in 2022 (Gupte, Eklavya. 2022).

Despite Europe's reduced reliance on Russian oil and gas supplies, parts of Europe remain at risk from the Russian weaponization of energy supplies. LNG imports are significant and remain relatively unaffected by the import restrictions. Also, parts of Europe with Russian VVER nuclear reactors including Bulgaria, the Czech Republic, Slovakia, Hungary, and Finland rely on Russian deliveries of nuclear fuel.

Norway has stepped up exports of gas to EU countries, but it has a long coastline and 9000 kilometres of pipelines that are sending oil and gas to the UK and Europe. It is one example of the immense challenges of securing energy systems from possible attacks. In January 2023 the EU Commission and NATO established a joint task force to counter threats to Europe's infrastructure in light of the sabotage of the Nord Stream pipelines (Euronews 2023).

Cyber and hybrid warfare along with physical attacks against energy systems and energy infrastructure by rogue states and grey-zone actors are likely to increase in the future because the physical and psychological impact of such attacks is considerable, yet the costs of mounting them relatively low. Energy infrastructure in Europe (and globally) remains highly vulnerable to attacks and disruptions, and much needs to be done to improve robustness and resilience against such threats. The Eurasia Group warns that "A humiliated Russia will turn from global player into the world's most dangerous rogue state, posing a serious security threat to Europe, the United States, and beyond" (Eurasia Group 2023). As tensions increase between the West and rogue states, the risk of attacks on Western energy infrastructure and energy systems also rise.

Geopolitics and global competition

Competition between great powers – and even competition between regions – is making cooperation on global issues and threats increasingly difficult. There is a trend toward stronger regional integration and even protectionism, and the world appears to be dividing itself into blocs of economic and geopolitical power. The recent tensions between the US and Europe caused by trade barriers and industrial policies despite close cooperation on climate change and in standing up against Russian aggression in Ukraine is just one example. The US *Inflation Reduction Act* is set to shut out many European suppliers of clean technologies from the US market and cause companies to move to the US and Canada where they can have access to the North American market. The Organization of the Petroleum Exporting Countries (OPEC), especially Saudi Arabia, are going to become more powerful in the short- to medium-term, not less powerful, because scarcer and limited oil production capacity will be increasingly concentrated in those countries. The implications for Europe – and Canada – are obvious.

Impacts on Asian supply and demand

Energy security will be a top priority for Asia and Europe for at least the next couple of years in the aftermath of the sanctions against Russian oil and gas supplies. Disruptions in the flow of oil and pipeline gas have changed market dynamics significantly. Russian oil that formerly flowed to Europe is now being diverted to India, China, and other markets in Asia.

The ban on Russian oil products that began on December 5, 2022, is paving the way for major Asian fuel producers to maintain their production and sharply increase their shipments of diesel fuel and other refined oil products to Europe. Ironically, these shipments will use Russian crude oil feedstocks and be sold to Europe at premium prices. European traders are willing to pay premium prices to acquire diesel fuel from Asia so that they can actively stock up on liquid fuels to support the region's power and industrial sectors, as well as meet heating needs (Vahn, Zhou, and Mohanty 2022).

Since the Russian invasion of Ukraine and the cut-off of Russian gas supplies to Europe, the EU and Asia have been competing for limited LNG cargoes from other suppliers. In North Asia, both Japan and South Korea have been securing LNG shipments, diversifying sources, and building stockpiles of gas for the winter season. As a result, prices have set record highs on both markets amid intense competition and supply-side problems. Up to this point, Europe has managed to outbid Asia for these cargoes because of higher prices in Europe and lower demand in Asia, including in China where demand remains depressed due to its (until only recently) COVID-19 lockdowns (Paraskova 2022).

Since the Russian invasion of Ukraine, Japan has been trying to wean itself off Russian oil and gas supplies. However, Japanese companies retain partial ownership in the Sakhalin 1 and 2 oil and gas projects and continue to import oil and gas from there. Due to its heavy reliance on imported fuels, Japan received an exemption from the import ban on Russian oil and gas from its G7 partners. However, as long as Japan has to continue to rely on Russian fuel imports, it is vulnerable to Russia's weaponization of energy.

The pace at which China's economy recovers following the sudden relaxation of its zero-COVID policy is the single most important factor that will determine global demand in commodities and energy in 2023. China's total

energy demand is forecasted to increase by the equivalent of 3.3 million barrels of oil a day in 2023 from almost no growth in 2022 and represent 47 percent of all global energy demand growth in 2023 (Bove 2022). This would not only drive up the price of oil and gas, but it would also feed global inflation and possibly cause central banks to tighten further. This means that high energy prices and inflation will likely continue to plague Asia as well as Europe as 2023 progresses.

Canada and Europe: Policy implications

In the midst of the current energy crisis, Germany's chancellor asked Canada to help alleviate gas shortages by facilitating the export of LNG to Europe. In advance of European Commission President Ursula von der Leyen's visit to Canada, she called for Canada to "broaden its exports of liquefied natural gas as an interim step toward more hydrogen exports" (Canadian Press 2023). Europe acknowledges that the most immediate priority is finding alternative oil and natural gas supplies in order to make up for the loss of Russian energy supplies.

Yet the reply to these urgent pleas for help in ensuring Europe's energy security have been met with indifference by the Canadian government. No call to action for LNG exports have been made. No efforts to speed up approvals and expedite the construction of new LNG export terminals have been proposed. Instead, there were pledges to help with Europe's long-term need for hydrogen. But this will do nothing to help Europe in the short- to medium-term. The message to Europe and global markets is clear: Canada cannot be relied upon to help meet global energy security needs anytime soon.

The current inventory of energy export projects in Canada that could help satisfy Europe's needs is extremely thin. The West Coast is the only region in Canada that currently has both access to feedstocks and terminals under construction or proposed. The TransMountain pipeline expansion project, which will bring crude oil from Alberta to an export terminal in Burnaby, BC, should be complete by the autumn of 2023. The project will almost triple the volume

of oil available for offshore export and will make an important contribution to global energy security. Primary markets for this oil are expected to be in Asia and California.

While a number of Canadian LNG export facilities have been proposed over many years, none have yet been built. Currently on Canada's West Coast there is only one LNG export facility under construction with another scheduled to begin construction later in 2023.⁴ The largest of the two by far – the LNG Canada project – is now over 70 percent complete and on track to begin shipping by 2025. The current project has a capacity of 14 million tonnes per annum (mtpa) but the company has already stated there is a strong case for doubling plant capacity to 28 mtpa in future (Potkins 2022). The shipments from Canada's West Coast will almost surely go to Asia given Canada's proximity to the region and shorter shipping times. This will benefit Europe indirectly by helping alleviate the competition for LNG supplies in Asia and freeing up LNG volumes from the US Gulf Coast to go to Europe.

Beyond fossil fuels, Canada has significant endowments of mineral resources and access to clean hydroelectricity that could help contribute to European energy security over the longer-term. Hydrogen, ammonia, biogases, critical minerals, and rare earths are the most prominent examples of emerging alternative energy sources being actively developed in Canada.

In December 2020, Natural Resources Canada released its Hydrogen Strategy for Canada to provide a framework to stimulate investments and to promote hydrogen's role in Canada's net zero future, while also positioning Canada as a "supplier of choice" to the world for clean hydrogen and related technologies. Since the Russian invasion of Ukraine, the EU has stepped up plans to replace some Russian energy with "green" hydrogen. The Canada-Germany Hydrogen Alliance, announced in August 2022, is aligning policies and investments to develop hydrogen supply chains between the two countries. Canada hopes to begin exporting hydrogen to Europe by 2025 (Natural Resources Canada 2022).

Canada recently released its new critical minerals strategy and has committed significant funds toward building critical minerals and battery supply chains to help meet the growing demand for electric vehicles. However, building a full "mines to mobility" supply chain is still years away. The Canada-EU Strategic Partnership on Raw Materials was established to be the primary mechanism for engagement with Europe on critical mineral and battery value

chains. The overarching objective of the partnership is to advance the value, security, and sustainability of trade and investment into the critical minerals needed for the clean energy transition. The two parties have agreed upon areas in which they will collaborate: the integration of raw materials value chains; science, technology, and innovation; and in international forums to advance world-class environmental, social, and governance (ESG) criteria and standards (Canada 2023).

These are positive developments, but they pale in comparison to Canada's potential as an energy resource supplier to the world. Unfortunately, this potential has been severely limited by bad policy and a lack of vision.

Good energy policy should balance economic, environmental, and energy security concerns, which implies that trade-offs will have to be made. However, energy policy in both North America and Europe have largely shared a myopic approach by prioritizing environmental concerns over all other considerations and have “lost sight of the important contribution that energy makes to economic resilience and regional security” (Mintz and Wallace 2022).

Canada's impotence in contributing to global energy security can be traced to the approach it has taken to the energy transition. As a recent report pointed out, the impact of energy transition policies in Canada are undermining continental energy security and national security, similar to what has taken place in Europe. The report's authors state that “just when North American energy could be backfilling against sanctioned Russian oil and gas, Canada has limited additional supply available for export – a circumstance further hampered by an inadequate infrastructure that limits options for potential exports” (Mintz and Wallace 2022).

In short, Canada's contribution to Europe's energy security is likely to be rhetorical rather than practical, at least in the short- to medium-term. While new export projects for oil and LNG will soon come online, Canada's supply chains for critical minerals, batteries, and other clean energy technologies will take much more time and are more likely to be aimed at satisfying the North American rather than the European market. As Canada pursues its hydrogen strategy and infrastructure is gradually built for hydrogen, there will be more opportunities for exports of ammonia and hydrogen in future.

Conclusion

In September 2022, Vladimir Putin said that Europeans would “freeze” if the West maintained its energy sanctions against Russia. Yet as spring 2023 approaches, it seems that Europeans have managed the energy crisis exceedingly well with a combination of effective short-term policy responses, massive spending, and the luck of a mild winter. Europe’s success at replacing Russian pipeline gas with LNG sourced from friendly suppliers like the United States and Norway have helped the region fill its stockpiles. Gas and electricity prices have fallen from their highs and Europe avoided rolling blackouts. New plans to build LNG infrastructure, speed up renewables capacity, and improve energy efficiency are underway. Putin’s goal to make Russia the principal energy supplier to Europe has failed and his gambit to use energy as a weapon to force Europe and Ukraine’s hand has thus far come to naught.

Yet the energy crisis is not over. Gas and electricity prices remain much higher than before the invasion of Ukraine and this is seriously threatening European industrial competitiveness. But over the past several months, Europeans have managed the energy crisis exceedingly well, employing a combination of effective short-term policy responses and massive spending while benefiting from a mild winter. A recovering economy in China could cause oil prices to spike again. Ambitious plans for scaling up renewables face regulatory hurdles. And the potential remains for Russia to ramp up acts of sabotage, cyber warfare, and other threats to European energy infrastructure. Besides dealing with climate change, Europe also has to respond to the threats of deindustrialization, inflation, and unemployment, and to calls for massive investments in infrastructure and defence, and other fiscal pressures.

The Russian invasion of Ukraine has exposed deep fault lines in the global energy system. This is especially stark in the divide between rich and poor nations. Countries such as those in Europe who can afford to pay rising energy prices are buying up natural gas while at the same time accelerating their move toward renewable power such as wind and solar. Those countries that can’t afford the rising costs of energy (including many in developing Asia and Africa) are moving toward greater reliance on dirtier fuels such as coal.

In a responsible energy transition where the goal is to mitigate emissions as fast as possible while maintaining economic sustainability and affordable

energy prices, countries should consider all low-carbon sources (Kucharski and Exner-Pirot 2022). Despite the short-term success in managing the crisis, Europe continues to demonstrate a preference for idealism over realism in its energy policies. With the IPCC's 1.5°C goal out of reach and the strong likelihood of between 2 and 3 degrees of global warming, there is no acknowledgement of this reality in Europe (or elsewhere), which leads to policies that would rely almost totally on variable renewables despite the significant technical, economic, and energy security risks this path poses. The continued resistance to nuclear power in Europe and the failure to move rapidly toward the development of a diversified portfolio of any and all emissions-free sources of energy is baffling in the face of the region's urgent need for stable, clean, and reliable power.



Europe continues to demonstrate a preference for idealism over realism in its energy policies.

The Russian invasion of Ukraine and the subsequent cut-off of Russian energy supplies have taught Europe a hard lesson about the dangers of over-reliance on unfriendly suppliers for strategic commodities. The current energy crisis is also a reminder that Europe needs to strike the right balance between ensuring stable, affordable supplies of energy and meeting the challenges of climate change. Rash decisions to rapidly phase out fossil fuels and instead rely heavily on renewables comes with its own energy security risks. There is no guarantee that Europe will be able to reach its ambitious renewables targets if the critical minerals it needs to manufacture the infrastructure for the renewables projects are constrained, unavailable, or too costly. Europe must be careful and prudent about winding down the existing fossil fuel supply as some parts of the fossil fuel system remain vital for energy security, and the region needs to manage the retirement and reuse of existing infrastructure (IEA 2022a).

Despite the ever-increasing ambition of the UN's climate change summits and their singular focus on decarbonization, the invasion of Ukraine and the deepening energy crisis have demonstrated to the world that economies still

rely heavily on hydrocarbons to meet their basic energy needs. The fact remains that a hydrocarbon-based energy system will need to continue to exist alongside a growing clean energy system for several decades to come. Governments must balance decarbonization efforts with other important societal goals like economic stability, energy affordability, and national security.

The clean energy transition is unlikely to be effective or efficient if it is solely a “managed transition” – that is, with governments directing industrial policy on a top-down basis. The scale of investment and innovation required means that markets must also be free to experiment and invest where it makes economic and technological sense. Governments in Europe, as elsewhere, should beware of prescriptive measures that are not market-based and focus on revising and streamlining regulations and permitting, removing trade barriers, being judicious in the use of subsidies, adapting market structures, and correcting market failures.

Despite the ever-increasing ambition of the UN’s climate change summits and their singular focus on decarbonization, the invasion of Ukraine and the deepening energy crisis have demonstrated to the world that energy security still matters and that hydrocarbons still remain essential to meeting basic energy needs. Governments must balance decarbonization efforts with other important societal goals like economic stability, energy affordability, and national security. [MLI](#)

About the author



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References

Abnet, Kate. 2022. “European Governments Spend Half a Trillion Euros on Energy Crisis – Report.” Reuters (September 21). Available at <https://www.reuters.com/markets/europe/european-governments-spend-half-trillion-euros-energy-crisis-report-2022-09-21/>.

Abnett, K., & Baczyńska, G., 2022. “EU countries to back energy windfall levies, lock horns over gas price cap.” Reuters (September 30). Available at: <https://www.reuters.com/business/energy/eu-countries-back-energy-windfall-levies-lock-horns-over-gas-price-cap-2022-09-30/>

Alvarez, Carlos Fernández, and Gergely Molnar. 2021. “What is Behind Soaring Energy Prices and What Happens Next?” International Energy Agency (October 12). Available at <https://www.iea.org/commentaries/what-is-behind-soaring-energy-prices-and-what-happens-next>.

Bellamy, Daniel. 2022. “New Green Hydrogen Pipeline Planned Between Barcelona and Marseille.” *Euronews* (September 12). <https://www.euronews.com/2022/12/09/new-green-hydrogen-pipeline-planned-between-barcelona-and-marseille>.

Bouso, Ron. 2022. “Britain’s Windfall Tax Risks North Sea Cash Flight, Output Drop, Industry Warns.” Reuters (November 22). Available at <https://www.reuters.com/business/energy/britains-windfall-tax-risks-north-sea-cash-flight-output-drop-industry-warns-2022-11-22/>.

Bove, Tristan. 2022. “China’s reopening is going to be a gas guzzler. S&P sees it sucking up 3.3 million barrels of oil a day” *Fortune*. Available at <https://fortune.com/2022/12/12/china-reopening-energy-demand-oil-surge-europe-crisis/>.

Bruegel Datasets, 2022. Available from: <https://www.bruegel.org/dataset/european-natural-gas-imports>

Canada. 2023. Our Critical Minerals Strategic Partnerships. Government of Canada. Available at: <https://www.canada.ca/en/campaign/critical-minerals-in-canada/our-critical-minerals-strategic-partnerships.html>.

Canada, Department of Finance. 2022. “G7 and Australia Move Forward with Price Cap on Russian Oil.” News Release. Government of Canada. Available at <https://www.canada.ca/en/department-finance/news/2022/12/g7-and-australia-move-forward-with-price-cap-on-russian-oil.html>.

Canadian Press. 2023. “Canada should focus on exporting clean hydrogen to Europe, EU head says”. The Globe and Mail (March 6). Available at: <https://www.theglobeandmail.com/business/industry-news/energy-and-resources/article-canada-should-focus-on-exporting-clean-hydrogen-to-europe-eu-head-says/>

CarbonBrief. 2023. *European Commission releases Net-Zero Industry Act*. Carbon Brief (March 17). Available at: <https://www.carbonbrief.org/daily-brief/european-commission-releases-net-zero-industry-act/>

Cooban, Anna. 2022. “Europe Still Can’t Live Without This Russian Energy Export.” CNN Business (November 10). Available at <https://www.cnn.com/2022/11/09/energy/russian-lng-imports-europe/index.html>.

De Beaurepaire, C. 2023. “EU seeks to diversify critical raw material supply away from China”. Nikkei Asia (March 17). Available at: <https://asia.nikkei.com/Economy/Trade/EU-seeks-to-diversify-critical-raw-material-supply-away-from-China>

DiChristopher, Tom. 2022. “Europe Facing Gas Insecurity, ‘Uncontrolled Deindustrialization’ through 2025.” S&P Global (October 13). Available at <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/natural-gas/101322-europe-facing-gas-insecurity-uncontrolled-deindustrialization-through-2025> [paywall].

Eckert, V et al. 2022. How dependent is Germany on Russian gas? Reuters (March 8, 2022). Available at: <https://www.reuters.com/business/energy/how-dependent-is-germany-russian-gas-2022-03-08/>

Eckert, Vera. 2022. “Germany Completes Wilhelmshaven Floating LNG Terminal, More to Come.” Reuters (November 15). Available at <https://www.reuters.com/business/energy/germany-completes-construction-wilhelmshaven-floating-lng-terminal-2022-11-15/>.

Ember and Statista, 2021. Available at: <https://ember-climate.org/>

Ember and Statista, 2023. Available at : <https://www.statista.com/statistics/1267500/eu-monthly-wholesale-electricity-price-country/?locale=en>

EnergyNow. 2022. “Russian Pipeline Gas Exports to Europe Collapse to a Post-Soviet Low.” EnergyNow (December 29). Available at <https://energynow.ca/2022/12/russian-pipeline-gas-exports-to-europe-collapse-to-a-post-soviet-low/>.

Eurasia Group. 2023. *Top Risks 2023*. Eurasia Group. Available at <https://www.eurasiagroup.net/issues/top-risks-2023>.

Euronews. 2023. “NATO and EU bolster infrastructure security plans.” Euronews. Available from: <https://www.euronews.com/2023/01/11/nato-and-eu-bolster-infrastructure-security-plans>.

European Association for Storage of Energy. 2022. “REPowerEU Recognises the Role of Energy Storage, but the Lack of a Dedicated Storage Strategy is a Missed Opportunity”. EASE Storage (May 19). Available at: <https://ease-storage.eu/news/repowereu/>

European Commission. 2022a. *Proposal for a Council Regulation Enhancing Solidarity Through Better Coordination of Gas Purchases, Exchanges of Gas Across Borders and Reliable Price Benchmarks*. Document 52022PC0549. European Commission (October 18). Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A549%3AFIN&pk>.

European Commission. 2022b. *Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions*. Document 52022DC0230. European Commission (May 18). Available at <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2022%3A230%3AFIN&qid=1653033742483>.

European Commission. 2022c. “REPowerEU: A Plan to Rapidly Reduce Dependence on Russian Fossil Fuels and Fast Forward the Green Transition.” Press Release. European Commission (May 18). Available at https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131.

European Commission. Undated. EU Energy Platform. European Commission. Available at https://energy.ec.europa.eu/topics/energy-security/eu-energy-platform_en.

European Council. 2022a. “Where Does the EU’s Gas Come from?” [Infographic]. European Council (December). Available at <https://www.consilium.europa.eu/en/infographics/eu-gas-supply/>.

European Council. 2022b. “Liquefied Natural Gas Infrastructure in the EU” [Infographic]. European Council. Available at <https://www.consilium.europa.eu/en/infographics/lng-infrastructure-in-the-eu/>.

European Council. 2022c. “Council Formally Adopts Emergency Measures to Reduce Energy Prices.” Press release. European Council (October 6). Available at <https://www.consilium.europa.eu/en/press/press-releases/2022/10/06/council-formally-adopts-emergency-measures-to-reduce-energy-prices/>.

European Council. 2023. “EU Sanctions Against Russia Explained.” European Council. Available at <https://www.consilium.europa.eu/en/policies/sanctions/restrictive-measures-against-russia-over-ukraine/sanctions-against-russia-explained/>.

European Nuclear Society [ENS]. 2022. Nuclear Basics. ENS. Available at <https://www.euronuclear.org/>.

European Parliament. 2022. “Deal Reached on New Carbon Leakage Instrument to Raise Global Climate Ambition.” Press release. European Parliament (December 13). Available at <https://www.europarl.europa.eu/news/en/press-room/20221212IPR64509/deal-reached-on-new-carbon-leakage-instrument-to-raise-global-climate-ambition>.

Eurostat 2021. *Gas consumption in the EU*. Available at: <https://www.consilium.europa.eu/en/infographics/eu-gas-supply/#:~:text=In%202021%2C%20the%2027%20countries,gas%20to%20heat%20their%20homes>

Eurostat. 2022a. *Energy mix and import dependency*. Available from: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_energy_mix_and_import_dependency#Energy_mix_and_import_dependency

Eurostat 2022b. *Extra-EU Imports of Energy 2021-22*. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_imports_of_energy_products_-_recent_developments#Main_suppliers_of_natural_gas_and_petroleum_oils_to_the_EU

Eurostat 2022c. *Energy Production and Imports*. European Union (January). Available from: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_production_and_imports.

Eurostat 2023. *Main suppliers of natural gas and petroleum oils to the EU*. Available at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=EU_imports_of_energy_products_-_recent_developments#Main_suppliers_of_natural_gas_and_petroleum_oils_to_the_EU

Eurostat and Statista, 2023. Available at: <https://www.statista.com/statistics/800217/eu-power-production-by-fuel/>

Foltynova, K. 2022. *Russia's Stranglehold On The World's Nuclear Power Cycle*. Radio Free Europe/Radio Liberty (September 1). Available at: <https://www.rferl.org/a/russia-nuclear-power-industry-graphics/32014247.html>

Global Energy Monitor. 2022. *Europe Gas Tracker [Map]*. Global Energy Monitor. Available at <https://globalenergymonitor.org/projects/europe-gas-tracker/tracker-map/>.

Gupte, Eklavya. 2022. "Energy Security Sentinel: Cyberattacks Surge in 2022 as Hackers Target Commodities." S&P Global (October 10). Available at <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/electric-power/101022-energy-security-sentinel-cyberattacks-surge-in-2022-as-hackers-target-commodities>.

Hanley, J. 2022. *The Battle for 1.5 Degrees of Warming Is Already Lost, So What's Plan B?*. American Institute for Economic Research (April 7). Available at: <https://www.aier.org/article/the-battle-for-1-5-degrees-of-warming-is-already-lost-so-whats-plan-b/>

International Energy Agency [IEA]. 2022a. *World Energy Outlook 2022*. IEA. Available at <https://www.iea.org/reports/world-energy-outlook-2022>.

International Energy Agency [IEA]. 2022b. *Renewables 2022*. IEA (December). Available at <https://www.iea.org/reports/renewables-2022>.

International Energy Agency [IEA]. 2022c. "How the European Union Can Avoid Natural Gas Shortages in 2023." IEA (December 15). Available at <https://www.iea.org/news/how-the-european-union-can-avoid-natural-gas-shortages-in-2023>.

International Energy Agency [IEA]. 2022d. *Wind Electricity Tracking Report* (September). Available at <https://www.iea.org/reports/wind-electricity>.

International Energy Agency [IEA]. 2023. *Oil Market Report – January 2023*. IEA. Available at <https://www.iea.org/reports/oil-market-report-january-2023>.

Jedrych, Jacqueline. 2022. “The EU Needs Alternatives to Russian Energy. Here’s the Plan.” Council on Foreign Relations (December 13). Available at <https://www.cfr.org/in-brief/eu-needs-alternatives-russian-energy-heres-plan>.

Jolly, J. 2023. “BASF to cut 2,600 jobs as energy crisis puts Germany on track for recession”. The Guardian (February 24). Available at: <https://www.theguardian.com/business/2023/feb/24/basf-cut-jobs-energy-crisis-germany-recession>

Konig, Olof, Fredric Ericsson, and Riccardo Ovidi. 2023. “EU Introduces Additional Sanctions Against Russia.” Sanctions and Export Controls Update. Baker Mackenzie. Available at <https://sanctionsnews.bakermckenzie.com/eu-introduces-additional-sanctions-against-russia/>.

Kucharski, Jeffrey B. 2022. *The Evolution of Energy Security in the Indo-Pacific: Why Is It Important for Canada?* Commentary. Macdonald-Laurier Institute. Available at https://macdonaldlaurier.ca/wp-content/uploads/2022/02/Feb2022_Evolution_energy-security_Indo-Pacific_Kucharski_COMMENTARY_FWeb.pdf

Kucharski, Jeffrey B., and Heather Exner-Pirot. 2022. “Canada’s Role in Global Energy Security: Practical Considerations for a Low-Carbon Transition.” *Canadian Foreign Policy Journal* 24, 3 (November): 1-15.

Mazneva, Elena, and Anna Shiryaevskaya. 2022. “EU Gas Price Cap Would Have Been Triggered on More than 40 Days This Year.” BNN Bloomberg (December 19). Available at <https://www.bnnbloomberg.ca/eu-gas-price-cap-would-have-been-triggered-on-more-than-40-days-this-year-1.1861374>.

Mining Technology. 2022. “European Commission Announces New Critical Minerals Legislation.” Mining Technology (September 15). Available at <https://www.mining-technology.com/news/european-critical-minerals-legislation/>.

Mintz, Jack, and Ron Wallace. 2022. *The Global Energy Transition Confronts East vs. West realpolitik: Why Energy Security Matters*. MacDonald-Laurier Institute (April 12). Available at <https://macdonaldlaurier.ca/the-global-energy-transition-confronts-east-vs-west-realpolitik-why-energy-security-matters/>.

Natural Resources Canada. 2022. “Canada and Germany Sign Agreement to Enhance German Energy Security with Clean Canadian Hydrogen.” News release (August 23). Government of Canada. Available at <https://www.canada.ca/en/natural-resources-canada/news/2022/08/canada-and-germany-sign-agreement-to-enhance-german-energy-security-with-clean-canadian-hydrogen.html>.

North Atlantic Treaty Organization [NATO]. 2022. “Short Remarks by NATO Secretary General Jens Stoltenberg and the Minister of Foreign Affairs of Ukraine Dmytro Kuleba.” NATO (November 29). Available at https://www.nato.int/cps/en/natohq/opinions_209648.htm.

Paraskova, Tsvetana. 2022. “Asian LNG Importers Set to Benefit from the EU Gas Price Cap.” OilPrice.com (December 20). Available at <https://oilprice.com/Latest-Energy-News/World-News/Asian-LNG-Importers-Set-To-Benefit-From-The-EU-Gas-Price-Cap.html>.

Potkins, Meghan. 2022. “LNG Canada CEO Says Case for Doubling Export Capacity ‘Very Strong.’” *Financial Post* (September 29). Available at <https://financialpost.com/commodities/energy/oil-gas/lng-canada-kitimat-export-liquefied-natural-gas>.

Robinson, Therese. 2022. “Russian LNG Exports Continue to Grow as Kremlin Targets Expansions.” Natural Gas Intelligence (November 28). Available from: <https://www.naturalgasintel.com/russian-lng-exports-continue-to-grow-as-kremlin-targets-expansions/>.

S&P Global Commodity Insights. Undated. *Energy Security Sentinel*. S&P Global. Available at <https://storymaps.arcgis.com/stories/6e44901bfd7e421ca06cacc7c6e9ea1d>.

Sapir, André. 2021. “The European Union’s Carbon Border Mechanism and the WTO.” Blog post. Bruegel (July 19). Available at: <https://www.bruegel.org/blog-post/european-unions-carbon-border-mechanism-and-wto>.

Scislowska, Monika, Jan M. Olsen, and David Keyton. 2022. “Blasts Precede Baltic Pipeline Leaks, Sabotage Seen Likely.” AP News (September 27). Available at <https://apnews.com/article/russia-ukraine-germany-berlin-00232df3f4b4bc89afd47d4707724e33>.

Sgaravatti, Giovanni et al. 2023. *National fiscal policy responses to the energy crisis*. Bruegel. <https://www.bruegel.org/dataset/national-policies-shield-consumers-rising-energy-prices>

Statista 2023. *Production of primary energy in the EU, 2019-2021*. Available at: <https://www.statista.com/statistics/236316/primary-energy-consumption-in-the-eu-by-fuel-in-oil-equivalent/>

Timmins, Beth. 2022. “EU Agrees Windfall Tax on Energy Firms.” *BBC News* (September 30). Available at <https://www.bbc.com/news/business-63089222>.

UN Climate Change Conference UK. 2021. “Secure Global Net Zero and Keep 1.5 Degrees Within Reach.” UN Climate Change Conference UL 2021 [COP26]. Available at <https://ukcop26.org/cop26-goals/mitigation/>.

United States Energy Information Agency [EIA]. 2022. “Europe’s LNG Import Capacity Set to Expand by One-Third by End of 2024.” *Today in Energy* (November 28). Available at <https://www.eia.gov/todayinenergy/detail.php?id=54780>.

Vahn, Gawoon Philip, Analyst Oceana Zhou, and Sambit Mohanty. 2022. “APPEC: Energy Security Focus to Drastically Shift Asia-Europe Oil Trade Flows.” S&P Global (September 26). Available at <https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/oil/092622-appec-2022-energy-security-focus-to-dramatically-shift-asia-europe-oil-trade-flows>.

Zettelmeyer, Jeromin, Simone Tagliapietra, Georg Zachmann, and Conall Heussaff. 2022. *Beating the European Energy Crisis*. International Monetary Fund (December). Available at <https://www.imf.org/en/Publications/fandd/issues/2022/12/ beating-the-european-energy-crisis-Zettelmeyer>

Endnotes

- 1 The United States formed a “coalition of the willing” comprising 38 allies who have implemented sanctions and/or export controls on Russia. This coalition consists of Australia, Canada, the 27 EU member states, Iceland, Japan, Liechtenstein, New Zealand, Norway, South Korea, Switzerland, the United Kingdom, and the United States.
- 2 CO2 prices almost doubled – to €85/tonne – compared to 2021.
- 3 Based on German gas consumption of 90.5 billion cubic metres in 2021.
- 4 The other project is the Woodfibre LNG project that will be based in Squamish, BC.

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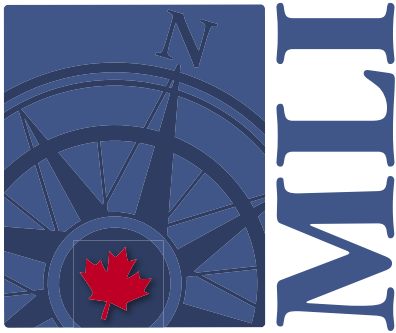
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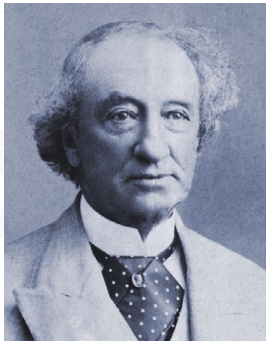




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