

Four challenges of the energy crisis for the EU's strategic autonomy

SUMMARY

That the EU imports almost 60 % of its energy shows that real EU strategic autonomy in energy is far from achieved. The current energy crisis poses a risk to all four EU energy policy objectives. Crisis in the energy market is causing public and private debt and inflation, which risks destabilising the European energy market. While diversifying gas imports away from Russia reduces dependency on one big supplier, reliance on several other third countries implies new supply risks. Although high fossil fuel prices may accelerate the transition towards renewable energy, short-term investment in alternative fossil fuels and energy price caps risk diluting incentives for the green transition. Finally, improved cross-border energy network connectivity is susceptible to the yet untested risk of a lack of solidarity between Member States in the event of a structural supply crisis. Now that energy policy is increasingly determined by geopolitics, mitigating these risks is essential.

So far, the EU has managed these four challenges quite well, although concerns remain. Diversification of supply, filling gas storage and a relatively mild winter have limited the impact of the energy crisis. Initially, most responses to the crisis came from national governments, safeguarding their national strategic autonomy in energy matters. Member States took the lead with short-term measures to diversify supply and mitigate the effect of rising prices, mostly according to national energy priorities. The EU has also reacted swiftly, with a range of strategies and practical measures designed to increase coherence and EU strategic autonomy. The measures focus both on the internal autonomy of a functioning and well connected internal market and on the external autonomy of supply security in a global market. One of the biggest challenges will be to enhance strategic autonomy for renewable energy, for instance by producing renewables in the EU, while managing dependence on imports of the necessary raw materials.



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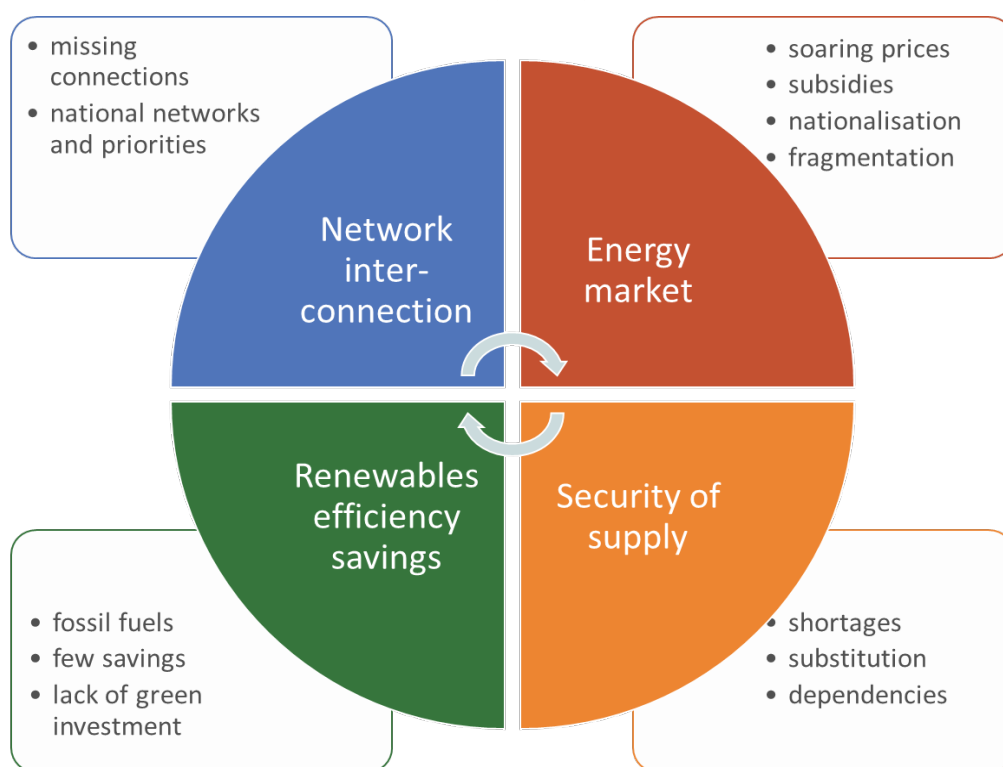


Four challenges ensuing from the energy crisis

A main driver of European integration, as the European Coal and Steel Community of 1951 and the Euratom Treaty of 1956 illustrate, a focus on energy policy returned to the political agenda after the 1973 oil crisis and the 1992 Rio Declaration on Sustainable Development. Article 194 of the Treaty on the Functioning of the EU (TFEU) provided a reinforced legal basis for EU energy policy in 2009. The March 2022 [Versailles Declaration](#)¹ brought energy policy back to the heart of EU policy, emphasising the need to build European sovereignty – another expression for strategic autonomy – and reduce energy dependencies.

Today, the EU is far from energy independence, importing almost 60 % of its energy (57.5 % in 2020). The current energy crisis could make achieving strategic energy autonomy even harder, challenging all four objectives of Article 194 TFEU: a functioning energy market; security of supply; energy efficiency and saving, combined with the development of renewable energy; and energy network interconnection. These objectives were formulated at a time when the primary concern was the transformation of national energy markets with a high degree of public ownership into a European energy market. The second paragraph of the article implies security of energy supply was primarily seen as a national responsibility: 'Member State's right to determine [...] its choice between different energy sources and the general structure of its energy supply'. The sense of urgency on supply security may have been low, as few Member States had experienced large-scale supply interruptions (the 1973 oil crisis; the 2006 and 2009 interruptions of Russian gas delivery via Ukraine). Climate change increases the importance of energy efficiency, saving and a transition to renewable energy.

Figure 1 – Challenges to the four EU energy policy objectives



To enhance strategic energy autonomy, the EU should address all four challenges of the energy crisis. From its beginnings as an economic crisis of increased prices, the energy crisis has evolved into a supply security crisis. A short-term focus on diversifying fossil fuel supply could risk achieving the climate goals, set globally by the Paris Climate agreement and in the EU by the European Green Deal. Network connectivity and Member States solidarity are therefore critical.

A market challenge

After a low during the first COVID-19 lockdown in 2020, gas and oil prices [rose steadily](#) from mid-2020. As the pandemic abated, instead of returning to 2019 levels, they continued to increase. Among the multiple causes were supply interruptions and increased global demand due to the post-pandemic economic recovery and weather conditions.² Towards the end of 2021, gas prices not only reached unprecedented levels, but also showed great volatility. As early as 2021, Russia started decreasing its gas exports to EU countries, and continued during 2022. Because [prices of different energy products](#) are closely linked, electricity prices also rose steeply. Increases in energy prices caused hardship for both private household consumers and commercial businesses. An increased number of private consumers could not pay their energy bills, leading to [energy poverty](#). Energy intensive industries, such as the steel, aluminium, cement, paper and chemicals industries, faced extreme rises in production costs. While these industries were already under pressure to change their energy consumption patterns in view of carbon emission reduction targets,³ the energy crisis increases the urgency to act. Possible options include production reduction and the use of government support programmes.⁴ The transport sector was equally hit, in particular by price rises for fossil fuels. A [Bruegel](#) think tank paper of September 2022 confirmed that the **EU was facing an energy market crisis with scarce supplies and high prices in all fuel markets**, making substitution of Russian gas more difficult. Coal could only replace gas or oil to a limited extent, because capacities are limited and coal prices tripled in the second quarter of 2022. Because investments in renewable energy sources such as solar and wind had not been sufficiently accelerated prior to the crisis, these could not sufficiently serve as alternatives. Finally, 'unlucky coincidences', such as corrosion in French nuclear power plants and low water levels due to drought equally limited the role of nuclear energy and hydrogen power as fall-back options. As a result, **liquid natural gas (LNG) imports have become the most important means of substituting Russian gas, but at a considerable price.**

A strong and short-term focus on energy prices entails the risk of uncoordinated market interventions and destabilisation of the European energy market. Until 2020, the main concern of most EU governments was to reduce carbon emissions and initiate a green transition towards more renewable energy sources. This involved a mix of carbon pricing and investment in renewables. However, the energy crisis incited many governments to take immediate action to ensure energy supply and to mitigate price increases. In May 2022, five European think tanks joined forces to make an [initial assessment](#) of national measures. They concluded that the overall government spending on crisis measures was nearing 2 % of EU gross domestic product (GDP) – which is high compared to the recommended national budget stimulus of 1.5 % of EU GDP for the 2008-2009 European Economic Recovery Plan for the financial crisis. They called for better coordination of national responses and signalled the dilemma between energy price reduction and the fact that this reduces incentives to save energy.

Continued high energy prices also create second order economic risks. Among these are increased government debt, which at some point in time will have to be compensated for through tax revenue. Those taxes will weigh further on private and business consumers, who are already coping with another second-order effect of the crisis: inflation. This puts additional pressure on the economic affordability of energy. If the cumulative effect of these economic risks cannot be mitigated, further second-order risks could include social unrest (similar to the 'yellow vest' movement in France in 2018-2019, initiated by high fuel prices and living costs), bankruptcies, economic recession, or ultimately disintegration of the internal market. An April 2022 European Parliament [study on future shocks](#) concluded that the effects of the energy market crisis will mostly depend on how long high prices continue. According to the Bruegel think tank, until early 2023, EU countries had managed the energy market crisis quite well. However, because supply of affordable LNG is highly dependent on the world market, it [recommended](#) continued demand reduction, even after March 2023.

A supply security challenge

While the energy market crisis began in 2021, serious risks for the security of supply of energy only became apparent after the Russian invasion of Ukraine in February 2022 and the subsequent further reductions of Russian gas exports in the course of that year. Already on 8 March 2022, the European Commission published a [first](#) communication on the REPowerEU plan, in which it noted that the EU imported more than 40 % of its natural gas from Russia (45 % in 2021), as well as 27 % of its oil and 46 % of its coal. The communication aimed at reducing these dependencies. That same month, the International Energy Agency (IEA) published a [10-point plan](#) to reduce EU reliance on Russian natural gas, as well as a plan to [cut the use of oil](#). On 18 May 2022, the Commission published a [second](#) version of the REPowerEU plan, pleading for a swifter reduction of dependencies. The tone of the document combines concern with optimism, suggesting that a triple approach of saving energy, diversifying supply and accelerating the rollout of renewables would compensate for Russian energy sources. The necessity to do so became obvious when several explosions seriously damaged both Nord Stream gas pipelines in September 2022.

New fossil fuel contracts have so far mainly substituted Russian energy supply. In the course of 2022, EU governments have concluded new contracts for pipeline gas and LNG with a range of third countries. Hardest hit by falling Russian gas imports, Germany has been [particularly active](#), aiming at new or increased imports from countries as diverse as Algeria, Australia, Nigeria, Norway, Qatar and the United States. The EU also developed its energy relations with, for instance, [Algeria](#), [Azerbaijan](#), Egypt and Israel (signing a [joint memorandum](#) in July 2022) and the [US](#) (including an [EU-US task force](#) on energy security). These actions considerably reduce dependency on one big supplier, however increased reliance on several other third countries nevertheless also implies future supply risks, which may originate from economic or political tensions.

A different and possibly shorter-term risk to security of supply would be the bankruptcy of a main energy supply company in the EU, which could lead to a domino effect of liquidity problems in the energy sector and in the European economy as a whole. Bruegel warns against such a scenario in its paper of September 2022, noting that in some Member States the energy market is dominated by one big player.⁵ The German case of saving energy provider [Uniper](#) from bankruptcy through government intervention equally shows that this scenario is not merely theoretical.

A renewables challenge

In the years between the conclusion of the Paris Climate Agreement in 2016 and the soaring energy prices of 2021, EU energy policy was mostly focused on achieving the climate goals by steering towards a [green energy transition](#). Phasing-out the use of carbon intensive fossil fuels and accelerating the development and introduction of renewable energy sources was (and is) at the heart of these policies. To achieve these goals, the EU adopted the [EU Green Deal](#), setting the objective that Europe's economy and society will be climate neutral by 2050, with the intermediate target of reducing net greenhouse gas emissions by at least 55 % by 2030, compared to 1990 levels. This is to be implemented through the [EU Climate Law](#), adopted in June 2021. In July 2021, the Commission published a package of proposals to deliver on these targets called '[Fit for 55](#)'. Carbon pricing is an essential element of these proposals. The [energy sector](#) has an important contribution to make towards reaching these goals,⁶ as does the [transport sector](#). The 2021-2027 long-term EU budget sets aside a substantial amount for [investment](#) in the green transition. Important decisions on reform of the Emissions Trading System ([ETS](#)) and the introduction of a Carbon Border Adjustment Mechanism ([CBAM](#)) were taken in 2022.

While the EU has gone a long way towards achieving its green energy target, concerns remain whether this is enough. In [2018](#), the International Renewable Energy Agency (IRENA) noted that the EU has been at the forefront of global renewable energy deployment, with renewables consumption growing from a 9 % share in 2005 to 16.7 % in 2015. According to [Eurostat](#), renewables counted for 22.1 % of EU energy consumption in 2020 – above the 20 % target. The [EU solar energy](#)

[strategy](#) of May 2022 welcomes the 82% reduction in costs for photovoltaic solar energy over the last decade.⁷ However, it also states that to reach the EU 2030 targets, energy demand covered by solar heat and geothermal should triple at the minimum. The United Nations Environment Programme (UNEP) [2022 Renewables Global Status Report](#) shows that Europe's 22.1 % figure is relatively good compared to a global share of 12.6 % of renewables in energy consumption, however [Eurostat](#) figures show that the EU average depends on successful results in three Member States (Sweden, Finland and Latvia), whereas 12 EU countries have less than a 20 % share of renewable energy consumption. The [Climate Action Tracker](#), an independent analysis of government climate action, sees 'significant room for improvement' in the REPowerEU plan and rates the EU's climate plans as [insufficient](#) to achieve the 1.5°C temperature limit.

The energy crisis has added new risks for achieving EU climate goals. While the REPowerEU plan increased the target for the share of renewable energy from 40 % to 45 % in 2030, [big oil companies](#) made huge profits on fossil fuels in 2022 and reduced their targets for renewables. Investment in LNG terminals or further extraction of fossil fuels require time to recoup investment costs, thereby hampering investment in the green energy transition. Tax reduction schemes or price caps for fossil fuels increase consumer affordability, but may remove incentives for using renewables.

Prices and the effects of climate change are strong drivers towards green transition in the longer term. Even if prices of fossil fuels come down from current peak levels, they are likely to remain higher than before the crisis and renewables prices could then outcompete fossil fuels. This effect may be reinforced when the new carbon pricing legislation is implemented. The climate crisis itself, with more dry seasons and forest fires, is also becoming a driver towards transition. The 2022 heatwave had a negative impact on energy production for instance, reducing the capacity of hydropower, diminishing available cooling water for power plants and hampering shipping of coal on rivers. Availability of more renewable energy would diminish such effects. Many consumers have decided for themselves to reduce their dependence on fossil fuels. Heat pump sales rose by [34 %](#) in 2021 for instance, according to the European Heat Pump Association.

A connectivity challenge

The energy crisis emphasises the importance of connectivity between Member States and the willingness to pool energy through connected networks. The trans-European network for energy (TEN-E) aims at achieving a more integrated internal energy market by linking energy infrastructures between Member States and with third countries. Whereas connectivity only works for sharing an identical resource, Member State energy mixes vary substantially. For the whole of the EU, petroleum products and natural gas are the most-used energy sources, together counting for 59 % of the EU's energy mix. The high degree of freedom that Member States enjoy to choose between different energy sources and structure their energy supply will constrain common approaches. The [TEN-E Guidelines Regulation](#) was updated in May 2022 to include the EU Green Deal objectives. Projects of common interest (PCIs) are identified under the TEN-E, with the [list of PCIs](#) in November 2021 reflecting the policy aim to move away from fossil fuels by presenting no new gas or oil projects and focusing on electricity interconnectivity.

The energy crisis poses two new connectivity risks: a renewed focus on fossil fuels and a lack of solidarity. Fossil fuel gas supply connectivity has regained importance and the REPowerEU plan states that 'In 2022 alone, gas PCIs with a total additional gas transmission capacity of 20 bcm/year have been or will be commissioned'.⁸ It also highlights the gas interconnector Poland-Lithuania project, and a new LNG terminal in Northern Greece. Another potential risk is the Member States' lack of willingness to share energy through these networks. Regulation [\(EU\) 2017/1938](#) on measures to safeguard the security of gas supply even contains a solidarity mechanism (Article 13) to ensure that Member States prioritise 'protected customers', like households and hospitals in another Member State have access to gas before other (for instance industry) consumers in their own country, in the event of an extreme gas crisis. Whether such solidarity will hold in case of economic

crisis in the delivering Member State has not been tested by circumstances (yet). Another possible constraint on solidarity is differing political views between Member States. These were seen, for instance, when sanctions limiting imports of Russian oil were decided, which requires unanimity under the current legal framework.

Table 1 – the mix of energy sources for the whole of the EU and national differences in 2020

Energy source	EU average	Highest 3	Lowest 3
Petroleum products (crude oil and products derived from it)	35 %	CY 87.1 % MT 86 % LU 60.4 %	EE 5.2 % CZ 21.4 % SK 21.9 %
Natural gas	24 %	IT 40.5 % NL 37.6 % HU 33.5 %	CY 0 % SW 2.7 % FI 6.5 %
Renewables (biomass, biogas, biofuels, waste, hydropower, geothermal, wind, solar and tidal)	17 %	SW 48.6 % LV 39.6 % DK 37.8 %	MT 1.9 % NL 8.4 % BE 8.5 %
Nuclear energy	13 %	FR 41 % SW 25.2 % SK 24.6 %	14 MS 0 %
Solid fossil fuels (black and brown coal and product derived from it)	12 %	EE 53.1 % PL 40.7 % CZ 31.2 %	MT 0 % LV 1.7 % CY 1.9 %

Source: [Eurostat](#) showing shares of the different energy sources in the total energy available.

Potential effects on EU strategic autonomy

So far, the EU has managed the four challenges [quite well](#). Diversification of supply, filling gas storage and a relatively [mild winter](#) have limited the impact of the crisis. This may distract from the goal to achieve real EU strategic energy autonomy. Therefore, a closer look at the way in which national governments and the European institutions have dealt with the energy crisis is needed. Two important questions arise:

- 1 Have responses to the energy crisis come from the national or the European level? Put another way: has priority been given to **national or EU strategic autonomy**?
- 2 Have European responses to the energy crisis focused on the internal situation in the EU or on the crisis as part of a global energy market and system? Put another way: has priority been given to **internal or external aspects of EU strategic autonomy**?

National versus European

Given the perceived threat level to supply security and the immediate effects of price increases, **Members States took the lead in responding to the crisis. They have tried to uphold their national strategic autonomy by ensuring supply security.** Responses have been diverse, according to national energy mixes and economic priorities. A regularly updated Bruegel [overview](#) of measures taken by a number of European states, notes for instance, securing new import deals for gas supply and new infrastructure for in particular LNG, increasing the use of existing coal power plants, postponing the closure of nuclear power plants and planning new ones. In doing so, national

measures may have constrained EU strategic autonomy,⁹ for instance when Member States competed with each other – and sometimes with the Commission – for imports from the same countries at the best possible prices, mostly in the first half of 2022. **Competition in 'energy diplomacy' may have prevented optimal results by driving up prices.**

Differences between Member State approaches to mitigating the effects of price rises have led to fierce debates at EU level. Bruegel has also produced an overview of [national price measures](#), showing the use of several economic tools to cope with prices. The debate in the second half of 2022 was particularly heated as regards possible price caps for gas and electricity.¹⁰ In April 2022, the European Commission allowed Spain and Portugal to implement a price cap for gas, with the argument that both countries imported their gas from countries other than Russia and had limited gas interconnection with the rest of the internal market. However, the Spanish and Portuguese price cap did have an indirect effect on the internal market, resulting in increased use of cheap gas for electricity production, which was sold at low prices to France. France, for its part, has introduced a cap in gas prices for final consumers and curbed the rise in regulated electricity prices. Most concerns were however voiced over Germany's price compensation measures of up to €200 billion, which could have a greater effect on the internal energy market, given its central position in Europe and ensuing connectivity.

The [role](#) of the President of the European Council includes helping to facilitate cohesion and consensus within the Council. **To facilitate consensus and enhance overall EU strategic autonomy, President Charles Michel** called for a [genuine energy union](#) in October 2022, which should be 'underpinned by common values and principles such as solidarity, fairness and transparency'. This accords with the trend to call for sectoral unions in response to crises, such as the banking union in response to the financial crisis and the health union in response to the COVID-19 pandemic. However, the term 'energy union' dates back to at least 2015, when the Juncker Commission published an [energy union strategy](#), followed by annual 'state of the energy union' reports. The term also figured in the [conclusions](#) of the Council of Energy Ministers in 2019. In 2016, a [scientific analysis](#) noted that the 'energy union' was 'the most significant policy idea that seeks to reform energy governance' but remained 'so far an empty box in which every stakeholder tries to put whatever is on top of their priority list'. The authors differentiated between an intergovernmental and a more supranational scenario for the future EU energy policy. A third 'governance mechanism' approach could bridge the national and European approaches. This appears to be a quite accurate description of developments since 2021, where the (intergovernmental) European Council, starting with the Versailles Declaration, facilitated the role of initiative and coordination of the (supranational) Commission.

The European Commission responded to the Council's guidelines with a number of proposals, aimed at a **coherent EU energy policy to increase overall EU strategic autonomy**. All recent Commission proposals aim at persuading Member States of the benefits of solidarity, complementarity and a common approach. The most important policy document of the Commission was the May 2022 [REPowerEU](#). Following the triple approach of saving energy, diversifying supply and accelerating the rollout of renewables set out in the plan, the Commission and the Member States first focused on saving and diversifying. Initiatives aimed at [saving energy](#) include the revision of the Energy Efficiency Directive and reduction targets for the consumption of [gas by 15 %](#) by 31 March 2023, decided in July 2022. The [30 September 2022](#) Council meeting of EU Energy Ministers adopted a set of emergency measures to reduce energy prices, but also an electricity consumption reduction of 5-10 %. In terms of energy governance, the most remarkable Commission proposals and Council decisions are those introducing **interventions in the energy market**. A rather modest step was the establishment of an EU platform for the common purchase of gas, LNG and hydrogen, which held its first meeting in [April 2022](#). Further steps were a new [EU Regulation on Gas Storage](#) and (partial) bans on [coal](#) and [oil](#) from Russia. While the crisis unfolded, the EU Commission constantly presented new or amended initiatives. Some of these would at first sight appear to go against the goals of market liberalisation that originally drove EU energy policy.

They include proposals to cap revenues from energy producers making large profits due to general price increases without facing increased costs (mainly producers of energy from renewables, nuclear and lignite) and the introduction of a 'solidarity levy' on profits of fossil fuel companies deemed to be 'excessive',¹¹ which were adopted by Council on [30 September 2022](#). In October 2022, the Commission published a proposal for a regulation aiming at enhancing [solidarity in EU gas markets](#), addressing joint purchasing of gas, the efficient operation of gas infrastructure, pipelines and LNG terminals, measures to enhance security of supply, and high prices and volatility in EU gas markets.

The possible capping of gas prices illustrated a clash between national interests and national and European views. Some 17 Member States pushed for a price cap in the [run-up](#) to the 20-21 October 2022 European Council, which only [agreed](#) on the principle of temporary price interventions under certain conditions. The Commission came up with a proposal in November, but the 15 December 2022 European Council referred the issue back to the Council of Energy Ministers four days later, which adopted a [regulation](#) by [qualified majority](#) that 'aims to limit episodes of excessive gas prices in the EU that do not reflect world market prices, while ensuring security of energy supply and the stability of financial market'. This long formula reconciles an automatically activated market correction mechanism with a suspension mechanism which will apply 'if risks to security of energy supply, financial stability, intra-EU flows of gas, or risks of increased gas demand are identified'. The difficult road to this compromise could indicate a further difference of views between internal and external EU autonomy.

Internal EU versus external autonomy

Debates on price measures not only reflect differences in national energy interests, but also different views on the role of the market in achieving EU strategic autonomy. The strongest opponents of a European cap on gas prices, Germany and the Netherlands, take the view that capping the gas price in Europe [risks supply security](#), because it may divert gas flows to other parts of the world. This could particularly be the case for the increasingly important LNG market, where gas tankers can react faster to price differences than fixed pipelines. In other words, these Member States emphasise the global nature of the gas market and see EU strategic autonomy as a balancing act between EU decision-making autonomy and global market dynamics. Reflecting the trade-based attitude of these economies, this view states that the EU can only pursue an open strategic autonomy in the economic area, and focuses on the external dimension of strategic autonomy, recognising the limits of a global market to autonomy. Some Member States such as [Belgium](#), take the opposite view, insisting on price caps to manage the internal economic effects for European citizens. This view could be a reminder that Article 194-1a TFEU speaks of ensuring the functioning of the energy market, as it focuses on the internal dimension of strategic autonomy, recognising that a functioning internal market is in jeopardy when many consumers can no longer afford energy prices.

Enhancing connectivity between Member States can also be considered as strengthening internal EU strategic autonomy by absorbing external shocks through intra-EU solidarity. Even when parties agree on sharing energy via a common network connection, differing national views can complicate decisions. This was the case for gas connections between the Iberian Peninsula and France. Plans for the MidCat gas pipeline through the Pyrenees did not materialise due to [environmental concerns](#). Instead, in October 2022, France, Spain and Portugal [decided](#) to build a pipeline through the Mediterranean to carry gas and hydrogen. Two months later, the corridor was renamed [H2Med](#) and would focus on hydrogen alone. The Commission embraced the plan as a green energy corridor, making it eligible for EU funding.

Because the EU produces only around 41 % of its energy inside the EU, strategic autonomy in terms of supply security is mostly a matter of external autonomy – reducing dependencies on imports from non-EU countries. In 2020, EU countries imported [57.5 %](#) of their energy from outside the EU on average. This figure has been relatively [constant](#) over the past decades, with a low of 50 % in 1990 and a peak of 60.5 % in 2019. The situation regarding fossil fuels is unlikely to improve. For instance, due to recurring earthquakes, the [Netherlands](#), the main gas supplier in the EU, [advanced](#)

the planned date for stopping gas production from 2030 to possibly 2024. In 2020, a European Parliament study on '[On the path to strategic autonomy](#)' noted that energy production in the EU has declined over the past two decades and that all EU Member States have become net importers of energy. While dependence on Russia has fallen rapidly since 2022, the risk remains that relying on new energy exporters becomes a future critical dependency. Energy supplies from Africa or the Middle East may be interrupted by regional crisis or conflict. Energy suppliers may use their economic leverage over EU countries to contest or influence EU policies, for instance restrictive EU migration policies, a critical EU stance on human rights or certain EU foreign policy decisions. In a world of growing geo-economic tensions, the EU needs to spread the risk of dependency through diversification, even with partners, including the US, which has become a [major supplier](#) of LNG to European countries. In 2022, [Europe overtook Asia](#) as the main export destination of American LNG.

The third pillar of the REPowerEU plan therefore intends to accelerate the rollout of renewables, overcoming the short-term challenges of gas management and creating long-term opportunities for clean energy. **Producing most renewable energy needs in the EU would increase green EU strategic autonomy.** Four energy sectors will be crucial: solar, wind, nuclear and hydrogen. On **solar energy**, the EU already lost its leading role in the production of solar panels to other countries, in particular China. To rebalance this situation, the EU should [consider](#): increased cooperation with a diverse group of solar panel-producing countries in the framework of a new industrial strategy; make conscious trade-offs between the green transition and supply security; and support the development of modern solar technology inside the EU through investment and research and development. Offshore **wind energy** is covered by the 2020 [EU strategy on offshore renewable energy](#). This aims at cooperation in the North Sea and Baltic Sea to consolidate the EU's leading role on wind power. Although the REPowerEU plan merely states that 'supply chains need to be strengthened and permitting drastically accelerated' for wind energy, both solar and wind energy depend on the import of specific [raw materials](#), for which the EU is mostly dependent on Asian countries and in particular China. In the current geo-economic context, with the US suggesting Europe reduce its economic dependency on China, the supply of raw materials may become critical. **Nuclear energy** is not considered a sustainable form of energy by many, due to the unsolved problem of nuclear waste. However, it can count as a form of green investment under the EU taxonomy rules, as it contributes to avoiding carbon emissions. Some EU Member States, such as Germany, have decided to phase out the use of nuclear energy, while others, such as [France](#), the [Netherlands](#) and [Poland](#) have recently decided to increase investment. Nuclear power can reduce dependency on fossil fuels, but involves dependency on uranium. According to [Eurostat](#), in 2020, only 0.5 % of uranium came from the EU, whereas four countries, Canada, Kazakhstan, Niger and Russia, provided 20 % each of about 80 % of the EU's imported uranium.

Green hydrogen is not an energy source, but an energy carrier, produced with green electricity, for instance from solar or wind energy. It can replace fossil fuels and flow through (adapted) gas pipelines. The [global hydrogen review 2022](#) suggests that, in spite of uncertainties about demand, regulation and infrastructure, with today's fossil fuel prices, renewable hydrogen could compete with hydrogen produced with fossil fuels. According to the report, Europe is among the front-runners in hydrogen production using water electrolysis. The European Commission adopted an [EU hydrogen strategy](#) in 2020 and approved [first](#) and [second](#) PCIs in 2022. Current hydrogen projects are often carried out by private industry for the production of specific products, such as fertilisers. Some projects increase external strategic autonomy by producing in a Member State, such as those in Spain,¹² using local solar energy, or in the [Netherlands](#), using wind energy. Other Member States, such as [Germany](#) focus on hydrogen imports. Although it makes sense to import hydrogen from countries with abundant solar energy, such as [Namibia](#), this does not strengthen the energy independence and thereby strategic autonomy of the importing country.

Enhancing both EU strategic autonomy and a green energy transition will be among the Union's biggest challenges for the years to come. Producing green energy in the EU while managing dependence on imports of the necessary raw materials to do so, could be a viable EU

energy agenda. Seen globally, the IEA [2022 World Energy Outlook](#) takes the optimistic view that the energy crisis is not a huge setback for efforts to tackle climate change, but could be a historic turning point towards a cleaner and more secure energy system. The European Commission [2022 State of the Energy Union report](#) highlights the challenges of the energy crisis, but equally aims at a positive outcome, in which energy supply and the green transition resonate.

ENDNOTES

- ¹ See point 7 of the Versailles Declaration.
- ² See International Energy Agency '[statement on recent development in gas and electricity markets](#)', September 2021.
- ³ See the study commissioned by the European Parliament's Committee on Industry, Research and Energy (ITRE) '[Energy-intensive industries – challenges and opportunities in energy transition](#)', Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, July 2020.
- ⁴ Germany, for instance, launched a [€5 billion support programme](#) for energy intensive industries, which was approved by the European Commission in July 2022. Although [BusinessEurope](#) Director General Markus Beyrer called forced curtailment of production an 'option of very last resort', voluntary examples have been reported in [Germany](#) and the [Netherlands](#). The [Organisation for Economic Co-operation and Development \(OECD\)](#) noted in July 2022 that gas-intensive industries are spread across Europe, with particularly high regional concentrations in Sweden, Finland, Central Europe and Northern Italy.
- ⁵ Bruegel quotes sources stating that [Électricité de France \(EDF\)](#) retains a market share of more than 70 % in France, [ČEZ Group](#) a market share of about 70 % in Czechia and [Public Power Corporation S.A \(PPC\)](#) owns about 66 % of the retail market in Greece.
- ⁶ Energy-related measures are outlined in the July 2020 [EU strategy on energy system integration](#). A 2021 [EPRS study](#) revealed that the costs of not pursuing a green energy transition could amount to 5.6 % of EU GDP by 2050, or higher should high fossil fuel prices continue, as a 2022 [update](#) notes.
- ⁷ See A. Widuto, [Solar energy in the EU](#), EPRS, European Parliament, September 2022.
- ⁸ [REPowerEU](#), page 12.
- ⁹ M. Damen, '[EU strategic autonomy 2013-2023: from concept to capacity](#)', EPRS, European Parliament, July 2022.
- ¹⁰ See the second part of A. Wilson, [Emergency intervention to address high energy prices in the EU](#), EPRS, European Parliament, October 2022.
- ¹¹ This concerns profits in 2022 and/or 2023 above a 20 % increase of the average yearly taxable profits since 2018.
- ¹² In particular projects in [Castellon and Cartagena](#) and in [Portollano](#).

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