

A grand bargain to steer through the European Union's energy crisis

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Executive summary

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EUROPE'S ENERGY SYSTEM faces unprecedented physical and institutional stress. The policy response so far has been excessively nationally focussed and could undermine the goals of calming energy markets over the next 18 months and achieving ambitious decarbonisation targets. At the basis of the crisis is a post-COVID-19 global energy imbalance. While demand bounced back quickly as economies re-opened, supply did not. A particular challenge is that the reducing supply of fossil fuels in line with climate targets has not been matched by a commensurate reduction of fossil-fuel demand.

RUSSIAN MANIPULATION OF European natural gas markets since summer 2021, exploiting its significant market power, has deepened the crisis. Finally, events including weak French nuclear output and the ongoing drought, which has cut hydropower generation, have further escalated the situation.

IN RESPONSE TO high and volatile prices and forced demand reduction, European governments have tended to opt for narrow and uncoordinated measures that prioritise national security of supply and affordability over an integrated European approach. Subsidising energy consumption instead of demand reduction has been a common and misguided approach. Governments run the risk that energy consumption subsidies become unsustainable, eroding trust in energy markets, slowing action in sanctioning Russia and increasing the cost of the net-zero transition.

AN INTEGRATED EUROPEAN approach and a coordinated plan is essential to address the crisis. European Union leaders must strike a grand energy bargain based on four broad principles: (i) all countries bringing forward every available supply-side flexibility, (ii) all countries making comprehensive efforts to reduce demand, (iii) a political commitment to maintain energy markets and cross-border flows, (iv) compensation for the most vulnerable consumers. This grand bargain can be the first step on a new course towards united energy policy at EU level.

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1 Introduction

Europe's energy system faces extraordinary physical and institutional stress not seen since the 1970s oil shocks. The current crisis looks set to leave behind it a radically different system, but what that system will look like remains an open question. We argue that despite the most recent measures adopted at European Union level, the response so far has been too nationally focussed, potentially impeding Europe's efforts to calm energy markets over the coming 18 months and to reduce greenhouse gas emissions substantially by 2030.

The market stress results from three shocks:

- Public policy has discouraged upstream fossil fuel investment¹, but has not accelerated sufficiently the deployment of alternative clean energy sources or reductions in fossil fuel demand. This has resulted in a profound energy supply-demand imbalance in the context of the bounce back of global energy demand after the peak COVID-19 crisis. All fuel markets in virtually all corners of the world are experiencing scarce supplies and high prices.
- Even before it invaded Ukraine on 24 February 2022, Russia was manipulating European natural gas markets. It substantially reduced exports after summer 2021 and did not refill Gazprom-owned storage sites in the EU. Since spring 2022, Russia has used its remaining supplies as leverage to push individual countries to relax sanctions on financial transactions and technology. By the beginning of July 2022, Russia was sending one-third of previously anticipated volumes, leading to a more than tenfold increase in EU gas prices.
- Unlucky coincidences have worsened Europe's already tight energy situation. Corrosion problems have pushed France to shut down many of its nuclear power plants, increasing the need for gas in power generation. A severe drought has drained rivers and lakes to extremely low levels, compromising hydropower generation and also thermal plants that require cooling and coal-fired power plants that rely on waterways to deliver coal (Toreti *et al.*, 2022). This has increased demand for liquified natural gas (LNG), which has been only partly met by substantial recent investment in United States LNG production, and the ongoing slowdown of the Chinese economy, which has made more LNG available for Europe.

As almost all fuels are affected, short-term fuel-switching supply elasticities are close to being exhausted. For example, EU coal-fired power generation increased only from 82 terawatt hours in the second quarter of 2021 to 95 TWh in the second quarter of 2022 because available capacities were limited and coal prices tripled. Instead, demand reductions – both actual and anticipated – now play an outsized role in clearing the market.

High prices and forced demand reduction are a huge political problem. In August 2022, EU countries adopted a law (Regulation (EU) 2022/1369) on demand reduction² to reduce gas use in Europe by 15 percent by spring 2023, and the European Commission has modified state aid rules³ in a bid to accelerate the rollout of renewable energy and industrial decarbonisation. Governments have adopted or are considering exceptional policies including energy price caps, storage obligations, rationing plans and nationalisations. European countries are spending more (and in some cases much more) than 1 percent of GDP propping up energy systems.

Moreover, mismanagement of the impending winter energy crisis will reduce Europe's capability to decarbonise over the next decade. The impact of the energy crisis and the responses to it will shape the physical and institutional setting of the European energy sector. We argue that excessive focus on national energy policy solutions will substantially undermine the ability of

1 IEA, 'Global investments in oil and gas upstream in nominal terms and percentage change from previous year, 2010-2020', chart, 26 May 2020, <https://www.iea.org/data-and-statistics/charts/global-investments-in-oil-and-gas-upstream-in-nominal-terms-and-percentage-change-from-previous-year-2010-2020>.

2 See <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32022R1369>.

3 See https://ec.europa.eu/commission/presscorner/detail/en/IP_22_4622.

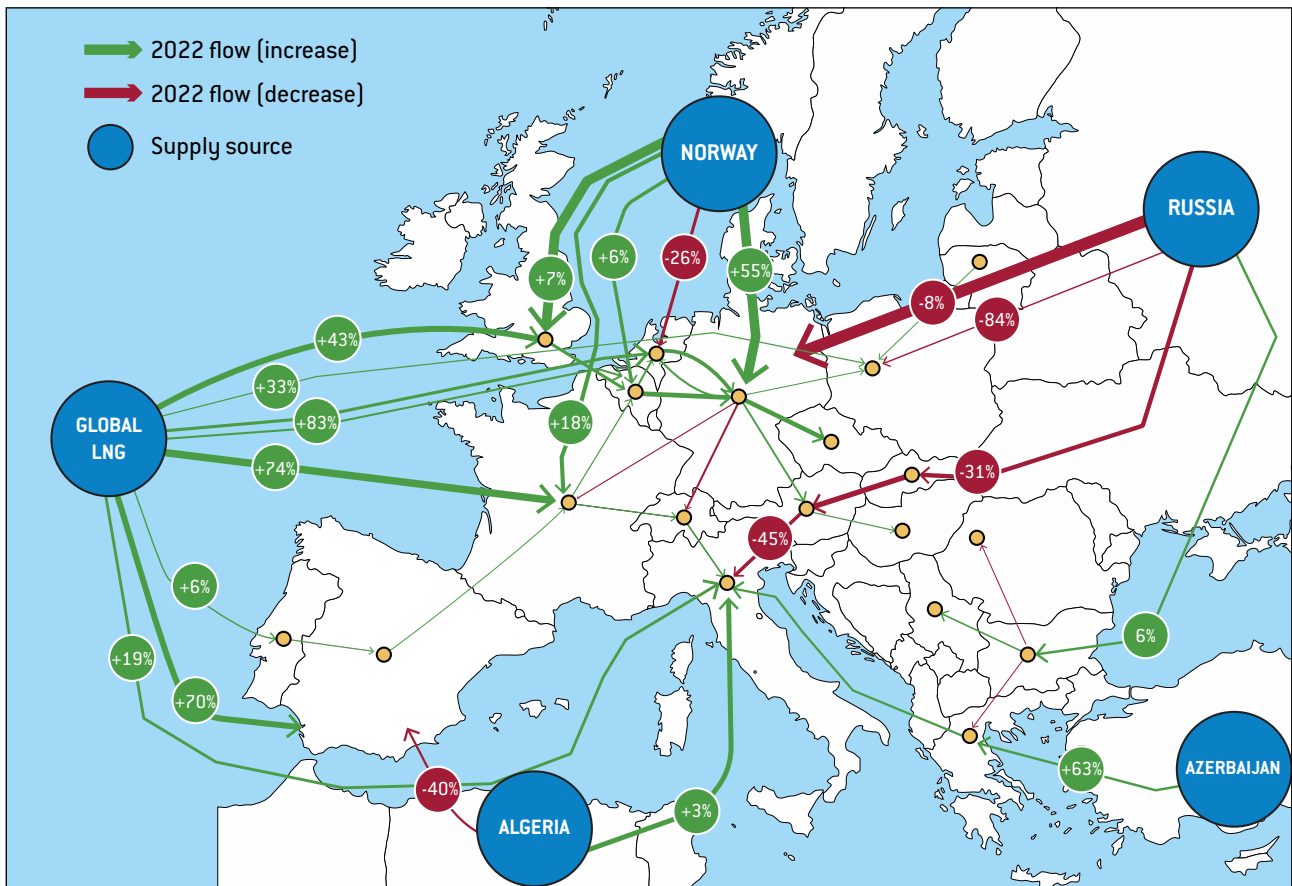
Europe to cope with the current crisis. Additionally, trust in Europe’s energy markets will be eroded, weakening the investment case for renewables and increasing the cumulative cost and difficulty of the net-zero transition. Instead, coordinated, European-level policies are needed urgently to address the crisis in the short-term.

We outline a number of areas in which nationally-focused approaches could undermine European energy security. We also identify areas where increased cooperation between EU countries can reduce substantially the cost of managing the energy crisis. Based on this assessment, we propose a grand energy bargain that will involve pooling the energy resources of EU countries and removing dependence on Russia, while preparing for a substantial acceleration of the transition to cost-efficient green energy⁴.

2 Natural gas markets

The European gas market is a complex system that is nevertheless quite efficient at dispatching gas across the continent. The market continues to function resiliently as Russian gas disappears from the system, with direct replacement of a substantial share of the shortfall with LNG and alternative suppliers (Figure 1 and Box 1).

Figure 1: Natural gas flows in the European market, first half 2022 vs first half 2021



Source: Arrows on the map show the largest flows of natural gas around the European market and selected smaller flows. Arrowheads indicate direction, while arrow width indicates size of 2022 flow. Natural gas flows in the European market, first half 2022 vs first half 2021

⁴ Long-term green investment is imperative to resolve the energy crisis in a structural manner, but this paper focuses on the short-term issues and policy proposals to manage the winter energy crisis effectively.

However, the market is now stretched to breaking point and faces four major coordination problems: refilling of storage; gas use reductions; new supply; and ensuring continued gas flow to where it is most needed. All four areas require national government intervention, with coordination failures leading to a less secure, sustainable and affordable system.

Box 1: The role of markets in allocating scarce energy supply

Cross-border electricity exchanges help smooth regional demand fluctuations and renewable energy supply, thus increasing security of supply and allowing variable renewables to displace more costly and dirty fossil fuels. Cross-border electricity trading in the EU delivered an estimated €34 billion in benefits in 2021, compared to a scenario of isolated national markets (ACER, 2022). One third of these benefits corresponded to the last quarter of 2021 when prices were at their highest, suggesting that cross-border trade is providing further savings into 2022 as energy prices continue to increase.

France's ability to switch from exporting more than 19 percent of the electricity it produced in July 2021 to importing 12 percent of its electricity needs in July 2022 illustrates how important interconnections are to ensure supply security for a major European economy amid a drastic domestic power generation crisis.

Similarly, integration of the gas market at European level (and globally through LNG⁵) acts as a buffer against external shocks. The reconfiguration of gas flows amid the shortfall of gas imports from Russia demonstrates this. An example is Belgium's role in north-west Europe. Prior to the crisis, Belgium imported moderate volumes of LNG, steady volumes of gas from the Netherlands and Russian gas via Germany in winter months to meet peak demand. Trade with the United Kingdom fluctuated depending on demand. As the crisis has developed, Belgium has increased its LNG imports to maximum capacity and has boosted pipeline imports from the UK. As a result Belgium has become a significant net exporter to Germany, a vital aid as Russian gas flows are cut.

2.1 Coordinating storage refilling

Gas storage facilities are normally filled by private companies and traders who maximise the expected profits from summer-winter gas price differentials. When gas prices are low in summer, they try to buy as much gas as they expect to sell at high winter prices. But the extremely high and volatile prices currently and the high uncertainty about future gas prices, have made this arbitrage more risky and very capital-intensive. Accordingly, national governments have provided stronger incentives for storage filling in order to ensure supply security, and new storage obligations for EU countries have been adopted⁶. EU member states must ensure that storage filling for winter 2022/2023 is synchronised across countries⁷. However, despite the new EU obligations there is a risk that possible severe additional disruptions on the supply side may result in gas not being transported before it is too late to where it provides the greatest value during winter months, as capacity constraints become binding. Austrian storage, for example, which would be very useful to replace a regional shortfall of Russian gas, remains relatively empty⁸. Bilateral solidarity agreements between EU countries would help mitigate

5 The International Monetary Fund (IMF) estimated that a complete shut off of gas supplies from Russia would result in an EU GDP loss of 0.4 percent to 0.5 percent in the current integrated market, against a loss of 1.4 percent to 2.7 percent if Europe was completely cut off from the global LNG market (IMF, 2022).

6 See <https://www.consilium.europa.eu/en/press/press-releases/2022/06/27/council-adopts-regulation-gas-storage/>.

7 Austria and Germany, for example, offer bonuses for companies that put gas in storage through so-called strategic-storage based options.

8 See aggregated gas storage inventory data available at <https://agsi.gie.eu/#/>.

such risks in the absence of an EU-wide solution, which would be preferable but has been too slow to materialise (Boltz *et al*, 2022).

2.2 Coordinating efficient reduction of gas usage

Despite the recent diversification efforts, the EU may not have enough natural gas to meet typical winter demand. A complete stop to Russian supplies will require EU demand to drop by 15 percent over winter 2022/2023 even if record-high LNG imports continue. To minimise the overall economic impact, demand reduction should be coordinated and distributed broadly across different consumer groups in EU countries. The August 2022 Regulation (EU) 2022/1369 on demand reduction (see section 1) states that all EU countries will make “*best efforts*” to reduce gas demand by 15 percent between 1 August 2022 and 31 March 2023. However, behind the headline figure, multiple concessions were granted, meaning that many member states will in reality not have to comply. The agreement is a positive step but not the last word on coordinating demand reduction.

In any case, very high prices should lead to lower demand. In the first six months of 2022, gas wholesale prices were around 10 times above average, while demand was just 7 percent lower, implying an extremely low demand elasticity. Why? Wholesale market prices were not passed through to consumers because of existing national price-regulation systems, new government intervention and contract designs that have temporarily shielded consumers from higher prices. The immediate policy response to high natural gas prices was to dramatically subsidise domestic energy consumption in an uncoordinated manner across the EU. While it is essential to continue targeted supports for vulnerable households, the overall result has been that governments have burned money in a race to consume more gas (see section 6). Overall demand reduction has been muted and has varied significantly by country. For example, in Italy there was no demand reduction in the first six months of 2022⁹. Substantial quantities of Russian gas have transited Austria to serve this demand. Theoretically, a 3 percent gas demand reduction in Italy for the first six months of 2022 could have allowed 80 percent filling of Austrian storage facilities, which at time of writing are 63 percent full.

So far, EU efforts to reduce gas demand have been uncoordinated and until recently, insufficient. European governments have almost all been reactive in responding to Russian gas cuts, rather than proactive in taking measures to reduce gas demand. To achieve the 15 percent gas-reduction target, governments should implement a range of policy measures, including promotion of awareness of energy saving behaviours and quick investments that households can make, financial schemes to compensate for energy reductions at households and industry level, and rules to limit inefficient consumption, for example in public buildings.

2.3 Coordinating additions to supply

EU countries have options in terms of increasing energy supply or switching from gas to other fuels in the short-term. But they withhold some of the options from the European market because much of the benefit would be shared with other countries, while the sometimes substantial costs would not. For example, the German debate on whether to close three nuclear plants at the end of 2022 focuses on their ability to displace gas demand in the German power system. Most German gas-fired power is produced from combined heat and power generators, meaning these plants must anyway continue to run and provide heat even if a nuclear plant could substitute the power output. This debate should simultaneously consider whether gas demand could be reduced in neighbouring countries, such as the Netherlands, given Germany is a huge player in the intra-EU power trade.

In the longer term, inward-looking national policies might not only haunt the European gas sector during the next weeks or months, but could affect the build-out of new infrastructure. With each government focussed on ensuring its own security of supply, the EU as a whole risks

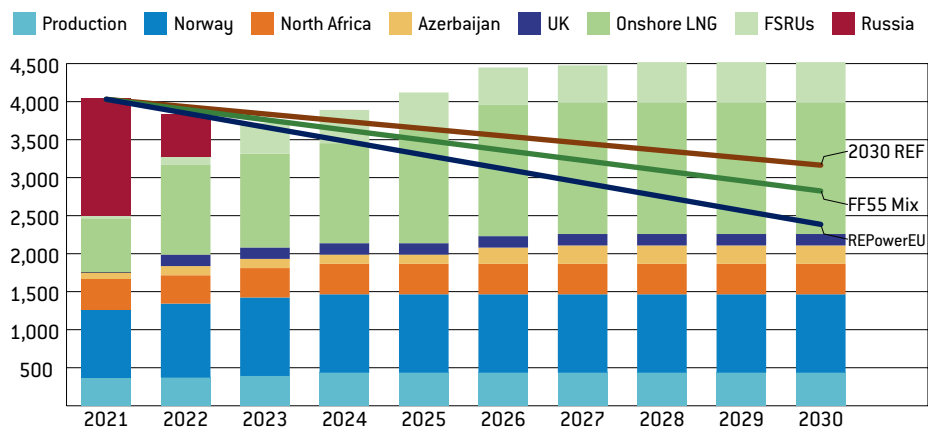
⁹ See Eurostat, ‘Supply, transformation and consumption of gas - monthly data’, https://ec.europa.eu/eurostat/databrowser/view/NRG_CB_GASM_custom_3287279/default/table?lang=en.

The overall result of consumption subsidies has been that governments have burned money in a race to consume more gas

building substantial gas overcapacity. This would be an inefficient use of resources and would risk entrenching new interest groups opposed to a speedy phase-out of natural gas. Instead, strategies for energy-infrastructure development must be based on European energy and climate targets. To make this happen, European level system planning and coordination needs to play a stronger role. While some import infrastructure investments are necessary, a focus on better connecting European gas, and more importantly power grids¹⁰, would create a more resilient system and better facilitate a cost-efficient transition.

Figure 2 compares expected EU gas supply (stacked bars) and demand (lines) up to 2030. Expected supply was calculated on the basis of all announced investment in additional pipeline and LNG infrastructure, and new contracts for gas through existing pipelines. We assume existing infrastructure will continue to be utilised as the same rate as in the first half of 2022. We thus do not show total capacity (which would be much larger) but implied actual supply based on realistic utilisation rates. Achievement of the EU’s climate targets implies a sharp reduction in gas use. The most recent and ambitious reduction plan – the RePowerEU package (European Commission, 2022) – would see a gas demand reduction of 41 percent by 2030 compared to today. Figure 2 shows that while balances will remain tight for a couple of years, current policies and necessary demand reductions imply that the EU would build substantial natural gas overcapacity by 2030.

Figure 2: EU gas demand and supply 2021 (effective) and 2022-2030 (projected), TWh



Source: Bruegel. Note: LNG additions are from ICIS (see <https://www.icis.com/explore/resources/news/2022/05/03/10760415/eu-rope-s-lng-capacity-boom-could-lead-to-step-change-in-regas-volumes/>) and GEM (see <https://globalenergymonitor.org/projects/eu-rope-gas-tracker/european-gas-crisis-2022/>). For all other sources, ENTSG was used along with public announcements and agreements. Both onshore LNG and floating storage regasification units (FSRUs) are assumed to continue running at 65 percent capacity, pipeline flows from Norway at 86 percent, from Azerbaijan at 92 percent, North Africa at 45 percent and the UK interconnector at 61 percent. Demand projections are based on the 2030 reference scenario of the European Commission [2030 REF], the EU Fit for 55¹¹ package and the REPowerEU strategy (European Commission, 2022). In 2022 Russia’s supply is estimated to be one third of the pipelined and LNG aggregate of 2021.

2.4 Ensuring gas flows to where it is most needed

If storage facilities are filled, demand is on aggregate low enough and supply overall is sufficient, energy must still flow to where it is most needed. Natural gas flows within Europe are constrained by historical infrastructure bottlenecks between regions. Prices in different regions thus do not converge fully but provide signals for dispatching gas flows. For example,

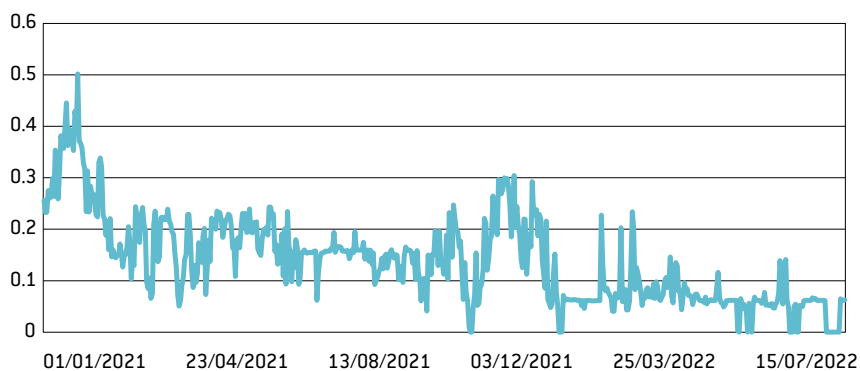
¹⁰ New infrastructure to connect power markets will help displace gas from its role as a marginal producer and has the benefit of being fit for the zero-carbon transition.

¹¹ See <https://www.consilium.europa.eu/en/policies/green-deal/fit-for-55-the-eu-plan-for-a-green-transition/>.

around a quarter of the overall LNG capacity in the EU resides in the Iberian Peninsula, and is effectively disconnected from the wider European market. Previous attempts to construct a gas pipeline from Spain to France were dismissed as uneconomic, but in today's situation this merits re-evaluation. Spain's environment minister has suggested that adding compressors to the small existing pipeline could increase capacity within two to three months¹².

Other bottlenecks are of a more regulatory nature and can be resolved more easily if there is political will. For example, gas cannot be sent from France to Germany because natural gas is odorised¹³ in the French pipeline system, while the German transmission pipelines do not accept odorised gas. As a result, the flow of gas does not always follow the short-term price differential. Although gas prices are substantially lower in France, gas still flows from Germany to France (Figure 3).

Figure 3: Gas flows from Germany to France (TWh/day)



Source: Bruegel based on ENTSOG.

Some non-Russian gas import sources offer flexibility in terms of where they can be delivered, as illustrated by Figure 1. Gas from Algeria might be sent either to Spain, where it will be stuck because of the lack of cross-border capacity to France, or to Italy, where it could replace Russian gas volumes. The same holds for LNG cargos that might be shipped to the regions with the highest shortfalls, or the already well-supplied Iberian peninsula. LNG and pipeline imports are often part of long-term contracts that are difficult to change, even when short-term market dynamics indicate that changing the delivery point could be welfare enhancing. A solution would be to establish an EU fund to compensate countries for re-directing flows away to those in more need, for example, to compensate Spain for allowing Algerian gas to be re-routed through Italy towards central European markets.

¹² Paul Messad, 'France keeps blocking MidCat gas interconnection with Spain', *Euractiv*, 26 August 2022, <https://www.euractiv.com/section/energy/news/france-keeps-blocking-midcat-gas-interconnection-with-spain/>.

¹³ That is, the gas is given an odour by adding certain molecules, in order to quickly detect dangerous leaks.

Optimising natural gas markets: recommendations

- Let the market function to efficiently allocate scarce molecules within and between countries;
- Coordinate or pool national policies to support storage refilling;
- Jointly procure gas on international markets;
- Only accept gas imports from Russia if the volume and price meet Europe's needs;
- Reconsider increasing energy production and fuel-switching options that were blocked administratively in better times;
- Do not subsidise gas consumption, but support gas consumers with price-neutral policies;
- Encourage gas saving through campaigns, financial incentives and regulations;
- Coordinate infrastructure investments;
- Avoid locking in gas investment (too many fixed LNG terminals) that might hamper the green transition;
- Tackle intra-EU gas-flows bottlenecks.

Very high fuel prices have placed massive stress on cross-border electricity exchange, leading to wildly diverging prices

3 Power markets

Together with the internal market design, cross-border electricity exchanges are the centre-pieces of Europe's energy system, with 700 TWh exchanged each year (ENTSO-E, 2020). Making low-cost electricity available to neighbouring countries in times of abundance reduces the need to run more polluting and expensive power plants while raising overall welfare. The benefits of a geographically interconnected grid will increase as more renewables are deployed and electricity generation becomes increasingly variable.

The market arrangements that make this possible are very sophisticated. But fundamentally the whole system relies on creditworthiness, liquidity and trust: trust that electricity that has been contracted for is delivered, trust that cross-border flows are not politically overruled, and trust that prices on both sides of a border reflect true demand and supply conditions. The currently unplanned generation shortfall in individual EU countries (eg nuclear in France) and the very high fuel prices have placed massive stress on cross-border exchanges, leading to wildly diverging prices. Countries that used to import electricity at modest prices (such as Spain) now see neighbours (such as France) bidding up prices to extremely high levels. Futures markets indicate that this is not a temporary problem but rather could last for years¹⁴. The consequences are uncomfortably high prices for households and a loss of competitiveness in energy-intensive sectors. As a result, discussions on reducing exports in order to manage domestic prices are gaining momentum in different countries¹⁵.

EU countries have a number of technical, regulatory or political tools that can substantially constrain export capacities.

In June 2022, Spain and Portugal intervened in their wholesale electricity markets by placing a cap on the price of natural gas used in electricity generation. In the following months, the average transfer capacity between Spain and France was 30 percent lower than the same period in the previous year. While this reduction in transfer capacity could be coincidental, it points to the potential fragmentation of the European electricity markets if electricity is subsidised unevenly across the EU. It is possible that countries could reduce the transfer capacities made available to the markets to reduce the export of subsidised power.

While such policies might appear to be easy vote winners, they will raise the aggregate

¹⁴ Forward prices imply that traders are at time of writing willing to pay more than €200/MWh for power in winter 2024/25, while prices in the pre-COVID-19 winter were about €60/MWh. See Kuik *et al* (2022).

¹⁵ See for example Jesper Starn and Lars Erik Taraldsen, 'Norway Faces Pressure to Curb Power Exports as Prices Surge', *Bloomberg*, 22 April 2022, <https://www.bloomberg.com/news/articles/2022-04-22/norway-seeks-talks-with-eu-on-power-exports-as-prices-surge>.

price of electricity, erode trust in Europe's electricity market, weaken the case for investment in new renewables and increase the cumulative net-zero transition cost. The result would be that each member state would feel under pressure to install enough capacity to manage each conceivable situation of high demand and low supply as islands, like Japan or South Korea, are forced to do. This will be particularly detrimental for systems with high shares of volatile renewables that benefit from geographic averaging. Furthermore, isolated power systems tend to result in higher prices for consumers who cannot benefit from cheap electricity from their neighbours. Ireland, where the power system has limited interconnection with the United Kingdom and is still not directly connected to mainland Europe, had the EU's highest electricity prices for household consumers in 2021, excluding taxes and levies.

Moreover, providing investors with incentives to ensure the autonomy of the national system would undermine the European market. In the presence of cross-border wholesale markets, overcapacities in one country reduce the incentives to invest in neighbouring countries. There is thus a risk that more investment decisions will be delegated from markets to national administrations, putting a further burden on system efficiency.

Finally, electricity demand reduction is as necessary as it is for gas. Because gas is used widely across Europe to generate power, electricity demand reduction will lead to gas demand reduction across borders.

Optimising power markets: recommendations

- Ensure that existing safely-operatable electricity production capacities are available to the market – possibly by lowering the administrative burden for bringing plants back into operation or switching fuels;
- Coordinate an emergency-deployment programme for renewable electricity generation and resolving network bottlenecks;
- Encourage demand reduction through campaigns, incentives and regulation;
- Do not subsidise electricity consumption;
- Avoid policies (market redesign) that risk severely impairing the ability of the market to efficiently dispatch electricity production and to allocate scarce electricity among consumers;
- Avoid fragmentation of the electricity market.

4 Fragilities in the system of European energy providers

The market capitalisation of the biggest 50 publicly listed energy companies in Europe (€1.3 trillion) corresponds to roughly 40 percent of the market capitalisation of the Eurostoxx 50 (€3.3 trillion). The utilities sector alone represents a fifth of the market capitalisation of the Eurostoxx 50 (€0.7 trillion).

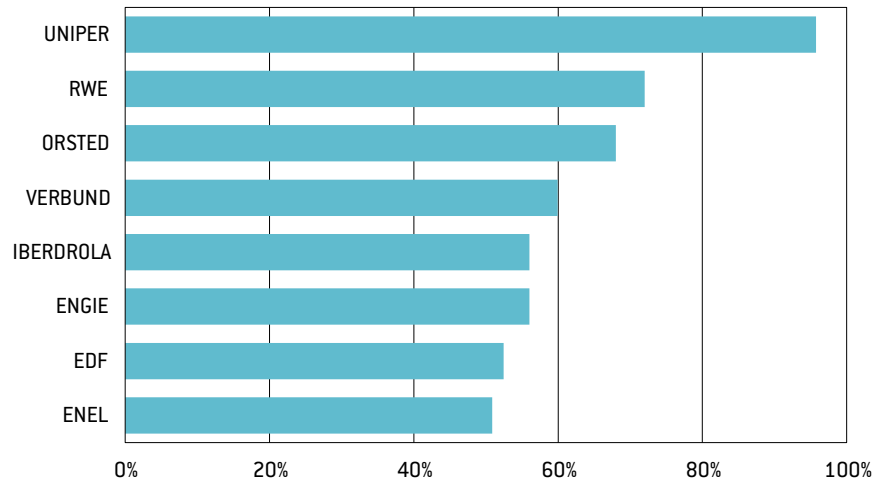
Even though the energy market in Europe has been gradually liberalised, a European internal market for electricity remains uncompleted (Pepermans, 2019). Local players still dominate their domestic markets. Moreover, the degree of market concentration varies greatly, and instances of high market concentration still remain: Electricité de France retains a market share of more than 70 percent in France¹⁶ and in many smaller countries, individual players have similar levels of dominance (For example, CEZ has about a 70 percent share of generation and distribution in

¹⁶ Hayat Gazzane, 'La hausse des prix de l'électricité devrait atteindre environ 12 % début 2022', *Les Echos*, 30 September 2021, <https://www.lesechos.fr/industrie-services/energie-environnement/la-hausse-des-prix-de-lelectricite-devrait-atteindre-environ-12-debut-2022-1350746>.

Czechia (S&P Global, 2022), and PPC has around 66 percent of the retail market in Greece¹⁷).

Despite their often big size, European energy companies rely on each other to meet final consumer demand (Figure 4). A key function of energy companies is to manage the risks arising from volatile supply, volatile demand and volatile prices. Energy companies match long-term and short-term contracts to procure energy (eg from external suppliers) with final consumers expecting stable supplies.

Figure 4: Selected EU utilities' value of (mainly) energy purchases as % of revenues



Source: Bruegel based on 2021 annual reports. Note: while total revenues are consistently labelled in annual reports, the terminology for energy purchasing varies among utilities. The relevant entry in their reports was picked based on the best knowledge of the authors. It was not always clear whether the energy production of subsidiaries was accounted for in the same fashion in all annual reports analysed.

The massive price swings on wholesale energy markets, the substantial risk of main supplier Gazprom not delivering its long-promised volumes and the risk that consumers are asking for higher volumes of energy at previously agreed lower prices – or that consumers are unable to pay more for energy they already consumed – are putting the risk management of energy companies under severe stress.

In the past some energy retailers sold longer-term supplies to customers in the hope of making money by buying the corresponding energy more cheaply on short-term markets. In the energy crisis, these business models have become unsustainable and several retailers, most prominently in the UK, have closed or been taken over by the public sector. Since September 2021, nearly 30 UK energy suppliers have filed for bankruptcy¹⁸. Bankruptcies elsewhere include Bohemia Energy, the largest alternative supplier to state-owned CEZ in Czechia, which filed for bankruptcy in October 2021¹⁹, while multiple energy providers have said they will withdraw from the French market, with Planet Oui activating an accelerated safeguard procedure in January 2022²⁰.

Much energy trading takes place between energy companies, so they can re-adjust their portfolios to ensure that at each moment supply and demand match. To hedge the risk associated with the physical trade in commodities (contracts are often agreed well before actual

17 See <https://struja.mk/en/greek-state-owned-electricity-company-dei-ppc-increases-its-share-of-the-greek-retail-market-by-3-to-66-3-in-november/>.

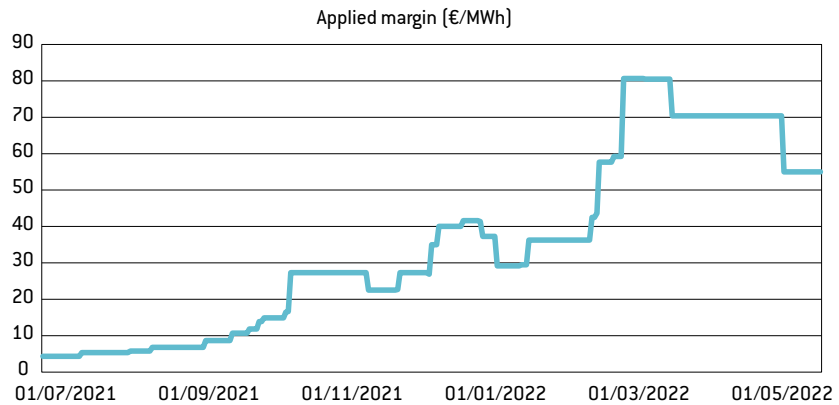
18 Nathalie Thomas, 'Energy providers hit out at regulator's plans to protect UK consumers', *Financial Times*, 20 June 2022, <https://www.ft.com/content/59cad679-6c6f-42ec-840b-4e5387e9ff19>.

19 Giorgia Maura, 'Bohemia Energy Goes Bankrupt, Leaving Almost One Million Czech Customers Without A Supplier', *Brno Daily*, 13 October 2021, <https://www.brnodaily.com/2021/10/13/news/bohemia-energy-goes-bankrupt-leaving-almost-one-million-czech-customers-without-a-supplier/>.

20 *Hopenergie.com*, 'Faillite des fournisseurs d'énergie en Europe : et la France ?' 31 August 2022, <https://www.hopenergie.com/comparateur-energie/faillite-fournisseur-energie>.

delivery dates), market infrastructures called central counterparties (CCPs) come into play. CCPs stand between the two counterparties of a derivative contract (eg futures), acting as a buyer to the seller and as a seller to the buyer. To perform this function, CCPs impose margin requirements to be deposited, which is normally done by banks on behalf of energy companies. As uncertainty around future prices increase, so do the margin requirements. In May 2022, the European Central Bank's Financial Stability Report (ECB, 2022) showed that for natural gas and electricity some of these initial margin requirements have reached up to 80 percent of the contract price, meaning that hedgers are faced with larger liquidity needs (Figure 5).

Figure 5: Natural gas futures applied margin



Source: Bruegel based on ECB (2022).

Increases in volatility thus lead to a need for more credit in the commodity sector for a given level of activity. Abrupt increases in capital requirements are normally met by banks, who in the current scenario have raised their risk premia, making hedging more expensive. If the situation worsens further, banks could even consider the operations too risky to finance, creating a liquidity problem.

Small firms may not have the internal expertise and capacity to hedge and are thus more exposed to price volatility. On the other hand, hedging may also become less and less appealing for firms that actively engage in risk management: as existing derivative contracts settle, new contracts need to be entered into at prevailing market prices.

As demand for capital increases, especially if the crisis is prolonged, there is risk of contagion to other sectors of the economy that rely on banks for their own credit needs. Moreover, if one big player fails, the strong interconnections between the commodity market and the financial sector could generate a negative feedback loop, leading to a string of bankruptcies²¹.

It is unclear if utilities would have the capacity to step in in case of the insolvency of one big player. If the failure of an important counterparty leaves the energy market exposed, the lack of liquidity might push up prices by more than the posted margin would allow. Counterparties might remain exposed. Moreover, it will be an unprecedented challenge for the energy sector to resolve the complex web of contracts between all companies affected by the failure of a big player. In 2021 alone, 2.7 billion energy-related transactions were reported in the EU²². Transaction data gaps and dispersion of data among different authorities and jurisdictions, which hinder monitoring, further contribute to uncertainty in the market.

²¹ See for example Bank of England (2022): "should commodity market disruption result in insolvencies among commodity market participants, that could further increase commodity prices and worsen disruption to physical commodity supply. Those higher energy and food costs would squeeze households' real disposable income even more, especially if businesses continue to pass on additional commodity price rises. If businesses are unable to do so, and profit margins fall to an unsustainably low level, then insolvencies could rise by more than currently expected."

²² See <https://www.acer.europa.eu/remit/about-remit>.

Some governments in Europe have been taxing the windfall profits of energy companies, while others are considering bailing out major domestic energy providers (Sgaravatti *et al*, 2022), so not everyone is making the same profits. For example, the German government is preparing to bail out its major utility company, Uniper, with a rescue package worth €15 billion; the Élysée has announced a €10 billion package to finalise the nationalisation of Electricité de France (EDF); and in early July CEZ, Czechia’s biggest utility, signed a credit agreement with the country’s finance ministry for up to €3 billion, providing liquidity to the company.

Because national governments might ultimately have to stabilise domestic energy companies, a situation might arise in which energy companies in fiscally weaker EU countries find it harder to access finance and to buy energy under longer-term contracts or sell energy to customers under longer-term contracts. This might spiral into a full fragmentation of the European energy market.

Tackling fragilities in the European system of energy providers: recommendations

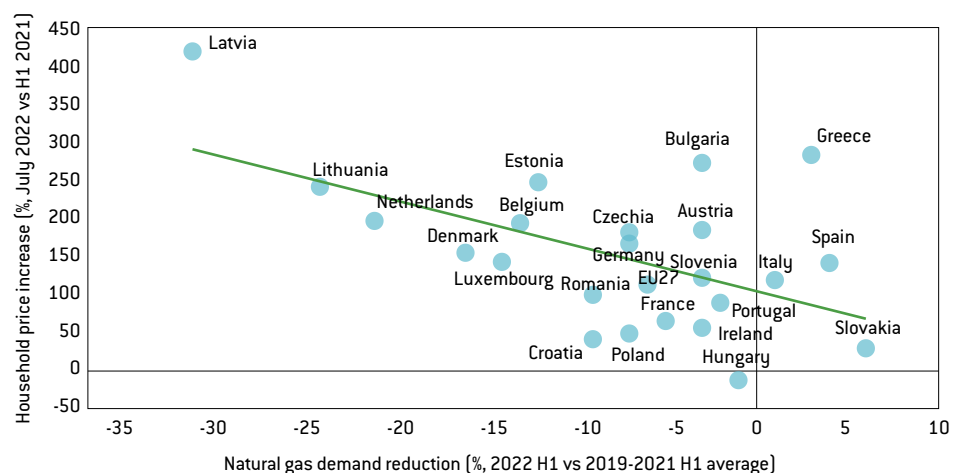
- Allocate sufficient public resources to monitoring energy trading activities;
- Ensure supervisors have a sufficient understanding of systemic risk in the energy-finance nexus;
- Be prepared to appropriately address liquidity events.

5 National energy consumption subsidies

The dramatic price increases on European energy wholesale markets have put retail prices for industrial and household consumers under immense upward pressure. The consequences of this differ substantially between EU countries and consumer groups because of differences in contract structures, national retail markets and how they are regulated. Moreover, many governments are devising new policies, including tax breaks, retail price caps and reductions in levies, to mitigate the pass-through of high wholesale prices to final consumers.

Such policies are rational when viewed nationally but risk undoing the incentives to reduce energy demand (Figure 6).

Figure 6: Price increases for households and gas-demand changes in EU countries



Source: Bruegel based on Eurostat and on the Household Energy Price Index (HEPI). Note: the HEPI collects price data in capital cities, these were taken as a proxy for the retail prices of the respective countries in July 2022.

They could also undermine efficient cross-border energy trade. Subsidising scarce energy for consumers might also prop up suppliers' windfall profits: in situations of scarcity, suppliers can increase prices in line with tax cuts because consumers will not find cheaper offers. Therefore, following offcuts to energy taxes in one part of the internal market, suppliers have the incentive to sell more where taxes are lowest, leading other countries to adopt the same type of price-distorting policy. In this scenario, virtuous demand-reducing behaviours will not be sufficient, and government support will become ineffective and unsustainable in the medium run.

Energy subsidies to businesses have also been very different across countries. Some countries have made ample use of such subsidies, while others have preferred to focus on households. This represents a risk for the EU single market, as a subsidy race undermines the integrity of the internal market for industrial products.

Coordination at EU level is important to make sure subsidies are targeted as much as possible at vulnerable households and businesses. Such an approach is required to stop those energy subsidies from becoming unsustainable from an energy-security perspective, as well as from fiscal and EU playing field perspectives.

National energy consumption subsidies: recommendations

- Harmonise the policies of EU countries;
- Prioritise income policies (some form of monetary compensation paid to consumers) over price policies (directly targeting the final energy price);
- Coordinate business subsidies so the single market is not hampered.

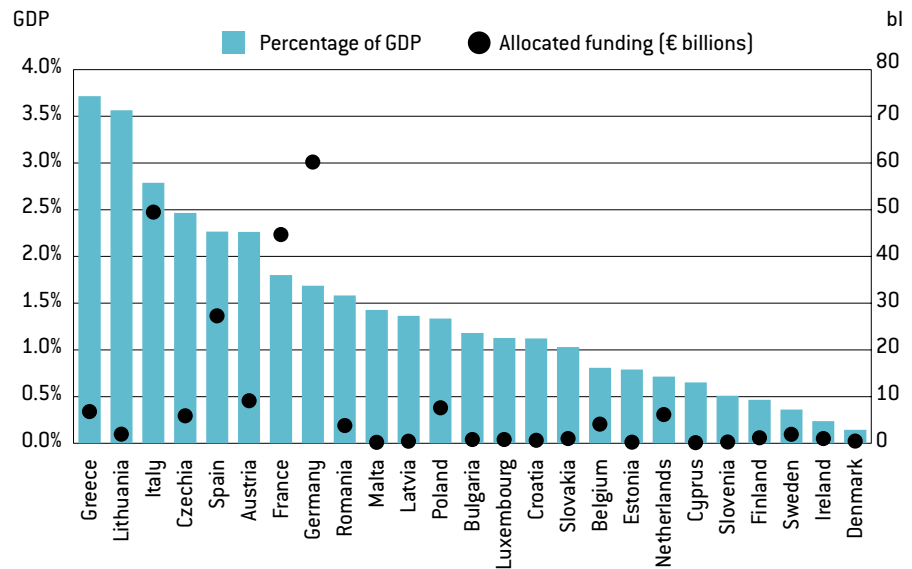
6 Fiscal consequences

When energy prices started to increase in summer 2021, European governments rushed to put in place measures to partially shield households and businesses. Initially designed as a temporary response to what was supposed to be a temporary problem, these measures have ballooned and become structural. EU governments have already spent more than €230 billion, and this number is set to increase as energy prices remain elevated.

European governments granted these energy subsidies in an uncoordinated manner. While common trends can be identified – such as, the use of tax breaks and support for vulnerable consumers – the measures rolled out have been different from both quantitative and qualitative perspectives.

From a quantitative perspective, since September 2021, governmental interventions have spanned between 0.1 and 3.6 percent of GDP (Figure 7).

Figure 7: Support provided by selected EU countries to their citizens and firms (Sept 2021 – Jul 2022)



Source: Bruegel, see Sgaravatti *et al* (2022).

The energy crisis is clearly having a macroeconomic impact. The value of gas and electricity traded in the EU has jumped from about 1 percent of GDP in 2020 to over 10 percent of GDP based on August 2022 price levels²³. If there are allowed to, governments with more fiscal space will inevitably better manage the energy crisis by outcompeting their neighbours for limited energy resources over winter months. This has the potential to further deepen economic divergences in the EU.

Managing the fiscal consequences: recommendations

- While important to shield consumers, temporary polices rolled out since September 2021 should not become structural;
- Design of energy policies should ensure fiscal sustainability;
- Coordinate the size of the fiscal response among EU countries.

7 Conclusion: Europe’s grand energy bargain

Since invading Ukraine, Russia has continued to exploit energy as a divide-and-rule tool aimed at weakening Europe’s resolve. The winter months might see an escalation of Putin’s energy blackmail. In response, EU leaders must reconfirm unity over energy and strike a grand bargain to alleviate pressures on energy markets. This will involve all countries taking difficult domestic decisions to exploit diverse untapped energy potential.

²³ Assuming rough annual EU electricity demand of 2,800 TWh and natural gas of 4,000 TWh. 2020 prices of €50/MWh electricity and €15/MWh for natural gas. August prices are taken as €500 /MWh electricity and €250/MWh for natural gas. This gives a value of €200 billion in 2020 compared with €2,400 billion based on August 2022 levels. EU GDP is €18,000 billion.

Such a bargain should start from the acknowledgement that the risk of not having enough energy to meet societal needs represents Europe's greatest short-term systemic risk, both economically and politically. Agreement between member countries is of existential importance to the European Union. EU countries should commit to mobilise available energy supply, actively discourage energy demand, not divert cross-border energy flows and compensate the most vulnerable consumers.

Mobilising supplies

All countries must honestly and immediately bring forward every available supply-side flexibility to the European energy market. This will require painful political compromises. For example, extending the lives of nuclear plants set to close this year in Germany will have a calming effect on power markets. Dutch gas fields could substantially boost production. Temporarily reducing pollution and working-time standards would help markets readjust. Energy security is challenged as never before and some trade-offs with social and environmental goods must be reassessed temporarily.

Agreeing to joint procurement of gas on international markets will reduce the risk that EU unity is undermined as member countries compete with each other for limited supplies. Moreover, joint procurement promises to reduce the financial and political cost of gas, and would allow the use of pooled gas volumes to provide energy to the most severely hit consumers.

Increased use of existing fossil-fuel options in the short term must not detract from the need to immediately speed up investment in clean domestic energy sources and energy efficiency. Quick agreement is needed at the highest level on a temporary moratorium on some of the most constraining national and European rules that hinder the needed emergency scale-up of sustainable alternatives (Box 2), and on sizeable financial incentives to overcome some supply bottlenecks. Otherwise, individual countries might be inclined to free-ride on politically/fiscally difficult investments by their partners.

Box 2: Long-term green investment

Investment in clean energy technology and the associated infrastructure is an essential part of escaping the energy crisis and meeting the EU's decarbonisation targets. The energy crisis is an opportunity to invest in further connecting Europe's energy grids, which will improve resilience to future shocks and facilitate a cost-efficient transition. One estimate is that the EU must double the pace of wind and solar deployment to meet its goals based on limiting global warming to 1.5 degrees Celsius (Fox *et al*, 2022). A long permitting process is cited as a major obstacle to rapid renewables deployment. This process should be simplified and accelerated (Fox *et al*, 2022).

Scaling up deployment of renewables and long duration storage, more rapid electrification for heating, public transport solutions and clean mobility, among many other decarbonisations measures, should all be reinforced. Such long-term investment will improve energy security and decisively eliminate Europe's dependence on Russian gas.

Reducing demand

All countries must make comprehensive efforts to reduce demand. This requires serious and straightforward communication to the public. Policymakers must explain to citizens that there is an impending trade-off between household energy consumption and the preservation of jobs and peace. Countries need to ensure that all consumers have sufficient incentives to reduce consumption. High energy prices will incentivise demand reduction in sectors that can cut consumption. In general, EU leaders should agree to stop subsidising energy con-

sumption directly and should instead subsidise energy reduction. Rules such as lower speed limits or reduced minimum temperatures in buildings will help.

Defend market-based allocation of energy across borders

The more supply can be increased and demand reduced, the lower energy prices will be. This will make it easier for governments to accept market based-allocation of energy across borders. To prevent drastic misallocation of resources in the European energy system, now and in the future, EU countries should commit to not intervene politically/regulatorily in cross-border energy flows in order to protect domestic consumers at the expense of foreign ones.

Compensate the most vulnerable

Governments will need to have the fiscal room to support households that can neither adapt easily nor afford skyrocketing energy prices. Otherwise, there will be not only massive social and political problems, but the disposable income of significant parts of society will shrink with an impact on aggregate demand and thus macroeconomic risk. National governments should provide lump-sum transfers or other social aid that to the greatest degree possible does not weaken price signals for reducing energy consumption.

Enabling pareto improvements

The starting point for the bargain will be that efforts are equalised around the continent, as all countries agree together to take difficult decisions. However, in many cases the efforts will not be equally distributed. Relatively well-supplied countries will have to take action largely for the benefits of their neighbours. In this case, a joint European fund might be considered. This would, for example, compensate citizens in Groningen, the Netherlands, for the increased tremor risk associated with greater gas production. An EU-level agreement to redistribute funds must be accompanied by a political commitment to maintain a well-functioning energy market which allows electrons and gas molecules to flow where they are most needed.

By sealing a special declaration on a European grand energy bargain, EU leaders would commit their governments to a coordinated and fair approach to the energy crisis. This would bind ministers and regulators, guiding them through the difficult choices they will have to make, and would be the first step of a new, and necessary, course for energy policy at EU level.

Choices over how to manage limited energy supply will shape the future of Europe's energy system. If managed correctly, deeper integration and accelerated investment can allow Europe to defeat Putin's strategy while also pushing the transition toward cleaner and more affordable energy.

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