CENTRE FOR BRITAIN AND EUROPE

UNIVERSITY OF SURREY

BRIEFING NOTE

EU Energy Security and Strategic Autonomy

EU ENERGY SECURITY AND STRATEGIC AUTONOMY

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Professor Amelia Hadfield
Amelia joined the Department of Politics as Head in 2019. Since then, she has researched, taught and engaged actively in her core specialisms of European and British foreign and security policy. Her expertise includes post-Brexit implications for UK and Europe, European security and defence, as well as European energy governance, and foreign policy more broadly. Amelia is the founder and former co-director of the Centre for Britain and Europe, and obtained prestigious Jean Monnet Centre of Excellence funding which supports a wide range of CBE activities. Amelia is also Dean International at the University of Surrey.

Sam Moffoot
Sam graduated from the University of Surrey in 2022 with a First-Class Honours degree in BSc International Relations. He is now completing a Masters degree in Ma International Security at the University of Birmingham. Keen to explore contemporary security challenges Sam has previous experience in environmental research in developing nations and hopes to continue expanding the research agenda moving forward.

Dr Alia Middleton
Dr Alia Middleton is Senior Lecturer in Politics and Co-Director of the Centre for Britain and Europe at the Department of Politics, University of Surrey. She researches political communication, voting behaviour, political leadership and election campaign strategies, with a specific focus on local, territorial and national politics in Britain.

"As the UK and EU adjust to a new relationship, this reports highlights a key area of required continued access and reciprocity. As Europe as a whole strives to address the challenges of climate change, it is clear that the adjustment involves the UK due to its unique holdings in off-shore wind and tide-power, whilst it continues to rely on EU storage. Targeted, joint investment in which both sides reap the rewards must remain a common goal."

Professor Daniele Albertazzi
Daniele Albertazzi is Professor of Politics and Co-Director of the Centre for Britain and Europe at the Department of Politics, University of Surrey. The major strands of his research are about populism in Western Europe, party organisation, Italian politics, Swiss politics, and the communication strategies and mass media use of political parties.

"This timely report reminds us that energy security is a cross-national issue requiring a European-wide response. The Russian invasion of Ukraine has reawakened a key geopolitical topic, namely how and where nations source their energy from. To strive for ever-stronger energy security and resilience, we require an understanding of the overall energy make-up of Europe. The research and data within the report is a critical tool in helping to answer the issues facing us all."

CONTENTS

INTRODUCTION

The war in Ukraine has put energy security front and centre once again. Energy transformations have bubbled away in the EU with predictable familiarity: rising and falling in tandem with geopolitical shifts or climate change pressures. 2022 however has been an epochal year in European energy terms, and 2023 and beyond are likely to be just as seismic. The EU has folded energy security, sustainability, foreign and security policy, strategic autonomy and trade into one enormous package, and used it to both cohere itself as anegotiating actor, and render itself influential with regional and global powers, from Ukraine and Russia to the US, NATO and the UN. Some turning points are long overdue, including the broader area of European energy security. Others, in terms of possibilities by which to overhaul the European oil, gas, electricity and renewable markets, have come online in a more radical fashion.

There are however, two clear themes to be considered. First, the largely joint efforts made by the EU to break the asymmetric dependence on Russian fossil fuels. Second, the collective approach to tackling the consequent energy crisis brought on by the interruption of gas supplies at regional, market and individual levels. As this CBE Policy Paper explores, there is much context that needs to be set out, in order to fully understand the sweeping nature of some of the energy mobilisation that has taken place in the EU's attempt to move towards a form of energy independence. It is easy enough to cite the statistical drop in numbers of imported Russian gas to the EU from roughly 40% to 9%, or list the series of EU policies that have arisen throughout 2022, including REPowerEU, the revamped 'Fit For 55' and European Green Deal. But the wider transition that the EU is now embarking upon requires reflection, before identifying the current challenges and proposing policy options.

As the Policy Paper illustrates, energy security itself is a highly contested definition, depending on which end of the metaphorical pipeline one finds oneself. Each Member State is also approaching the energy crisis from different standpoints, whether they be geographical (e.g. proximity to Russia), financial, political and domestic. Some are keener on energy autonomy – and the costs incurred - than others. Some are independently-minded in approaching the ensuing changes, others are keen to work with the EU, still others are determined to ensure market forces and energy actors take precedence over policies.
The results will need to produce an EU far more effective in managing its energy needs autonomously than previously, combining ambitions for strategic autonomy to robustly bolster its foreign and security policy, with demands for a socially just and equitable transition in implementing an ambitious climate policy. Whatever the outcome, what lies ahead is an unparalleled opportunity for the EU to recast itself as a coherent regional energy actor.

SETTING THE STAGE: THE GLOBAL ENERGY LANDSCAPE

In the months since Russia's invasion of Ukraine, European energy policy has moved front and centre as a central tenet of EU foreign policy and security. Some would argue the shift is long overdue. Others may suggest that in doing so, the EU has an unparelled opportunity to align the concepts of European *energy security* with European security more broadly, and consider also the degree to which Europe needs to be strategically autonomous in both these areas. Simply put, energy security represents the ability to access the necessary energy sources required to maintain national power without compromising other objectives of foreign policy, economics, social and environmental (Paravantis & Kontoulis: 2020: 1). In considering these options, EU and other decision-makers need to remember the shifting global energy landscape, in which dependency of any sort is increasingly viewed as untenable, whether from the perspective of security or demands to tackle climate change.

> **The global energy landscape has undergone multiple fundamental changes, kickstarting a variety of 'energy transitions', including the initial shift from fossil fuels to renewable energy. This transition is characterised by the alignment of three key agendas: security, economics and sustainability**.

How these three requirements play out both globally, and in Europe is the focus of the next few sections.

Economics

The economic agenda of the global energy transition encompasses the factors of national competitiveness, supply, and demand. In terms of **national energy competitiveness**, institutions and policies are key to determining levels of productivity, and represent an important determinant of a state's well-being within the international trade environment (Liu et. al.: 2016: 1073). The economics of **energy supply** comprises *depletable* and *non-depletable* resources (Medlock: 2009: 51), while **energy demand** encompasses exponential growth whereby alongside global economic growth, energy demand and consumption will inevitably increase (Liu et. al.: 2016: 1074-75). Global energy shifts have witnessed complex shifts across all three areas, in some cases altering global perceptions towards renewables and climate-friendly policies, and in some cases, back to fossil fuels.

> **It is no longer the case that national policies represent merely decarbonisation ambitions for environmental purposes. In Europe, and indeed globally, the past decade has seen climate policy increasingly integrated with industrial policy, producing a two-pronged approach aligning the economic benefits available in driving down CO2 emissions with an emerging 'green job market', underwritten by steadily falling renewable energy costs (Tsafos: 2022).**

Many of these shifts are indeed innovative. In comparison to fossil fuels, renewable energy modes have represented a costly alternative. However, downward trends in unit prices have produced a more even, generally lower 'levelized cost of energy' (LCOE) for renewables. In simple terms, the costs of construction and operation contrasted against energy gained via renewables is becoming increasingly comparable to those of fossil fuels, creating improved market incentives for investing in such sectors (Timmons, Harris and Roach: 2014: 17.). This in turn has shifted global energy relations, and not always evenly. For those reliant on fossil fuel economies, there is the risk of diminishing national competitiveness, for others an important to diversify. Countries that traditionally have been restricted in their access to energy value chains are likely to see new opportunities, in emerging global markets (Tsafos: 2022). To some extent, shifts in early twenty first century global energy trade have kickstarted processes whereby consumer countries have become producers, producer countries have become consumers, and transit countries have become new players through the demand for raw resources (Paravantis and Kontoulis: 2020: 2).

Security

The security component of the global energy transition has traditionally revolved around the **strategic dependence** on fossil fuels, and rests upon the twin principles of **sensitivity and vulnerability of systems**. These are particularly concepts important for the EU, given its longstanding dependence on both energy types, and energy producers. As defined by the European Commission in 2021, before the 2022 Ukraine crisis, dependencies represent a core reliance on a finite number of actors for the supply of resources (among other factors), combined with limited capacity for the substitution of imports in internal production (2021a: 8). **Strategic dependency**, therefore, encompasses dependencies that are of critical importance within key areas including, security, defence, health, technology, and the climate change transformations. The very concept of 'strategic dependencies' heightens the sense of perceived threats of both supply and demand: importing countries fear threats to their security of supply, and exporting countries fear the threats to their security of demand (Lilliestam & Ellenbeck: 2011: 3381).

Strategic dependencies are in turn driven by two factors: the sensitivity and vulnerability of a given system, whether it be national, regional or global (Keohand and Nye, 2012: 11). In energy terms, **sensitivity** represents a given energy actor's response to possibly harmful external events, vulnerability highlights their exposure to and ability to subsequently endure extended costs of external events, possibly after policy change (Gnansounou 2008, 3735 as cited in Scholten, D., & Bosman, R. 2016). The European Union for example has traditionally been highly **sensitive** to Russia's control of extensitve gas pipeline systems flowing east-west across and into the EU; the difficulty in diversifying itself away from this system subsequently represents the EU's vulnerability to Russia's actions, demonstrated first by a lack of alternatives, and second by skyrocketing prices from both Russia and the few alternative suppliers.

Within energy supply and demand, the main dynamic affecting both sensitivity and vulnerability is the extent of **interdependence** between supplier and importer states and markets. When the relationship is one of equitable interdependence, the supply of resources generally remains stable, and the entire system is significantly less vulnerable to political and security shocks (Schaffer: 2011: 39). However, when the relationship becomes imbalanced to the extent of long-standing and chronic asymmetrical interdependence, the less dependent state is inevitably gifted a source of direct power and influence (Keohane and Nye: 2012: 9) over its dependencies.

> **If energy asymmetries become entrenched, the entire system can be affected, with issues of supplier reputation on the one side and demand-side reliability on the other, impacting everything from long-term contracts, to payments, to transit tariffs for pipelines.**

Energy politics is uniquely difficult to conduct during times of high crises. When a crisis breaks out, two things happen almost instantaneously. First, energy security is quickly transplanted into the broad arsenal for foreign policy for both sides. Second, as the situation worsens, the sensitivity and vulnerability that characterise the system translate into coercive behaviour, reducing the opportunities for cooperative outcomes, and the restoration of functioning interdependence. While the term may feel contemporary, foreign energy policy is hardly a newcomer to global affairs. Energy as a form of diplomacy, security, defence and even development has existed throughout much of the twentieth century, and some of the nineteenth. Europe's energy wars in the 21st century however have ratched up the the role of energy security within foreign policy, to the consequent securitisation of energy, to the weaponization of energy security. 'Energy as a weapon' represents actions taken by a given energy supplier – usually of significant market size – to strategically, tactically and harmfully deploy energy resources, including supply and access to supply, as a political tool in order to routinely or intermittently coerce or punish customers or citizens on the receiving end (Smith Stegen: 2011: 6511).

Weaponising energy requires four steps:

- the consolidation of state resources;
- the control of transit routes;
- the operationalisation of energy resources in furthering political objectives via explicit or implicit threats, rewards, and punishments;
- reactionary policy change from dependent states (Ibid: 6506-6507).

Across the EU, for the past twenty or more years, importing states facing various political crises retain a higher vulnerability than exporting states, even when a functioning energy market is of high importance to the exporter (Schaffer: 2011: 39). In terms of natural gas, due to the significant expense of building alternative natural gas supply infrastructure, importing European states have not seized the opportunity to consider other supply options, increasing their vulnerability to the use of energy as a weapon by Russia (Schaffer: 2011: 38). More recently, the war in the Ukraine has demonstrated the use of energy across all four of these steps in its relations with Russia.

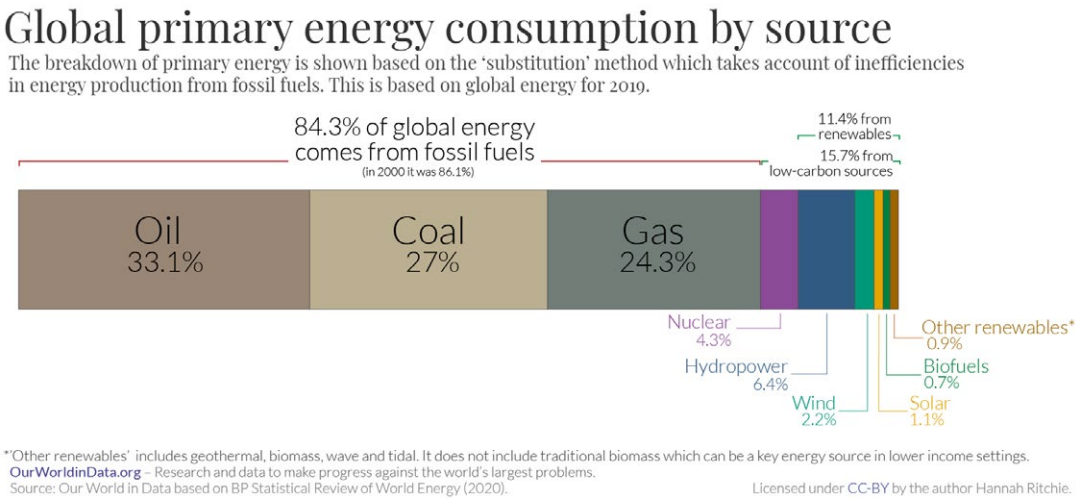
Sustainability

The global sustainability agenda centres around various approaches implementing the lowest possible carbon energy mix. The goal of the green transition is ultimately to replace the high-carbon, fossil fuel mix of the present (Figure 1) with low-carbon (in some cases wholly carbon-free) energy options consisting of renewable energy sources such as solar, wind, hydro, bioenergy and thermal (Tian et. al.: 2022: 2). Accounting for roughly three-quarters of global greenhouse, gas emissions arise from the burning of fossil fuels for energy, making the global goal of a systemic, permanent shift from fossil fuels to low-carbon sources of paramount importance (Ritchie, Roser & Rosado: 2020).

> **The good news is that clean energy is steadily increasing within the global energy mix. The less good news is that fossil fuels still dominate much of the landscape.**

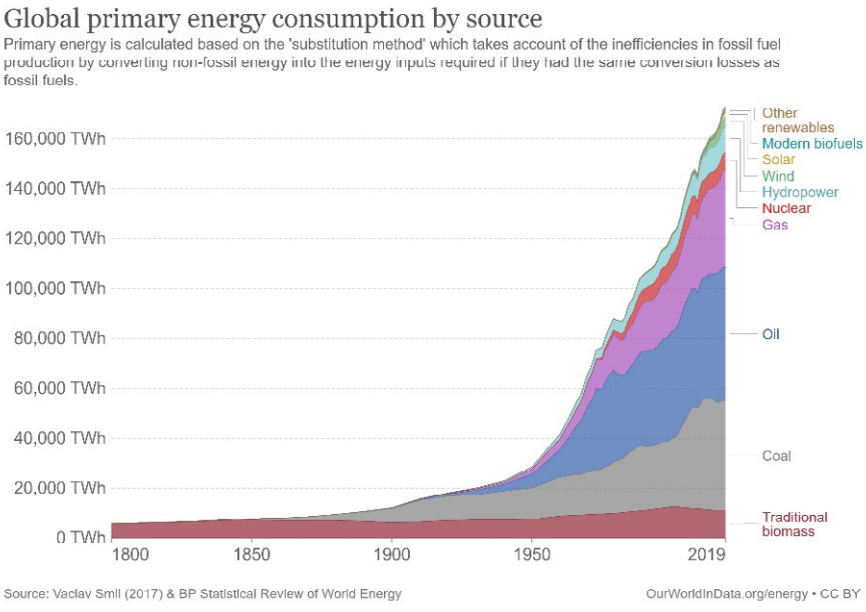
Despite depleting reserves and an intensifying transition to decarbonisation, the role of coal, oil and natural gas in trade, industrial processes and modern economies remains central (Scholten: 2018: 2). While being regarded as something of a 'transition fuel', natural gas has if anything accelerated its dominance, through its tandem identity as both a traditional fossil fuel, and a moderately cleaner source than coal and oil, providing a reliable backup for many still-intermittent renewables (Criekemans: 2018: 39). Thus, the sustainability agenda to search for a permanently low carbon energy mix in the face of ongoing reliance on fossil fuels represents the greatest challenge to both global and European green transitions.

Figure 1: Global Energy Mix



Source: (Ritchie, Roser & Rosado: 2020)

Figure 2: The Rise of Renewables



Source: (Ritchie, Roser & Rosado: 2020)

Invasion and Impact

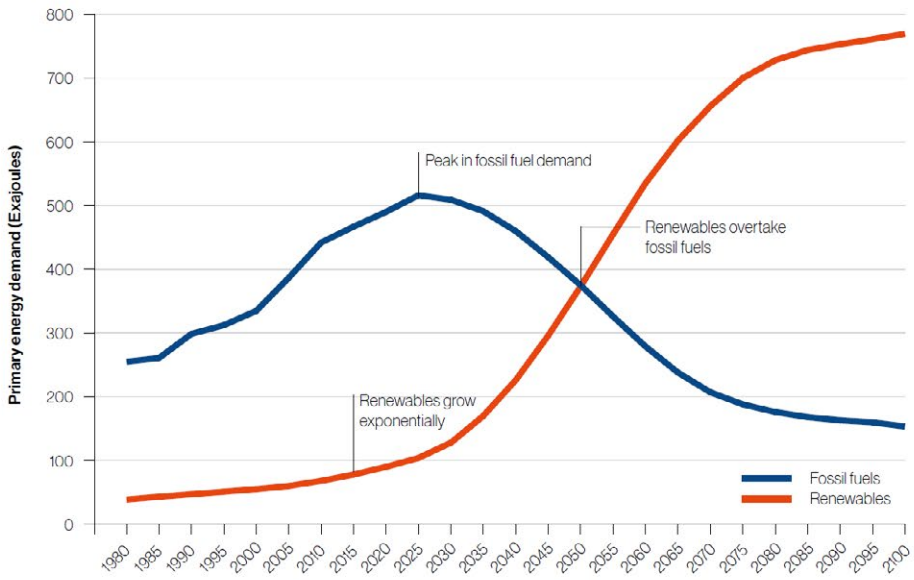
Energy throws up many a contradiction. Decarbonisation has presented a near-desperate case in terms of the sheer limits of planetary toleration. Time is undoubtedly ticking. For some,this has accelerated the scramble to identify and exploit the sum total of fossil fuel, continues unabated, with peak fossil fuel use continually moved forward, year on year (Figure 3). For others, the race to mainstream renewables has at last hit its stride, with the industry expected to account for 50% of the global power mix by 2030, and 85% by 2050 (McKinsey: 2022: 6,11).

> **National energy markets, energy companies, and individual consumers face a curious mix of incentives to simultaneously continue fossil fuel habits and discontinue them. The result is that global trends demonstrate both ongoing, even increasing use of fossil fuels, and decreasing dependence upon them thanks to rising use of renewable energy.**

From a climate change perspective, leading green advocates (including the EU) have made clear that renewables reduce the necessity for fossil fuel imports and dependence on traditional exporter countries. This transition can be attributed to many drivers such as declining costs of renewables and technological innovation, the concern over climate change and pollution, ambitious renewable energy targets, increasing corporate and investor action and shifting public opinion (IRENA: 2019: 18-23).

In this respect, and as evidenced below, the EU has impressive credentials promoting decarbonisation transitions. The most recent pre-Ukraine crisis was the 2021 Fifth Energy Package entitled 'Delivering the European Green Deal', aiming at carbon neutrality for all of Europe by 2050 by focusing on renewables, energy efficiency, energy taxation, air and maritime transport and buildings (European Parliament: 2021a: 3) (See 2.0 "5th Energy Package"). The origins and developments of previous EU packages are explored below, each building upon the other, suggesting a ready legacy of sustainable governance. However, these targets and the emergent transition notwithstanding, in the years and months leading up to the invasion of Ukraine on 24 February 2022, and for some time afterwards, the EU

Figure 3: Renewables to overtake fossil fuels by 2050

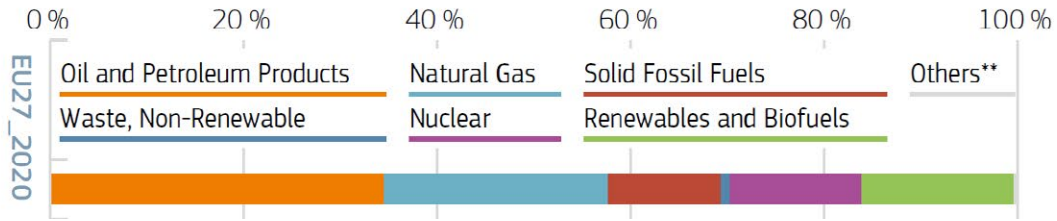


Source: (IRENA: 2019)

was and is, largely dependent on fossil fuels sourced from an undiversified supply roster, which contributed directly to energy security issues. EU energy dependence has both increased its sensitivity to both proximate and remote forms of external change, and vulnerability in terms of its overall exposure to such changes.

The EU's energy mix (Figure 4) is arguably still underpinned by fossil fuels as the primary driver of energy, with renewables accounting for less than 20% despite growth from 6.4% in 2000 (European Commission: 2021b: 22-23).

Figure 4: European Energy Mix



Source: (European Commission: 2021b: 23)

The slow growth of renewables within Europe's mix is the result of a host of different dynamics, some key to the structure of the internal market, others connected to the historic European dependency on key fossil fuel suppliers including Russia.

The overall picture is not particularly encouraging. Dependency upon energy imports within the EU has grown steadily since 2000 from 56.3% to its peak in 2019 of 60.7%, when natural gas dependency peaked at an unsustainable 90% (Energy Monitor: 2022, 24). Within this landscape, Russia has dominsated as the standout supplier of energy to the EU, accounting for 43% of natural gas imports, 26% of oil imports and 54% of coal imports (European Commission: 2022: 26). To futher complicate matters, EU member states – until the war in Ukraine - do not represent a homogenous entity in terms of their attitude to, or reliance upon Russian imports.

Some EU member states have radically upended their energy mix. In 2011, Germany for example sought to remove nuclear energy from its energy mix, necessarily increasing dependence on natural gas as an energy product, and Russia as a supplier, with the preferred method of import via the Nord Stream pipelines (Bartuška, Lang & Nosko: 2019). For other states, Russia's presence simply as the cheapest supplier created few incentives to search for alternative sources (Bartuška, Lang & Nosko: 2019). Further enhancing the dominance of Russian imports within the EU energy mix is the traditional lack of EU autonomy over energy security at a policy level (decisions on energy mix and suppliers remaining firmly with the Member States). Overarching European strategies have tended to shy away from attaching energy security explicitly to centralising, harmonising or even aligning projects, allowing member states to view their energy mix as not only national, but sovereign.

The EU has historically found itself torn between assumptions that its energy supply security can remain secure in the hands of private utility companies, with energy supply disruptions somehow easily offset by alternative oil and gas imports and the geopolitical reality that post-Cold War Russia is far less of a reliable national supplier than its Cold War predecessor (Umbach: 2010: 1230). As outlined above, European energy dependency has backfired badly. During the early months of the war in Ukraine in 2022, Russia unsurprisingly made punitive use of its natural gas and oil exports, as well the pipeline architecture, transforming energy supplies first into a critical security issue, and then foreign policy tool, and ultimately a 'weapon'. creating an energy security problem as affordability and availability are constrained and out of the EU's control (Misík: 2022: 2). While the 2022 Ukraine conflict has put energy security firmly atop key global agendas, European import asymmetry is a long-standing hallmark of Europe's energy mix. A number of gas spats and conflicts, ranging back to the first serious 2005 gas conflict between Russia and Ukraine have periodically forced the EU to assess its definitions of energy resources, not merely as necessary commodities, or even exclusive economic goods, but brutally strategic ones that are increasingly located within the confines of foreign and security policy, rather than public or private sector market principles. The tug of war is clear. Energy for Europe needs to be both a reliable commodity as managed by the private sector and a highly securitised asset too precious to be left to anyone other than governments.

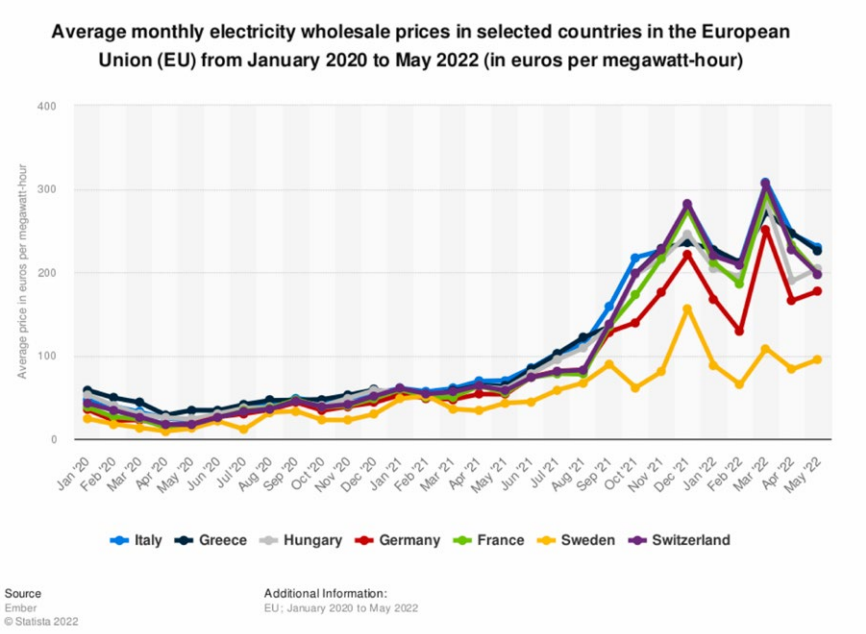
Russia has attempted to operate in two domains: simultaneously portraying its monopolistic oil and gas structures as commercially dependable, as well as deploying them routinely as the driving force behind its aggressive foreign energy policy.

EU energy security is now at the forefront of foreign policy, having undergone a long overdue geopolitical transformation forcing the EU to confront its dependency on fossil fuels in general, and Russia in particular (EEAS: 2022). Faced with cripplingly high energy prices in terms of oil, has and electricity (Figure 5) and the prospect of a steadily embedded frozen conflict in key parts of the Ukraine, the EU needs to seize an admittedly uncomfortable opportunity to revamp its entire approach to energy security.

Global Knock-on Effects

The stakes could not be higher. Russia's invasion has not only instigated a regional energy crisis, but has rcaused a global domino effect leading to soaring commodity prices and a cost-of-living crisis for citizens well beyond Europe. There is plenty of evidence to illustrate the gravity of the crisis. First, both unit prices and inflation have risen sharply within the EU and UK with the EU27's annual inflation above 11% (Eurostat: 2022, ONS: 2022).

Figure 5: Rise in Electricity Prices



Source: (Ember: 2022)

Second, the ongoing conflict has seen a series of sanctions and counter-responses, resulting in blocking Ukrainian sea ports, Ukrainian agriculture and agricultural exports at a standstill, alongside key market barriers, which together have crippled logistics and trade routes, leading to disrupted movements of commodities and supply chain volatility. These have in turn exacerbated inflationary consequences and price rises (Noble: 2022, Stackpole: 2022).

As has become clear in the months since the invasion, both Ukraine and Russia play key roles in the global supply system, including the production and export of agricultural products and metals, with over 600,000 businesses reliant on various Russian and Ukrainian suppliers (Dun & Bradstreet: 2022: 6). Within agriculture for example, Russia and Ukraine together account for over 25% of global wheat trade, 20% of corn sales and 80% of sunflower oil exports (Ibid.: 14). With the supply of such products threatened, the possibility of a global famine has dramatically increased. Low-income countries in Africa have for already been badly hit with wheat prices rising to their highest point in 13 years (Stackpole: 2022, Dun & Bradstreet: 2022: 14).

Within the global metal market, Ukraine and Russia lead production of vital metal resources including nickel, aluminium, copper and iron ore and rare metals such as neon, platinum, palladium, manganese and gallium, among others (Dun & Bradstreet: 2022: 14). With alternative sources of such resources in East Asia and South America hampered by geographical or supply chain constraints, prices have soared, with aluminium, nickel and copper reaching all-time highs. Piecemeal and reactive adaptation to such constraints has been complicated by transportation route cut-offs such as that between China and Europe, with fuel prices increasing costs of transportation and train routes increasingly competitive from already high levels due to COVID-19 (Stackpole: 2022). Policy responses thus far have applied a focus on subsidies and tax cuts which only worsen supply shortfalls and pressures upon prices rather than implementing long-term measures attempting to reduce demand and diversify supply (World Bank: 2022).

EU ENERGY PACKAGES: DIRIGISTE OR DEMAND-LED?

The First Energy Package (1996-1998)

The EU's first Energy Prrackage sought to liberalise energy within the EU and create an internal energy market. The major outputs of this package inlcluded the **1996 Electricity Directive and 1998 Gas Directive**, which sought to open the market for competition within the energy sector. The goal here was to create a single integrated market that would reduce grid costs and bring benefits through synergy within the security of supply. The main driver by which to achieve this goal was the process of '**unbundling**', a method whereby the generation, transmission, distribution, and retail activities of the energy sector are separated to avoid monopolistic behaviours (Next-kraftwerk: n.d.). However, difficulties within the unbundling process meant that implemented directives were greatly diluted, with Member States retaining many powers that limited the package's efficiency (Eikeland: 2011: 19).

The Second Energy Package (2003)

The EU's second attempt sought to create a **more open energy market through liberalisation** and further unbundling. This time around, The Commission used a new bottom-up approach, aiming to harmonise cross-border transmission rules by involving a broad range of stakeholders through the Electricity Regulatory Forum of Florence and the Gas Regulatory Forum of Madrid (Eikeland: 2011: 21). The second package consisted of three key regulations: the Electricity Market Directive II (2003/54/EC), the Regulation on Cross-border Electricity Exchanges (Regulation (EC) No 1228/2003), and the Gas Market Directive II (2003/55/EC). This trinity of directives built on the original energy package and more robustly mandated the organisational separation of transmission activities from operating generation and supply activities. In the end however, a renewed proposal of complete ownership unbundling again failed to emerge, due to Member state opposition (Eikeland: 2011: 21).

The Third Energy Package (2009)

The EU's Third Package worked to develop **foundational legislation of the internal energy market** in five areas: a return of unbundling, national independent regulators, enhaced cooperation, the establishment of ACER (the Agency for the Cooperation of Energy Regulators), and creation of Fair Retail Markets. These steps helped to identify and improve protection for 'energy poor' areas, while empowering national energy regulators, in an attempt to increase rights for consumers (Langsdorf: 2011: 3). Aiming to further strengthen integration of the internal electricity and gas markets, and stimulate competition to benefit consumers, the third package also introduced a key regional body: ENTSO (European Network of Transmission System Operators), in an attempt to grant greater power and harmonisation within regulatory authorities, including REMIT and TEN-E (Trans-European Networks for Energy), and ACER (CRE: 2020, European Parliament: 2021a: 3, Langsdorf: 2011: 3)

The Fourth Energy Package (2015-2019) Clean energy for all Europeans

With an explicit focus on climate change commitments, the EU's Fourth Package concentrated on delivering the EU's commitments as set out in the Paris Agreement. The package's new rules aimed to benefit consumers, the environment and the economy, coordinating changes at EU level to state the EU's ambitions to be a global leader in renewables and tackling global warming, representing an important contribution to the EU's 2050 carbon neutrality (net-zero) goals (European Commission 2021c). This required the introduction of new rules on energy storage and incentives for consumers that sought to improve the functioning of the internal energy market whilst also addressing issues arising from Brexit. Proposed reforms to market design and network operation were focused on enabling renewable energy generation offering gfar reater variability and flexibility (CRE: 2020). Based largely on electricity market design, the Fourth Package was operationalised through four key regulations: the Electricity Directive, Electricity Regulation, Risk Preparedness Regulation, and further ACER Regulation (European Parliament: 2021b: 2-3).

The Fifth Energy Package (2021) delivering a green new deal

The EU's latest energy package was introduced in 2021, with ambitious aims to align the EU's overall energy targets alongside its climate ambitions. Key goals include reducing greenhouse gas emissions by 55% by 2030, and achieving climate neutrality by 2050 (European Parliament: 2021a: 2-3). Pushing ahead with previous initiatives, the package also introduced a swathe of new measures, including furthering the EU Emissions Trading System (ETS), the Renewable Energy Directive, the Energy Efficiency Directive, setting higher emissions standards for vehicles, the Effort Sharing Regulation, a series of revisions within the Energy Taxation Directive, and the Carbon Border Adjustment Mechanism designed to prevent 'carbon leakage' (European Commission: 2021d).

The European Energy Union

Emerging just before the EU's Fourth Energy Package in 2014, with foreign energy policy emerging increasingly clearly, the initial concept of the Energy Union contained 5 dimensions:

- Energy security, solidarity and trust
- A fully integrated European energy market
- Energy efficiency contributing to moderation of demand
- Decarbonising the economy
- Research, Innovation and Competitiveness

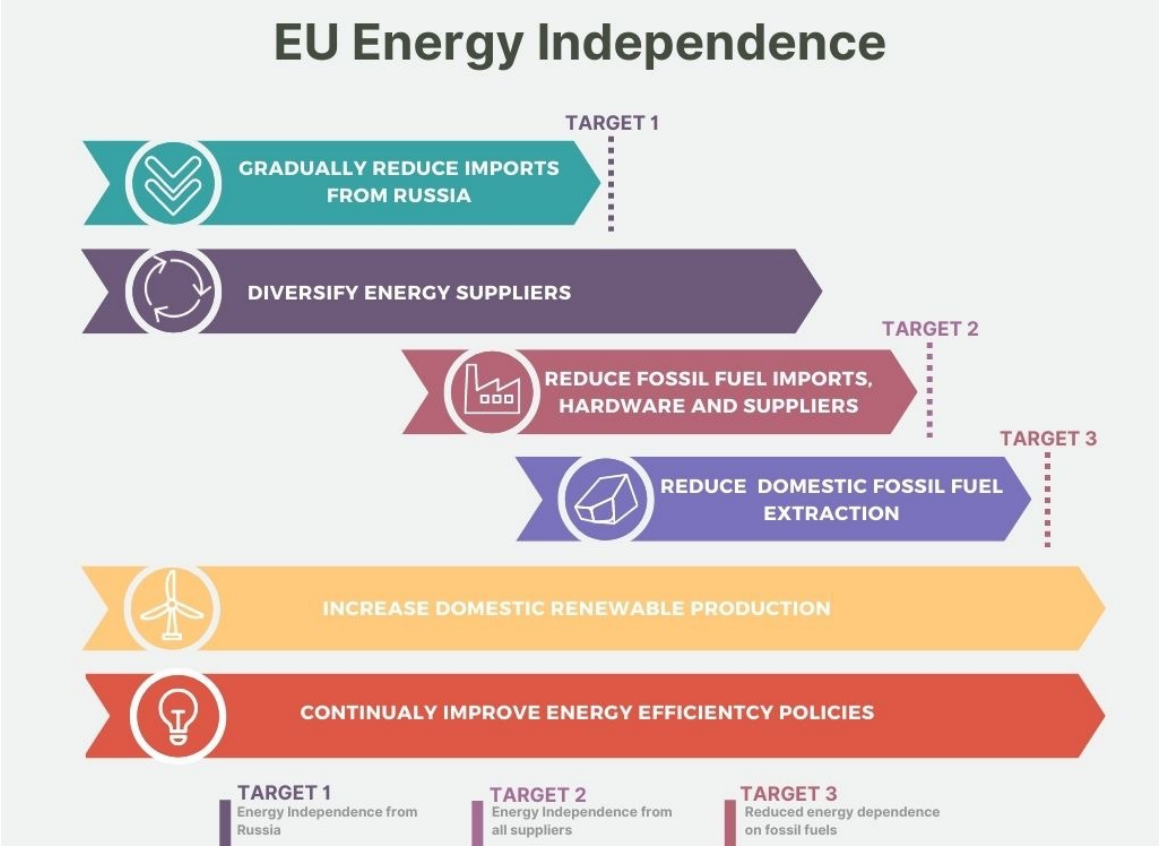
> **The 2014 European Energy Union puts energy security first and foremost, though it was less robust in declaring the need for full-blown renergy independence.**

What the European Energy Union does make clear is the neeed for deepening integration in key energy areas, based on enhanced political alignment and solidarity in understanding the risks and rewards of Europe's current energy mix (European Commission: 2015: 4). A key novelty included the suggestion of an Energy Purchase Platform, a mechanism for the common purchase by all Member States (managed by the Commission) of gas, LNG and hydrogen. This platform would operate via mechanisms of demand pooling, collective bargaining, the efficient use of gas infrastructure, helping to coordinate member states, and steadily moving them collectively towards the envisaged energy union (European Commission: 2022c). Despite its potential benefits, the joint purchasing program failed to advance, until the 2022 invasion, which significantly reduced opposition (Sandbu: 2022). While still in its early stages within the EU itself, the mechanism has been successfully extended to a number of key neighbourhood states including Georgia, Moldova and Ukraine, thereby allying both internal energy market goals with external, third party energy actors.

EU AMBITIONS: SECURITY AND/OR INDEPENDENCE?

The issue at the heart of much of the EU's energy policies and packages is that of energy security. Is basic security against seasonal spats enough, or is full-blown energy self-sufficiency required, shifting the EU towards concepts of strategic energy autonomy? The invasion of Ukraine has thrown this issue into stark relief. Rapid, even enforced diversification of the EU's energy portfolio is the initial step towards weaning itself off Russian-sourced fossil fuels, raising the prospect of various forms of energy independence in the medium and long term. However, this is by no means a simple, or swift process, but rather one of multiple overlapping, and interconnected stages (Figure 6). Aside from the various definitions, scope and implementation of concepts like diversification, and strategic energy autonomy, EU decision-makers need to appraise their current systems and structures in a realistic fashion, and balance their desire for regional self-sufficiency with the risks of upending the delicate trilemma of security, equity and environmental sustainability (Platias: 2022).

Figure 6: Roadmap to EU Energy Independence



Europe's Energy Options

Reducing Energy Imports from Russia

> **Reducing imports from Russia has emerged as the EU's overriding priority, both in terms of its emerging energy security structures, and its wider east-west foreign policy ambitions.**

Reducing imports from Russia will also prove decisive for both its energy mix and its ability to influence the Ukraine-Russia conflict. As of late 2022, the EU has spent over €137 billion on Russian fossil fuel imports, an amount which crtiics point out could have sourced and funded green solutions including over 400 onshore wind turbines, 1,600,000 solar homes and 600,000 insulated homes with funds to spare (EBC: 2022). The uncomfortable truth is that despite the EU's best efforts to commit vast sums to support Ukraine, they have simultaneously enabled the Kremlin to continue the war in Ukraine as a direct result of its energy purchases (IFW: 2022). Logistically, the challenge is even more complex. While some EU member states use little or no Russian fossil fuels (e.g. Ireland), many others are deeply dependent, and have been so for years. Latvia and Finland for example have a gas dependency of over 90%; their shift alone to alternate sources will be nothing short of dramatic.

> **Given the combination of geopolitical tensions, heightened by increasing overtones of self-sufficiency, EU diversification from Russian fossil fuels will be both a means to an end, and something of an end in itself.**

From a practical perspective, alternative sources need to be sourced to help mitigate short-term drop-offs and medium-term shortages. Here, there are several energy suppliers who could be sought after to balance the EU's overall energy mix.

Natural gas

Natural gas is set to continue its dominance in the EU's energy mix, and its use by individual member states, with an estimated share of 30% of the EU energy mix forecasted for 2030. However, the sheer feasibility of diversification is hampered by limitations of both hardware and infrastructure for transport and storage. Further, many long-term contracts between member states and Gazprom still run to 2035 (Ratner et. al.: 2021: 309-310, 322). The EU however has several options.

First, an increase in domestic production of natural gas. This trend visible already in the North Sea with the Netherlands and Germany agreeing to begin operating a gas field in Borkum. New sources in Greece could potentially yield up to 600 billion cubic meters (BCM) of recoverable natural gas reserves (Leeson: 2022, Koutantou: 2022).

Second, sourcing from North Africa with Algeria as a core supplier, currently supplying around 8% of EU natural gas (European Commission: 2021b: 26). Regionally, North Africa currently possesses the necessary infrastructure for LNG, with Algeria and Libya possessing direct pipeline access to the EU. However, growing domestic consumption within these states, including disruptions to production and government interference could create obstacles to reliable supply (Ratner et. al.: 2021: 337).

Third, increasing Liquified Natural Gas (LNG) imports. The EU has significantly developed infrastructure for LNG in recent years now operating with 20 large-scale grid-connected terminals with more to be developed (European Commission: 2022a). Notwithstanding, further investment and development is required in order to realistically support any large-scale transition, with many current terminals operating at near full capacity (Rashad & Binnie: 2022). Following the invasion of Ukraine, various global LNG suppliers including the U.S committed to increasing supply to the EU; further cooperation is expected from others including Qatar, Norway, Japan and South Korea (European Commission: 2022a).

The issue for LNG is not just one of supply, but rather feasibility due to overall capacity. As Figures 7 and 8 illustrate, the EU's commitment to developing its own autonomous LNG capacity reflects current LNG routes and terminals, rather than proposed or in-construction terminals. The overall picture therefore remains unclear.

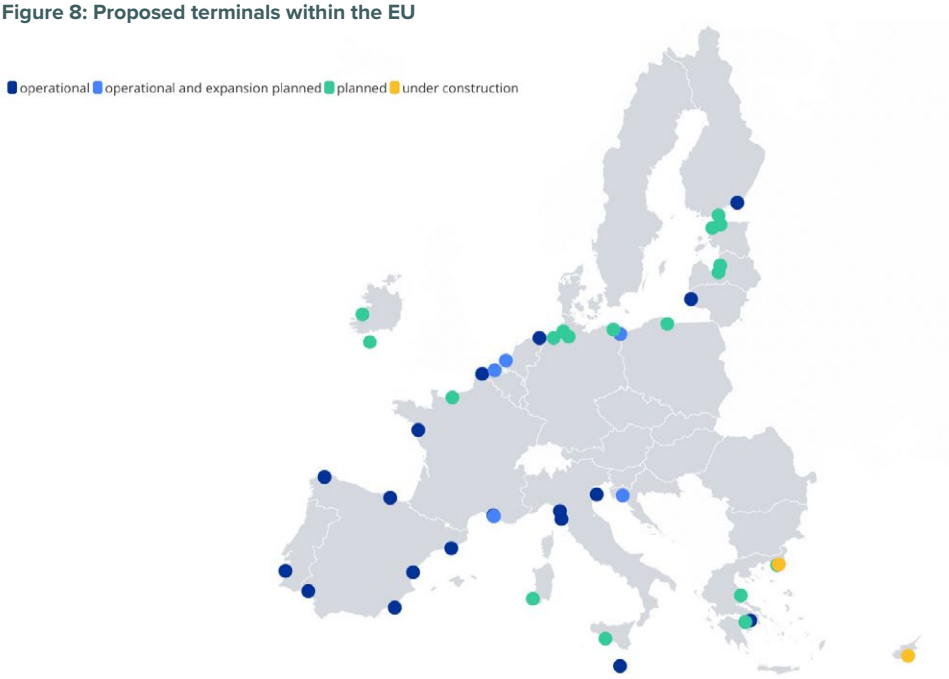
Fourth, enhancing the role of Norway, which as a significant energy state maintains a strong relationship with the EU, providing 20% of its natural gas imports (European Commission: 2022: 26, Ratner et. al.: 2021: 313). Steadfast in its role as an EU supplier, Norway continues to push for further oil and gas exploration with key infrastructure already in place, and current activity on the Nordic shelf remaining high, accompanied by pledges to cooperate on renewables (Abnett & Buli: 2022, NPD: 2019).

The final thorny issue for the EU – particularly in light of its Fifth Energy Package – is the role natural gas can and ought to play in both EU diversification, and medium-term climate change goals. Currently, the EU has attempted to ensure the security of its indigenous natural gas projects and investments in the by granting its eco-friendly "green" label (Abnett: 2022). This may function as a temporary stopgap, green consciences temporarily assuaged by the sheer political expediency of needing to support Ukraine via short and medium-term fossil fuel increases. However doing so does rather concentrate the role of natural gas as a transition fuel – even a gateway fuel – allowing the EU to simultaneously permit its ongoing use as 'green' while touting its non-fossil fuel global credentials.

Figure 7: Current EU LNG routes and terminals

Source: (Global Energy Monitor: 2022)

Figure 8: Proposed terminals within the EU



Source: (European Commission: 2022)

Oil

Russia is the largest exporter of oil to the EU, making up 26% of imports (European Commission: 2021b: 26). In the short term, whilst the prospective loss of oil has sent shockwaves through global markets throughout 2022, overall security of oil supply to Europe remains relatively stable, for three reasons.

First, the EU Oil Stocks Directive requires Member States to maintain emergency stocks of crude oil and petroleum products sufficient to cover 90 days of net imports, or 61 days of consumption (with the higher of the two making the requirement). Second, OECD members themselves possess around 1.5 billion barrels in oil reserves that can provide support for up to a year. Third, the IEA undertook a series of historic measures, releasing 240 million barrels of emergency oil stocks, resulting in 1 million barrels per day available over a 6 month period (Council of the European Union: 2009, Zachmann et. al.: 2022, IEA: 2022b).

In the longer term, diversification of EU oil options are just as challenging as gas.

Rerouting intra-European oil infrastructure designed for East-to-west flows via alternative methods is a significant task in itself. Further, European refineries that function most effectively using crude oil of Russian quality could diminish in efficiency with alternate sources. Lastly, in terms of associated energy products, the EU will ultimately have to replace Russian refining capacity for the vital supply of diesel, naphtha and fuel oil (Zachmann et. al.: 2022). A number of suggestions have of course arisen, starting with demand-side reductions, with Greenpeace proposing five short-term measures to reduce the EU's imports of Russian oil by a third. Suggestions here align with some of the EU's own goals, including cutting commuting emissions, making public transport more affordable, while others pose logistical challenges including shifting goods transportation from road to rail.

Coal

EU dependence on coal imports remains high at 57.7%, almost half of which (54%) comes from Russia. In line with in line with its UNFCCC Paris Agreement pledges, the EU is set to phase out coal by 2030 (with the exception of a few Member States set to phase out in subsequent years). However, with the falloff in both oil and natural has arising from current tight energy market conditions, coal could feasibly be set for a comeback, used to mitigate the high demand for natural gas (European Commission: 2022: 24). This in turn has shifted the prospect of diversifying EU coal to the foreground, at least in the short term.

As of August 2022, the EU imposed a ban on all coal imports from Russia as part of its fifth package, based a four-month wind-down period for existing contracts (Reuters: 2022). The EU is not short of options for coal diversification, with Australia, the US, Colombia, and South Africa easy options to make up supply. The real issue however is in fully satisfying EU's own needs, as coal supply is now increasingly constrained by its own (likely temporary) domestic demand, and increased global competition (Saul: 2022).

> **With natural gas facing immediate scarcity, the EU has proposed the use of coal as a 'backup' option should demand increase.**

In preparing for the winter months of 2022-23, natural gas remains the priority, but electricity can and may very well be produced by burning coal in the short term (Brown: 2022). This of course raises concerns that the EU is acting outside of its climate ambitions. The short term impacts needs to be weighed against long-term promises. The IEA for example suggests that the 14 gigawatts-worth of coal plants (currently on standby), running at 65% capacity, are capable of providing power to the EU for a fully week, with an increase in emissions deemed negligible at an estimated 1.3% of 2021 emissions (30 million tonnes). The IEA also estimates that a temporary gas to coal switch across most of the EU could mitigate overall European gas demand by up to 28 bcm before energy related emissions yield a material overall increase (IEA: 2022a: 11).

There are no easy outcomes here. The EU remains committed to phasing out coal, but the current crisis is impelling the EU to revert temporarily to various fossil fuels, while attempting to maintain support for the Ukraine and begin the process of energy self-sufficiency. Aside from the sources of energy, the hardware of energy used to transport imports needs careful consdieraiton. These include Russia-EU pipelines like Nord Stream and Nord Stream2, as well more recent constructions such as the Baltic Pipe, set to play key role in connecting the North Sea to the EU.

Wind

On and offshore wind farms feature as key components of the EU's 21st century energy mix. There is however, much more to accomplish in this sector. Current building rates forecast the EU missing its own renewable targets if no material change to its region-wide installation rates occurs, falling short by 14.4GW per year (O'Sullivan: 2022: 37). Brexit has unhappily worsened this problem, with the EU effectively losing 39% of its aggregate offshore wind capacities, with the UK representing the Union's second-highest wind market (Ibid: 29). In the long-term, EU movement in this sector has begun with a declaration signed by Denmark, Belgium, the Netherlands, and Germany to build 65 gigawatts (GW) of offshore wind power capacity and 20 GW of hydrogen capacity by 2030 with a target of 150gw from offshore wind by 2050 (Simonyi and Svendstorp: 2022). This amount of production would power 230 million homes whilst also offering the potential to power the production of hydrogen and green fuels for industries where direct electrification is not easily achieved (Jacobsen et. al: 2022).

Solar

Solar energy has undergone the largest increase in use within the EU's renewable market, growing 700 times between 2000 and 2019 (Errard et. al: 2021). Key motivators driving the use of PV (photovoltaic) technology include increasing consumer independence from traditional energy suppliers, and the increasing marketisation of solar technology as profitable commercial investments (Karakaya, Hidalgo & Nuur: 2015: 1095-1096). With energy prices soaring in traditional quarters, consumers and companies in others may turn increasingly to the use of PV – depending on its unit price and availability - making solar an ideal target for increased investment and/or subsidisation depending on the EU's overall renewables appetite. Observers have further suggested that to stimulate enhanced uptake in this area, commercial and public buildings could be targeted for initial deployment of wide-spread solar paneling, strengthening the argument for economies of scale, but clearly requiring an accompanying simplifying of licencing procedures could further increase grid capacities and enhance efficiency (Bódis et al., 2019).

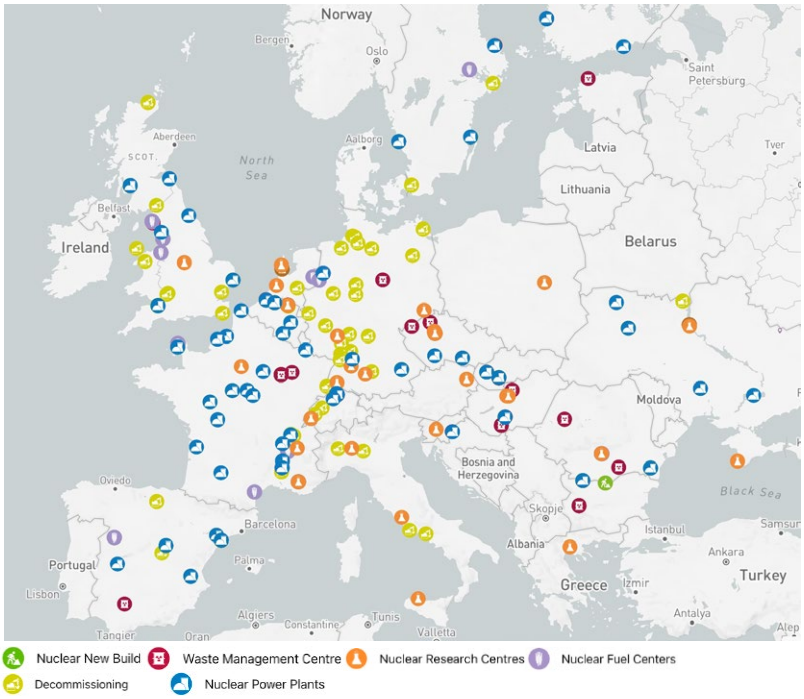
Nuclear

Along with natural gas, an increasing number of nuclear investments have been approved by the EU – like natural gas – as a 'green investment'. Whilst the source of power is not without some risk including the disposal of nuclear waste, nuclear power overall is increasingly regarded as providing vital support for an efficient transition to energy self sufficiency.

Nuclear power encompasses high reliability and high capacity, offering 1.5 to 2 times more reliability than coal and gas, with generally reduced requirements for routine maintenance and refuelling logistics (Mueller: 2021). Nuclear's reliable baseload capacity is what sets it apart from the lower capacity factors found in solar (24.9%) and wind (35.4%), which in turn has seen it paired with other forms of renewables to produce both a reliable energy spread in terms of output and mix in terms of sources.

Set against the current crisis, and in order to ensure increased availability of nuclear energy, the EU may well consider delaying expected nuclear plant closures arising from routine checks and maintenance or decommissioning (IEA: 2022a: 7). However, leading a renewable transition with nuclear power - even with the eventual goal of energy self-sufficiency - will not be easy. Key member state opposition, chiefly from Germany which has phased out nuclear power, to widespread EU nuclear power advancement is expected. In material terms, other obstacles include in-situ dependence on uranium and related products, many sourced from Russia, requiring sector-specific diversification. Bulgaria, Finland, Hungary and Slovakia for example all currently operate nuclear reactors supplied solely by Russian fuel providers (European Commission: 2022b: 5). Potential alternative sources however include Australia, Niger and Canada who, alongside Russia make up the EU's primary uranium suppliers (Wise Uranium Project: 2021).

Figure 9: Nuclear facilities across Europe



Source: (nucleareurope: 2021)

Continually improving energy efficiency policies

To ensure the energy transition is as strategically logical, economically efficient and as effective as possible, the EU must continually improve energy efficiency. This would ease the negative effects of increased energy costs, align with the immediate goal of weaning itself off Russia's supply, whilst contributing to a more climate-friendly energy market. There are several immediate changes the EU can implement to begin this improvement.

- Introducing minimum gas storage requirements: with no previous EU-wide obligation to maintain a minimum level of supply, the Commission has focused first on this particular goal. While existing gas storage supplies represent up to 30% of consumption during the winter months, many member states posses no existing storage capacity, and rely instead on neighbouring states for their supplies (European Parliament: 2022: 2-3). Gas storage is therefore a key component self-sufficiency transitions, providing enhanced security if and when supply from external and regular sources is reduced or stopped. The EU has proposed introducing obligations for member states to ensure gas storage to 80% by winter 2022, and 90% in subsequent years.

- Accelerating the shift to heat pumps: this initiative requires replacing boilers that utilise gas or other fossil fuels, creating a more cost-effective method to heat homes. The IEA (2022: 8) forecasts that by doubling heat pump installation rates across the EU, an additional 2bcm of gas could be saved in the first year alone, with considerable further savings in subsequent years.

- Smart heating controls: starting with smart thermostats. At the consumer end of the process, the EU could introduce more 'nudging' policies to encourage demand reduction, boosting energy-saving behaviour via the increased use of 'smart' technology to induce intelligent consumption.

EUROPEAN STRATEGIC ENERGY AUTONOMY

Strategic autonomy has become something of a 'must-have' for states, regions and international organisations. Given the sheer upheaval in global events since (and quite possibly well before) the Covid-19 outbreak, this is hardly surprising. In approaching strategic autonomy, its existence as a spectrum of options, rather than a single-use definition, is helpful; with energy security itself located along this spectrum (Lippert, Ondarza and Perthes: 2019: 5).

> **Put simply, strategic autonomy represents the ability of a given actor to act freely within a given sector, area, or policy, setting priorities and making decisions in a generally independent manner, underwritten by the material and political capabilities necessary to fulfil such decisions.**

Set against a spectrum from outright unilateralism to mutually acceptable action codified by legal or organisational constraints, strategic autonomy represents a capacity to act generally insulated from external impacts, with reduced sensitivity and vulnerability to the power, influence and decisions of other entities (Youngs: 2021).

Strategic energy autonomy suggests something of a spectrum from wholesale independence as a producer or consumer, to mid-range and negotiated bargaining power with, and possibly over, other third parties, with the goal of continually reduced energy dependence. The concept also suggests – as outlined above - that energy security itself is capable of being politicised, securitised, and even weaponised, rendering it

comparable in strategic value to that of national defence (Ryon: 2020: 243). Heightened by the exigencies of the Ukraine crisis, various options for EU strategic energy autonomy naturally exist. At one level, the basic completion of the European internal energy market, coupled with externalities drawn from the original European Energy Union could suffice. Given the emphasis on shifting wholesale from Russian fossil fuels, the prospect of collective purchasing, and the foreign and security content of the Commission's RePowerEU Plan, coupled with ambitious climate change goals however, the EU's post-2022 options are likely to be considerably more robust.

The challenge here is considerable. Avoiding monopolistic suppliers in core sectors is one thing; but reducing materially, and finitely, the influence of other energy actors upon the EU is quite another. Strategic energy autonomy is a duality at best, and possibly a paradox at worst, entailing both internal coherence and external consistency, underpinning rather than undermining EU authority. EU autonomy not only has to be agreed on by, and across the member states as operating on behalf of the EU as well as themselves, but in a way that still enables member states to fulfil their national energy needs (not all of which can be simply uploaded to EU level) and EU-level goals (Russell & Tokatlian: 2003: 1-2).

> **While the Ukraine crisis has seen astonishing examples of EU-wide solidarity in key aspects of enhanced energy security, energy is a deeply interdependent, cross-border, cross-sector, multi-actor area that the concept of a single actor – even one as large as the EU – attempint to operate wholly free from external influence or interference feels unlikely.**

Equally, the crisis has also fostered a greater desire for energy unity and security within member states, which in turn eases opposition, framing and reframing concepts of energy efficiency, self-sufficiency, and autonomy, helping to curate legal frameworks and governance tools that could over time see enhanced EU energy independence (Dupont: 2020: 109).

There is of course, something of a double edged sword regarding strategic autonomy, and no more so than in energy terms. In the short term, reactive diversification is a useful a vehicle for the EU, strengthening partnerships with potential alternative suppliers. In the long term however, the EU's ambition for energy independence could diminish its global relationships, undermining its hard-sought geopolitical power and liberal democratic underpinnings.

> **Herein lies the 'autonomy trap', in which fraught attempts at sectoral independence lead to a perpetual cycle of vulnerability, bringing about a loss of influence over other powers, diluting further their leverage and severing external pathways which in turn reinforces both material and perceived vulnerabilities (Youngs: 2021).**

Having established itself as global trading partner seeking a robust range of deeper international partnerships, the EU needs to tread carefully in its desire for any form of autonomy. The latter generally comes at a cost, a separation, reducing influence and authority. In traversing the spectrum of strategic energy autonomy, the EU should take care to maintain its global role, aiming instead for a strategic equilibrium that allows it to define and defend itself in a calculated, pragmatic but progressive way, that does not inadvertently lead to the severance of historic ties or diminish its global prominence.

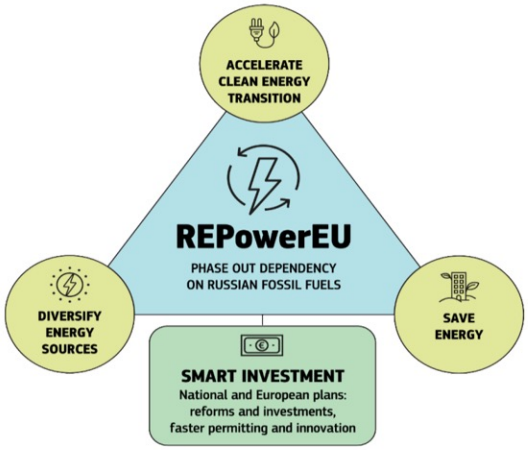
POLICY CONSIDERATIONS

Set again the spectrum of strategic energy autonomy options examined above, the EU's goal for 2023 and beyond is to drive through with its REPowerEU policy.

Rapidly sketched out within weeks of the February 2022 invasion of Ukraine, REPowerEU is a multifaceted, multi-goal response that folds together broad east-west foreign policy goals, ambitious energy security objectives, and long-term climate change goals.

The EU's course of action here based on a gradual but clear shift away from reliance on Russian gas and oil, striving to diversify its overall energy mix, reducing demand side requirements, while simultaneously accelerating its region-wide green transition driven by a host of energy-smart investments (Figure 10) (European Commission: 2022b: 1). Such a multifacted goal perforce requires not merely joint effort, but serious and sustained commitment from each EU Member States. Indeed, in order to achieve such high ambitions, the EU and its member states will be tasked with a multi-level operation, pushing forward simultaneously on long-established climate change goals and the complex mix of diplomacy, energy security and strategic autonomy, a goal requiring a considerable amount of work both within the EU, and between the EU and its energy neighbourhood (Dennison: 2022).

Figure 10: REPowerEU Transition Plan



Source: (European Commission: 2022b: 1)

At its heart, REPowerEU and contains a key strategic component in terms of the role that energy security now plays in EU foreign policy. This in turn demands domestic appreciation of this well-established but only recently appreciated maxim within the EU itself, as well as clear thinking about identifiying and then collaborating with trusted partners (Banet: 2022).

> **REPowerEU can only succeed if two factors are fully appreciated. First, an honest appraisal of the demands of energy diversificiation. Second, the challenge of working sustainably with a new range of energy sources and suppliers.**

In terms of widening its energy portfolio, and set against the onerous backdrop of a regional energy crisis, the EU is not the only actor diversifying and searching for new suppliers. Competition is fierce and strong, preferably well-established diplomatic networks will be key. This is especially relevant as the market undergoes a shift from an open trade structure to one dominated by direct long-term deals that necessitate bilateral and even multilateral deals, including those that link energy supply with broader goals including investment and sustainability (Butler: 2022: 2). As set out previously, the EU has stepped up relations with partners such as the US, Norway, Algeria and Qatar. This initial ring of partners must now grow in size and its relationships deepen in quality in order to safeguard the future energy supply of member states.

> **While the various iterations of the EU's external energy strategy, including REPowerEU as the most recent restatement, have all made clear the multi-faceted and strategic nature inherent in the diversification of European energy supply, the practical challenge of doing so, is the prime goal of the EU for 2023 and well beyond.**

In constructing a new energy architecture, the challenge is to strike an equilibrium between a robustly progressive energy mix in terms of sources, and a diplomatically reliable mix of energy suppliers, preferably understood as 'energy partners'. The focus will therefore be both on finding immediate new energy partners to replace the lost resources from Russian imports, and curating networks and relationships with key actors for the EU's overall green transition. This includes states and regions that possess the necessary resources for renewable infrastructure and equipment such as Africa and Latin America with a wealth of 'future-facing commodities', including critical rare minerals such as lithium, nickel, cobalt, manganese, and palladium (Staden: 2022, Purdy & Castillo: 2022). From a diplomatic perspective however, the risk of triggering something akin to a quasi-imperial climate clash between Global North and Global South communities is considerable, and needs careful attention. The EU (and others) need to prevent (and not merely avoid) the resurfacing of systematic extraction of raw materials from the Global South that historically facilitated a range of social, civil, financial and environmental deprivation in exporting nations (Staden: 2022.). If the EU is serious in maintaining a leading role in global energy transitions, it must use the full range of its diplomatic influence through bilateral and multilateral channels, international organisations, trade and energy relations, to ensure these are not replicated.

WHAT NEXT: OPPORTUNITIES AND CHALLENGES

Whether via REPowerEU, or a subsequent update, the EU now requires a transformative energy policy, to which all member states and EU institutions can commit. As outlined below, opportunities require the EU to think honestly about the range autonomy, and strategic depth, that it wishes to underwrite its future foreign energy policy. Challenges are similarly aligned, in terms of ringfencing cooperation, budget and external commitment to either a more centralised EU energy policy, or one comprising differentiated approaches to energy security, and foreign energy policy more broadly.

Opportunities

Increased energy autonomy, security, and reduced vulnerabilities to manipulation

- Diversification and increased self-production of renewable energy reduce dependencies on both fossil fuels and influential suppliers. As outlined above, the reduction of asymmetric dependencies alleviates the likelihood of energy-related conflicts whilst diversification provides stability, (Perez et al.: 2019: 4).
- Historic concerns regarding severing energy ties with Russia have been largely recalibrated for the majority of EU Member States as a result of Russia's invasion of Ukraine, facilitating both the philosophy, and pursuit of diversification.

Energy 'actorness'

- Energy independence via enhanced sources and suppliers could underwrite augmented forms of energy autonomy. Given the strategic nature of energy supply, and its intrinsic role in wider forms of security, enhanced energy autonomy could act as a catalyst for greater EU actorness, which relates to the ability of a world region like the EU to act with intent and impact.

- **Actorness as a concept encompasses three components: *opportunity* – constraining and enabling factors arising from the external environment; presence – an organised ability to reliably exert influence on the basis of record and reputation; and *capability* – the availability and willingness of domestic policy instruments and decision-makers to capitalise on presence or respond to opportunities (Bretherton & Vogler: 2006: 13, 24-33, 381).**
- In terms of *energy opportunity*, diversification and independence within energy would decrease the EU's sensitivity and vulnerability to external shocks and diminish external influence. This would reduce the risk and frequency of energy-critical situations (e.g. Nord Stream 2 pipline issues in which the US and Russia wielded power over the EU, issueing sanctions against EU companies; Batzella: 2022). Whiel evolving energy relations would still require bilateral, multilateral, and global relationships, post-2022 opportunities allow the EU to dramatically redraw both the form of its energy architecture, and the content of its governance.
- In terms of the EU's *energy presence*, increased forms of energy self-sufficiency, even aspects of autonomy could enhance EU global influence, demonstrating the feasibility of a green energy system, shaping both its, and partner energy preferences. The EU needs be clearer about the domestic and international impact of its past and current energy record, and its desired future reputation in energy security, climate change, and foreign energy policy.
- EU *energy capabilities* are at once wide-ranging in terms of overarching policies, underwritten by regulations and directives, and ambiguous in terms of both individual member state preferences and the ability to neatly fold energy security into the EU's overall diplomatic preferences. Pulling both sides together coherently is feasible, but complicated, and requires an even-handed approach covering market, trade, investment, security, diplomacy and climate change components.While the Ukraine/energy crisis has driven something of a convergence between member states to support an energy transition, locking down the correct range of policies and requisite political will is possibly the third and most challenging aspect to building the EU's new energy architecture and governance.

Reduce fossil fuel dependence

- Shifting to renewables sets an example to the world whilst demonstrating and furthering commitment to green targets.

Energy Justice

- **The EU needs to ensure that the wholesale (if gradual) shift to renewables does not disproportionately negatively affect any citizens over others, making progress towards ameliorating energy poverty.**
- Greater energy access can be obtained through the shift to renewables. Currently 8% of the EU's population reports their inability to keep their homes adequately warm (Eurostat: 2021). This figure has likely risen in the face of winter 2022 and possibly spring 2023 temperatures. While implying complex market and sector shifts, reduced costs need to be considered in terms of leveraging greater access, particularly as renewables become increasingly affordable. For example, in the wind energy industry, costs are expected to fall by 37–49% by 2050 (Wiser et. al.: 2020: 558).

Economic benefits

- In the long term, the green transition proposes a gradual but material economic upturn through the creation of direct and indirect jobs in the renewable sector, with an estimated 19 million additional jobs globally by 2050, offsetting the job losses in the fossil fuel sector (7.4 million). (Gielen et. al.: 2019: 42-43)
- Despite initial higher system costs, ancillary health benefits associated with shifts promoting decarbonisation strengthen overall green transition policies.

Spill over effects

- Collaboration within the renewable market and further integrating energy within the framework of the Union could lead to a deeper connectedness between member states.

Challenges

Avoiding divergence

- There is potential for divides to worsen between groups of member states, isolating some whilst championing others. Such divisions arise through the multiple and divergent interests between member states further exacerbated by the economic aftermath of the pandemic (Hafner & Raimondi: 2020: 374). Differences also arise from differences in energy identities, e.g. energy import and supplier dependency, vulnerability or resistance to energy cut offs, being susceptible to, or able to capitalise on the economic costs of the renewable transition, as well as current and forecasted domestic renewable sources.
- Resistance to pressure to conform to greener policies may also emerge due to economic downturn and other hardships possible for certain states. These divisions could further diverge throughout the Union, with states either constructing or separating from various groups in their overall goal to define and defend national energy security within the broader context of EU energy policy (Perez et. al.: 2019: 4).
- These divisions could in turn increase the EU's vulnerability, creating opportunities for third countries to implement divide and conquer tactics. Russia and China have amply demonstrated such tactics, including Russian 'divide and rule' approaches to gas supply, and China's "16+1" Belt and Road Initiative platform which emplys a similar approach.

Energy poverty, negative externalities and achieving local acceptance

- Institutions and legislation obliging member states to Sustainable Development Goals and legally binding targets are pursued differently by economies and publics throughout the Union. For different regions and different member states, the speed of the transition appears less feasible due to the economic costs involved, with energy poverty affecting many households and emerging opposition to the energy transition, slowing or even halting the process from the ground up.
- **All such transitions, including decarbonisation, should therefore be approached with consideration of and in combination with local grassroot initiatives, acknowledging the challenge of popular opposition for those for whom the energy transition presents perceived threats to economic wellbeing (Pietrzak et. al: 2022: 18-19).**
- To some extent, the Covid19 pandemic has exacerbated the challenges energy poverty presents to the energy transition. The pandemic induced a period of absent investment, poor market demand, reduced government subsidies, higher start up and technical investment costs for renewable projects. The challenge therefore is not only to effect a post-pandemic reset within the context of a different but equally challenging double crisis: Ukraine and energy. Reworking global supply chains is not merely a matter of resuscitating declines in industrial output and competition, but appreciating post-pandemic reactions to onshore possibly more rather than less in terms of core energy equipment and facilities. This in turn could present restrictions undermining decarbonisation shifts (Tian et al.:2022:4).
- The green transition also means job losses in legacy industries; the coal industry for example estimates job losses in power plants and mines of 160,000 by 2030 (Hafner & Raimondi: 2020: 385). Unemployment (both short term and extended) in other areas is likely, and needs to be factored into all manner of costs and approaches.
- Loss of tax revenue from fossil fuel activities may also affect local communities reliant on such revenues (Carley & Konisky: 2020: 571)
- In the short term, the cost of energy production will be higher through requirements for new infrastructure and technology such as smart meters, power lines and battery storage.

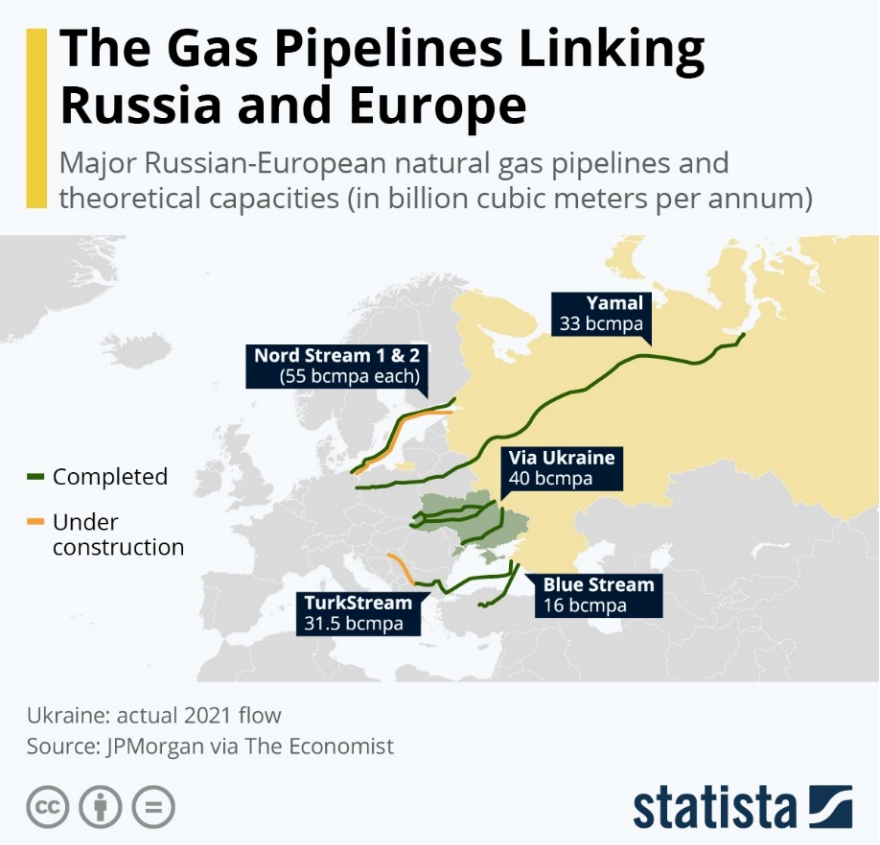
Ameliorating concerns over sovereignty

- The prospect of the EU taking collective action to diversify, transition and reduce dependence on Russia will only be feasible if member states are willing to recalibrate and possibly redirect their energy choices, and their sovereignty over these choices, with and to the EU. Even in the teeth of the Ukrainian crisis, certain member states are likely to be (or become) unwilling to participate fully in this area, insisting that national competencies are safeguarded in terms of energy supply and security (Perez et. al.: 2019: 2). While the current crisis context ameliorates some of this resistance with 85% of Europeans agreeing that the EU should reduce dependency on Russian energy in light of the events in Ukraine (European Commission: 2022b: 2), 2023 and beyond may bring both changes and induce energy fatigue ultimately wearing down this level of commitment.

Further practical considerations of decarbonising and diversification

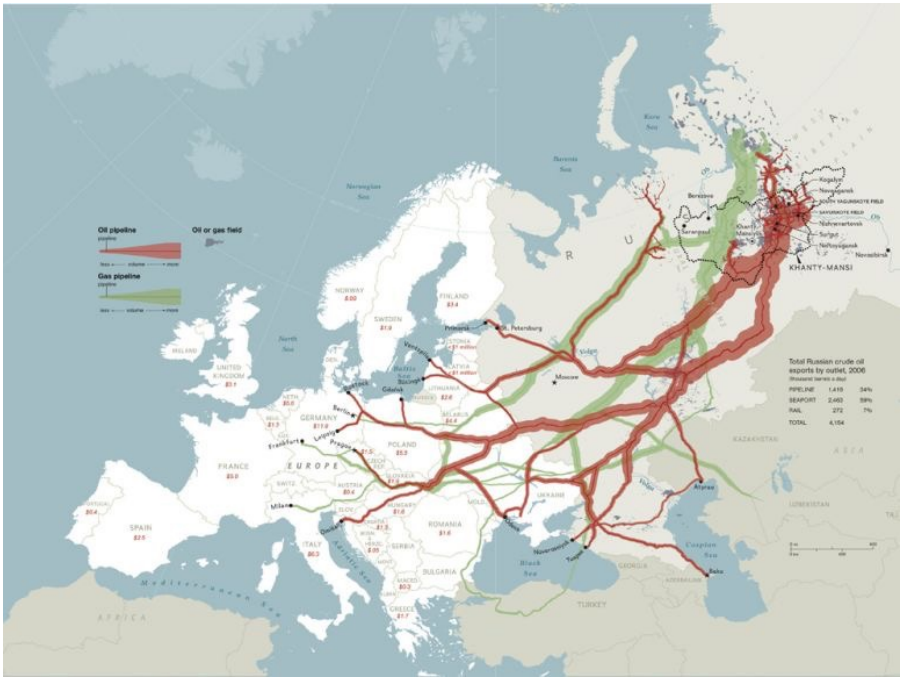
- **Reducing dependence on fossil fuels requires behavioural changes across the whole Union and entire sectors of society through rapid consumption reduction of carbon-based goods. This in turn will require the maintenance of high technological investment and innovation.**

Figure 11



Source: (Buchholz, K. (2022). The Gas Pipelines Linking Russia and Europe. Statista. Statista Inc.. [Accessed: 25/01/2023]. https://www.statista.com/chart/26769/russian-european-gas-pipelines-map/)

Figure 12



Source: (Natural Geographic (nd.) Oil and Gas Pipelines, Map: Oil and gas pipelines from Russia to Europe (online). Available at: https://education.nationalgeographic.org/resource/europe-map [Accessed: 12/08/2022].)

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