Jacopo Maria Pepe

Geopolitics and Energy Security in Europe

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Geopolitics and Energy Security in Europe

EXECUTIVE SUMMARY

The energy decoupling from Russia in the wake of Russia's invasion of Ukraine represents a major sea change for the EU. It exposes not only the failure of its diversification strategy but also the limits of its energy security approach and governance.

Geopolitically, the EU faces a major dilemma on how to preserve its own model of open and liberalised energy markets and its "liberal-regulatory power" **while adapting to a more "realist" world** where geopolitics, states and security considerations dictate energy policy and distort markets.

The EU also faces another more critical double dilemma of reconciling long-term climate goals with short-term supply security and energy independence aspirations with new supply dependencies and risks emerging in the transition to a green and decarbonised energy system.

This forces the EU to recalibrate priorities in the sustainability, supply security and competitiveness trilemma and to redefine energy security in a broader sense, including better coordination with industrial policy goals but also with military capabilities.

The EU is, however, not yet institutionally up for this challenge: the Energy Union, as proposed back in 2015, has largely failed to deliver on its promises to create a more integrated, coordinated and secure internal energy market. It has not resolved the **tension between different levels of energy governance (regional, national and supranational) and different preferences in terms of the energy mix, domestic resources and external partners**. The current crisis calls not only for a rebalancing between energy and climate policy but also for a reconciliation between diverging national priorities and the urgency to coordinate an external response to secure present and future energy supply.

Currently, centralised European energy governance is politically **out of reach** and economically potentially dysfunctional, given the varying structures of European economies and their energy mixes.

However, as the EU must act urgently, a substantial inter-governmental agreement at the European Council level, or at least among willing Member States, is the necessary first step.

A **solid political bargain** for **energy, climate and hydrogen** to bridge existing divergences on how to deliver the Green Deal should flank regulatory and technical compromises on single, sector-specific issues.

This bargain should cover two major lines of action:

The **internal action** should focus on **state or EU-funded energy infrastructure, with a focus on electricity networks and natural gas and hydrogen infrastructure**, which market participants would not otherwise consider viable; joint LNG purchases and multilateral solidarity gas agreements, a focus on low-carbon rather than carbon-free technologies and major government support for technological innovations and the hydrogen industry; and the creation of an agency to support international mining with strong sustainability criteria to minimise the risks of raw materials supply disruption.

The **external action** should first approach **energy and industrial relations with the US and China pragmatically** but **not exclude robust responses**. As a decoupling from China will be hard to achieve, a mix of engagement and diversification will be needed. Dialogue and partnership with the USA should focus on securing supply chains and gas supplies and nurturing green technologies without excluding symmetrical responses when it comes to green investments and industrial competition.

Moreover, the **military dimension of energy security needs to be strengthened**, with a focus on marine energy infrastructure protection, while **new energy & climate partnerships should be broad in scope**, flexibly combine a focus on natural gas, renewables energies, (low-carbon) hydrogen and minerals with support for local low-carbon value chains.

Finally, the EU should focus on regional electricity and hydrogen **interconnectivity and a regional governance mechanism** to strengthen present and future energy supply chains. In doing so, the EU should also increase the level of its engagement in the regional governance mechanism, considering that the current geopolitical fragmentation and supply and value-chain disruption undermine the role and effectivity of global energy-governance institutions.

INTRODUCTION

PROVIDING AN OVERVIEW OF THE KEY ISSUES AND CHALLENGES

The debate surrounding the EU's energy security strategy has been ongoing for decades at varying intensity levels. However, the European Commission took the first major formal step in this direction in February 2015, when the Energy Union Package[1] was launched. The package was meant to pave the way for a truly integrated European energy market (an Energy Union), where Member States cooperate to strengthen their energy security while accelerating the decarbonisation of the energy system.

Several years after the European Commission set up the Energy Union Package, Russia's war against Ukraine has reshaped the geopolitical order and reshuffled global energy supply chains. In fact, the Russian-European energy decoupling represents a sea change for the EU's energy and climate policy in general and specifically for its energy security.

First, the war has exposed the failure of the EU's diversification strategy and the limits of the EU's energy-governance mechanisms. The energy crisis had admittedly started before the war, while shifts in the geopolitical landscape, a fragmentation of global energy-governance mechanisms, divergent approaches to energy policy and markets, and non-alignment on the climate-policy priorities were already visible. Nevertheless, the war caught the EU off-guard, and it was largely unprepared to cope with a geopolitically induced supply crunch. As more statist approaches dictate energy policy and shape energy markets, the EU's regulatory, market-driven and climate-orientated energy policy is now under pressure.

Second, the EU faces a potential trade-off between short-term needs to secure an alternative fossil-fuel supply and the long-term priority to decarbonise its economy. In the years since the Energy Union Package was approved, the EU has come to prioritise climate policies over energy security considerations, while the REPowerEU plan has reaffirmed that accelerating the transition is a top priority. However, current investments in fossil-fuel infrastructure and reactivation of coal-fired power plants might cause lock-in effects, undermining climate-policy goals and yearly emission targets. The combination of ambitious climate goals, a very tight timeline, short-term fossil-fuel supply constraints, and mid-to-long-term, almost unrealistic increases in green-electricity production, green-technology manufacturing and hydrogen make the task almost impossible without a joint, coordinated and possibly integrated effort.

Third, the EU's future energy-security strategy also needs to strike a balance between the ambition to increase supply resilience and energy sovereignty on the one hand and the reality of growing new dependencies on the other. A sudden decoupling from – or simply a sensible decrease in – Russia's gas, oil and coal supplies will have significant geopolitical consequences for both present and future energy security. The EU must now navigate between tense relations with and substantial dependencies on China, non-aligned interests with the US and the new fierce systemic competition on technologies, standards, critical minerals, and resilient value and supply chains.

While discussions on short-term measures to substitute Russian gas and to secure supply over the next two winters started right after the war broke out, there is still a lack of a more long-term, holistic analysis, discussion and rethinking of the future of the EU's energy security and its core assumptions, instruments and goals.

By focusing primarily on EU institutions, strategies such as the Energy Union package and instruments – rather than on single Member States – this study attempts to sketch a possible path out of the current crisis. It will focus on two crucial questions: what does the EU's energy security in the transition from a fossil fuel to a post-fossil-fuel energy system look like both now and in the future? What kind of pragmatic approach to energy security could the Union take to cope with the challenges and uncertainties it faces?

This study is structured as follows: the first chapter will discuss the EU's concept of energy security, its evolution over time, particularly since the war, and how the return of geopolitics changes the EU's traditional, market-centred definition of energy security. The second chapter takes stock of the EU Energy Union Package to discuss the Energy Union provisions and the related implementation shortcomings in more detail. The third chapter focuses mainly on the geopolitical, long-term impact of Russia's war on the EU's approach to energy security in the transition to a post-fossil-fuel energy system. Particularly, it outlines potential lessons learned and how to avoid similar shocks in the future. The fourth chapter focuses mainly on the new challenges the EU will face after the end of the "Russian energy tyranny" and take stock of the energy and industrial policies of China and the US to assess the impact on the EU's energy security. In the conclusion, the main findings will be summed up as five major dilemmas and key recommendations formulated along two major lines of action.

1 European Commission: Energy Union Package (25.02.2015) https://eur-lex.europa.eu/resource.html?uri=cellar:1bd46c90-bdd4-11e4-bbe1-01aa75ed71a1.0001.03/DOC_1&format=PDF (last accessed: 17.11.2022)

1

REDEFINING ENERGY SECURITY

FROM MARKET TO GEOPOLITICS

The EU's concept of energy security builds on the International Energy Agency's definition of "reliable and affordable access to all fuels and energy sources".[2] This implies availability, affordability and reliability.[3] In May 2007, the European Council developed a coordinated energy and environment policy.[4] In 2009, the Treaty of Lisbon introduced a new legal basis for shared competencies in the field of energy and climate. Since then, the EU has been entitled to take measures to ensure the security of energy supplies by diversifying routes and suppliers (particularly given the historically high dependence on Russia). Its action also aims to reduce market dominance and supplier concentration and keep energy affordable for European consumers by reforming, liberalising and integrating gas and electricity markets. The EU's understanding of energy security is primarily supply-centred and quintessentially market-orientated. Along with energy supply reliability and affordability, environmental sustainability has been more recently added as a third pillar, also in line with global trends.[5] The 2015 Energy Union Package is the most comprehensive attempt to define objectives and an instrument for a holistic approach to energy security. It states that "the goal of a resilient Energy Union with an ambitious climate policy at its core is to give EU consumers – households and businesses – secure, sustainable, competitive and affordable energy".[6] The triangle of security of supply (reliability), sustainability (climate) and competitiveness (affordability) forms the core of the EU's energy policy. The EU believes these mutually reinforce each other. However, by declaring all goals equally important, the EU has long failed to define clear priorities and tackle the trade-off between climate and supply security goals.

Two assumptions lie at the very core of the EU's energy security: first, economic efficiency, cost calculations and open, functioning markets for suppliers and consumers would allow for economic affordability, timely investments and uninterrupted supply, respectively. In the EU's case, given the institutional design of its energy governance, market size and the regulatory power of the single market should make up for the lack of external geopolitical and state coercion capability, especially vis-à-vis external suppliers.[7] This is particularly true in the absence not only of a common foreign energy policy but also of significant financial resources and interventionist capabilities to define industrial and economic policy at the European level.[8] These key policy areas, along with the choice of energy technologies, energy mixes and priorities in terms of partners and routes, remain delegated to Member States. Consequently, the European Commission has focused on its core competencies – single energy-market implementation and climate governance regulation – to define its radius of action in the energy-security field.

The market-driven approach, underpinned by the Union's regulatory power, has proven quite successful occasionally. First, since the early 2010s, the shift from a supplier to a consumer market and from long-term oil-indexed gas contracts to more global and competitive (LNG) markets has allowed for several renegotiations of long-term contracts with Gazprom. As a result, prices for Russian-gas imports for Central European countries, including Germany, declined significatively, while long-term contracts allowed for supply stability.[9] Second, as part of the third liberalisation package approved in 2009, the EU extended the "ownership unbundling" rule to non-European companies operating on the single market with an additional restrictive clause and certification requirements to prevent non-European (i. e., Russian) third parties from acquiring critical transmission infrastructure.[10]

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2 International Energy Agency: Energy security- Reliable, affordable access to all fuels and energy sources, Energy security – Topics – IEA (2022) https://www.iea.org/topics/energy-security, (last accessed: 16.10.2022).

3 Yergin, D. (1988): Energy Security in the 1990s, in: Foreign Affairs, vol. 67, no. 1, Fall 1988.

4 European Council: Presidency Conclusion (2007) https://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/93135.pdf, (last accessed: 16.10.2022).

5 Elkind, J.: Energy security call for broader agenda, in Carlos Pascual/ Jonathan Elkind (eds): Energy Security: Economics, Politics, Strategies, and Implications, 1st ed., (Washington, DC: Brookings Institution Press, 2009).

6 European Commission: Energy Union (2015).

7 Goldthau, A., Sitter, N. (2015): A Liberal Actor in a Realist World: The European Union Regulatory State and the Global Political Economy of Energy. Oxford: Oxford University Press.

8 Austvik, O.G., Lembo, C. (2016): International Law and EU-Russian Gas Relations, Harvard Kennedy School, p. 15, available at: https://www.hks.harvard.edu/sites/default/files/centers/mrcbg/files/Austvik_final_53.pdf, (last accessed: 02.12.2022).

9 International Energy Agency: "Despite short-term pain, the EU's liberalised gas markets have brought long-term financial gains" (2021) https://www.iea.org/commentaries/despite-short-term-pain-the-eu-s-liberalised-gas-markets-have-brought-long-term-financial-gains, (last accessed: 16.11.2022).

10 Cottier, T., Matteotti-Berkutova, S., Nartova, O. (2010): Third Country Relations in EU Unbundling of Natural Gas Markets: The "Gazprom Clause" of Directive 2009/73 EC and WTO Law, WTI Working Paper No 2010/06| May 2010, https://www.wti.org/media/filer_public/96/9b/969b5456-820f-4077-a716-67576d322ca9/access_to_gas-grids.pdf, (last accessed: 16.11.2022).

The second assumption at the very centre of energy security, as defined by the Energy Union Package back in 2015, is that technological innovation and green transformation will decisively contribute to displacing geographical concentration and geopolitical abuse of energy resources. Therefore, the decarbonisation of the energy system and the growing electrification of the economy, along with a strong focus on research, innovation and competitiveness in green technologies, will not only help achieve the climate targets but also diminish dependence on fossil fuels and automatically increase energy security, thus resolving the dilemma between sustainability and supply security.

In the years after the launch of the Energy Union Package, the European Commission decided to prioritise climate goals and the completion and upgrade of the internal market over external supply security. Thus, it shifted priorities within the energy triangle from security and competitiveness to sustainability. In doing so, the energy transition and the transformation of the economic system have become the sole prism to securing the energy supply.

The impact of Russia's war against Ukraine on energy markets and supplies has forced the EU to rethink its perception and reassess and rebalance instruments, policies and short-term priorities in the energy trilemma. However, the EU has not yet fundamentally changed its understanding of energy security nor its long-term priorities, while structural flaws and contradictions at the basis of its energy-policy governance remain unaddressed.

Diversification of fossil-fuel supplies and decoupling from Russia's energy imports is now certainly a geopolitical priority and necessity, along with the need to increase Europe's resilience and strategic energy autonomy. The REPowerEU plan, presented by the Commission a few weeks after the war outbreak, aims to rapidly reduce and replace Russia's gas imports with other suppliers and new routes and to phase out Russian gas imports well before 2030.[11] Meanwhile, the Commission has also stepped up efforts to strengthen the international dimension of energy security. In May 2022, the European Commission presented EU External Energy Engagement in a Changing World (with several innovations on the concept of energy security as opposed to the Energy Union Package. This includes diversifying partners, a renewed focus on hydrogen and renewables value and supply chains, and raw materials partnerships.

However, the EU's understanding of energy security remains very market-driven and reliant on its normative-regulatory power. The core assumption is that decoupling from Russia is a geopolitical necessity to increase the EU's strategic autonomy and secure gas supplies in the transition. In a post-fossil-fuel energy system, green technologies and renewables will pay off in terms of greater reliance and absence of asymmetrical dependencies or risks of weaponisation. Consequently, a fundamental change in how the EU perceives energy security might not be necessary. This approach is hardly in line with the current global development, though, where geopolitics rather than economics increasingly defines energy security and shapes energy markets.

The role of geopolitics in influencing global energy security is changing as well. For industrialised net energy importers like the EU, it can be traditionally defined as "the influence of geographical factors, such as the distribution of centres of supply and demand, on state and non-state actions to ensure adequate, affordable and reliable supplies of energy".[12] A successful green transformation can indeed reduce asymmetrical dependencies, limit the possibility to weaponise energy resources and ultimately reduce the role of geography. However, in the transition period, new dependencies and risks might add to old ones. The emerging new energy world will be technology-intensive without being any less resource-dependent. A major role is to be played by sector-coupling, industrial transformation processes and energy transport corridors for electricity and hydrogen, as well as for critical green technology components. Diffuse and multiple dependencies and new international partnerships will arise. As economic and energy spaces are redrawn, there will continue to be a major shift in the geopolitical power balance, defined by competition between the great powers – not limited to the US and China – and a fragmentation of the global economy driven by protectionism, a return of the state as an economic actor and decoupling tendencies. Thus, geopolitical, technological, industrial, and market competition will add to the geological concentration of minerals and the need to secure and control supply and value chains. The role of geography and geopolitics in defining energy security is evolving but still proves essential. This forces a deep rethink for the EU, starting with its institutional tools and governance mechanisms.

11 European Commission, REPowerEU Plan, 18.5.2022, https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131, (last accessed: 18.11.2022) p.5.

12 Bradshaw, M.J.: The Geopolitics of Global Energy Security, in: Geography Compass 3/5, 2009, pp.1920–1937 (1921).

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THE EU ENERGY UNION

WHAT WENT WRONG? THE UNRESOLVED COMPETENCE DILEMMA

A few months after the annexation of Crimea by Russia, the new Juncker Commission recognised in the EU's first Energy Security Strategy that the EU remained extremely exposed to external supply shocks and highly dependent on Russia, particularly for gas.[13] Notwithstanding the measures taken after the Ukraine-Russia gas wars in 2006 and 2009 – especially the amended Gas Supply Regulation in 2013[14], Russia made up 39 per cent of the EU's natural gas imports or 27 per cent of EU gas consumption, with six members, in eastern and south-eastern Europe, completely dependent on Russian supplies. At that time, the three Baltic republics were also connected and synchronised with Russia's electricity grid. The third energy package approved in 2009 aimed to create a liberalised and fully integrated energy market, covering particularly unbundling.[15] Unbundling refers to separating activities that are subject to competition (gas and electricity production and supply) from those where competition is not possible or permitted (such as transmission and distribution of gas and electricity, which are regulated monopolies in the EU). It proved successful in reducing Gazprom's leverage but not in addressing Europe's divergent energy interests, its dependency on Russia and its lack of diversification.

Against this backdrop, the Energy Union Package released in 2015 aimed to take a holistic approach to energy and climate policy and supply security. With the package, the European Commission sought to achieve the ambitious goal of strengthening, coordinating, harmonising and, where possible, gradually centralising at EU-level energy and climate governance mechanisms – or at least competencies. This was intended to forge a truly integrated internal and external EU energy and climate policy, and the Energy Union correctly identified areas where action was urgently needed.

First, the European Commission rightly recognised that the internal market as designed in the Third Energy Package was not functioning well. This was true both in terms of harmonisation and unification of national regulatory frameworks and in terms of infrastructure connectivity (interconnectors) among several national markets, particularly in central-eastern Europe. This fact undermined any possibility of leveraging the free flow of energy to shield the Union's members from external supply shocks. Between 2015 and 2020, the Commission revised a series of laws, including both directives and regulations, to enhance the functioning mechanisms and the design of an integrated electricity market fit for the energy transition and the expanded use of renewables, but also to become more resilient to external shock. While an integrated electricity market has been successfully implemented, the crucial aspect of interconnectors expansion – crucial to allow an uninterrupted electricity flow and to accommodate increased electricity needs – has remained largely unaddressed. The Clean Energy Package adopted in 2019 as the Fourth Energy Package set the ambitious, though non-binding, goal to achieve cross-border interconnections of at least 10 per cent of each Member State's installed electricity production capacity by 2020, rising to 15 per cent by 2030.[16] However, construction of additional cross-border electricity interconnectors has remained largely unachieved, with only 17 out of 28 member countries having reached the 10 per cent goal by 2020.[17]

Major problems identified were in the regulation framework privileging public TSO over private merchant investors, but also Member States' national preferences for energy sovereignty as well as physical bottlenecks particularly prominent in Germany's transmission grid. For its part, the liberalised gas market and the EU provisions have since allowed for the establishment of several trading hubs, most prominently in north-west Europe, but also gradually in Italy and central-eastern Europe. The European gas market had therefore gradually turned into a liquid and flexible market, with growing internal downward price convergence and a major

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13 European Commission (2014): European Energy Security Strategy, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52014DC0330&from=EN, (last accessed: 02.12.2022).

14 European Commission (2009a): Regulation of the European Parliament and of the Council concerning measures to safeguard security of gas supply and repealing Directive 2004/67/EC, available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52009PC0363&from=EN, (last accessed: 16.11.2022).

15 European Commission (2009): Third Energy Package, https://energy.ec.europa.eu/topics/markets-and-consumers/market-legislation/third-energy-package_en, (last accessed: 17.11.2022).

16 European Commission (2019): Clean Energy for All Europeans, https://energy.ec.europa.eu/topics/energy-strategy/clean-energy-all-europeans-package_en, (last accessed 17.11.2022).

17 Sutton, I. (2021): New cable between Germany and UK advances Europe's integrated power system, in: Clean Energy Wire, https://www.cleanenergywire.org/news/new-cable-between-germany-and-uk-advances-europes-integrated-power-system, (last accessed: 18.11.2022).

decoupling from the oil indexation in long-term contracts. However, regulation for the construction of additional gas interconnectors has grown increasingly complex and politicised, particularly in the post-2014 environment and following the discussion on the Nord Stream 2 pipeline. Meanwhile, European players have shown "limited interest for building new multi-border pipelines in the post-2000 liberalised EU gas market environment, the only supplier making – and proposing to make – substantial investment in new cross-border pipelines" (Yafimava).[18] To add to this, the EU's Green Deal has led to a significant shift in the priorities on building new energy infrastructure, clearly prioritising decarbonised gas markets and hydrogen, and deprioritising investments in additional natural gas capacities.

Second, and related to the above, the Commission once more stressed the need for joint approaches to external supply security, including building up alternative corridors to Russia's pipeline network and an LNG terminal to increase LNG trade and alternative supply sources for enriched uranium. It also proposed the creation of voluntary mechanisms for demand aggregation and joint gas purchase. In 2016, the Commission presented an LNG and gas-storage strategy pledging to construct LNG terminals in the Mediterranean and the Baltic Sea and to improve the cross-border use of gas storage facilities, so far unevenly distributed across Europe and scarcely connected across borders.[19] In 2015, the EU had 27 operational LNG terminals, eight under construction and 22 in planning.[20] However, in 2022, just two more terminals became operative (bringing the total to 29 terminals), while eight were still under construction and 26 were in planning.[21] Several amended gas-supply regulations introduced gas-security safeguards and enhanced prevention, solidarity and crisis-response mechanisms. Equally, the Commission amended the Gas Directive in 2019 to ensure that the EU internal gas market rules apply to gas-transmission lines between a Member State and a third country. This amendment particularly targeted the Nord Stream 2 pipeline and aimed at countering Gazprom's dominant position in Europe's gas market. There are new rules to allow reverse flow, plus the new Southern Gas Corridor (TANAP) project, but their impact has indeed been limited when it comes to significantly reducing dependence on Russia. In 2020, Russia retained its role as the main EU supplier of crude oil (29 per cent), natural gas (43 per cent) and solid fossil fuels (54 per cent) for the entire EU.[22] In the case of gas, the increase in Russia's share between 2015 and 2020 owes largely to a combination of declining domestic production, a lack of significant alternative volumes of piped gas from other countries and a slower-than-expected expansion of LNG infrastructure and LNG trade, particularly in gas-intensive countries like Germany and Italy.

Third, the Commission rightly prioritised ambitious climate goals and the decarbonisation of the economy also as an instrument to secure future energy resilience and diminish reliance on Russia. In fact, this is the area where the Energy Union's priorities have translated into a major binding political decision and moved to the top of the EU's political agenda. After committing to the Paris Agreement goal, the 2018 Renewable Energy Directive (RED) has revised the EU's targets upwards and introduced an EU-wide binding share of 32 per cent of renewables in final gross consumption by 2030. After the Green Deal was presented in 2020, the Union has since set far more ambitious and comprehensive goals: an EU-wide 55 per cent reduction in greenhouse gas emissions compared with 1990 by 2030 and net-zero emissions by 2050. This represents a major leapfrog in positioning the EU as a frontrunner in energy transition and global climate policy. Within this scope, the European Commission has taken impressive steps to update and upgrade the binding directives on the Emissions Trading System (expanding it to heating and transport) on energy efficiency as well as the Renewable Energies Directive. Specifically, the European Council agreed to further increase the target share of renewables in the overall energy mix to 40 per cent by 2030.[23] So far, however, results remain below expectations. Major achievements are concentrated in the electricity sector: the share of renewable energy in the EU electricity mix reached 38 per cent in 2020, exceeding the share of gas and coal for the first time.[24] However, industry, transport and heating are still overwhelmingly responsible for the high share of fossil fuels in the EU energy mix and thus for the Union's high external dependence on fossil-fuel imports: in 2020, natural gas, petroleum and petroleum products accounted for 60 per cent of the EU's energy mix.[25] This is less surprising, as the EU sets overall binding targets at the EU level but leaves a certain level of flexibility in national contribution targets as well as sub-targets for energy-intensive sectors. In view of the Ukraine war, the European Council has agreed upon binding targets for the transport and industrial sectors. However, these prove either relatively unambitious or allow for intra-sector flexibility.

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18 Yafimava, K. (2018): Building New Gas Transportation Infrastructure in the EU – what are the rules of the game? In: The Oxford Institute for Energy Studies, available at: https://a9w7k6q9.stackpathcdn.com/wpcms/wp-content/uploads/2018/07/Building-New-Gas-Transportation-Infrastructure-in-the-EU-what-are-the-rules-of-the-game.pdf, (last accessed: 02.12.2022), p.3.

19 European Commission: EU Liquefied Natural Gas and gas storage strategy, 2016, https://ec.europa.eu/commission/presscorner/detail/en/MEMO_16_310, (last accessed: 18.11.2022).

20 Gas Infrastructure Europe: The European LNG terminal infrastructure 2015: Status and Outlook, https://www.gie.eu/wp-content/uploads/filr/2544/20150617%20GLE%20LNG%20abstract_final.pdf, (last accessed: 18.11.2022), p.4.

21 Statista: Number of operational and planned liquefied natural gas (LNG) import terminals in Europe as of April 2022, by country, https://www.statista.com/statistics/326008/lng-import-terminals-by-country-europe/, (last accessed: 18.11.2022).

22 Eurostat (2022): From where do we import energy?, available at: https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2c.html, (last accessed: 18.11.2022).

23 European Council (2022): "Fit for 55": Council agrees on higher targets for renewables and energy efficiency, Press release, https://www.consilium.europa.eu/en/press/press-releases/2022/06/27/fit-for-55-council-agrees-on-higher-targets-for-renewables-and-energy-efficiency/, (last accessed: 02.12.2022).

24 Agora Energiewende (2021): Renewables overtake gas and coal in EU electricity generation, available at: https://www.agora-energiewende.de/en/press/news-archive/renewables-overtake-gas-and-coal-and-coal-in-eu-electricity-generation-1, (last accessed: 18.11.2022).

25 Eurostat: Where does our energy come from?, 2022, <https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2a.html, (last accessed: 18.11.2022)).

Fourth, the Commission stressed the need to overcome an inward-looking approach to energy and climate policy and proposed to revitalise bilateral energy partnerships with a vast number of countries and suppliers. The implementation of this crucial element has proven scarce: internally, it was limited to updating the internal exchange mechanism requiring EU countries to submit all existing international energy agreements to the Commission for assessment. As a non-binding instrument, this provision remained largely unfulfilled. Externally, the EU developed rather technical energy partnerships, mostly in the form of Memoranda of Understanding, with single current or potential suppliers like Algeria (2015) or Egypt (2018) and fostered energy dialogues as part of multilateral frameworks, including the Eastern Partnerships, the Mediterranean Union and the Central Asia strategy. Until the war broke out, however, these partnerships did not focus on securing energy supplies.

Notwithstanding the Commission's activism and undisputable improvements, particularly in completing the single electricity and gas market and in defining and implementing climate-related legislative acts, the EU Energy Union Package has proven inefficient and inadequate in making the European energy system more resilient and less risk-prone to supply disruption amid rapidly changing energy markets and an uncertain global geopolitical landscape. The lack of diversified supplies and the high dependence on Russia is the most visible failures. However, this is more a symptom of a single major, unresolved dilemma: the EU – and specifically the European Commission – lack exclusive competence when it comes to two critical energy-policy fields: energy mix choice and energy foreign policy as part of a sovereign-European foreign policy action.

Article 194 of the Treaty on the Functioning of the European Union, as amended by the Treaty of Lisbon, makes some areas of energy policy a shared competence, particularly those related to the energy transition, energy efficiency, internal energy networks interconnection and most importantly supply security, signalling a move towards a common energy policy. Nevertheless, each Member State maintains its right to "determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply".[26] Otherwise, while the Union may conclude binding international agreements (Article 216–218), it is the Council and not the Commission that may authorise the opening o f negotiations, adopt negotiating directives, authorise the signing of agreements and conclude them. As a result, any decision to conclude international agreements, including in the energy sector, is the result of an intergovernmental bargaining process at the Council level, while nation-states retain the right to develop energy relations in line with national priorities and energy mix structure.

The Commission has reacted by introducing the Governance of the Energy Union and Climate Action Regulation in 2018 "to help the EU reach its 2030 climate and energy targets, and to set common rules for planning, reporting and monitoring to the Commission synchronised with the ambition cycles under the Paris Agreement.[27] Under the regulation, EU Member States need to establish 10-year integrated national energy and climate plans for the period from 2021 to 2030, submit a progress report every two years and develop consistent national long-term plans to meet the goals of the Paris Agreement (European Commission, Governance of the Energy Union and Climate Action). However, with persisting and pre-existing national energy competencies come increasingly diverging geopolitical priorities and perceptions, particularly between eastern, western and southern European members in the post-2014 energy and geopolitical environment (the annexation of Crimea and the Paris Agreement), leading to continued incoherent policies and unresolved disputes on energy-mix priorities and energy partner diversification, which have become visible since the war.

26 European Union: Treaty of the European Union - consolidated version, 2020: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:12016E/TXT&from=EN, (last accessed: 18.11.2022). p.134-135.

27 European Commission: Governance of the Energy Union and Climate Action, 2019 https://climate.ec.europa.eu/eu-action/climate-strategies-targets/progress-made-cutting-emissions/governance-energy-union-and-climate-action_en, (last accessed: 18.11.2022).

3

RUSSIA'S GEOPOLITICAL SHOCK

THE SHORT AND LONG-TERM IMPACT ON EU ENERGY SECURITY

Russia's war against Ukraine represents a sea change in EU energy policy: immediately after the outbreak of the war, the Commission presented the REPowerEU plan to reduce dependence on Russian gas by two-thirds by the end of 2022 and to phase out Russian gas supplies well before 2030. EU Member States have been particularly fast in reducing their reliance on Russia by securing alternative LNG volumes. Meanwhile, the European Commission has brokered a compromise for a coordinated consumption reduction. It has also created an ad-hoc platform to enable voluntary common purchases of gas, LNG and hydrogen by pooling demand, optimising infrastructure use and coordinating outreach to suppliers. Russia's share in EU gas imports sank from 43 per cent to 9 per cent since the beginning of the war, while LNG now makes up 38 per cent of total EU imports. However, this is more the result of Russia's decision to decrease supplies and single Members' activism rather than the EU's coordinated diversification.

So far, EU Member States have been slow in agreeing on further, more substantial coordinated steps, like common gas purchases, measures to support low incomes and industries and approving a gas price cap. Unfortunately, they have ended up making less-than-ambitious compromises while discussions on a global hydrogen market ramp-up, on a clear and accepted definition for clean hydrogen, on technological standards and preferences, and on transport and trade issues are still ongoing.

Besides short-term debates on securing alternative supplies for coming winters, the geopolitical impact of Russia's war in Ukraine on the EU's energy-supply security is long-lasting:

First, the war has exposed the vulnerability of energy interdependences solely based on economic rationality. Nevertheless, it has also revealed the limits of the EU's liberal-regulatory power and its energy governance to secure energy supplies in a geopolitical context increasingly marked by realpolitik.

The war has augmented and highlighted the long-term trends already unfolding. The return of great power rivalry, the fragmentation of the liberal world economic order, the disruption of energy and industrial supply chains, and the weaponisation of energy have all had a direct negative impact on global energy governance mechanisms (largely dysfunctional), on the relations between producers and consumers, and the relation between state and markets long before the war.

What is particularly striking is the usage of energy supplies and infrastructure both as leverage to maximise geopolitical dividends or as a target of asymmetrical warfare, as the Nord Stream 2 attacks show. One of the geopolitical implications of the war is that for the EU, sea-based energy supplies and maritime energy infrastructure are becoming increasingly important as a result of the commercial and infrastructural decoupling from land-based supplies. This is even more true in light of the energy transformation. Maritime energy infrastructure is becoming more and more relevant for the EU for three reasons, making it particularly vulnerable to hybrid warfare: firstly, in addition to pipelines under the Baltic Sea, the North Sea, and the Mediterranean Sea, LNG terminals, in particular, will be built in the coming years. Re-gasification plants on land, as well as floating terminals on sea and LNG ships, form the backbone of European and German gas supplies. Secondly, planned offshore wind farms and undersea power cables will cover a significant part of the EU's electricity demand in the maritime region of the Baltic Sea and North Sea. Due to the digitisation of the power supply (decentralised smart grids), acts of sabotage in the form of cyberattacks against control systems are also becoming more common. Thirdly, in the medium to long term, pipelines, ports and ships from neighbouring as well as distant countries such as Chile and Australia will form the backbone of regional and global hydrogen supply chains. At the same time, safe and secured sea routes are also critical for the transport of raw materials and industrial components crucial for the energy transformation, particularly since this is associated with growing dependencies on countries such as China and a possible disengagement with the USA as a guarantor of safe and open sea routes. The protection of increasingly complex and elongated energy supply chains, coupled with a large number of interlinked sea-based infrastructure systems for the transport and conversion of energy sources, poses a financial and logistical challenge. This includes protection from sabotage or espionage but also the limitation of one-sided dependencies by one supplier or by one route/piece of infrastructure.

Consequently, states and companies are reassessing their energy partnerships based on geopolitical resilience, infrastructure protection and control of the supply chain, but less

on economic opportunities. While private operators and companies remain the major players in the energy market, the role of the state is growing again. In the EU, these global trends also impact the design and the logic of the internal single market, exposing its institutional weakness and the unresolved conflict between statist and market-driven approaches and between exclusive and shared competencies between different governance levels (supranational, regional and national). Meanwhile, geopolitical power rooted in a common and shared foreign-energy policy agenda and economic strength can help mitigate the risk of disruptions through pre-emptive risk management and by diversifying and securing routes and suppliers more than market size and regulatory power.

Second, the energy transformation and the decarbonisation of the energy systems will be technology-driven and industry-intensive. Renewable-energy technologies will be vital to securing energy in a decarbonised system. Consequently, both competition and cooperation on these technologies and their standards will define the new energy landscape and the new geopolitics of energy. Along with keeping the technological edge, however, scaling up manufacturing production will not only prove crucial for securing enough energy output to reach the mid and long-term climate goals; it will be essential for shaping more independent and resilient supply and value chains. Retaining industrial capacities on the continent will also allow for greater influence when defining technological standards.

The new energy system will also be more raw materials-intense: securing access to and the processing of critical materials, especially minerals like cobalt, lithium, copper, platinum, iridium and nickel, will be as essential as securing the technology edge and manufacturing capacity. Controlling and diversifying supplies in the downstream sector (mining, processing, smelting and transport) will be essential. While some of these minerals, such as nickel and copper, are not rare and there is no scarcity on the market, they are either highly concentrated in few countries or mining, and processing capacities are largely controlled by non-Western powers like China or Russia and the influence of these two powers on critical supplier countries is growing.[28]

Transport networks and new energy corridors will further play a crucial role. The role of energy connectivity networks will increase, particularly when it comes to electricity grids and new hydrogen supply chains, which will require significant financial, military and diplomatic efforts to secure infrastructure resilience and protection.

Finally, during the transition period, as energy value and supply chains become more complex and the number of actors in the energy landscape increases, this calls for more active, flexible and all-encompassing energy and climate diplomacy and more flexible and interest-driven relations with new and old partners, starting with the two major stakeholders of the future energy order, China and the US.

The experience with Russia shows that to prevent similar shocks in the future, security and military considerations, industrial-technological competition, and sovereignty aspirations need to be factored in when designing energy relations, energy markets and access to secure energy more than cost calculations, efficiency or open markets. This calls for a multi-pronged approach to energy security, which goes beyond a narrow focus on supply to include a military, industrial and technological dimension.

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28 Ansari, D./ Grinschgl, J./ Pepe, J.M. Electrolysers for the hydrogen revolution, Challenges, dependencies, and solutions, SWP Comment 2022/C 57, https://www.swp-berlin.org/en/publication/electrolysers-for-the-hydrogen-revolution, (last accessed: 18.11.2022).

4

THE NEXT CHALLENGE

THE UNITED STATES, CHINA AND THE IMPACT ON EU ENERGY SECURITY

China and the US present two distinct challenges for the present and future of Europe's energy security. Even if the EU successfully phases out Russian gas for good, it remains heavily dependent on energy imports and whatever the scenario, it will not be able to reach complete energy independence. In short to mid-term, gas especially remains essential to securing the transition. The US will play an essential role here. In the mid to long term, as the decarbonisation of the economy proceeds, China especially, but also the US, will have a major impact on the EU's green value and supply chains.

China and the US are very different actors in terms of geopolitical interests and their position in the global energy market. But both are leveraging their role as upcoming prosumers (both consumers and producers of energy sources and technologies).

The US is an energy-abundant country and has emerged since the oil and gas shale revolution as a major net energy exporter of petroleum products and LNG. Against this backdrop, the US perspective on energy security is moving from one of a major consumer to one of a major prosumer. After the Trump presidency, US climate policy has risen in importance. However, climate policy is accompanied and underpinned by more robust industrial policies and spending programmes to strengthen resilience and the scope of the US's manufacturing sector. The Biden administration plans to unleash unseen levels of fiscal spending to expand renewable energies and modernise the country's infrastructure needed for a net-zero carbon economy by 2050. The most recent example of this approach is the Inflation Reduction Act (IRA), a landmark law which aims to curb inflation by investing in domestic energy production while promoting clean energy through generous tax credits and exemptions.[29] A further essential element of the US approach to energy policy revolves increasingly around its conflictual relation with China. Since 2018, the US has articulated a domestic and international response to China's technological rise based on decoupling, diversifying and reshoring. It aims at decreasing dependencies in critical supply chains (Executive Order on Supply Chains), developing international initiatives to establish globally accepted technical standards, certification rules and infrastructure building as an alternative to the Chinese model. The US also imposed higher tariffs for imports of critical industrial components from China (Inflation Reduction Act and Build Back Better World Partnerships). The need to take on China is one of the few policy fields with bipartisan consensus. For the EU energy security, the US American approach to energy and climate policy represents both a short-term opportunity and a mid to long-term challenge.

After phasing out Russian gas supplies, the EU will rely almost entirely on US LNG supplies and – only after 2025 – presumably on some supplies from the Gulf. Russia's decoupling comes with a transatlantic recoupling, which no doubt strengthens US-EU relations and offers a gas-supply alternative to Russia. In the wake of Russia's invasion of Ukraine and a spiking gas price and supply crisis, the EU and the US have announced in a joint statement the establishment of a US-EU Task Force on Energy Security.[30] This aims to discuss both short and long-term LNG supplies to Europe and harmonise policies with respect to the energy transition, energy savings and methane emission reduction. The task force is also an instrument to reaffirm the joint commitment to shared climate goals.

Indeed, the US will emerge as the main EU supplier, making up almost 40 per cent of the EU's gas imports.[31] US volumes to Europe almost doubled in the first ten months of 2022 compared with the entire of 2021 (from 26 to 48 bcm), while for 2023 and the coming years, the US has committed to exporting an additional 50 bcm annually.[32]

However, envisaged additional volumes might still not be enough to make up for Russian volume losses in the coming years, and refilling storage will prove increasingly challeng-

29 United States Congress: Inflation Reduction Act, 2022, https://www.congress.gov/bill/117th-congress/house-bill/5376/text, (last accessed: 18.11.2022).

30 Joint Statement by President von der Leyen and President Biden, 24.03.2022, https://ec.europa.eu/commission/presscorner/detail/en/statement_22_2007, (last accessed: 18.11.2022).

31 Energiewirtschaftliches Institut an der Universität zu Köln (EWI) (2022), Entwicklungen der globalen Gasmärkte bis 2030 - Szenarienbetrachtung eines beschränkten Handels mit Russland, https://gas.info/fileadmin/Public/PDF-Download/studie-entwicklung-der-globalen-gasmaerkte.pdf, (last accessed: 19.11.2022) p.4.

32 The White House: Joint Readout of the US-EU Task Force Meeting on Energy Security, 2022, https://www.whitehouse.gov/briefing-room/statements-releases/2022/11/07/joint-readout-of-u-s-eu-task-force-meeting-on-energy-security/, (last accessed: 18.11.2022).

ing, even if we factor in a 15 per cent consumption reduction. Much more, as new LNG projects will go on stream in the US only after 2025/2026, Europe currently obtains any additional volume from other markets, especially Asia, at a premium price. Price differences between LNG production costs in the US and spot market prices in Europe have allowed price arbitrage and guaranteed US (and European) companies and traders major speculative extra profits. In the long term, however, it is doubtful that US LNG producers will commit themselves to a market which offers no long-term off-take guarantees. Hence, the EU's new dependence on US LNG imports leaves it dependent on a tight and potentially volatile market.

The US is also a crucial partner for the energy transition, especially when it comes to technological standards and investments in green technologies. After the tumultuous Trump presidency and the growing estrangement in the bilateral economic relation, the EU and the US established a Trade and Technology Council in 2021 to coordinate action on a series of issues, including securing supply chains for critical components and minerals on green technology standards.[33] So far, however, the Council's impact on bilateral industrial-technological and energy cooperation has remained limited. On the contrary, the Inflation Reduction Act contains measures to bolster America's electric vehicle and battery production as well as green hydrogen. The Act aims to make the US less reliant on foreign suppliers by providing financial incentives to locate factories and produce goods in the US. Specifically, the IRA will, for example, subsidise hydrogen production for the next ten years, with the cost expected to fall below 2 USD/kg. The value of the credit is based on life cycle emissions, while the Act substantially increases the value of the existing tax credit for carbon sequestration, which is used to produce blue hydrogen. Under the legislation, investment flows in green technology will be potentially diverted from Europe to the US, negatively affecting the EU's ability to retain and build up manufacturing capacities in green technologies. Meanwhile, the US has adopted a pragmatic approach to hydrogen, both in terms of technologies and emissions calculation, which contrasts with the EU's approach, shifting the competition in their favour.

China, by contrast, is a rather energy-poor country, largely dependent on imports of oil, pipeline gas, LNG and coking coal. Industry dominates demand, accounting for almost half of China's total final consumption, making its economy reliant on cheap and reliable energy input. Consequently, China's strategy aims to keep supplies stable and affordable by diversifying routes and suppliers. Notably, China has developed strong gas and oil relations with Central Asian countries and Russia.[34] While Russia emerged as China's second-biggest oil supplier even before the war, the country remains heavily dependent on the Middle East for its oil imports.[35] In 2020, China imported crude oil that totalled roughly USD 176 billion. Almost half (47 per cent) of this came from Middle Eastern countries.[36] China's gas imports, on the other hand, are more diversified, with over 50 per cent coming from Turkmenistan, Australia and the US, and only 20 per cent from the Middle East. While Russia is already the third single largest supplier of gas to China, it still plays a marginal role. The war in Ukraine and the European phase-out of Russian oil and gas might end up altering China's import mix, with Russia becoming a major supplier and helping to reduce dependency on far-away or unreliable countries.

Beijing is building up its role as a prosumer, given the increasingly hostile international environment and the prospect of decoupling from the US and its allies. The energy transition and its technologies serve not only the goal of tackling environmental pollution. Alongside diversifying fossil-fuel imports, they can help secure a stable and continuous future energy supply to China's industry. Most prominently, however, they will also secure economic growth, technological leadership and domestic industrial capacities in new green value chains and exports. With its state-funded programmes Made in China 2025 and China Standard 2035, the principle of a dual circulation economy, China is attempting to reduce its dependence on advanced economies and develop strategic autonomy along the entire supply and value chain, in down, mid and upstream, from raw material extraction and refining to research and development, industrial production and assembly, market ramp-up and export. As part of the Belt and Road Initiative, China supports the creation of a global electricity network to connect the main production and consumption centres in Europe, Africa, Eurasia and Asia.[37] China is, in fact, the biggest producer and exporter of renewable energy technologies and also the largest investor in clean energy projects in China and worldwide.[38] China already leads in clean-energy manufacturing: Chinese companies have a 73 per cent share in the global production (downstream) of lithium-ion batteries[39], 72 per cent for solar modules, 66 per cent for polysilicon, 78 per cent for solar cells and 58 per cent for global wind-turbine in-

33 EU-US Trade and Technology Council, https://ec.europa.eu/info/strategy/priorities-2019-2024/stronger-europe-world/eu-us-trade-and-technology-council_en#areas-of-cooperation, (last accessed: 18.11.2022).

34 Calder, K.: The new continentalism- Energy and Geopolitics in the 21st century, (Yale: US: Yale University Press, 2011).

35 S&P Global Commodity Insights (2022): Factbox: A look at key Russia-China crude oil ties as Ukraine crisis rages, available at: https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/oil/030122-factbox-a-look-at-key-russia-china-crude-oil-ties-as-ukraine-crisis-rages, (last accessed: 18.11.2022).

36 Dale Aluf: China's reliance on middle east oil, gas to rise sharply in: Asia Times, 11.01.2022, https://www.insights-global.com/chinas-reliance-on-middle-east-oil-gas-to-rise-sharply/, (last accessed: 18.11.2022).

37 See Global Energy Interconnection Development and Cooperation Organisation (2022): GEIDCO, https://m.geidco.org.cn/?lang=en, (last accessed: 20.11.2022).

38 Bloomberg New Energy Finance (2021): Energy Transition Investment Trends - Executive Summary, available at: https://assets.bbhub.io/professional/sites/24/Energy-Transition-Investment-Trends_Free-Summary_Jan2021.pdf, (last accessed:18.11.2022).

39 Moores, S.: The Global Battery Arms Race: Lithium-ion battery gigafactories and their supply chain, in: *Oxford Institute for Energy* Studies, 2021, https://www.oxfordenergy.org/wpcms/wp-content/uploads/2021/02/the-global-battery-arms-race-lithium-ion-battery-gigafactories-and-their-supply-chain.pdf, (last accessed:18.11.2022), p.4.

stallation.[40,41] In terms of raw materials and minerals, while 90 per cent of the rare earths are concentrated in China, this does not mean that China has a monopoly on each critical mineral. For instance, China domestically mines only 23 per cent of the raw materials needed for battery production. However, it already controls the mid-stream, from refining to further manufacturing, accounting for a production share of 70 to 80 per cent globally.[42]

For its part, the EU plans to accelerate the energy transition both in scope and time. The REPowerEU plan prioritises the massive scaling-up and speeding-up of renewable energy as a critical instrument to secure the future of the energy supply. For instance, the plan increases the target for green-hydrogen production and import (20 million tonnes in total) and accelerates the roll-out of renewables by increasing the headline 2030 target for renewables from 40 to 45 per cent under the Fit for 55 package. However, the EU can hardly cover the expected demand for (green) hydrogen and renewable energy with its own production alone. For example, the decarbonisation of the electricity mix, the electrification of the heating and transport sectors, and the hydrogen-induced decarbonisation of the hard-to-abate industrial sectors, like steel and petrochemical, cement or glass industry, will indeed be decisive in order to achieve the climate goals. As a result, however, European electricity needs will increase by more than 50 per cent by 2030 compared with 2015.[43] The EU has also set a target of sourcing 20 million tons of hydrogen by 2030, half of which must be produced domestically. This implies an installed electrolysis capacity of 120 GW – a nine-hundred-fold increase to installed capacities worldwide.[44] The success of deep decarbonisation will therefore depend on upgraded, expanded and repurposed energy networks and on the availability of sufficient investments and manufacturing capacity to produce and install solar panels, wind turbines, batteries and electrolysers, as well as on technological innovations.

Against this backdrop, China represents a distinctive challenge to the EU's present and future energy security. In the short term, should the economy bounce back after the COVID-induced lockdown, gas demand in China might increase significantly. China could end up competing with other Asian economies and the EU over additional LNG volumes from the US and the Gulf, putting further pressure on prices. In the longer term, should the EU not be quick in diminishing gas demand and consumption and accelerating the transition, and if Russia is able to reorient its gas flows, China will have a competitive advantage vis-à-vis Europe, as it can flexibly rely on different and potentially cheap gas supplies from both the Gulf and continental Eurasia. Otherwise, China's dominance of green supply and value chains and mass manufacturing of key industrial components like PV panels might undermine the EU's transition plans. The EU faces a trade-off between the need to rapidly scale-up production and reduces unitary costs and the geopolitical need to reduce dependencies on imported intermediate goods or raw materials, where, however, Chinese manufacturing is hard to substitute.

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40 BNEF & CSIS (2021): Industrial policy, trade, and clean energy supply chains: Solar PV Trade and Manufacturing - A Deep Dive, https://www.csis.org/analysis/industrial-policy-trade-and-clean-energy-supply-chains, (last accessed: 02.12.2022), p.2-4.

41 Global Wind Energy Council (2021): Global Wind Market Report 2021, https://gwec.net/global-wind-report-2021/, (last accessed: 18.11.2022), p.4.

42 Moores, S. (2021): The Global Battery Arms Race: Lithium-ion battery gigafactories and their supply chain.

43 Agora Energiewende (2019), European Energy Transition 2030: The Big Picture, available at: https://www.agora-energiewende.de/fileadmin/Projekte/2019/EU_Big_Picture/153_EU-Big-Pic_WEB.pdf, (last accessed: 18.11.2022).

44 Ansari, D., Grinschgl, J., Pepe, J.M. (2022), p.1.

5

CONCLUSION AND KEY RECOMMENDATIONS

BUILDING A UNITED EUROPEAN ENERGY FRONT TOWARDS A FUNCTIONAL ENERGY SECURITY STRATEGY

This study has shown that Russia's war in Ukraine and the expected decoupling from Russia's energy supply chains have dramatically exposed the limits and flaws of the EU's approach to energy security, as well as the major failures in the implementation of the EU's Energy Union. This includes both the issue of overreliance on Russia and the creation of a coherent, coordinated and effective foreign-energy security framework in the face of a dramatically changing geopolitical landscape and a rapidly transforming global energy system. From the analysis, we identify **five major dilemmas** the EU faces on its way to an effective energy security strategy.

First and foremost, **the EU faces lasting tension between different levels of energy governance (national, regional and supranational)**: the Energy Union Package has not fundamentally solved this tension. Today's dilemma is the difficult reconciliation of different national priorities with the urgency to coordinate an external response to secure present and future energy supply.

Second, **the EU faces a dilemma between market and economic rationality and the return of state intervention and geopolitical competition**: the current dilemma is how to preserve Europe's model of open and liberalised energy markets while adapting to a world where energy markets will be disrupted, energy is scarce and flows are reoriented. Geopolitics, states, and security considerations, more than economic rationality, cost efficiency, and market design, dominate both fossil fuel and renewable value and supply chains.

Third, **the EU faces a dilemma between long-term climate goals and short-term fossil-fuel supply security**: gas remains an essential bridging technology in the mid-term. While high gas and electricity prices increase the business case for renewables, securing fossil-fuel supply in the short term will be costly, putting further pressure on the cost-intensive green transformation processes in the hard-to-abate industrial sectors and increasing the risk of lock-in effects. This could jeopardise EU emissions reduction targets and slow down global climate goals.

Fourth, **the EU faces a short-term dilemma between securing gas supply and volatile global (LNG) markets**: the issue is not only the complicated substitution of Russian gas supplies in the short-term but also the growing dependence on volatile and tight global markets in the mid-term. The reality is that while diversification is needed more than ever, more diversification does not necessarily mean a secure, affordable and stable gas supply.

Fifth, **the EU faces a long-term dilemma between energy independence aspirations and new supply dependencies and risks**: the task facing the EU is not only reducing "old" fossil-fuel energy security risks by strongly reprioritising supply diversification. It is much more about securing future greater energy independence amidst growing external dependencies and competition along the entire green value and supply chains, including critical infrastructure.

To successfully tackle these five major dilemmas and build a more united energy front, the EU should act pragmatically, realistic and strategically. A new, broader understanding of energy security, which includes but transcends the narrow focus on supply security, market-driven mechanism and regulation to extend to industrial and raw materials, should be the basis to start with. The EU's post-war approach to energy security points to a growing awareness of the European institutions need to consolidate instruments while broadening the scope of its approach. However, effective implementation would first and foremost imply a substantial reform of the EU energy governance, up to a treaty reform, to assign exclusive competence to the Commission on sensible areas like energy mix choices, utilisation of national resources and titularity in defining and implementing effective energy diplomacy. A similar centralisation of energy governance is politically out of reach and potentially dysfunctional in economic terms, given the heterogenous structure of European economies and their energy mixes. As the EU must urgently act, a substantial inter-governmental agreement at the European Council level, or at least among willing Member States - specifically Germany, France, Spain, Italy and Poland- is the first step. A solid energy, climate and hydrogen political bargain to resolve existing divergences that act as barriers to the Green Deal should flank regulatory and technical compromises on single, sector-specific issues like RED-II Directive, sector-specific emissions reductions, hydrogen market ramp-up, CBAM and the Emissions Trading System.

Action should be rooted in a pragmatic but substantial agreement among the nation-states and between them, the Commission and the Parliament, and be articulated along two different dimensions.

A) INTERNAL DIMENSION OF A FUTURE EU ENERGY SECURITY STRATEGY

Energy infrastructure funding, with an eye on electricity, natural gas and hydrogen: the EU's gas and electricity network will undergo a significant reorientation in internal and external flows. In the gas sector, the decoupling from Russia forces an inversion of flow direction from east-west and north-south to west-east and south-north and calls for a rapid build-up in terms of capacity and missing links. By doing so, any new fossil-fuel infrastructure should be built as H2-ready to avoid lock-in effects. For its part, the electricity network will need to cope with a significant increase in electricity flows, along with the doubling of electricity demand in the coming decades. Electricity grids will form the infrastructural backbone of the energy transition. According to the EU, even before the war, EU energy infrastructure required investments of about EUR 140 billion in electricity and at least EUR 70 billion in gas. For the 2021-2027 period, however, the energy budget to "help the transition towards clean energy and complete the Energy Union" is a mere EUR 5.84 billion.[45]

It is evident that the Connecting Europe Facility has not delivered on its expectation as – "under current market and regulatory conditions, some energy projects are not commercially viable and would normally not make it into investment programmes of infrastructure developers".[46] A coordinated effort is required here, not only to identify and prioritise the main gas and electricity interconnector gaps along the TEN-E strategic corridors and the Project of Common Interests. This should also include the Hydrogen Backbone Network and the construction of dedicated H2 pipelines if these are instrumental in completing the backbone, which would also build on the existing well-functioning gas network. The EU states should consider additional extra-budget, dedicated funds to finance construction which market participants would otherwise not consider viable. Moreover, key cross-border interconnectors of European or at least regional relevance should be under the supervision or even the direct management and operation of the ACER rather than of the national TSO.

Joint LNG purchases and multilateral solidarity gas agreements: the current situation on the global LNG market calls for joint action at the European Level, at least for the time being. A price cap's economic and political rationality remains economically doubtful, considering the tight LNG-market situation and the risk of losing supplies to other markets. Instead, the EU Member States could empower the Commission to jointly purchase gas to aggregate demand and increase the EU's attractiveness as a buyer vis-à-vis the expected price and volume competition as long as the LNG market remains tight. The mechanism would need to address the not unsubstantial issue of intra-European reallocation and its governance, with a high probability of undermining the functionality of the internal market, but this could be only a temporary solution. Joint purchases could be made by creating an ad-hoc extra-budget facility instrument to be funded by nation states or guaranteed by them. State contributions and gas volume redistribution on the continent would be made in proportion to the national gas demand of the previous year. Alternatively, the EU purchase platform created should become a mandatory instrument along with a solidarity mechanism to compensate for gas shortages across countries with a similar level of risk, gas-intensive economies like Italy and Germany, and those with infrastructural linkages and geographic contiguity. Finally, to ensure internal reallocation, the states involved should close infrastructural gaps by rapidly building missing interconnectors.

Focus on low-carbon rather than carbon-free technologies and government support for technological innovations and the hydrogen industry: a mix of technological pragmatism, innovation and government support may prove the best solution to reduce energy supply risks in the future energy system. New low-carbon technology will be critical to the energy transition and ensure post-fossil-fuel energy security. While the EU's Taxonomy Regulation now classifies gas and nuclear as green investments and provides incentives for companies to invest, preferences on the future green technology mixes diverge significantly across the continent. Different priorities among the countries regarding industrial policy represent the major obstacle. While an exclusive focus on renewable technologies, i.e., solar, wind and green hydrogen, would be preferable, the necessity to act and speed up the transition while maintaining leadership on a broader spectrum of technologies calls for some pragmatism. EU Member States, especially France and Germany, should agree on assessing the effectiveness of green technologies based on their final carbon footprint and less on the production process. Funding schemes for low-carbon technologies should be approved according to life cycle emissions. As for new low-carbon technologies such as electrolysers, government support for production scaling, appropriate loans, and guaranteed demand should provide sufficient incentives for project developers. Particularly in the case of hydrogen, defining hydrogen based on its CO_2 footprint instead of the production process helps producers, particularly amid growing competition for green investment from the US.

Fostering technological innovation and creating an agency supporting international mining with strong sustainability criteria to minimise the risks of raw materials supply interruption: EU Member States and companies should address the risks of future dependencies in the raw material supply chain for green technology products. Pooling efforts at the European level to support technological innovation like recycling infrastructure to diminish dependence on raw materials for electrolysers and EV batteries, but also solar panels and wind turbines, is essential. To secure raw materials and their processing and to reduce dependence on Russia and China, the EU countries should consider supporting mining activities by including firm conditions on social and environmental standards in mining countries to prevent unrest and supply disruption. EU countries do not have their own international mining companies. However, examples like

45 European Commission: About Connecting Europe Facility, 2021, https://cinea.ec.europa.eu/programmes/connecting-europe-facility/about-connecting-europe-facility_en#cef-energy, (last accessed 18.11.2022).

46 European Commission: EU-US Trade and Technology Council, (2021) https://ec.europa.eu/info/strategy/priorities-2019-2024/stronger-europe-world/eu-us-trade-and-technology-council_en#areas-of-cooperation, (last accessed: 18.11.2022).

the Japanese state agency JOGMEC show that foreign mining projects can still be promoted through loans, investments and guarantees. Therefore, the EU should develop a similar instrument to promote foreign private-mining activities and consider creating a European mining champion.

B) EXTERNAL DIMENSION OF THE EU ENERGY SECURITY

Energy and industrial relations with the US and China need to be approached pragmatically, but not exclude robust responses: as decoupling from China will be hard to achieve, a mix of engagement and diversification, in particular, will be needed. The EU needs to take a more nuanced approach than the US. While it would be unwise to cut supply-chain components like solar panels and presumably electrolysers, the EU should seek diversification, particularly in the raw material supply chain. This calls for a more proactive approach to raw materials partnerships. The technological dialogue with the US on standard harmonisation and supply chain resilience, as well as on the military protection of critical infrastructure, should be intensified at the level of the European Commission. However, the EU should also closely monitor the developments around the Inflation Reduction Act and explore the possibility of influencing the US legislators to consider changes to the provisions before the next presidential elections. Conversely, the European Commission should consider proportional measures to shield and support its own clean industry as described above. It should also avoid repeating the mistake it made with Russia and instead try to diversify its LNG supplies as soon as possible.

The military dimension of energy security needs to be strengthened, with a focus on marine energy infrastructure protection: the sabotage of the Nord Stream 2 pipeline has shed light on the vulnerability of critical energy infrastructure, particularly of its maritime component. The limited resources of a single Member State make the military protection of LNG routes, undersea electricity cables stretching for a thousand nautical miles beyond the territorial waters and offshore wind parks almost impossible. The European Commission should be empowered to conduct tests on critical infrastructure resilience and strengthen cooperation among Member States and third countries in line with the recent proposal.[47] This should, however, include stronger military-to-military and military-to-business cooperation at the level of nation states as well as at the NATO level.

New energy and climate partnerships should be broad in scope and flexibly combine a focus on natural gas, renewables energies, (low-carbon) hydrogen and minerals with the support for local low-carbon value chains: Member States should agree to pursue a more encompassing but flexible approach to energy and climate partnerships. Besides Ukraine, which remains a crucial priority, these should target especially the MENA Region, the Gulf, and the former USSR (excluding Russia), as well as some key countries in Southeast Asia. Normative-regulatory exchange and transfer (energy market reforms, network codes and tariffs, technical standards and certificates, and renewable energy, as well as legislation for clean gases) should be part of the renewed partnerships. It is imperative to have a continuous exchange, particularly between transmission operators and regulators at the EU level (ENTSO-E/G and ACER) and its counterparts in the countries connected to – or willing to conform to – the EU's power market (Ukrenergo and NEURC in Ukraine, TEİAŞ and EMRA in Turkey, ONEE and ANRE in Morocco, etc.). Furthermore, energy & climate partnerships should include the possibility for the European Commission to negotiate long-term agreements on natural gas if this is a precondition to securing volumes. These long-term contracts should, however, include obligations to switch to long-term low-emissions gases. By doing so, the newly proposed Hydrogen Bank or the EIB should be used as an instrument to secure demand, match supply and demand, but also foster projects for sustainable low-carbon value chains in producing countries. In the case of mineral-rich countries such as the Philippines, Australia, South Africa and Indonesia, energy and commodity partnerships should promote local refining processes with loans and investments. More generally, the EU should include energy-sector-specific provisions when negotiating or renegotiating Association Agreements, Deep and Comprehensive Free Trade Areas, Partnership and Cooperation Agreements, and Preferential Trade Agreements in order to secure access to emerging local and regional production networks. The renewed energy partnerships should also be instrumental to a more pragmatic approach to CO_2 emissions when approaching partners, particularly in the Global South. The secondary effects of the current European energy crisis on many of these countries call for a more humble and adaptive approach: focusing on sustainable economic growth, fighting local pollution, and promoting green financing, electrification, and integrated energy systems should be prioritised. Directly demanding a decrease in CO_2 emissions or phasing out coal and oil would be unwise in a period where these countries are suffering from a gas shortage and cannot advance the transformation of their own energy system.

Finally, the EU should focus on **regional (electricity and hydrogen) interconnectivity and regional governance mechanisms** to strengthen present and future energy supply chains. Before the war, initiatives to integrate or reintegrate regional electricity networks were taking place in the Gulf, North Africa and Central Asia. Now, the EU needs to increase imports both of green electricity and green, low-carbon molecules. This calls for greater engagement in regional transport and infrastructure. The EU could consider technical, regulatory and financial support (through the EIB, for example) for critical countries located in the broader MENA-GULF-Central Asia-East Asia region (Saudi Arabia, Uzbekistan, Egypt and Morocco) and set out distribution hubs for electricity or producers and exporters of hydrogen. By doing so, the EU should also increase the level of its engagement as a regional governance mechanism, considering that current geopolitical fragmentation and supply and value chain disruption undermine the role and effectivity of global energy-governance institutions.

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47 European Commission: Council Recommendation on a coordinated approach by the Union to strengthen the resilience of critical infrastructure, 2022, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022DC0551&from=EN, (last accessed: 18.11.2022).

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