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The EU De-Risking of Energy Dependencies: Towards a New Clean Energy Geopolitical Order?

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Abstract

The mounting geopolitical tensions and rivalries between the world's major economies transform the goals and instruments of domestic and external policies. Industrial strategies of leading global powers call for technological decoupling, strategic autonomy, and the de-risking of dependencies in critical value chains. Economic interdependencies become a liability and de-globalisation tendencies come to the fore. The energy sector is not exempted from these trends, leading even to the weaponisation of energy in some cases. In that vein, this article explores the character and directions of EU international energy engagement through the geoeconomic lens. Taking inspiration from literature on energy security and the geopolitics of energy transition, the article theorises the concept of de-risking in energy to investigate how the EU is positioning itself as a power while ensuring security and competitiveness. Looking at three illustrative examples of the energy transition—supply of natural gas, access to energy-critical minerals, and international hydrogen markets—the article shows that EU de-risking means not only diversifying suppliers but, most notably, constructing new economic, sustainable, and potentially long-lasting international relations. As a result, despite the deep geopoliticisation of energy and the new global "disorder," the EU's de-risking has the potential to reshape international relations by forging new partnerships or reconfiguring existing ones, thus establishing a new economic order driven by clean energy while offering new economic opportunities to create local value chains and decarbonise economies in third countries.

Keywords

clean energy transition; dependence; de-risking; EU energy policy; geoeconomics; geopolitics; international cooperation

1. Introduction

At the turn of the 2020s, the global economic order disintegrated and became unwieldy (Babić et al., 2022). China's growing assertiveness has been challenging the US and EU global technological and industrial leaderships (Herranz-Surrallés et al., 2024; Lavery & Schmid, 2021; Roberts et al., 2019), and the Covid crisis exposed the vulnerabilities of highly intertwined global supply chains (Eckert, 2021; Goldthau & Hughes, 2020). In parallel, the climate emergency has worsened, with 2023 becoming the hottest year on record. Most recently, Russia's aggression on Ukraine obliged the Western countries to cut off trade and financial relations with Russia to a bare minimum by imposing several packages of sanctions. As a result of this global polycrisis (Lawrence et al., 2024), political attention has been shifting to the securitisation of economic policies and weaponisation of strategic trade and investment networks (Farrell & Newman, 2019) while advocating for relative rather than absolute gains and propelling deglobalisation forces (Kornprobst & Paul, 2021). In this new geoeconomic order (Roberts et al., 2019), economic interdependencies once believed to bring peace and stability are perceived as vulnerabilities and elicit the leading global powers to call for technological decoupling, strategic autonomy, and scaling-down of dependencies in critical value chains.

Confronted with these strategic shifts, the von der Leyen "geopolitical Commission" (Haroche, 2024 von der Leyen, 2019) launched the European Green Deal as Europe's new growth strategy towards climate neutrality by 2050, followed by several specific measures to boost EU competitiveness in innovative clean technologies and in setting global industrial standards. In parallel, the EU embraced an increasingly geoeconomic stance by adapting its goals and policies (Herranz-Surrallés et al., 2024) through a mix of offensive and defensive instruments that blend trade and investment with security concerns such as the Foreign Direct Investment Screening mechanism (Bauerle-Danzmann & Meunier, 2024; Weinhardt et al., 2022). The adoption of the "open strategic autonomy" model for its trade and investment policies (European Commission, 2021) encapsulates a political paradox whereby the EU attempts to strike a balance between remaining open while becoming assertive to strengthen its resilience and reduce its strategic dependencies (Juncos & Vanhoonacker, 2024; Lavery et al., 2022). This balancing act obliges the EU to manage its interdependencies and economic relations to achieve more independence and de-risk its relations.

In 2022, the EU leaders agreed to take further steps to build European sovereignty, reduce dependencies, and design a new growth and investment model (European Council, 2022), calling for a de-risking of economic relations by strengthening the EU's competitiveness, developing new defensive measures, and seeking alignment with other international partners (von der Leyen, 2023). These policy developments raise the question of what this de-risking means for EU external engagement. Does the EU response indeed entail scaling down its engagement and turning inwards to reduce dependencies? Or is EU external engagement transforming into new forms of partnerships and collaboration patterns?

This article answers these questions by looking at de-risking in the EU energy sector, which is characterised by a decades-long dependency on imports of fossil fuels. Moreover, the advancing clean energy transition brings new energy vulnerabilities to the fore by exposing the EU's acute reliance on imported critical minerals, indispensable for the energy transition, and highlighting an aggressively growing competitive pressure in green energy technologies. Recent literature has concluded that the energy transition will considerably alter relations between states. However, it has not yet explored the impact of these vulnerabilities and the de-risking approaches in energy for the character and direction of EU external energy

engagement. This article attempts to address this gap in two steps. Firstly, the article conceptualises the de-risking strategy and identifies that it consists of internal and external components. In the second step, the article explores what de-risking means for the character of the EU's external engagement. This will be done by looking at three energy dimensions of imperative relevance in the geopolitics of energy transition: ensuring supplies of natural gas, seeking access to energy-critical minerals, and developing global hydrogen markets.

The article shows that, despite deep geopoliticisation in energy, in the sense of decoupling from Russia and preventing new dependencies in green energy technologies and critical raw minerals (Herranz-Surrallés et al., 2024), the EU is not turning fully inwards, simply because it can't, as the EU lacks the necessary resources for its clean energy transition. While the EU decouples decisively from Russian energy and aims at curtailing its exposure to Chinese energy-critical minerals, it lays at the same time the grounds for new international energy partnerships, with new countries and on new terms that altogether create opportunities for long-lasting engagement and a new energy order. The re-assessment of EU external energy engagement through the geopolitical lens outlines the potential for the emergence of a new economic order driven by the paradigm of security, the urgent need to decarbonise the global economy, and the complementarity of external geoeconomic preferences.

These conclusions offer a fresh visualisation of the leverage that clean energy transition policies may have on international relations between the EU and other countries, which is equally important for scholars as well as for policymakers. Firstly, the results contribute to the understanding of de-risking as a concept that has the potential to constructively shape the new economic order. Secondly, the article emphasises that the EU is not operating in a political vacuum, and relations with third countries remain imperative for energy security and energy transition. As the world continues on an unwieldy, belligerent path, fresh knowledge about and understanding of strategies on how to rebalance external relations seem vital and timely.

The remainder of the article is structured as follows. Section 2 reviews the literature on EU external energy engagement and links it to the literature on the ongoing clean energy transition and geopolitics. Section 3 develops a conceptualisation of de-risking and presents the analytical approach. Section 4 constitutes the empirical core of the article, and the last section concludes, summarising the findings and discussing the wider implications.

2. A Geoeconomic Turn and the Geopolitics of Energy

For decades, the EU energy sector has been particularly affected by geopolitical shifts due to the scarcity of endogenous energy resources, notably oil and gas, and a heavy reliance on one dominant supplier. The academic community has been widely occupied with EU energy dependency and its susceptibility to manipulation and weaponisation, notably by Russia (LaBelle, 2023; Siddi, 2018; Wigell & Vihma, 2016). While, domestically, the policy focus was on reinforcing the interconnectivity and resilience of its internal energy market, externally, the EU was seeking to achieve its security goals predominantly through the promotion of its market-liberal rules and institutions, striking a balance between its inherently liberal identity and greater assertiveness (Goldthau & Sitter, 2015; Herranz-Surrallés, 2016). Even after the Crimea annexation in 2014, the EU was trying to handle Russia's dominant position as a gas supplier by using the rules of its internal energy market (Batzella, 2022; de Jong & Van de Graaf, 2021; Goldthau & Sitter, 2020).

Nevertheless, with the growing geopoliticisation of economic and trade relations, the EU's external energy engagement also grew progressively more strategic and geopolitical (Bocse, 2019; Prontera, 2020; Siddi & Kustova, 2021; Siddi & Prandin, 2023), culminating in a shift to deep geopoliticisation in the wake of the Russian aggression on Ukraine (Jerzyniak & Herranz-Surrallés, 2024).

In parallel, the ongoing clean energy transition started reshaping international energy relations and the roles of different countries (Global Commission on the Geopolitics of Energy Transformation, 2019), but the respective research comes with unclear and even contradictory results on the exact implications. On the one hand, the clean energy transition may attenuate the geopolitics of physical resources and their transportation routes because of the omnipresence of renewable energy, contrary to geographically concentrated fossil fuels, thus improving the geopolitical standing of energy importers (Giuli & Oberthür, 2023; Overland et al., 2022; Scholten et al., 2020). For example, some developing countries with abundant energy-critical minerals and/or geographical conditions for the production of renewable hydrogen could join the global energy markets if they were able to develop the necessary infrastructure supported by a favourable economic and political environment (Eicke & De Blasio, 2022); in the case of hydrogen, they could even capture 70% of the global export revenues in 2050 (Shirizadeh et al., 2023).

On the other hand, international energy trade might not disappear but instead create new interdependencies related to the control of clean technologies (Scholten et al., 2020), hydrogen trade (Van de Graaf et al., 2020), and access to energy-critical minerals (Apergi et al., 2023; Vezzoni, 2023). Moreover, scholars also observe that new and planned hydrogen and critical minerals projects between the so-called developed Global North and the developing Global South pave the way for green extractivism (Goldthau & Youngs, 2023; Hickel et al., 2022), as they drain the Global South of its resources and profits without contributing to local economies and without paying attention to human rights (Kalt et al., 2023; Lindner, 2023).

Certainly, the EU will not be spared from the geopolitical tectonics of the clean energy transition. Despite decades-long measures to build the EU internal market, the EU imported 90% of its natural gas, of which more than 45% came from Russia when the country started waging its war against Ukraine in 2022 (European Commission, 2022). The situation with energy-critical minerals seems even more dismal as the EU almost entirely relies on their imports with more than 90% of these imports coming from only one country, China (European Commission, 2023b). This is because more than 75% of the global production of lithium, cobalt, and rare earth elements is produced by only three countries, while their processing is even more concentrated, with China accounting for 35% of processing operations for nickel, 50–70% for lithium and cobalt, and nearly 90% for rare earth elements (International Energy Agency, 2023). In the "Net Zero Emissions by 2050 Scenario" of the International Energy Agency, the demand for critical minerals will further grow three and a half times by 2030. For some minerals, like lithium, the global demand is expected to grow by more than 40 times between 2020 and 2030. Regarding hydrogen, the global market is in fact in its nascency with the EU common rules for hydrogen agreed only at the end of 2023 (Council of the EU, 2023b). Nevertheless, the EU has admitted that for the creation of a viable hydrogen economy, imports will be necessary. While the European Hydrogen Strategy has set out the objective to produce 10 million tonnes of renewable hydrogen domestically, the REPowerEU plan (European Commission, 2022) complemented this goal by another 10 million tonnes to be imported by 2030. Production of clean hydrogen is still negligible, but estimates show that, globally, clean hydrogen would meet up to 12% of final energy consumption by 2050 (International Renewable Energy Agency, 2022). While the existing literature has

grasped the various possible trends in the geopolitics of energy transition, it has not yet linked them with the implications for the EU's external energy engagement in the context of the de-risking of energy dependencies and the European Green Deal and its complementary Green Deal Industrial Plan. Some emerging research explores new partnerships, described as friend-shoring, between countries that attempt to jointly overcome their dependencies (Vivoda & Matthews, 2023), like in the case of the US-led Minerals Security Partnership, or that even try to maintain cooperative relations with their competitors, as in the case between the EU and China (Kalantzakos et al., 2023). Similarly, some initial evidence shows new forms of international and multilateral collaborations, which attempt to support structural change in shared value chains in energy transition through regulatory, technology, trade, and policy collaboration (Aisbett et al., 2023). Nevertheless, the shift to assertive, or even aggressive, international competition in energy requires a balancing of dependencies in an ever more sophisticated manner. This article will close this gap and explore these implications for the character and directions of the EU's international engagement in energy.

3. Conceptualising De-Risking

There is no academic definition or metric of the concept of de-risking. In the political discourse, the European Commission, in its European Economic Security Strategy, refers to an "ability to make ourselves more resilient and reduce the risks arising from economic linkages that in past decades we viewed as benign," pointing to actions "diversifying economic ties to reduce harmful dependencies and increasing local production" (European Commission & High Representative, 2023).

The academic debates related to de-risking can be best found in the world of finance, taking inspiration from an adage whereby one should not put all of their eggs in one basket. This idea was excellently theorised by the economist and Nobel Prize laureate Henry Markowitz in his 1952 seminal paper "Portfolio Selection" (Markowitz, 1952). Accordingly, to avoid the risks of over-dependence, the dominance of one or only a few ventures in an investment portfolio should be diluted through diversification by adding more assets with uncorrelated exposure to risks. In finance, such assets would represent, for example, different investment classes (stocks, bonds, commodities, etc.), different industrial sectors, or different countries. As a result, a potential loss of a dominant asset would be reduced and compensated by potential gains of other assets. It should be noted that, despite its popularity in modern finance, the theory addresses only idiosyncratic risks (i.e., associated with individual assets) and fails to mitigate the aggregate or systemic risk that can potentially affect an entire sector at once (Lukomnik & Hawley, 2021).

Following this logic, de-risking in energy would mean managing dependence to avoid overreliance on one or very few dominant energy sources (suppliers) by increasing the number of alternative, uncorrelated energy sources. Managing such dependence can be achieved by internal (domestic) and external measures (Högselius, 2018). Internal measures reduce reliance on dominant foreign sources by developing domestic energy production and/or simply by saving energy. External measures reduce this reliance by adding new or increasing the share of other existing foreign sources. On the one hand, such "balancing dependence" (Choer Moraes & Wigell, 2022) means adopting state policies that seek to reduce economic dependencies on foreign actors, whether public or private, by promoting economic autonomy. On the other hand, it means forging new partnerships or strengthening existing relations with minor partners, and possibly complementing them with alliances with other dependent countries to strengthen its own negotiating position and discriminate against non-members (Meunier & Nicolaidis, 2019). This conceptualisation

excludes the most radical measures, such as the use of armed forces in exporting countries, which do not comply with the EU identity as a peace project. Managing de-risking through internal and external measures also corresponds with finding a balance between becoming autonomous and remaining open. Linking the energy portfolio approach to the trade and investment debates, de-risking through internal measures would support the claims of de-globalisation (Kornprobst & Paul, 2021) and the EU's quest for "strategic autonomy" (Lavery et al., 2022; Schmitz & Seidl, 2023), while de-risking through external measures would mean reaching out to international partners, thus being "open."

Nevertheless, the capability of internal measures is often limited due to the scarcity of domestic relevant resources. Consequently, the risk assessment of external measures must be reckoned more profoundly. Such risks can be analysed from various perspectives: economic, engineering, geopolitical, environmental, or geological. Because there is no single quantitative indicator, the measurement of energy risks is a highly complex and context-dependent task, spanning several interrelated technical, economic, and political dimensions (Siksnelyte-Butkiene et al., 2024). To add to this complexity, different risks can be present at different stages of the energy supply chain: firstly, risks related to the availability of energy resources to satisfy demand; secondly, risks related to the import of energy and the reliability of suppliers and supply routes; thirdly, risks related to the reliability and resilience of domestic markets and infrastructure; and, finally, risks related to economic vulnerability to price movements, and the cost of supply interruptions (Månsson et al., 2014). In this context, while domestic markets and infrastructure resources play a key role in de-risking internally, risks related to import routes and the reliability of suppliers stand out in the external dimension. In sum, the analytical framework of this article will assess the EU's de-risking efforts through three elements: the actual geographical diversification of energy routes and sources, the alignment of the partners with the EU values (a "quality" of the partner), and the potential scope of the partnership.

Imports are exposed to disruptions if they pass through strategic passageways (e.g., maritime routes) that could become chokepoints due to geopolitical factors or accidents. Therefore, geographical diversification of new suppliers has the potential to reduce risks of energy transportation and is considered the first crucial indicator in the de-risking assessment. The reliability of energy partners is more complex and relates to a couple of elements. To produce energy resources, countries need to possess the capacity to develop the necessary infrastructure. Such capacity depends largely on a wider political, administrative, and economic context in a supplier country (Eicke & De Blasio, 2022). In addition, politically unstable countries might deliberately cut off supplies or even weaponise energy resources as was done repeatedly in recent times by Russia. This leads us to the identification of two other de-risking indicators: the quality of the partnerships and their attractiveness for the third countries.

In fact, the EU's strategy for external energy engagement (European Commission & High Representative, 2022) stresses the need to "conclude partnerships with reliable partner countries to ensure open and undistorted trade and investment relations" and that "new standards and governance arrangements will be required to build more reliable and mutually beneficial partnerships through a rules-based approach." This closely reflects the EU's identity and objectives specified in the primary EU law whereby EU international actions must be driven by EU values and principles, as specified in Article 21 of the Treaty on the European Union (European Union, 2010). The alignment can be well measured by adherence of the relevant countries to democratic and transparency systems as assessed by the *Economist*'s Democracy Index (Economist Intelligence Unit, 2024), based on the assumption that there is a negative correlation between the

functioning of the government on the one hand and the likelihood to disrupt energy trade or even weaponise energy on the other. High scores on the Democracy Index also assume a higher capacity to develop the necessary infrastructure in third countries, hence ensuring higher reliability of the partnerships. Summing up, de-risking entails not only managing dependence by replacing one source with another but also dealing with the diversity and quality of energy sources (Chalvatzis & Ioannidis, 2017). Finally, effective de-risking hinges upon the implementation of the partnerships that also depend on the motivation of the partners to exploit the actual complementarities of preferences between the partners and the EU (Jerzyniak & Herranz-Surrallés, 2024). There are some indications that while the urgent need for clean energy is recognised in third countries, they might not perceive the urgency to export energy resources to the EU (Brauner et al., 2023).

Table 1 summarises the conceptual framework. In the first step, it demonstrates the two dimensions of de-risking: domestic and external. Analytically, in the first step, the article unpacks de-risking by mapping the presence of internal measures such as policy actions to increase EU-internal production of energy, domestic sourcing of relevant critical minerals, and energy-saving measures. In the next step, which constitutes the core of the analytical novelty, the article looks at external actions to increase the share of new or existing minor suppliers. In this regard, three areas stand out: the geographical diversity of the energy import portfolio (to avoid the occurrence of correlated potential political and security risks); the potential quality of the new energy portfolio; and, lastly, the character of the partnership, i.e., whether the partnerships have the potential to go beyond mere access to energy and focus on cooperation along the entire value chains. Noteworthy, due to the early stage of all these measures, is that the article's analytical emphasis is placed on strategies rather than the actual results of these strategies.

As regards the empirical data, this article analyses the EU's de-risking strategies based on two groups of documents. The first group includes the relevant Commission's communications and conclusions of the

Table 1. De-risking strategies in energy.

	Domestic (autonomy) dimension	External (open) dimension
Objectives of the de-risking strategy	Reducing the share of the dominant supplier by domestic substitution, i.e., domestic production of energy and relevant energy resources;	Reducing the share of the dominant supplier by external substitution, i.e., seeking new sources and/or increasing the share of existing minor suppliers;
	Reducing the share of the dominant supplier thanks to energy-saving.	Complemented by forging new alliances with other dependent countries to strengthen its own negotiating position and discriminate against non-members.
Indicators	Strategies and policies to increase the share of EU-internal production of energy or relevant energy resources;	Is the EU energy portfolio becoming geographically diversified and spreading more globally?
	Strategies and policies to save energy, including recycling.	Alignment of a partner: Is EU international action aligned with EU values?
		Cooperation: limited to imports of raw resources? Integrating the partners in the value chain? Partnership based on complementarities?

European Council adopted between 2020 and 2023, thus after the launch of the European Green Deal strategy. These documents look at what exactly the EU has done to reduce the share of a dominant supplier, notably whether there are clear strategies developed and targets set. This step will help primarily investigate the domestic dimension of de-risking. Secondly, and specifically for the external component of de-risking, the article analyses political agreements signed by the European Commission and European leaders. The core of the analysis is non-binding, bilateral (with one exception) memoranda of understanding (MoUs) on energy, signed on behalf of the EU. These MoUs represent a political intention to cooperate on one or more of the three geopolitical dimensions. At this point, a word of caution is appropriate: Although such documents may carry a significant political weight, they are different from legally binding trade agreements, and they fall under the policy-making and coordinating functions of the Council. Nevertheless, they send the often-necessary signals for business, financial, and non-governmental stakeholders. This group of documents also includes other MoUs with a significant energy section and political joint statements signed by the European Commission. In addition, the article takes into account Green Alliances and Green Partnerships, concluded under the European Green Deal, with energy being a constituent pillar of these instruments. Lastly, and for the sake of completeness of the EU external activity, a few agreements under the framework of Team Europe are included, whenever they deal specifically with energy. These analytical steps aim to identify whether the energy portfolio has become geographically diversified and spread more globally, compared to the initial situation. Further, the quality of the partnerships is explored, i.e., whether the new cooperation agreements are concluded with partners that share the EU values. Lastly, the analysis looks at what the scope of the partnership is, i.e., whether the cooperation is limited to imports of relevant resources or it also aims at building more lasting, mutually beneficial linkages. In the investigated period, the article identifies a total of 39 relevant political documents as summarised in Table 2.

Table 2. Overview of the analysed agreements.

Country	Year of signature	Type of document*	Specific energy area agreement**	General energy agreement, including specific energy area**	General political agreement, including specific energy area**	Alignment of the partner (Democracy Index)***
Algeria	2022	JS		NG, H2		authoritarian
Algeria	2023	JS		NG, H2		
Argentina	2023	MoU	CM			flawed
Argentina	2023	MoU		H2		
Australia	2022	JS		H2, CM		full
Australia		MoU a	CM			
Azerbaijan	2022	MoU	NG			authoritarian
Brazil	2023	JS			H2, CM	flawed
Canada	2021	MoU	CM			full
Canada	2023	GA		H2, CM		
Chile	2023	JS	H2			flawed
Chile	2023		CM			
Democratic Republic of Congo	2023		CM			authoritarian

Table 2. (Cont.) Overview of the analysed agreements.

Country	Year of signature	Type of document*	Specific energy area agreement**			General energy agreement, including specific energy area**	General political agreement, including specific energy area**	Alignment of the partner (Democracy Index)***
Egypt	2022	JS				H2		authoritarian
Egypt	2022	JS		H2				
Egypt	2022	MoU		H2				
Greenland	2023		CM					full
Israel/Egypt	2022	MoU			NG			full/authoritarian
Japan	2021	GA				H2		full
Japan	2022	MoC		H2				
Kazakhstan	2022	MoU	CM	H2				authoritarian
Kenya	2023	JS		H2				hybrid
Korea	2023	GP				H2		full
Mauritania	2023	JS		H2				hybrid
Morocco	2022	GP				H2		hybrid
Namibia	2022	MoU	CM	H2				flawed
Norway	2022	JS		H2	NG			full
Norway	2022	JS			NG			
Norway	2023	GA				H2, CM		
Norway	2024	MoU	CM					
Rwanda	2024	MoU	CM					authoritarian
Tunisia	2023	MoU					H2	hybrid
Ukraine	2021	MoU	CM					Hybrid
Ukraine	2023	MoU		H2				
Uruguay	2023	MoU		H2				full
United States	2022	JS				NG		flawed
Uzbekistan	2024	MoU	CM					authoritarian
Zambia	2023	MoU	CM					hybrid

Notes: * type of document: Memorandum of Understanding, including announced (MoU, MoU a), Memorandum of Cooperation (MoC), Joint Statement on energy (JS), Green Alliance (GA), Green Partnership (GP); ** specific energy area: critical minerals (CM), hydrogen (H2), natural gas/liquefied natural gas (NG); *** the *Economist*'s Democracy Index: full democracy (full), flawed democracy (flawed), hybrid regime (hybrid), authoritarian regime (authoritarian).

The framework is applied to the three most geopolitical dimensions of energy transition as identified in the literature review: securing natural gas supplies, ensuring access to energy-critical raw minerals, and creating new hydrogen markets. The article does not look at cross-sectoral risks. For example, while the de-risking of the gas sector is also possible by replacing it to some extent with renewable hydrogen, the three dimensions of the energy sector are analysed separately. The overall analysis benefits from first-hand and participatory, though unstructured, observation of the policy process. Such a method allowed quicker identification of the relevant documents and provided important input to grasp the political nuances and insider understanding of the analysed agreements.

4. Exploring EU De-Risking in Energy

4.1. Domestic De-Risking Measures and Their Limitations

In all three geopolitical energy dimensions, the EU adopted strategies and policies to de-risk domestically. Regarding natural gas, it has been only with the Russian aggression on Ukraine that the EU decided to end its dependence on energy from Russia, well before 2030 (European Commission, 2022). Two of the three pillars of the REPowerEU plan emphasised domestic actions: firstly, through "a massive speed-up and scale-up in renewable energy" (Jerzyniak & Herranz-Surrallés, 2024) in all sectors, accompanied by a binding target at EU level to reach at least 42.5% of renewables by 2030, with an aspiration for 45% of renewables in overall energy consumption; and, secondly, through substantial savings by setting a legal target for at least 15% reduction of gas consumption, accompanied by a legally-binding EU target to reduce the final energy consumption by 11.7% by 2030. Both targets were accompanied by additional measures to improve the framework conditions.

The high dependence on imported energy-critical minerals was first addressed in 2008 with the adoption of the Raw Materials Initiative and followed by regular publication of a list of critical raw materials and other supportive actions. Nevertheless, it has only been in the last few years—when clean energy gathered speed—that access to critical minerals became one of the most urgent priorities for the EU. The 2020 Critical Raw Materials Action Plan (European Commission, 2020b) proposed 10 non-legislative actions. However, they were deemed insufficient to mitigate the risks for supply chains, and, in 2023, the Commission put forward, for the first time, a legislative proposal for regulation establishing a framework for ensuring a secure and sustainable supply of critical raw materials (European Commission, 2023b). The proposal aimed to strengthen the EU's capacities throughout the value chain and set four quantitative goals by 2030 to annually source 10% of the strategic raw materials through domestic mining and extraction, 40% through domestic processing, and 15% through recycling—with this goal raised to 25%, as agreed upon by the Council and the European Parliament (Council of the EU, 2023a)—and lastly, no single third country should supply more than 65% of the EU's consumption of each strategic raw material. Additionally, the proposal improves the overall framework conditions for the achievement of the goals, establishes a European Critical Raw Materials Board, and institutionalises international strategic partnerships.

The EU's domestic approach to a secure and diversified hydrogen economy relies on three pillars. Firstly, the EU attempts to trigger its own production to install 6 GW of electrolysers' capacity in 2024 and 40 GW in 2030 (European Commission, 2020a). To that end, a comprehensive legislative hydrogen and gas market decarbonisation package has been adopted (Council of the EU, 2023b). Secondly, dedicated financial mechanisms have been created, most notably the European Hydrogen Bank (European Commission, 2023a), with a first auction amounting to EUR 800 million from EU emissions revenues channelled through the EU Innovation Fund launched in November 2023 (European Commission, 2023c). Thirdly, the EU launched several industrial initiatives, most notably the European Clean Hydrogen Alliance and the Clean Hydrogen Partnership, to encourage industrial innovation and production of the necessary equipment. Table 3 provides a compact overview of the domestic and external de-risking measures in the three geopolitical energy dimensions.

Table 3. Overview of domestic and external de-risking measures.

	Domestic (autonomy) dimension	External (open) dimension
Natural gas	REPowerEU: replacing Russian natural gas with domestic renewables (dedicated targets and legislative framework) and setting targets for energy savings through legislative measures and saving campaigns.	Five political agreements to increase the share of existing and new suppliers; Half of the partners are authoritarian regimes, only one partner is a full democracy; Cooperation focuses also on the reduction of methane emissions and renewables.
Critical energy minerals	Critical Raw Materials Act (2023) setting 2030 goals for domestic mining/extraction, domestic processing, and recycling, as well as capping the share of supplies from one single country.	Geographically well-diversified portfolio: 12 new partnerships with countries from all continents; Mixed alignment of partners: from full democracies to authoritarian regimes; Cooperation focuses on the entire value chain: business cooperation, research and innovation, regulation, skills and capacity building, and funding.
Hydrogen	Goals for domestic installation of electrolysers, dedicated legislative solutions to enhance domestic production, new financial instruments, and support measures for domestic industry.	Geographically well-diversified portfolio: 21 partnerships with countries from all continents (except Australia), though not all with potentially exporting countries; Mixed alignment of partners: from full democracies to authoritarian regimes; Cooperation focuses on the entire value chain: supply of hydrogen, global standards, and development of domestic production and consumption capacities (domestic decarbonisation), business cooperation, research and innovation, regulation, skills, and capacity building and funding.

4.2. External De-Risking Measures: New Partnerships and Cooperation Patterns

Despite all the internal measures to de-risk EU energy, it has been evident that the EU will not be able to satisfy its demand for natural gas, critical minerals, and hydrogen through domestic measures only, which necessitates some form of external engagement. In the analysed period of 2021–2023, the EU launched a wide energy-related diplomatic outreach to reduce dependency and extend the diversity of energy sources, resulting in political agreements with 26 countries (Table 2).

To reduce the share of Russian energy in its natural gas portfolio, the EU reached five political agreements. Firstly, a presidential Task Force on Energy Security has been launched between the EU and the US (2022), followed by further presidential and ministerial statements. Shortly after, the EU signed two MoUs: a trilateral one with Israel and Egypt to boost new gas deliveries and another one with Azerbaijan (2022) to increase the delivery of gas to Europe to at least 20 bcm annually by 2027. In addition, three joint statements have

been issued: firstly, with Norway, at the ministerial level, to ensure additional short-term and long-term gas supplies (2022), complemented by a presidential joint statement to jointly develop tools to stabilise energy markets and limit the impact of market manipulation and price volatility (2022); and lastly, with Algeria, at the ministerial level, to further energy cooperation including natural gas (2022).

Regarding critical minerals, the EU has concluded 12 partnerships: with Canada and Ukraine (2021), with Kazakhstan and Namibia (2022), with Argentina, Chile, the Democratic Republic of Congo, Zambia, and Greenland (2023), and with Rwanda, Norway, and Uzbekistan (until April 2024). In addition, an agreement with Australia has been announced.

In the area of hydrogen, the EU has concluded six MoUs that specifically target cooperation on hydrogen with Egypt, Kazakhstan, Namibia, Japan (2022), Ukraine, and Uruguay (2023). Hydrogen cooperation has been also explicitly mentioned in two Green Partnerships with Morocco (2022) and Korea (2023), in three Green Alliances concluded with Norway (2022), Japan (2023), and Canada (2023), in a MoU on strategic and global partnership with Tunisia (2023) and a MoU on energy cooperation with Argentina (2023), and in a Joint Statement of the Energy Dialogue with Algeria (2023). In addition, the EU launched initiatives under the Global Gateway–Team Europe framework (EU, EU member states, and their implementing agencies and public development banks). A Fund for Renewable Hydrogen was launched with Chile initially offering EUR 225 million (2023) and another agreement was reached with Brazil to invest EUR 2 billion in the production of renewable hydrogen (2023). Moreover, a Team Europe initiative for large-scale development of green hydrogen was launched by the Commission with Mauritania (2023) and a Green Hydrogen Strategy and Roadmap was developed with Kenya (2023).

In all three areas, the EU energy portfolios have become geographically more diversified. As regards natural gas, the partnerships were mostly expressions of further energy cooperation with existing suppliers—Azerbaijan, Norway, Algeria, and the US, with the latter one, however, becoming the largest liquefied natural gas supplier to the EU. The trilateral partnership with Egypt and Israel is the only truly new addition towards de-risking, which nonetheless still needs to materialise. In contrast, partnerships for critical raw materials have been concluded (and announced) with countries from all continents, pointing to a diverse geographical distribution of the EU energy-critical minerals portfolio. The geographic distribution of partnerships for hydrogen is also wide and covers all continents (except Australia), offering potential for a well-diversified portfolio of future hydrogen supply sources.

As regards the alignment of the partnerships from a political perspective, the picture is quite diverse. Among the 26 investigated countries, as measured by the *Economist*'s Democracy Index, only eight countries are full democracies, five are flawed democracies, six have hybrid regimes, and seven have authoritarian regimes. What is more, some of the full democracies, such as Japan, cannot be considered a viable option to increase the diversity of the hydrogen portfolio but rather only help contribute to market creation. Moreover, three of the critical sources of additional gas—Algeria, Azerbaijan, and Egypt—are classified as authoritarian regimes. Also, some of the partners for cooperation on critical minerals belong to the group of authoritarian regimes (Kazakhstan, Democratic Republic of Congo, Rwanda, and Uzbekistan). This poses a question of to what extent such partnerships are reliable alternatives and help de-risk energy dependencies. At the same time, however, the fact that the EU is reaching out not only to democratic, like-minded constituencies, but also to ones that are not aligned with the EU's values, demonstrates the attempts to exploit the benefits of

complementary preferences with a wide range of states and involve them in global value chains irrespective of their political systems.

What appears as the most novel component of all partnerships is that they go well beyond the supply of energy resources, demonstrating that de-risking adds a new political layer to EU external energy engagement. Natural gas agreements show a strong climate-related component as they explicitly address the reduction of methane emissions in the value chain of natural gas and underline the need to strengthen the decarbonisation of the entire energy sector with investments in renewables. Similarly, agreements on critical minerals go well beyond the mere import of material basis, distinguishing between five clusters of activities: business cooperation and joint projects along the entire critical raw materials value chains; research and innovation cooperation; regulatory approximation, notably in the area of environmental, social, and governance standards; promotion of skills and capacity building in the partner countries; and lastly, mobilisation of funding whenever applicable. Further, the hydrogen partnerships initially follow broadly two goals: to diversify supplies of hydrogen to the EU by designing stable and secure supply chains based on international rules and standards, as well as to support the production of renewable hydrogen in developing countries by enhancing their industrial basis and helping them decarbonise. To that end, the EU provides support financially or through the technical cooperation development of new hydrogen facilities, enables the exchange of relevant technologies, promotes policy frameworks and regulatory aspects of domestic hydrogen economies, and also supports capacity building, training, and skills. With the developed countries, most notably Japan and Canada, the EU aims to create global hydrogen markets focusing on sustainable production, trade, transport, storage, distribution, and use of renewable and low-carbon hydrogen and promote common standards and certification, which is the evidence for joint efforts to overcome dependencies.

5. Conclusions

This article analysed the EU's external energy engagement amidst the mounting geopolitical tensions and rivalries between the world's major economies. It attempted to explore how the EU positions itself internationally given its energy dependence while striking a balance between necessary assertiveness and the need to import energy and energy-related resources. To that end, the article conceptualised a political notion of de-risking and applied it to three vital energy dimensions: natural gas, energy-critical minerals, and hydrogen.

The main result of this article shows that the de-risking of EU energy relations means managing dependence, diversifying suppliers, and constructing new economic partnerships. Hence, while de-risking may sound like another EU buzzword meaning nothing else than diversification at first sight, it is much more than simply diluting the share of dominant assets (as in the case of China) or replacing them with any other assets (as needed following the phase-out of Russian energy). De-risking is about constructing new, diversified, and potentially long-lasting energy portfolios along the entire value chain. It is about building new economic relations.

De-risking through domestic measures can improve energy security only to a limited extent due to the EU's scarcity of relevant energy resources. The EU is, and will remain, dependent on imports of natural gas, critical energy minerals, and hydrogen. Therefore, the second important conclusion is that despite the new global disorder (Lavery & Schmid, 2021), the EU is not looking inward but reaching out to build alliances with new

countries across the globe or strengthen existing international partnerships. De-risking, as applied by the EU, demonstrates thus a strong constructive component that has the potential to reshape international relations to the benefit of all participating parties. Paradoxically, it is the EU's energy dependence that can lay the ground for a new wave of "green cooperation," a new trade and investment order driven by the clean energy transition.

Three elements stand out in this potentially new clean energy geopolitical order. Firstly, the article identifies the redrawing of international relations by breaking up with traditional partners (Russia) and rebalancing relations with others (China) to the benefit of forging alliances with countries that have never played any significant role in global energy value chains (e.g., Chile, Namibia, or Zambia). Secondly, the EU de-risking strategies are designed to enhance economic growth and social development, especially in developing countries. If the desired aims are to be achieved in terms of building industrial capacity, promoting skills, and environmental and safety standards in the third countries, de-risking has the potential to debunk the claims of green extractivism. Thirdly, the de-risking agreements are built on the intention to create new, rules-based global trade networks by involving developed and developing countries. Such networks could create trust, enhance common technical and economic standards, and generate mutual benefits if implemented properly. Lastly, EU de-risking may create new economic and political bridges, or at least a springboard for dialogues with countries that are not necessarily considered like-minded in terms of their adherence to political values and human rights. This is of relevance, as many of the new agreements are concluded with authoritarian regimes or countries that are not fully aligned with EU values. Nevertheless, none of such countries can be seen as a main supplier of energy and energy sources as was the case of Russia in fossil fuels or the case of China's dominant role in processing and supplying energy-critical minerals.

This research leaves room for a follow-up. The analysed agreements, although concluded with several countries in a well-diversified way, currently express desirability and intentionality only, rather than deliver tangible results. Hence, a question mark hangs over whether the political intentions, even if based on seemingly complementary preferences, will materialise. It is not the first time that the EU hoped to establish value-driven partnerships through economic and trade cooperation. Therefore, this article proposes two steps for further research. Firstly, a follow-up analysis would be recommended to analyse the extent to which political desirability turns into actual deliverables. Such ex-post analysis would allow identifying whether there are specific factors, either on the side of the EU and the partner countries, or specific framework conditions, that determine the effectiveness of the political agreements. As a further refinement of such analysis, additional research would be needed to explore differences between the various partnerships, as countries differ in their institutional paths and economic and political nuances. Approaches that work in one country might seem ineffective in another. Moreover, the analysis of multilateral initiatives which were not explored in this article, such as those that try to integrate consumer and producer countries (e.g., the Minerals Security Partnership or the EU Critical Raw Materials Club), could provide valuable research results concerning the effectiveness of bilateral and multilateral cooperation patterns. In this regard, more and continuous research on political and economic international cooperation in the clean energy geopolitical order will be of immense value, equally for scholars, policymakers, and practitioners.

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Conflict of Interests

In this article, editorial decisions were undertaken by Milan Babić (Roskilde University), Nana de Graaff (Vrije Universiteit Amsterdam), and Lukas Linsi (Rijksuniversiteit Groningen). The author is an official of the European Union, yet the research for this article was developed independently from that role. The opinions expressed in this article are those of the author only and should not be considered as representative of the European Commission's official position.

References

Aisbett, E., Raynal, W., Steinhauser, R., & Jones, B. (2023). International green economy collaborations: Chasing mutual gains in the energy transition. *Energy Research & Social Science*, *104*, Article 103249.

Apergi, M., Zimmermann, E., Weko, S., & Lilliestam, J. (2023). Is renewable energy technology trade more or less conflictive than other trade? *Energy Policy*, *177*, Article 113538.

Babić, M., Dixon, A. D., & Liu, I. T. (2022). Geoeconomics in a changing global order. In M. Babić, A. D. Dixon, & I. T. Liu (Eds.), *The political economy of geoeconomics: Europe in a changing world* (pp. 1–27). Palgrave Macmillan.

Batzella, F. (2022). Engaged but constrained. Assessing EU actorness in the case of Nord Stream 2. *Journal of European Integration*, *44*(6), 821–835.

Bauerle-Danzmann, S., & Meunier, S. (2024). The EU's geoeconomic turn: From policy laggard to institutional innovator. *Journal of Common Market Studies*, *62*(4), 1097–1115.

Bocse, A. M. (2019). EU energy diplomacy: Searching for new suppliers in Azerbaijan and Iran. *Geopolitics*, *24*(1), 145–173.

Brauner, S., Lahnaoui, A., Agbo, S., Böschen, S., & Kuckshinrichs, W. (2023). Towards green hydrogen? A comparison of German and African visions and expectations in the context of the H2Atlas-Africa project. *Energy Strategy Reviews*, *50*, Article 101204.

Chalvatzis, K. J., & Ioannidis, A. (2017). Energy supply security in the EU: Benchmarking diversity and dependence of primary energy. *Applied Energy*, *207*, 465–476.

Choer Moraes, H., & Wigell, M. (2022). Balancing dependence: The quest for autonomy and the rise of corporate geoeconomics. In M. Babić, A. D. Dixon, & I. T. Liu (Eds.), *The political economy of geoeconomics: Europe in a changing world* (pp. 29–55). Palgrave Macmillan.

Council of the EU. (2023a, November 13). *Council and Parliament strike provisional deal to reinforce the supply of critical raw materials* [Press release]. https://www.consilium.europa.eu/en/press/press-releases/2023/11/13/council-and-parliament-strike-provisional-deal-to-reinforce-the-supply-of-critical-raw-materials

Council of the EU. (2023b, December 12). *Internal markets in renewable and natural gases and in hydrogen: Council and Parliament reach deal* [Press release]. https://www.consilium.europa.eu/en/press/press-releases/2023/11/28/internal-markets-in-renewable-and-natural-gases-and-in-hydrogen-council-and-parliament-reach-deal

de Jong, M., & Van de Graaf, T. (2021). Lost in regulation: Nord Stream 2 and the limits of the European Commission's geo-economic power. *Journal of European Integration*, *43*(4), 495–510.

Eckert, S. (2021). The European Green Deal and the EU's regulatory power in times of crisis. *Journal of Common Market Studies*, *59*(S1), 81–91.

Economist Intelligence Unit. (2024). *Democracy Index 2023*. https://www.eiu.com/n/campaigns/democracy-index-2023

Eicke, L., & De Blasio, N. (2022). Green hydrogen value chains in the industrial sector—Geopolitical and market implications. *Energy Research & Social Science*, *93*, Article 102847.

European Commission. (2020a). *A hydrogen strategy for a climate-neutral Europe* (COM(2020) 301 final).

European Commission. (2020b). *Critical raw materials resilience: Charting a path towards greater security and sustainability* (COM(2010) 474 final).

European Commission. (2021). *Trade policy review—An open, sustainable and assertive trade policy* (COM(2021) 66 final).

European Commission. (2022). *REPowerEU: Joint European action for more affordable, secure and sustainable energy* (COM(2022) 108 final).

European Commission. (2023a). *On the European Hydrogen Bank* (COM(2023) 156 final).

European Commission. (2023b). *Proposal for a regulation establishing a framework for ensuring a secure and sustainable supply of critical raw materials* (COM(2023) 160 final and SWD(2023) 161 final).

European Commission. (2023c, November 23). *Commission launches first European Hydrogen Bank auction with €800 million of subsidies for renewable hydrogen production* [Press release]. https://ec.europa.eu/commission/presscorner/detail/en/IP_23_5982

European Commission, & High Representative. (2022). *EU external energy engagement in a changing world* (JOIN(2022) 23 final).

European Commission, & High Representative. (2023). *European economic security strategy* (JOIN(2023) 20 final).

European Council. (2022). *European Council meeting (24 and 25 March 2022)—Conclusions* (EUCO 1/22).

European Union. (2010). *Consolidated versions of the Treaty on European Union and the Treaty on the functioning of the European Union: Charter of Fundamental Rights of the European Union*. https://data.europa.eu/doi/10.2860/58644

Farrell, H., & Newman, A. L. (2019). Weaponized interdependence: How global economic networks shape state coercion. *International Security*, *44*(1), 42–79.

Giuli, M., & Oberthür, S. (2023). Assessing the EU's evolving position in energy geopolitics under decarbonisation. *The International Spectator*, *58*(3), 152–170.

Global Commission on the Geopolitics of Energy Transformation. (2019). *A new world: The geopolitics of the energy transformation*. https://www.geopoliticsofrenewables.org

Goldthau, A., & Hughes, L. (2020). Protect global supply chains for low-carbon technologies. *Nature*, *585*(7823), 28–30.

Goldthau, A., & Sitter, N. (2015). Soft power with a hard edge: EU policy tools and energy security. *Review of International Political Economy*, *22*(5), 941–965.

Goldthau, A., & Sitter, N. (2020). Power, authority and security: The EU's Russian gas dilemma. *Journal of European Integration*, *42*(1), 111–127.

Goldthau, A., & Youngs, R. (2023). The EU energy crisis and a new geopolitics of climate transition. *Journal of Common Market Studies*, *61*(S1), 115–124.

Haroche, P. (2024). Geoeconomic power Europe: When global power competition drives EU integration. *Journal of Common Market Studies*, *62*(1), 938–954.

Herranz-Surrallés, A. (2016). An emerging EU energy diplomacy? Discursive shifts, enduring practices. *Journal of European Public Policy*, *23*(9), 1386–1405.

Herranz-Surrallés, A., Damro, C., & Eckert, S. (2024). The geoeconomic turn of the single European market? Empirical trends and conceptual challenges. *Journal of Common Market Studies*, *62*(4), 919–937.

Hickel, J., Dorninger, C., Wieland, H., & Suwandi, I. (2022). Imperialist appropriation in the world economy: Drain from the Global South through unequal exchange, 1990–2015. *Global Environmental Change*, *73*, Article 102467.

Högselius, P. (2018). Energy and geopolitics (1st ed.). *Routledge*.

International Energy Agency. (2023). *Critical minerals market review 2023*. https://www.iea.org/reports/critical-minerals-market-review-2023

International Renewable Energy Agency. (2022). *Geopolitics of the energy transformation: The hydrogen factor*.

Jerzyniak, T., & Herranz-Surrallés, A. (2024). EU geoeconomic power in the clean energy transition. *Journal of Common Market Studies*, *62*(4), 1028–1045.

Juncos, A., & Vanhoonacker, S. (2024). The ideational power of strategic autonomy in EU security and external economic policies. *Journal of Common Market Studies*, *62*(4), 955–972.

Kalantzakos, S., Overland, I., & Vakulchuk, R. (2023). Decarbonisation and critical materials in the context of fraught geopolitics: Europe's distinctive approach to a net zero future. *The International Spectator*, *58*(1), 3–22.

Kalt, T., Simon, J., Tunn, J., & Hennig, J. (2023). Between green extractivism and energy justice: Competing strategies in South Africa's hydrogen transition in the context of climate crisis. *Review of African Political Economy*, *50*(177/178), 302–321.

Kornprobst, M., & Paul, T. V. (2021). Globalization, deglobalization and the liberal international order. *International Affairs*, *97*(5), 1305–1316.

LaBelle, M. C. (2023). Energy as a weapon of war: Lessons from 50 years of energy interdependence. *Global Policy*, *14*(3), 531–547.

Lavery, S., McDaniel, S., & Schmid, D. (2022). European strategic autonomy: New agenda, old constraints. In M. Babić, A. D. Dixon, & I. T. Liu (Eds.), *The political economy of geoeconomics: Europe in a changing world* (pp. 57–80). Palgrave Macmillan.

Lavery, S., & Schmid, D. (2021). European integration and the new global disorder. *Journal of Common Market Studies*, *59*(5), 1322–1338.

Lawrence, M., Homer-Dixon, T., Janzwood, S., Rockstöm, J., Renn, O., & Donges, J. F. (2024). Global polycrisis: The causal mechanisms of crisis entanglement. *Global Sustainability*, *7*, Article e6.

Lindner, R. (2023). Green hydrogen partnerships with the Global South. Advancing an energy justice perspective on "tomorrow's oil." *Sustainable Development*, *31*(2), 1038–1053.

Lukomnik, J., & Hawley, J. P. (2021). *Moving beyond modern portfolio theory*. Routledge.

Månsson, A., Johansson, B., & Nilsson, L. J. (2014). Assessing energy security: An overview of commonly used methodologies. *Energy*, *73*, 1–14.

Markowitz, H. (1952). Portfolio selection. *The Journal of Finance*, *7*(1), 77–91.

Meunier, S., & Nicolaidis, K. (2019). The geopoliticization of European trade and investment policy. *Journal of Common Market Studies*, *57*(S1), 103–113.

Overland, I., Juraev, J., & Vakulchuk, R. (2022). Are renewable energy sources more evenly distributed than fossil fuels? *Renewable Energy*, *200*, 379–386.

Prontera, A. (2020). Beyond the regulatory state: Rethinking energy security governance and politics in the European Union. *Comparative European Politics*, *18*(3), 330–362.

Roberts, A., Choer Moraes, H., & Ferguson, V. (2019). Toward a geoeconomic order in international trade and investment. *Journal of International Economic Law*, *22*(4), 655–676.

Schmitz, L., & Seidl, T. (2023). As open as possible, as autonomous as necessary: Understanding the rise of open strategic autonomy in EU trade policy. *Journal of Common Market Studies*, *61*(3), 834–852.

Scholten, D., Bazilian, M., Overland, I., & Westphal, K. (2020). The geopolitics of renewables: New board, new game. *Energy Policy*, *138*, Article 111059.

Shirizadeh, B., Ailleret, A., Guillon, A., Bovari, E., El Khatib, N., Douguet, S., Issa, C. B., Brauer, J., & Trüby, J.

(2023). Towards a resilient and cost-competitive clean hydrogen economy: The future is green. *Energy & Environmental Science*, *16*(12), 6094–6109.

Siddi, M. (2018). The role of power in EU–Russia energy relations: The interplay between markets and geopolitics. *Europe–Asia Studies*, *70*(10), 1552–1571.

Siddi, M., & Kustova, I. (2021). From a liberal to a strategic actor: The evolution of the EU's approach to international energy governance. *Journal of European Public Policy*, *28*(7), 1076–1094.

Siddi, M., & Prandin, F. (2023). Governing the EU's energy crisis: The European Commission's geopolitical turn and its pitfalls. *Politics and Governance*, *11*(4), 286–296.

Siksnelyte-Butkiene, I., Streimikiene, D., Lekavicius, V., & Balezentis, T. (2024). Comprehensive analysis of energy security indicators and measurement of their integrity. *Technological Forecasting and Social Change*, *200*, Article 123167.

Van de Graaf, T., Overland, I., Scholten, D., & Westphal, K. (2020). The new oil? The geopolitics and international governance of hydrogen. *Energy Research & Social Science*, *70*, Article 101667.

Vezzoni, R. (2023). Green growth for whom, how and why? The REPowerEU plan and the inconsistencies of European Union energy policy. *Energy Research & Social Science*, *101*, Article 103134.

Vivoda, V., & Matthews, R. (2023). "Friend-shoring" as a panacea to Western critical mineral supply chain vulnerabilities. *Mineral Economics*. Advance online publication.

von der Leyen, U. (2019). *Speech by President-elect von der Leyen in the European Parliament Plenary on the occasion of the presentation of her College of Commissioners and their programme* [Speech transcript]. European Commission. https://ec.europa.eu/commission/presscorner/detail/en/speech_19_6408

von der Leyen, U. (2023). *Speech by President von der Leyen on EU–China relations to the Mercator Institute for China Studies and the European Policy Centre* [Speech transcript]. European Commission. https://ec.europa.eu/commission/presscorner/detail/en/speech_23_2063

Weinhardt, C., Mau, K., & Hillebrand Pohl, J. (2022). The EU as a geoeconomic actor? A review of recent European trade and investment policies. In M. Babić, A. D. Dixon, & I. T. Liu (Eds.), *The political economy of geoeconomics: Europe in a changing world* (pp. 107–136). Palgrave Macmillan.

Wigell, M., & Vihma, A. (2016). Geopolitics versus geoeconomics: The case of Russia's geostrategy and its effects on the EU. *International Affairs*, *92*, 605–627.

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