Title: Navigating Dependences: EU Energy Security, China's Green Technologies, and the Russian Challenge"

Introduction

The modification of global energy system has elevated energy autonomy to a central concern in contemporary international politics. Especially, the EU has entered a period of profound strategic reassessment following the Russian invasion of Ukraine, which exposed the structural vulnerabilities created by decades of dependence on Russian fossil fuels. This development accelerated the initiation of the European Green Deal and REPowerEU, designed to promote diversification, enhance security and accelerate the transition to renewable energy sources. However, while the EU has reduced its reliance on Russian hydrocarbons, it has simultaneously deepened another dependency with Chinese clean-energy technologies and critical raw materials essential for green transformation. In this context, China's dominance over global solar manufacturing, battery production, and strategic minerals poses long-term implications for Europe's technological sovereignty and strategic autonomy, while the USA emerges as a key partner in security guarantees, LNG supplies and transatlantic clean-tech cooperation.

Generally, energy autonomy has become not only an economic and technological objective but also a deeply political and security-driven project. All these competing narratives shape public perceptions of energy transition and geopolitics, influencing both political and public discourse across Europe. Hence, these narratives are particularly visible in media ecosystems, which play a central role in framing dependencies, risks and strategic priorities. This paper aims to examine how energy autonomy reshapes the European Union's security architecture in the context of evolving geopolitical dependencies on Russia, China and the USA. In order to answer this question, the following dimensions have been taken into consideration:

-Conceptual: In what way can energy autonomy be theorized as a component of security within the EU, and how has its meaning evolved in response to recent geopolitical transformation?

-Structural: How do the EU's relations with Russia and China influence the EU's strategic autonomy and security doctrine?

-Discursive: How is the EU's energy transition and autonomy discursively constructed through media narratives?

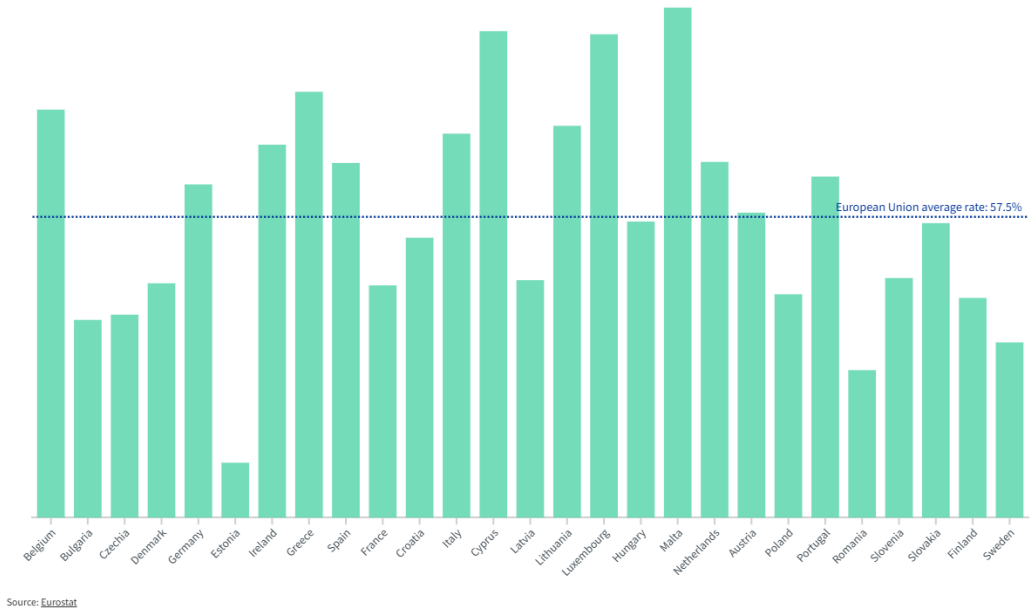
EU Energy Autonomy and Securitization

The notion of "energy autonomy" is a French concept that originated during the Cold War and focused mainly on European defence policy (Quirico, 2023). Jean Monnet argued already from the 1950s that Europe should be capable of acting autonomously, warning against excessive dependence on external powers. Over time, the concept of strategic autonomy has been progressively adapted by the EU and its meaning has been expanded. More precisely, in recent years, it has been connected with the energy sector, which carries comparable geopolitical and security implications. This idea gained renewed prominence in 2019 with initiatives such as the Intelligence College in Europe and President Macron's call to extend strategic autonomy also to environmental standards (Ryon, 2020). Arguably, it identified energy as an area where the EU must strengthen its autonomy. Therefore, European strategic autonomy is correlated with the freedom of political choice and action, which are vital, having in mind the geopolitical tensions of the period (Ryon, 2020).

The International Energy Agency (IEA) defines energy security as “the uninterrupted availability of energy sources at an affordable price” (Lokenberg & Cretti, 2023). As Jonsson states, energy security has become increasingly prominent in EU policy, focusing mainly on import dependency and security of supply. A broader understanding shows that energy security is a multidimensional issue, involving supply and demand considerations, affordability, geopolitical risks, technological vulnerabilities and environmental factors (Jonsson, 2015).

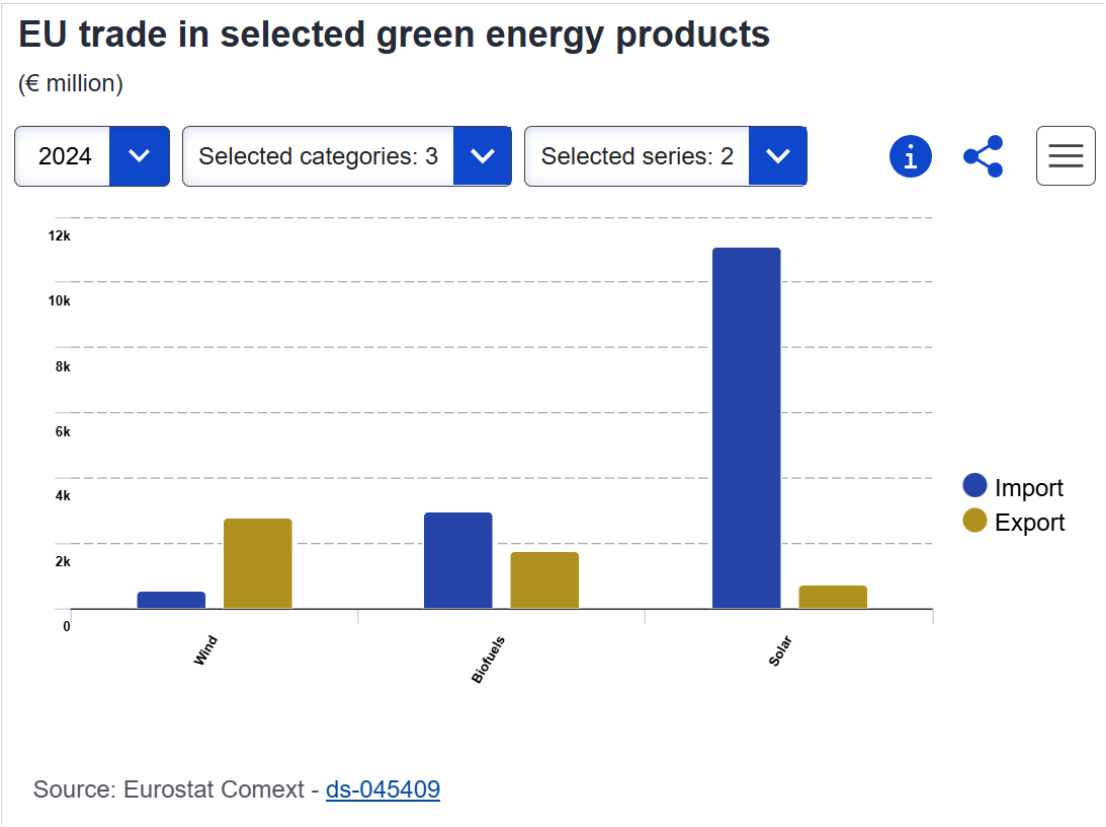
Taking these into consideration, external factors, particularly correlated with global climate action, internal market dynamics and geopolitical relations, strongly shape EU energy security outcomes. Therefore, energy diplomacy represents efforts by states to secure affordable and sustainable energy access (Proedrou, 2012).

A crucial element is that the EU is a net importer of energy. In accordance with the European Council statistics, in 2020, energy produced outside of EU member states accounted for 58% of the energy available in the EU. Estonia's reliance rate was 10.5%, Germany's was 63.7%, Greece's was 81.4%, and Malta's was almost 97%. Over 40% of the energy produced in the EU came from renewable sources, while about a third was generated in nuclear plants. Russia is the EU’s main supplier of fossil fuels. Over half of the solid fossil fuels imported in 2020 (mostly coal) came from Russia, as did 43% of imported natural gas (European Council, 2025).



According to Eurostat, the European Union remains structurally dependent on external suppliers also for critical green-energy technologies, a trend that has significant implications for its energy transition and strategic autonomy. In 2024, the EU imported approximately €14.6 billion worth of green-energy-related products from non-EU countries, dominated by solar panels (€11.1 billion), liquid biofuels (€2.9 billion), and wind turbines (€0.5 billion). Exports were comparatively limited, highlighting a notable trade imbalance in sectors essential for decarbonisation.

China overwhelmingly dominates EU import flows, providing around 98% of solar panels and serving as the largest supplier of liquid biofuels (24%), as well as one of the principal exporters of wind turbines. The data also reveal shifting market dynamics: between 2023 and 2024, the value of solar panel imports declined sharply (–43%) despite a small rise in imported quantities, while wind turbine imports more than doubled in both value and volume. These developments underscore both the volatility of global supply chains and the EU's continuing reliance on external actors, particularly China, for technologies integral to meeting its climate objectives (Eurostat, 2025).



Collectively, these trends reaffirm that the EU's green-energy sector remains characterised by high import dependence, raising concerns about supply-chain resilience, industrial competitiveness, and the broader pursuit of European strategic autonomy in the context of the energy transition.

Russian Dependence

The EU remains dependent on external suppliers, importing over half of its energy, with Russia historically serving as the dominant provider of gas, oil and coal, a concentration that developed major strategic vulnerabilities (Lokenberg & Cretti, 2023). Especially during the last years, this dependency has proved to be extremely harmful for the EU, which faces a significant external energy security issue, revealed by the soaring energy prices and gas shortages of 2021-2022. The EU remains heavily dependent on fossil fuel imports and has limited ability to manage price volatility or supply disruptions. Declining domestic production and insufficient renewable capacity have increased vulnerability, while Gazprom's actions, including low storage levels and reductions in pipeline flows, demonstrate how external suppliers can shape Europe's energy market (Misik, 2022).

More precisely, despite diplomatic pressure on Russia and efforts to reduce dependence, the European Union continues to import substantial volumes of Russian LNG. In the first half of 2025, Russian LNG imports reached €4.48 billion, up from €3.47 billion the previous year. Although the EU has imposed bans on Russian oil and coal following the 2022 invasion of Ukraine, natural gas continues to flow due to persistent dependencies among several member states. Pipeline gas, including flows through TurkStream, has sharply declined since 2022 but has not ceased entirely.

Substantial progress has been made in reducing Russian oil imports, from 29% of EU supply in early 2021 to 2% in 2025. However, Hungary and Slovakia remain heavily reliant on Russian oil due to exemptions from the EU embargo. Both countries argue that alternative supply routes, such as Croatia's Adria pipeline, lack sufficient capacity. Furthermore, Slovakia has threatened legal action if required to abandon Russian natural gas without compensation.

On the other hand, Russian LNG dependence varies across the EU. France, Spain, and Belgium collectively accounted for 85% of Russian LNG imports in 2024, with France and the Netherlands significantly increasing their purchases. By contrast, countries like Italy and Slovenia maintain small amount or no direct Russian gas contracts, having diversified supply routes in recent years. Bulgaria halted Russian gas imports in 2022 but continues to transit Russian gas to Serbia and Hungary via the Balkan Stream pipeline. (Where in Europe still relies on Russian energy?, 2025).

Differentiating from the previous traditional assumptions that energy interdependence fosters cooperation, the view has shifted to energy as a weapon, as shown by Russia's war in Ukraine and the energy crisis. In this vein, although European policies such as REPowerEU aim to reduce Russian fossil fuel dependency, this has shifted to other states such as Katar, Algeria, and Azerbaijan, raising new risks of EU strategic autonomy and the development of cooperation with other authoritarian regimes.

China and Critical Raw Materials

On the other hand, both the EU and China are major actors in global energy and climate governance and are evolving their relationships towards that direction. Since 2015 and the Paris Agreement, renewable energy sources have expanded significantly, increasing gradually from 2,8% in 2015 to nearly 13% in 2021. Hence, China was the leading force behind this growth, contributing to 36% of global solar and 40% of global wind capacity additions in 2021.

At the same time, the EU has doubled its renewable energy share between 2004 and 2021, reaching 21,8%. By reducing the use of coal (-20%) and gas (-4%) by 2020, Europe's electricity has become cleaner than in 2015, driven largely by wind and solar expansion. This momentum reflects the EU's integrated energy-climate policies and its goal of becoming the first carbon-neutral continent by 2050 (Stojanovic, 2024).

In the current geopolitical situation, the transition to renewable energy has created new dependencies on critical raw materials (CRM), especially those imported by China, which dominates both production and processing of essential minerals for solar panels, batteries and wind turbines. The CRM dependencies expose the EU to supply disruption, geopolitical manipulation and long-term technological vulnerability (Lokenberg & Cretti, 2023). This dependence contributes to EU's vulnerability, which has practical effects on political issues and also production disruptions (Sandkamp, 2024).

China leads the world in clean energy investment, investing 546 billion USD in 2022, surpassing the United States and the European Union, despite being the world's greatest emitter (31% of global energy-related CO2 emissions in 2021) (Stojanovic, 2024). Arguably, China is the largest producer of magnesium, germanium, Gallium, Indium and Silicon, materials which are used for photovoltaic cells, and rare-earth elements used for windpower stations and electric motors (Sandkamp, 2024). Furthermore, China refines the majority of the world's key minerals, including 68% of nickel, 59% of lithium, and 73% of cobalt, and is deeply integrated into battery supply chains: it manufactures 70% of cathodes, 85% of anodes, and holds 78% of global EV battery cell production capacity. It also dominates solar, wind, energy storage, and transmission component manufacturing.

Many of these raw materials are critical for the European energy transition and could be sourced by other countries; however, the setup of production facilities takes years. Thus, a sudden disruption in imports from China can be expected to slow down energy transition significantly (Sandkamp, 2024). This raises EU and USA's security concerns, having in mind the dependence on Chinese minerals, crucial for energy technologies (Castillo, 2022).

Despite the fact that there are attempts to develop alternative supply chains, expanding domestic or allied mineral production has multiple financial, environmental and social barriers. Maintaining China's dominance without improving environmental or social standards would heighten geopolitical risks, disrupt the energy transition and aggravate social and environmental implications from mining and processing (Castillo, 2022).

Public Diplomacy frames on Media

As Rochyardi-Reetz et. al. (2019) explain that the Media is the mediating point for governmental officials, politicians, activists, scientists, and other social factors to express their views and priorities and provide different framing on an issue. As a consequence, journalists and media outlets have the role to not only transfer the message to the public but also actively decide what point they want to highlight and if they will have a positive or negative representation for the general public. It is understood that in this way media has the power to influence public acceptance and usage of renewable energy and any other issue related to energy transition (Rochyadi-Reetz, Arlt, Wolling, & Bräuer, 2019).

To an extent energy transition is presented as a top-down approach. However, these vital changes are more than European, or national laws and policies. For example, the decision of gradual decarbonization with a mode of renewable energy production is mainly a responsibility on a national level for each state. Nevertheless, Batel and Devine-Wright (2015) highlight that the missing point up until now is that these goals have to be connected and understood by the local communities and individuals. Energy transition is not something that will affect an aspect of some people's lives, whereas, it is a social change in which communities should be directly involved for sustainability to actually be attained (Batel & Devine-Wright, 2015).

In order to understand how the European Media present our topic 3, indicative online outlets have been selected: Politico Europe, Euractiv and Brussels Times. Moreover, keywords have been used to identify specific news and opinions related to the topic of energy autonomy of Europe, like EU energy autonomy, Russian gas and China, clean energy.

Across Politico, Euractiv, and The Brussels Times, EU energy security in 2025 is portrayed as a multidimensional and unresolved challenge, shaped simultaneously by the legacy of Russian

fossil-fuel dependency and the emergence of a new dependency on Chinese clean-energy technologies.

Politico frames EU energy autonomy as an ongoing, fractious political project undermined by persistent Russian LNG imports and internal divisions. Emphasis is also given to the EU's growing reliance on Chinese solar panels, batteries, and critical minerals, situating energy autonomy within larger strategic autonomy debates and portraying the EU as "caught" between great-power pressures while depending on U.S. LNG as a security buffer.

Euractiv provides a more policy- and industry-oriented perspective, framing the EU's energy transition as dependent on securing critical raw materials, accelerating industrial decarbonisation, and building competitive clean-tech supply chains. China is depicted less as a geopolitical adversary and more as a structural challenge in supply-chain resilience, while Russian gas is seen as the legacy dependency the EU must decisively overcome. Euractiv repeatedly connects autonomy to Europe's ability to scale its own green-tech industries and digital-energy infrastructures.

The Brussels Times highlights ongoing tensions between political commitments and material realities, focusing heavily on the paradox of rising Russian LNG imports through EU ports. The newspaper depicts Russian energy dependence as uneven across member states and often entrenched by infrastructure constraints. In parallel, its sponsored content projects China as an economic partner, producing a contrasting narrative to Politico's more geopolitical framing.

All three outlets illustrate how EU energy autonomy is discursively constructed as a struggle between old and new dependencies on Chinese clean-energy technologies, with internal EU fragmentation and external geopolitical pressures shaping both perceptions and policy responses. Their combined coverage underscores the central argument that energy autonomy is not merely a technical or economic project but a highly politicised and narratively contested process, framed differently across media ecosystems and embedded in the broader struggle for European strategic sovereignty.

Conclusions

These developments showcased the weakness of EU mechanisms designed to ensure supply security and highlighted the lack of a coherent external energy policy. Existing internal market rules cannot effectively address geopolitical risks outside EU borders, nor can they prevent destabilization in price shocks. Despite the progress made in decarbonization, the EU will continue to rely on natural gas during the long transition to 2050, making external security a continuing priority.

A stronger common external energy policy, including coordinated purchasing, improved transparency, regional cooperation and stricter scrutiny of intergovernmental agreements, would strengthen the EU's negotiating position with suppliers. Without such measures, individual member states will remain exposed to geopolitical manipulation, undermining both energy security and transition (Misik, 2022).

The dependency of fossil foils and CRM should be treated differently, as Lokenberg & Cretti argued. Firstly, they should reduce reliance on petrostates through renewable expansion, while managing, on the other hand, CRM risks through diversification, recycling and strategic partnership.

Media on the other side of the spectrum has to intensify their actions to include more comprehensive, informative, and inclusive reports regarding energy developments. In many cases, the Media stays at presenting official announcements and fails to provide scientific perspective, data, and local perspectives regarding issues such as decarbonization or energy transition. Nonetheless, climate change and energy policies that affect people's everyday lives should be justified and explained to the public through public diplomacy and other means in order to be engaged with the process and the decision-making. Media are the main source of information and should play a pivotal role in the upcoming years.

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