Melania-Gabriela Ciot
(Editor)

Advancing Sustainability in the European Union:

Green Deal Challenges and Solutions

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FOREWORD

Professor Dr. Melania-Gabriela CIOT

The present volume brings together the scientific contributions presented at the Doctoral Conference in International Relations and European Studies (7th edition), organized by the Doctoral School of International Relations and European Studies, under the auspices of the third edition held within the activities of the Jean Monnet Chair Green Deal and European Negotiations. The publication of this volume is not only the result of a substantial academic exercise, but also the expression of an intellectual community in full consolidation, concerned with one of the most complex and important transformations that European societies and the international system as a whole are going through today.

In recent decades, the concept of sustainability has gone far beyond the limits of a simple environmental policy concern. It has become a paradigm for organizing economic development, democratic governance, international relations and global security. In this context, the European Green Deal represents one of the most ambitious political and strategic initiatives of the European Union, proposing not only a transformation of the European economic model, but also a redefinition of Europe's role in the world. Beyond its climate objectives, the Green Deal configures a new vision of the relationship between economic growth, social justice, technological innovation and global responsibility.

The contributions brought together in this volume clearly demonstrate that new generations of researchers understand the multidimensional nature of these transformations. The diversity of the themes addressed reflects the complexity of contemporary challenges and the need for interdisciplinary approaches capable of overcoming traditional boundaries between fields. Thus, sustainability is analyzed both from the perspective of diplomacy and the international image of states, through studies dedicated to green diplomacy as a nation branding tool, and from the perspective of the impact of new technologies on education and the development of European societies, through research devoted to the integration of artificial intelligence in educational processes.

The volume also explores the relationship between sustainability and democracy, examining perceptions of instruments for democratic participation and engagement, as well as the link between green transformations and strengthening the resilience of local communities. Equally, a series of contributions highlight the interdependencies between the green transition and the European security architecture, between climate change and new geopolitical configurations generated by access to Arctic Sea routes or the acceleration of digitalization processes.

Another important thematic group is dedicated to the economic and institutional instruments of the European Green Deal. Border carbon adjustment mechanisms, circular economy and recycling policies in the textile industry, green agriculture and food security are analyzed both from a theoretical perspective and through case studies relevant to the European and regional space. These contributions illustrate that the success of the green transition depends not only on the formulation of ambitious policies, but also on the capacity of institutions and societies to implement them efficiently and equitably.

Particularly relevant are the works that examine the implementation of the European Green Deal (or its policies) in states with different political and economic contexts, such as the Romania or Poland, but also Republic of Moldova and Turkiye. These analyses allow for a more nuanced understanding of how European objectives are adapted to national and regional realities, highlighting both the opportunities and the difficulties generated by the processes of structural transformation. At the same time, the impact of the war in Ukraine on the implementation of the Green Deal brings to the fore the need to articulate a European policy capable of simultaneously managing security, energy and climate challenges.

There is also no shortage of critical and reflective approaches to contemporary discourses on the environment and development. Analyses dedicated to ecofeminism, the relationship between public health and the objectives of the Green Deal, or the debate on the Green Deal's capacity to maintain Europe's competitiveness and strategic relevance in the context of new global rivalries demonstrate the intellectual maturity of the research presented and the willingness of the doctoral students to address topics at the heart of current academic and political debates.

A distinctive element of this volume is its concern for the human dimension of sustainability. From migration and urban resilience to the role of academic elites in shaping a new European culture of responsibility and sustainable development, numerous contributions emphasize that the green transition cannot be reduced to economic indicators or technical objectives. It involves profound transformations of the values, behaviors, and governance mechanisms that structure contemporary societies.

The impressive size of this volume – over 200 pages – as well as the large number of papers presented and subsequently submitted for publication represent eloquent proof of the growing interest of young researchers in the study of sustainability and the transformations associated with the European Green Deal. This interest is all the more significant as it reflects the concern of a new generation of specialists for the processes that will shape the world of tomorrow. In a period marked by geopolitical uncertainties, climate crises, technological revolutions and global economic reconfigurations, academic research becomes not only a tool for understanding reality, but also a space for formulating the solutions necessary for building a sustainable future.

The Doctoral Conference in the field of International Relations and European Studies has consolidated, over its seven editions, its status as an academic platform dedicated to dialogue, debate and the formation of a research community capable of responding to contemporary challenges. The fact that this edition is being held for the third consecutive year under the aegis of the Jean Monnet Chair Green Deal and European Negotiations confirms the

relevance of the topics addressed and the essential contribution of European programs to the development of research and education in the field of European studies.

We hope that the papers gathered in this volume will provide readers not only with a comprehensive picture of the challenges and solutions associated with sustainability in the European Union, but also with a perspective on future research directions in a field that is in constant evolution. At the same time, they demonstrate that the academic reflection of new generations can significantly contribute to understanding and shaping the transformation processes that define the present and will shape the future of Europe.

Cluj-Napoca,
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GREEN DIPLOMACY AS A TOOL OF NATIONAL BRANDING: TÜRKIYE'S POLITICAL RESPONSE TO THE EUROPEAN GREEN DEAL

Irina-Maria COSMA[1]

Abstract: *Our premise is that political messages are crucial for understanding the developments of the international community and its actors. In other words, what statal actors do is not necessarily what they mean – or in fact, there is a sub-text of the original message they convey. To be more specific and apply this to our case and subject of this paper, the actions that the Republic of Türkiye has pursued regarding implementing of measures in the green diplomacy might be interpreted to some extent as an intention of Turks to restart the accession process by reaching the European standards. Nevertheless, despite the several environmental policies undertaken, the integration process of Türkiye is still frozen. This means that their interest was rather different than the first-look interpretation.*

Keywords: *Türkiye, Green Deal, EU integration, environmental policies.*

Introduction

The focus of this paper is on the significance of the European Green Deal and Türkiye's response in ideological and political terms. Our main hypothesis is that measures (as in: political measures) cannot be separated from "ideas" (i.e. ideologies, in the broader meaning); as a consequence, our interest is in analysing the text and subtext – namely, the measures and environmental policies or ambitions of the Republic of Türkiye in response to the European Green Deal and environmental standards – as well as what they mean for the Turkish case and the scenario of the European integration. When it comes to the previous interactions between the Republic of Türkiye and the European Union, they can be traced back to the Ankara Agreement, representing the foundation of their ties with a focus on the economic cooperation. (Türkiye-AB İlişkilerinin Tarihçesi, 2024). It was followed by the official application, receiving the status of candidate state, and then adopting the framework for negotiation (Türkiye-AB İlişkilerinin Tarihçesi, 2024). Nevertheless, the following events in the regional and global arena (such as the migration crisis) and also the internal political issues in Türkiye were of

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great impact for the integration process, currently, the Republic of Türkiye remaining at the status of candidate state, with no relaunch of the integration process. Our motivation for the paper resides in the specificity of this case: on one hand, we can observe ambitious measures of the Republic of Türkiye in the environmental field, but on the other hand, Türkiye is a candidate state for a long period of time, with no relaunch of the integration process. This can be placed in a wider perspective, by analysing Türkiye's position not only politically, but also geopolitically and strategically. Therefore, some steps closer to the European Union might bring Türkiye farther from the East, even if not necessarily in a political meaning, but rather in an ideological perception.

Throughout this paper, we are going to analyse some of the most relevant environmental measures taken by the Republic of Türkiye: the "Zero Waste" Program, people-oriented green transition, the national automobile brand "TOGG", and public transportation strategies, such as "Go Türkiye" and "Türkiye Sustainable", encouraging public transportation as a less pollutant way to travel.

Literature Review

Our approach to this case study is to present the Turkish green diplomacy and environmental ambitions in relation with the European Green Deal. Our main focus in on the hypothesis that even though the Turkish candidacy started decades ago, acquiring environmental legitimacy through green policies and green measures can be seen as a tendency to gain regional and international recognition rather than an attempt to reopen the accession negotiations and become a member of the European Union. Given that our methodology is qualitative, more specifically, analytical and interpretative, we shall briefly present the main theories in the study of international relations, and the way in which we can correlate them with our case study.

To begin with, we shall refer to realism, which has among its fundamental concepts "power", "influence", "security" and "national interest". In other words, states' security and self-interests are primary, their actions being guided by the aim to achieve their national interest (realism, 2026). Applying this to our analysis, we can very well understand the Republic of Türkiye's environmental ambitions as a tool or a means for them to achieve their interest, i.e. securing their position as a "regional power". Moreover, we can understand power in relation with two entities: the West and the East. More specifically, by adopting green policies, Turks attempt to maintain a stable relation with the West (here, the European Union), but also with the East, displaying the country's green potential and modernised façade. In this way, Turks might understand this as a way for becoming an energetic hub between the two poles.

We can also mention liberalism among the central theories of international relations. In this case, the approach is rather different from the realist one. This theory accentuates the importance of cooperation, international organisation and human rights (Liberalism). Through the liberalist lens, we can understand the Turkish green diplomacy as a suitable way

to reiterate their European engagement in terms of cooperation and a suitable manner of Turks to display that their policies match the Western standards of modernisation.

Constructivism, on the other hand, creates an even larger perspective: under the premise that identities are rather constructed than given (natural) (Wendt, 1999). Therefore, we can apply the constructivist theory to our case study, by analysing the Republic of Türkiye's actions as a means to construct their international image. The international image construction represents a way in which Turks wants other actors to perceive them: as an environmentally ambitious and modernised state.

The Impact of the European Green Deal on Candidate States

The European Green Deal is very important for accession: Chapter 27 of the Aquis is strictly related to "Environment and Climate Change", stipulating the environmental conditions that must be acquired in order for a state to become a member of the European Union (European Commission). Moreover, besides the environmental standards, the European Green Deal does also have a regulatory role, crossing the environmental field. We can place it within the Brussels effect, for the Green Deal displays the normative influence of the European Union, becoming, therefore, a diplomatic tool; given the importance of the "green" field in the European cultural, ideological and political context, the European Green Deal represents even more than just a set of norms. For both the case of the European Union and the Republic of Türkiye, it is a matter of diplomacy and soft power.

The concept of "soft power", vehiculated in the field of international relations starting from by Joseph Nye, has "persuasion" as a central concept. Given that, we aim to analyse the way in which green diplomacy can represent a means of internal and international persuasion used by Turks to gain legitimacy.

Green Diplomacy and National Branding in Türkiye

The Republic of Türkiye is going through a process of rebranding, with several changes in the last years (one of the most known being the change of the international denomination from Turkey to Türkiye). Therefore, within this framework, we can analyse Türkiye's response to the environmental standards of the European Union. At a first level, we can see that Türkiye does implement several environmental policies; nevertheless, there is no relaunch of the accession process. This can be explained by understanding the green policies adopted by the Republic of Türkiye not only as a means to develop the environmental field in their internal policy, but also as a tool for their international image construction, rather than a means for their accession to the European Union. We can understand Türkiye's measures in the green field as part of "green diplomacy", defined as "a modern type of diplomacy" (Iftime, 2014), where ties between actors can be created and maintained by means of promoting environmental measures and policies.

We shall further analyse some of the most relevant measures taken by Turks in the green field and what they represent for their image at the regional and international level.

"Zero Waste" Program

In 2017, the Turkish Government launched the initiative called "Sıfır Atık", meaning "Zero Waste", a program for the encouragement of a circular economy by recycling and using resources efficiently (Sıfır Atık Nedir?).

Therefore, through this program, the reutilisation of hardly degradable materials is especially encouraged, but also their recycling, having as a foundation the following principles: "reducing, reusing and recycling", regarding the necessity to reduce the quantity of waste – by reusing and recycling any time it is possible and minimising the usage of plastic. Moreover, it is related to "projection for sustainability and resilience" by using time-durable and sustainable materials and "closing the circle", i.e. using materials keeping them and products is use for as long as possible (Sıfır Atık Nedir?).

The Turkish First Lady, Emine Erdoğan is very involved in the dissemination of information and raising awareness regarding the importance of realising the danger of pollution. Her involvement is seen by her presence at different activities and mediatising of this program (Sıfır Atık). We can exemplify her involvement in various fields, such as textile industry (organising an exhibition on the theme of recycling in textile industry), but also numerous other speeches within international organisations (such as the United Nations) to raise the matter of environment protection at a global level and to make known Türkiye's efforts in this regard (Sıfır Atık). This cand be translated as a matter of soft skills and public diplomacy, for constructing a positive image internationally. In relation to this project, President Recep Tayyip Erdoğan said: "The Zero Waste Project, carried out under the patronage of my wife Emine Erdoğan, has evolved into a global environmental movement" (T.C. Cumhurbaşkanlığı İletişim Başkanlığı, 2026). "The foundation of our environmental initiatives is the "Zero Waste" mentality. This movement teaches us the following: When we recycle a plastic bottle, we are not only disposing waste; we are also saving a living being's life, the beauty of a beach, and a child's hope" (T.C. Cumhurbaşkanlığı İletişim Başkanlığı, 2026). The use of emotional elements, such as ideas of saving lives or the appeal to children's hope turns this into a populist discourse as well, trying to appeal to the entire Turkish community, for which children and perpetuating generations represent very precious symbols (Cosma, 2025).

"When we save a tree, we are not only helping a sapling grow; more importantly, we are securing the breath of a generation" (T.C. Cumhurbaşkanlığı İletişim Başkanlığı, 2026). The idea of family and perpetuation are highlighted as well, representing an important pillar of the Turkish cultural identity (Cosma, 2025).

Now we are preparing to take all these efforts, projects, and services to the next stage. As you know, after very tough diplomatic negotiations, we have assumed the hosting of COP 31. This year, we will host nearly 200 countries in Antalya; and God willing, we will now say: 'It is no longer time for words, but time for action'" (T.C. Cumhurbaşkanlığı İletişim

Başkanlığı, 2026). The ending phrase frames very well the importance of a national image for Turkish citizens in a nationalist manner. The Minister of the Environment and Urban Planning, Murat Kurum, declared: "Türkiye today is not only a rising power, but also a model of good practice. Türkiye is now an example for the entire world through the vision of the Zero Waste Project conducted by Emine Erdoğan and now, Türkiye is the address for the solution of the climate crisis by hosting COP 31" (Türkiye bugün yalnızca yükselen değil, yön veren bir güçtür, 2026). Given that Türkiye will host COP 31, the creation of a solid image internationally is crucial for sending the message that the country is trustworthy and displays great ambitions in the environmental field.

People-oriented Green Transition

Public diplomacy and soft skills take a central place among the Turkish Government's strategies, including fields such as environment, climate and green economy. Therefore, the Turkish government proposes "an inclusive strategy, by including women and youngsters in the economy, especially in the field of SME's – by adopting green technologies and offering courses for their specialisation in these jobs" (World Bank Group). This measure means that Türkiye engages to demonstrate that it promotes gender equality and inclusion, that there is an inclusive economy in the country. Hence, the European Green Deal and environmental acquis represent a good means for the Turkish government to display their soft skills and inclusivity policies, being beneficial for the country not only environmentally, but also politically – the courses for specialisation being completely covered by the state.

We can analyse the political message of these measures: first of all, it is an example of the country promoting gender equality and inclusion, by showing that there is an inclusive economy; second of all, the Turkish government displays soft skills and inclusivity policies. Lastly, this initiative is supported by the state, offering courses for specialisation completely covered by the state. The general political message they want to construct is: a trustworthy international actor, where gender equality is covered and inclusive economy exists. Moreover, there is a message directed towards the Turkish population as well: by making the economy more inclusive, the Turkish citizens may be more open towards accepting changes in the environmental and green field of the economy.

TOGG – National Automobile Brand

In 2018, the Republic of Türkiye launched its own car company – TOGG ("Türkiye'nin Otomobili Girişim Grubu"), reaching the top in the segment of electric cars in Türkiye (Tribdino).

This brand was given the title of "national brand", being therefore directly supported by the Turkish government.

Moreover, charging stations were placed in all 81 districts of the country, the government creating their own charging system as well, called Trugo (Tribdino).We can see

that this measure is beneficial for the internal status-quo because the government attempts numerous inclusive measures so that all the regions of the country would be almost equally developed in this field and have equal access to these policies. Therefore, the entire country would have reached the same level of development in the environmental field.

Through this launch, the Turkish government wants to reduce the polluting emissions, supporting the transition to a green economy and the alignment to the European Union's environmental requirements.

More than being a means of reducing polluting emissions and supporting the transition to a green economy, TOGG represents a means of national branding or rebranding, but also a means of promoting the country both internally and internationally: "TOGG is pursuing a European expansion strategy" (Tribdino, Togg to Launch Second EV, Plans European Expansion). Another relevant aspect is the way in which the car design is presented. To provide an example, there are various colours in which the car is available, such as red, white, beige, blue etc. but instead of using the actual colour names, the branding strategy replaced them with representative places in the country, turning the car into a tourism brand as well.

Therefore, the red TOGG is called "Anadolu", meaning "Anatolia", red being a symbol for the Anatolian region, but also the colour of the Turkish flag – therefore becoming a national symbol as well; the blue TOGG is called "Gemlik", meaning "shipyard" but also the name of a coastal city in Türkiye. The beige TOGG is called "Kapadokya", where the colours are predominantly beige (rocks and soil) and the white TOGG is called "Pamukkale" (TOGG), literally meaning "Cotton (pamuk) Castle (kale)", a well-known tourism destination, known for the white travertine terraces and part of the UNESCO World Heritage (Hierapolis-Pamukkale). What we can deduce is the branding strategy – even if the cars are electric and made to reach the European environmental standards and reduce pollution, they represent a means to promote the country internally and internationally.

Public Transportation – Go Türkiye & Türkiye Sustainable Tourism Strategy

In the field of transportation, the Turkish government encourages the use of public transportation, making it more accessible and less polluting. Within the brand "Go Türkiye", the accessibility of public transportation is framed into the "Türkiye Sustainable" category, becoming a possibility to travel cheap and environmental-friendly: "the transportation with train lines in Türkiye assures a halving of the carbon dioxide emissions, as compared to the transportation with an own car or with the plane" (Türkiye Sustainable). Moreover, the Turkish government used public transportation as a method to encourage tourism: "by train, you can reach to explore even the smallest and less known destinations" (Türkiye Sustainable). Through this, Turks can better promote what they call "çevre mirası" (literally "the environmental heritage"), representing a good means to actually promote their national heritage and implicitly, their national identity.

Conclusions. Perspectives and Challenges

What we can deduce from the analysis of the above-mentioned environmental policies of the Republic of Türkiye in response to the European Green Deal is that Turkish nationalism prevails and the construction of their regional and international image is of greater interest than the relaunch of the accession process to the European Union. The perspectives of creating a powerful and influential actor in the region can be the foundation of Turks' ambitions in the environmental field, but they are also beneficial for the Turkish population, by stepping towards an inclusive green economy. Therefore, we can label this as "a Türkiye for Turks" – in other words, they do implement European environmental measures and attempt to reach the European standards, but it must be in their benefit: "el için çalışan yorulur, kendi için çalışan kazanır", meaning: "the one who works for others gets tired, the one who works for himself wins" – this Turkish proverb is rather representative for their political dynamics; it does not mean the refuse to cooperate internationally, but rather that in certain contexts, Turks prioritise their internal or international development, under the above-mentioned idea of "a Türkiye for Turks".

Moreover, environmental measures and developments may overcome other areas not so developed yet, for instance in the political or economic fields – which are otherwise very important for the European integration. As we presented some relevant environmental measures, we can deduce their similarity with other foreign policy actions of the Republic of Türkiye in its oscillation between the West and the East. In other words, from a diplomatic perspective, Turks attempt to maintain a close tie with the European Union, by adapting to the European environmental standards, but at the same time, they remain outside of the European framework, mainly due to the stagnation of the integration process.

Despite the ambitions in the environmental field, covering large areas such as transportation, tourism, recycling projects etc., we can raise the matter of challenges the country is currently facing. One of the most important challenges is the level of pollution: when it comes to the air quality, in 2025 the air quality index was measured at around 70, while the PM 2.5 reached 19.2 μg/m3, being stated that "PM2.5 concentration is currently 3.8 times the World Health Organization annual PM2.5 guideline value" (Air quality in Turkey). In 2024, Türkiye reached high levels of pollution because of fossil fuel production due to its reliance on coal in the energetic sector (Maguire, 2025). The question that raises further is whether greenwashing or green sheen can be attributed to the case of Türkiye. The definition of greenwashing provided by the United Nations describe the concept as a tactic to mislead others into believing that "an entity is doing more to protect the environment than it is" (Greenwashing – the deceptive tactics behind environmental claims). In other words, it can be understood as an attempt to display a higher level of environmental modernisation and green energy than it actually is. There are numerous ways to analyse this for our case study: on one hand, Türkiye's environmental ambitions might be understood, as mentioned, as a means to create an international image in this field; the idea behind constructing and consolidating their international image can be understood as their willingness to gain (regional) influence and

display credibility and hence, Turks would not be able to construct a trustworthy image if the internal situation does not reflect it.

Therefore, a more possible scenario for the case of Türkiye is not greenwashing, but rather a form of strategic green diplomacy, where environmental measures are actually more oriented towards the political and diplomatic fields, rather than rapid changes in the green field. Regardless of the field of policy, rapid changes are very challenging for the citizens, especially in the case of Türkiye, where there is the collective memory of the rapid changes the Kemalist Revolution has brought (Cosma, Faith-based Diplomacy and Neo-Ottomanism, 2025). In this way, the population must be accommodated to the green transition while policies must be adapted to the specificities of the Turkish population in order to attain a sustainable change.

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AI INTEGRATION IN EUROPEAN EDUCATION FOR SUSTAINABILITY: DIPLOMATIC AND POLICY PERSPECTIVES FROM ROMANIA AND FINLAND

Ioana Florina MAN (RUSSU-COLDEA)[1]

Abstract: *The accelerating integration of artificial intelligence (AI) into educational systems across Europe represents a critical intersection between digital transformation and sustainability policy (Tuomi, 2018; Holmes et al., 2019). Anchored in the European Union's regulatory and strategic frameworks—particularly the European Green Deal and the Artificial Intelligence Act—this study examines how Romania and Finland operationalize AI-driven educational innovation in alignment with sustainability goals (Boucher, 2020). Through a comparative policy and diplomatic analysis, the paper explores governance models, ethical considerations, and geopolitical implications of AI-enhanced education (Floridi et al., 2018). It further evaluates the extent to which national strategies contribute to resilient, eco-efficient, and inclusive sustainable educational systems (OECD, 2021).*

Keywords: *Sustainable educational policies; Finnish and Romanian Green Deal challenges; eco-efficient AI models; EU AI Act; digital diplomacy.*

AI and Sustainability in Education: Regulatory and Policy Frameworks

The EU Artificial Intelligence Act adopts a risk-based approach to AI governance, classifying systems into unacceptable, high-risk, limited-risk, and minimal-risk categories (Boucher, 2020). Within this framework, educational AI systems—particularly those used in assessment and admissions—are classified as high-risk and therefore subject to strict compliance requirements (Zawacki-Richter et al., 2019). High-risk AI systems must comply with stringent obligations, including risk management protocols, high-quality data governance, technical documentation, transparency requirements, human oversight mechanisms, and robust cybersecurity protections prior to market deployment within the EU (European Union, 2024). These provisions reflect broader ethical frameworks emphasizing accountability, fairness, and trustworthiness in technological design (Floridi et al., 2018).

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Moreover, the regulation extends to both developers and deployers of AI systems, including those operating outside the EU, thereby reinforcing its global regulatory influence (OECD, 2021).

The Act also introduces specific rules for General Purpose AI models (GPAI), requiring transparency regarding training data and compliance with copyright regulations (Tuomi, 2018). The European Commission oversees implementation through an AI Office, ensuring the development of trustworthy and compliant AI systems (European Union, 2024).

In parallel, AI technologies offer transformative potential for advancing sustainability in education through adaptive learning systems and intelligent tutoring platforms (Holmes et al., 2019). These tools can optimize resource allocation, enhance institutional efficiency, and support personalized learning pathways aligned with sustainability competencies (Luckin, 2018). However, their integration also raises significant ethical and environmental concerns, including energy consumption, data privacy risks, and algorithmic bias (Williamson, 2017). In response, the EU's human-centric AI approach emphasizes transparency, fairness, and accountability as foundational principles (Floridi et al., 2018).

Finland: A Model of Integrated Policy and Innovation

Finland's approach to AI integration in education is closely aligned with national sustainability and digitalization strategies (Kairamo et al., 2019). Policy initiatives prioritize AI literacy, open-access educational platforms, and lifelong learning frameworks (Holmes & Tuomi, 2022). The Finnish governance model is characterized by strong institutional coordination, policy coherence, and evidence-based decision-making processes (OECD, 2021). Teacher training systems, interdisciplinary curricula, and structured public–private partnerships further support the effective integration of AI into educational practice (Selwyn, 2019). In addition, Finland's diplomatic engagement in international digital policy forums reinforces its positioning as a global leader in sustainable digital education governance (Holmes & Tuomi, 2022).

Romania: Emerging Strategies and Structural Challenges

Romania's integration of AI in education reflects a transitional phase marked by both strategic opportunities and structural challenges (Nicu, 2021, pp. 26–34). National policy initiatives increasingly emphasize digital transformation and alignment with broader EU sustainability objectives (European Commission, 2019). Efforts to modernize the education system include the adoption of AI-assisted learning tools and participation in EU-funded digital innovation programs (OECD, 2021). Nevertheless, persistent disparities in digital infrastructure and levels of digital literacy continue to represent significant barriers to effective implementation (Williamson, 2017). Romania's evolving policy landscape thus highlights the complexity of integrating AI technologies within diverse socio-economic and institutional contexts, where reform processes remain uneven and gradual (Nicu, 2021, pp. 87–92).

Diplomatic and Geopolitical Dimensions. Governance Models and Ethical Considerations

The integration of AI in education has important geopolitical implications, shaping global standards and norms (Boucher, 2020). The EU's regulatory frameworks function as instruments of digital diplomacy, promoting a human-centric model of AI governance (Floridi et al., 2018). Romania and Finland contribute to these processes through diplomatic engagement and policy alignment (Kairamo et al., 2019; Nicu, 2021). The concept of an "AI Pact for a Sustainable Future" reflects the need for coordinated international action (OECD, 2021).

Effective governance of AI in education requires multi-level coordination and adherence to ethical principles (Floridi et al., 2018). Key concerns include data privacy, transparency, and algorithmic fairness (Zawacki-Richter et al., 2019). Finland's advanced governance frameworks provide a benchmark for best practices (Holmes & Tuomi, 2022), while Romania's reforms illustrate ongoing adaptation processes. These differences highlight the importance of contextualized policy approaches (OECD, 2021).

The integration of AI in European education systems represents a critical pathway for advancing sustainability objectives (Tuomi, 2018). The comparative analysis of Romania and Finland demonstrates the importance of coherent policy frameworks and international cooperation (Kairamo et al., 2019; Nicu, 2021). The EU Artificial Intelligence Act and the European Green Deal provide a strong foundation for aligning digital transformation with environmental goals (European Union, 2024). Future research should examine long-term impacts on equity, sustainability, and innovation (Selwyn, 2019).

Implementing the EU AI Pact in Education: A Comparative, Policy-Oriented, and Pedagogical Analysis of Romania and Finland

The integration of artificial intelligence (AI) into European education systems has become a central pillar of the European Union's digital and sustainability agenda. Framed by the EU Artificial Intelligence Act and the European Green Deal, the emerging concept of an "EU AI Pact" reflects a coordinated effort to embed ethical, transparent, and sustainable AI practices across member states. This study provides an extensive comparative analysis of Romania and Finland, focusing on practical examples of AI implementation in schools and universities. Through the examination of AI literacy, personalized learning, teacher training, ethical governance, and interdisciplinary projects, the paper highlights structural differences, policy convergences, and pedagogical innovations. Drawing on European policy literature and academic research, the study contributes to debates on digital transformation, educational equity, and sustainable development.

Artificial intelligence is reshaping education systems globally, offering new opportunities for personalization, efficiency, and innovation (Holmes, Bialik, & Fadel, 2019). Within Europe, AI integration is not only a technological process but also a political and ethical project, guided by regulatory frameworks such as the Artificial Intelligence Act and strategic

initiatives like the European Green Deal (European Commission, 2019; Tuomi, 2018). These frameworks emphasize sustainability, transparency, and human-centric AI (Floridi et al., 2018).

The concept of an EU AI Pact in education reflects a broader commitment to harmonizing national policies while respecting contextual diversity (Veale & Borgesius, 2021). This study explores how Romania and Finland implement these principles in practice. Finland is widely recognized for its advanced digital education ecosystem (Kairamo et al., 2019), while Romania is undergoing a process of digital transition and policy alignment (Nicu, 2021). AI in education can be understood through socio-technical and policy governance frameworks, where technological adoption is shaped by institutional capacity, cultural norms, and regulatory environments (Williamson, 2017). The EU's risk-based approach to AI governance places education among high-risk domains, requiring strict compliance with transparency, accountability, and data protection principles (Zawacki-Richter et al., 2019). Recent scholarship highlights the importance of integrating AI ethics and sustainability into educational practices (Holmes & Tuomi, 2022; Luckin, 2018). Furthermore, European policy studies emphasize the need for coordinated governance and teacher training (OECD, 2021).

AI Literacy Courses for Students in Romania and Finland

Romanian high schools are increasingly introducing "AI and Digital Ethics" modules within ICT curricula or as optional courses (Nicu, 2021). Students learn fundamental concepts such as algorithms, datasets, and risks associated with AI, including bias and misinformation (Luckin, 2018).

A practical activity involves students generating summaries of historical events using AI tools and verifying them against academic sources. This promotes critical thinking and aligns with EU transparency principles (Floridi et al., 2018). Students are also trained to cite AI-generated content properly, reflecting emerging academic integrity standards (Selwyn, 2019).

Finland has institutionalized AI literacy through national guidelines developed by the Finnish National Agency for Education (Kairamo et al., 2019). AI education is integrated across subjects, supported by teacher training and digital infrastructure (Holmes & Tuomi, 2022). Students engage in practical activities such as building simple machine learning models or analyzing datasets in Maths classes. These approaches emphasize experiential learning and interdisciplinary thinking (Holmes et al., 2019).

AI-Assisted Learning and Personalized Education

AI tools in Romanian classrooms support differentiated instruction by generating exercises, correcting grammar, and recommending reading materials (OECD, 2021). In English classes, AI generates prompts for essays or debates, which students must critically evaluate and edit. This model reinforces human oversight and encourages students to engage actively with AI outputs, rather than passively accepting them (Williamson, 2017).

Finnish schools utilize AI-supported learning environments that analyze student performance and suggest personalized exercises (Holmes & Tuomi, 2022). Teachers supervise these processes, ensuring ethical and pedagogical alignment. At the university level, AI tools facilitate multilingual learning by translating course materials into students' native languages, enhancing accessibility and inclusivity (Tuomi, 2018).

Teacher Training for Responsible AI

Teacher training in Romania is developing through Erasmus+ programs and national digital initiatives (Nicu, 2021). Teachers learn to use AI for lesson planning, detect AI-generated plagiarism, and teach ethical AI use. These initiatives reflect the growing recognition of teachers as key agents in AI integration (Selwyn, 2019).

Finland's teacher training programs include AI literacy workshops, mentoring systems, and pilot projects (Kairamo et al., 2019). Studies indicate that over 80% of teachers involved in such programs report increased confidence in teaching AI topics (Holmes & Tuomi, 2022). This systematic approach ensures consistency and scalability in AI integration (OECD, 2021).

Ethical Use of AI in Schools and Universities

Ethical Use of AI in Schools and UniversitiesCross-Curricular AI Projects

Romanian interdisciplinary projects combine subjects such as English, computer science, and civics. Students analyze AI's impact on democracy, media, and migration, producing reflective essays (Nicu, 2021). This approach promotes holistic understanding and critical thinking (Williamson, 2017).

Finland encourages interdisciplinary projects integrating science, ethics, and digital literacy (Holmes et al., 2019). Students simulate AI decision-making systems and debate fairness and bias. These projects reflect advanced pedagogical innovation and alignment with sustainability goals (OECD, 2021).

The comparison between Romania and Finland highlights significant differences in infrastructure, policy implementation, and pedagogical practices. Finland's success is attributed to strong governance, comprehensive teacher training, and integrated curricula (Kairamo et al., 2019). Romania, while progressing, faces structural challenges that require sustained investment and policy support (Nicu, 2021). Both countries demonstrate commitment to EU principles, particularly in promoting ethical AI and sustainability (European Commission, 2019).

The implementation of the EU AI Pact in education reflects a complex interplay between policy, technology, and pedagogy. Romania and Finland illustrate different stages of this process, offering valuable insights into the challenges and opportunities of AI integration. Future developments should focus on enhancing teacher training, ensuring equitable access,

and strengthening international cooperation. As Europe advances toward a sustainable digital future, education will remain a key driver of transformation.

The implementation of the European Union Artificial Intelligence Act and the emerging EU AI Pact within educational systems represents a paradigmatic shift in the governance of digital transformation, particularly in the intersection between sustainability, ethics, and pedagogy. As demonstrated throughout the comparative analysis of Finland and Romania, effective integration of AI in education is not merely a matter of technological adoption but a multidimensional process requiring systemic alignment across policy, institutional capacity, and socio-cultural practices (Holmes, Bialik, & Fadel, 2019; Floridi et al., 2018).

At its core, the operationalization of AI within European education necessitates five foundational pillars: AI literacy for students, teacher training, ethical guidelines, transparency and sustainability in AI use, and cross-disciplinary learning. These elements reflect both the normative framework of the EU AI Act and the preparatory objectives of the AI Pact, emphasizing a proactive rather than reactive approach to AI governance (Veale & Borgesius, 2021).

Finland exemplifies a systemic and anticipatory model, where AI integration is embedded within national curricula, teacher education, and sustainability strategies. The Finnish approach demonstrates how coordinated governance, long-term investment in digital infrastructure, and strong institutional trust can facilitate the development of a resilient and ethically grounded AI ecosystem in education (Kairamo et al., 2019; Sahlberg, 2015). In contrast, Romania illustrates a transitional and uneven trajectory, characterized by policy alignment with EU frameworks but constrained by structural challenges such as infrastructural disparities, limited teacher training, and persistent governance issues (Nicu, 2021; European Commission, 2022).

The Romanian context reveals critical tensions between regulatory ambition and practical implementation. While pilot projects, digital education reforms, and EU-funded initiatives indicate progress, systemic issues remain significant. Examples such as the use of video cameras in classrooms, automated exam scanning systems, and coded evaluation mechanisms illustrate attempts to modernize assessment and ensure compliance with transparency requirements. However, these measures coexist with structural inconsistencies, including the prohibition of mobile phones without corresponding digital alternatives, the existence of "green schools" lacking actual environmental infrastructure, and disparities in teacher competencies.

Moreover, deeply rooted challenges—such as aging teaching staff with limited digital literacy, the persistence of traditional pedagogical practices (e.g., dictation-based ICT lessons), and infrastructural deficiencies like wood-heated schools—highlight the complexity of implementing AI-driven reforms in contexts marked by socio-economic inequality (Popescu & Cernat, 2020; Vlăsceanu, 2018). Issues related to corruption and politicized appointments further complicate governance, undermining trust and slowing the adoption of innovative practices (Mungiu-Pippidi, 2015). These realities underscore that AI integration cannot be isolated from broader institutional reforms and governance quality.

In contrast, Finland's educational culture demonstrates how trust-based governance and pedagogical innovation can support the ethical and effective use of AI. The Finnish model

integrates AI literacy not only as a technical skill but as a component of civic education, fostering critical thinking, creativity, and ethical awareness (Vartiainen et al., 2022). Workshops conducted in Finnish schools have shown that students can develop sophisticated understandings of AI, including its societal implications, by engaging in activities such as identifying algorithmic bias in generative AI outputs and reflecting on ethical dilemmas. This aligns with broader European goals of cultivating responsible digital citizens (Holmes & Tuomi, 2022).

The Role of the EU AI Pact in Educational Transformation

The EU AI Pact represents a voluntary yet strategically significant instrument designed to prepare institutions for the full implementation of the AI Act by August 2026. It functions as a transitional governance mechanism, encouraging universities, schools, and other organizations to adopt best practices in AI management before legal obligations become binding (European Commission, 2024).

The Pact is structured around two main pillars. Pillar I, the AI Literacy Repository, provides a dynamic collection of practices aimed at supporting organizations in meeting AI literacy requirements. This repository reflects a shift toward knowledge-sharing and collaborative governance, enabling institutions to learn from each other and adapt to rapidly evolving technological landscapes (Tuomi, 2018). Pillar II, based on voluntary pledges, encourages organizations to commit to concrete actions such as adopting AI governance strategies, mapping high-risk systems, and promoting AI literacy among staff and students (Veale & Borgesius, 2021).

Within universities, the AI Pact plays a crucial role in addressing the complexities of AI integration across multiple domains, including administration, teaching, research, and student engagement. AI systems used in admissions, grading, and behavioral monitoring are classified as high-risk, requiring strict compliance with transparency, accountability, and human oversight requirements (Zawacki-Richter et al., 2019). The Pact thus serves as a preparatory framework, enabling institutions to identify potential risks and implement mitigation strategies in advance. From a comparative perspective, Finland has been more proactive in engaging with such initiatives, leveraging its existing digital infrastructure and policy coherence to align with AI Pact objectives (Sahlberg, 2015). Romanian institutions, while increasingly participating in EU programs, face challenges in translating voluntary commitments into sustained institutional practices (Nicu, 2021). This divergence highlights the importance of institutional capacity and governance quality in determining the effectiveness of voluntary policy instruments.

Education, Culture, and Sustainability: The Finnish Paradigm

Education and culture play a central role in Finland's implementation of the European Green Deal, shaping both individual behaviors and collective societal values. The Finnish

educational system integrates sustainability and digitalization as complementary objectives, recognizing that technological innovation must be aligned with environmental and ethical considerations (Kairamo et al., 2019).

Empirical research conducted in Finnish schools demonstrates that AI education can significantly enhance students' conceptual understanding, critical thinking, and creativity. As noted by Vartiainen et al. (2022), workshops involving generative AI tools enabled students to explore algorithmic bias, engage in ethical discussions, and develop reflective thinking skills. These findings underscore the potential of AI as a pedagogical tool for fostering not only technical competencies but also critical digital literacy. Furthermore, Finland's national strategy emphasizes the importance of positioning the country as a global leader in AI utilization. The 2017 guidebook published by the Finnish Ministry of Economic Affairs and Employment outlines key actions for achieving this goal, including investment in education, research, and innovation ecosystems (Auramo et al., 2017). This strategic vision is closely aligned with the objectives of the European Green Deal, highlighting the interdependence of digital and environmental policies.

The Finnish model also illustrates the importance of cultural factors in shaping the success of AI integration. High levels of trust in public institutions, strong teacher autonomy, and a culture of continuous learning create favorable conditions for experimentation and innovation (Sahlberg, 2015). These factors are less pronounced in Romania, where historical legacies and institutional challenges continue to influence educational practices (Vlăsceanu, 2018).

Broader Implications and Future Directions

The comparative analysis of Finland and Romania reveals that the successful implementation of the EU AI Pact in education depends on a combination of policy coherence, institutional capacity, and cultural readiness. While EU frameworks provide a common foundation, national contexts play a crucial role in shaping outcomes (Boucher, 2020).

Several key implications emerge from this study:

1. AI literacy must be institutionalized as a core component of education, extending beyond technical skills to include ethical and societal dimensions (Luckin, 2018).
2. Teacher training is critical, as educators serve as mediators between policy and practice (Holmes et al., 2019).
3. Ethical governance frameworks must be operationalized at the institutional level, ensuring transparency, accountability, and inclusivity (Floridi et al., 2018).
4. Infrastructure and resource disparities must be addressed to ensure equitable access to AI-enhanced education (Williamson, 2017).
5. International cooperation and knowledge-sharing are essential for fostering innovation and addressing common challenges (OECD, 2021).

Looking forward, the full implementation of the EU AI Act will likely intensify the need for compliance, particularly in high-risk areas such as educational assessment and student monitoring. The AI Pact provides a valuable opportunity for institutions to prepare for these requirements, but its effectiveness will depend on sustained commitment and capacity-building efforts.

Conclusions

Romania: Slow Digitalization and Its Effects on Romanian Students Limited Digital Skills Despite High Technology Use

The Romanian educational system illustrates a paradox frequently discussed in contemporary digital education literature: high access to digital devices coexisting with low levels of digital competence (OECD, 2021; Redecker, 2017). According to data from the Organisation for Economic Co-operation and Development, only approximately 28% of individuals aged 16–74 in Romania possess at least basic digital skills, placing the country at the lowest level within the European Union. This discrepancy highlights a structural divide between digital access and digital literacy, a phenomenon also identified in comparative European studies on educational technology (Ferrari, 2013; Vuorikari et al., 2022).

From the perspective of AI integration and the EU AI Pact, this gap presents a significant barrier. AI literacy—defined not only as the ability to use AI tools but also to critically understand their functioning, risks, and ethical implications—requires foundational digital competencies (Long & Magerko, 2020). Without such competencies, the implementation of AI-based educational reforms risks reinforcing inequalities rather than mitigating them (Williamson & Eynon, 2020). Romanian students' predominant use of smartphones and social media platforms for entertainment rather than educational purposes further exacerbates this issue. While access to devices is widespread, engagement with advanced digital tools—such as data analysis platforms, programming environments, or AI-assisted learning systems—remains limited (Popescu & Cernat, 2020). This pattern aligns with broader findings in Eastern European education systems, where digital consumption often outweighs digital production (Castaño-Muñoz et al., 2018).

Weak Participation in Extracurricular Educational Activities

Extracurricular education plays a critical role in developing higher-order cognitive skills, creativity, and digital literacy (Biesta, 2015). However, in Romania, participation in such activities remains limited and inconsistent. Empirical evidence suggests that only around 30% of students engage weekly in arts-related activities and approximately 29% in programming or STEM-related extracurriculars. These figures indicate a systemic underutilization of informal learning environments, which are essential for fostering innovation and interdisciplinary thinking (European Commission, 2022).

Moreover, extracurricular activities are often concentrated in short-term events, such as thematic school weeks, rather than being embedded into the continuous learning process. This episodic approach contrasts sharply with the Finnish model, where extracurricular and project-based learning are integral components of the curriculum (Sahlberg, 2015).

From the perspective of AI educational pacts, this limitation restricts opportunities for students to engage with AI in creative and exploratory ways. Research on AI education emphasizes the importance of hands-on, project-based learning in developing meaningful

understanding of AI systems (Holmes et al., 2019; Luckin, 2018). Without sustained exposure to such experiences, students may lack the skills necessary to navigate AI-driven environments effectively.

Excessive Social Media Consumption Without Critical Literacy

A growing body of research highlights the risks associated with excessive social media consumption among youth, particularly in contexts where media literacy is underdeveloped (Livingstone & Third, 2017). In Romania, students frequently access online platforms multiple times per day; however, their engagement is غالبly passive, involving content consumption rather than creation or critical analysis.

Studies indicate that many Romanian students struggle to identify misinformation, evaluate sources, or recognize algorithmic manipulation (McDougall et al., 2018). This vulnerability is particularly concerning in the context of AI, where algorithms increasingly shape the information environment. The inability to critically assess AI-generated or algorithmically curated content undermines both educational outcomes and democratic participation (Floridi et al., 2018).

The EU AI Pact emphasizes the importance of AI literacy and critical digital skills as prerequisites for responsible AI use. However, the Romanian case demonstrates that achieving these objectives requires addressing foundational gaps in media literacy and critical thinking (Vuorikari et al., 2022).

Impact on Literacy and Critical Thinking

The combined effects of low digital literacy, limited extracurricular engagement, and passive media consumption contribute to broader educational challenges, including functional illiteracy and weak analytical skills (Popescu & Cernat, 2020). These issues are particularly problematic in the context of AI integration, which demands higher levels of cognitive engagement and critical evaluation.

When digital technology is primarily used for entertainment, it can reinforce patterns of distraction and superficial engagement (Carr, 2020). Students may struggle to interpret complex texts, evaluate online information, and distinguish between reliable and unreliable sources. This dynamic not only affects academic performance but also exacerbates social inequalities, as students with stronger educational support systems are better equipped to navigate digital environments (Williamson & Eynon, 2020).

Comparative Reflections: Romania and Finland in the Context of AI Educational Pacts

The challenges observed in Romania stand in contrast to the Finnish approach, where digital literacy, critical thinking, and interdisciplinary learning are systematically integrated into the education system (Sahlberg, 2015). Finland's implementation of AI education aligns closely with the principles of the EU AI Pact, emphasizing early exposure, teacher training,

and ethical awareness (Holmes & Tuomi, 2022). Researches conducted in Finland demonstrates that structured AI education programs can significantly enhance students' understanding of both technical and ethical dimensions of AI (Vartiainen et al., 2022). These findings suggest that the successful implementation of AI educational policies depends not only on access to technology but also on the quality of pedagogical practices and institutional support (Kairamo et al., 2019).

Implications for the EU AI Pact and Future Policy Development

The Romanian case underscores the importance of adopting a holistic approach to AI integration, one that addresses not only technological infrastructure but also educational culture, teacher training, and governance frameworks. The EU AI Pact provides a valuable framework for guiding this process, but its effectiveness depends on the capacity of member states to implement its principles in practice (Veale & Borgesius, 2021).

Key policy implications include:

- The imperative to strengthen digital and AI literacy at all educational levels (Long & Magerko, 2020).
- The importance of embedding extracurricular and project-based learning into formal curricula (Biesta, 2015).
- The necessity to enhance media literacy and critical thinking skills to combat misinformation (McDougall et al., 2018).
- The requirement for systemic teacher training programs that bolster responsible AI usage (Holmes et al., 2019).

Ultimately, the comparison between Romania and Finland illustrates that the implementation of AI in education is not merely a technical challenge but a deeply social and institutional one. Addressing these complexities requires sustained investment, policy coherence, and international cooperation.

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PERCEPTIONS ON INSTRUMENTS FOR ENGAGEMENT IN EUROPEAN DEMOCRATIC LIFE. A STUDY OF YOUNG RESEARCHERS IN ROMANIA: A THEORETICAL PARADIGM

Mirela-Emilia MIRONIUC [1]

Abstract: *The research problem in the field of international relations is represented by the low involvement of young people, a significant category of society, in European democratic life, in issues related to the implementation and compliance with the Green Deal, among others, which exacerbates the democratic deficit. This paper aims to analyze the perceptions of young people in Romania regarding the instruments of participation in European democratic life. The research question we will try to answer is the following: „How do we streamline the process of using the instruments so that there is greater involvement in European democratic life?". The aim of the paper is to bring a range of theoretical contributions, a contribution to the specialized literature and the academic environment regarding the assessment of the level of awareness and knowledge of young people about European democratic instruments. The research method used in the data collection process will be mixed method, this means the use of both quantitative and qualitative analyses. First, we will select the Eurobarometers from the period 2020-2024 and we will look at the way in which they target the instruments of involvement in democratic political life and what is the level of knowledge and existence of a security culture. Secondly, we will conduct 50 semi-structured interviews to find out the motivations behind the answers provided and to identify the factors that influence the perceptions of the young people. Regarding the data analysis method, we will use multiple regression to analyze the eubarometers and deductive thematic analysis to analyze the semi-structured interviews. At the end of the paper, we find that improving the efficiency of the use of democratic participation tools among young people to reduce the democratic deficit can be achieved through a series of strategies and measures* [2].

Keywords: *European citizenship, participation in democratic life/participatory democracy, Europeanization, democratic deficit and intentional political socialization.*

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[2] Abstract found in Polis Magazine, Political Science Journal, Iași, Volume XIV, No. 2 (52), New Series, March-May 2026, currently under publication, addressing another dimension of the topic studied.

Introduction

The European Union represents a main pillar internationally through the principles of peace, respect for citizens' rights and freedoms, promotion of the rule of law and democracy (Jamieson, 2002, pp. 44-45). The notion of „being European" is mainly understood in an abstract sense rather than as a „strong sense of identity and shared belonging" (Jamieson, 2002, pp. 44-45). For this reason, it is desired to draw guidelines between being European and feeling European, knowing one's rights and activating one's European citizenship. In a representative democracy, the form of government derives its power from the participation of citizens in the political decision-making process (Goetz and Meyer-Sahling, 2013, pp. 133-134). Democratic renewal is a key pillar in the constantly changing international agenda. Dynamism and innovation are just some of the mechanisms through which citizens bring new ideas and innovative approaches that can reinvigorate democratic processes.

From the general spectrum of the term citizens, we identify a category that often identifies itself as open to change and more receptive to new technologies, which can modernize and make democratic systems more efficient. Young people represent the future generations and it is essential that the concerns, needs and voice of their generation, but also of future ones, are integrated into current policies. The involvement of young people ensures a greater diversity of opinions and perspectives in public debates and the decision-making process. In addition, active participation in democratic life helps them to better understand political processes and become informed and responsible citizens.

This research study is still ongoing, being part of the doctoral thesis, which is why the „Analysis" and „Conclusions" chapters will be more from a purely theoretical side, reviewing only the specialty literature, without the practical component, ie the interviews.

1. Theoretical Chapter

1.1. Theoretical Framework

Part of the research preparation process is to go through the narrative filters of the research topic, in a way that highlights how the topic has been thought and written by others and how this knowledge can be used to develop and expand one's own research ideas (Matthews and Ross, 2010, p. 93). The specialized literature that we consulted and on the basis of which we created the research study is extensive, it includes numerous lines of analysis, relevant data and information, aspects of notoriety. The goal is to more easily understand a series of ideas, norms, paradigms established at the international level, but also applicable at the level of the Romanian state, based on the subject of analysis.

However, continuing on the same note that we mentioned at the beginning of the paper, our goal is not to exhaustively approach this subject, so we will only relate to the international environment in conceptual terms and related definitions, because later we will focus our attention on the Romanian space where we will find specific elements and nuanced literature on the issues in question. The contextualization of the research subject represents an

imperative framework to approach, because it highlights the circumstances in which it takes place, the factors that influence it and the capacities it has in its truthful metamorphosis. Thus, in this case, first we need to reflect on the positioning of young people in Romania.

In what follows, we will attempt to present a brief review of the existing literature on the topic of youth participation in European democratic life and highlight the gaps in knowledge, especially those related to Romania. Participation in civic and political initiatives develops important skills, such as leadership, negotiation and communication (Ágh, 1995, pp. 75-94). Involving young people in the democratic process can increase their trust in political institutions and contribute to their legitimacy. Promoting youth involvement helps to strengthen a more cohesive and inclusive society, where all citizens feel represented and valued (Honneth, 2014, pp. 4-50). By actively participating in European democratic life, they can contribute to strengthening the European project and promoting common European values. Young people can bring Romania's specific problems to the attention of European institutions, thus ensuring that their country's interests are taken into account in decisions at the European Union level.

The involvement of young people in Romania in European democratic life is vital for the health and evolution of democracy, both at national and European level (Sloam, 2013, pp. 100-105). It is a process that brings benefits not only to young people, but to the whole society, contributing to the development of a robust, inclusive and adaptable democracy to future challenges (Yoldaş, 2015, pp. 40-5).

European Governance

Five principles underpin good governance and the changes proposed in the White Paper: openness, participation, accountability, effectiveness and coherence (White Paper, 2017). Each principle is important for establishing more democratic governance. They underpin democracy and the rule of law in the Member States, but they apply to all levels of governance - global, European, national, regional and local (Cullen, 2015, pp. 204-24) . The openness of states to innovation, free markets and benefits from international organizations bring with them the involvement of sub-national structures, private groups or civil society, so that they are no longer limited by national or local borders. The vertical and horizontal integration of governance systems is highlighted as key points in policy management (Kohler-Koch, 1999, pp 12-13).

Regarding a first type of governance, defined by Hooghe and Marks, national states retain the central role in defining the interests and goals they present. This happens, even though local governments and non-state actors are seen as having different degrees of action and capacity to influence policymaking (Hooghe, Gary Marks, 2001, pp. 102-103). The concept of „governance" refers to the ways and means by which the divergent preferences of citizens are translated into effective political choices, about how the plurality of societal interests are transformed into unitary actions and the conformity of social actors is achieved. Participation should enhance both the efficiency and legitimacy of European governance. Involvement at subnational, national and supranational levels, the presence of civil society, interference with the business/private sector, the reduction of the legitimacy of the state in any kind of action,

the isolation of the statist state and the primacy of bottom-up policies are just some of the prominent themes. In this context, NGOs can be seen as part of „civil society", they have been identified as a means of enabling individuals to become active in the political life of Brussels.

Multilevel Governance

The idea of „multi-level governance" has long been characterized by a predominant focus on the „multi-level" aspect in terms of vertical relations between territorial levels of government, rather than on the horizontal component of „governance" in terms of relations between public and private actors (Tortola, 2017, pp. 234-250). The role of civil society actors and public-private relations has now found a central place in the concept of governance as used in EU studies. Reiner Eising and Beate Kohler-Koch, for example, define governance as embracing all different modes of governance models, in terms of „network governance", where the „state" is vertically and horizontally segmented" and where governance „involves bringing together relevant state and societal actors and constructing problem-specific constituencies" (Kohler-Koch, and Rainer Eising, 1999, pp. 17-18).

More recently, Christiansen et al. have defined governance as „the production of authoritative decisions that are not produced by a single hierarchical structure, such as a democratically elected legislature and government, but instead arise from the interaction of a multitude of public and private actors, collective and individual" (Hooghe and Marks, 2001, pp. 193-194). Multilevel governance is the dispersion of authority to jurisdictions within and beyond nation states. Multilevel governance has become the new normal (Hooghe and Marks, 2001, pp. 193-194). In these circumstances, it can be observed that authority has shifted to both subnational jurisdictions and international institutions. This can be interpreted as a functionalist logic that conceives of governance as an instrument for the efficient delivery of goods that individuals cannot provide for themselves. The other logic, no less powerful, is the demand for self-governance by those living in distinct communities (DeBardeleben and Achim Hurrelmann, 2007).

The author highlights the vertical and horizontal integration of governance systems as key points in policy management. Regarding a first type of governance, defined by Hooghe and Marks (2001), it is surprising that national states retain the central role in defining the interests and goals they present. This happens even if local governments and non-state actors are seen as having different degrees of action and capacity to influence policy development. Another type of governance highlights governing authorities at different scales, polycentric and not monocentric as presented in the previous case. If we were to report to Romania, at the moment, it can be stated that it does not have multilevel governance.

Democratic Deficit

The concept of „democratic deficit" commonly refers to situations in which national or international institutions, as well as some of the processes they manifest, do not meet the principles of democracy (Lax and Philips, 2012, pp. 148-166). Institutional deficiencies can be permanent or crisis-ridden at the level of certain entities. This can occur in international organizations such as the European Union where decision-making processes may be

perceived as being removed from the control or input of the average citizen or at the level of the nation state. Whether referring to the national or local level, a democratic deficit can manifest itself as insufficient public participation in political processes, ineffective checks and balances, or a lack of responsiveness to the needs of the population.

At the same time, the lack of civic engagement, the non-activation of European citizenship, high levels of political apathy, low voter turnout and the disconnect between elected officials and voters can also contribute to a democratic deficit. Several changes introduced by the Treaty of Lisbon, which has applied since 1 December 2009, have served to address concerns about the democratic deficit in the EU (Jensen, 2009, pp. 45-46). The Treaty strengthened the Parliament's powers in three areas: financial, legislative and appointment. „Although elected by universal suffrage, MEPs are not sovereign" (Jensen, 2009, pp. 45-46). They often have to leave the final word to national governments. While everyone wants a more democratic EU, its representative body remains a weak link.

Green Deal

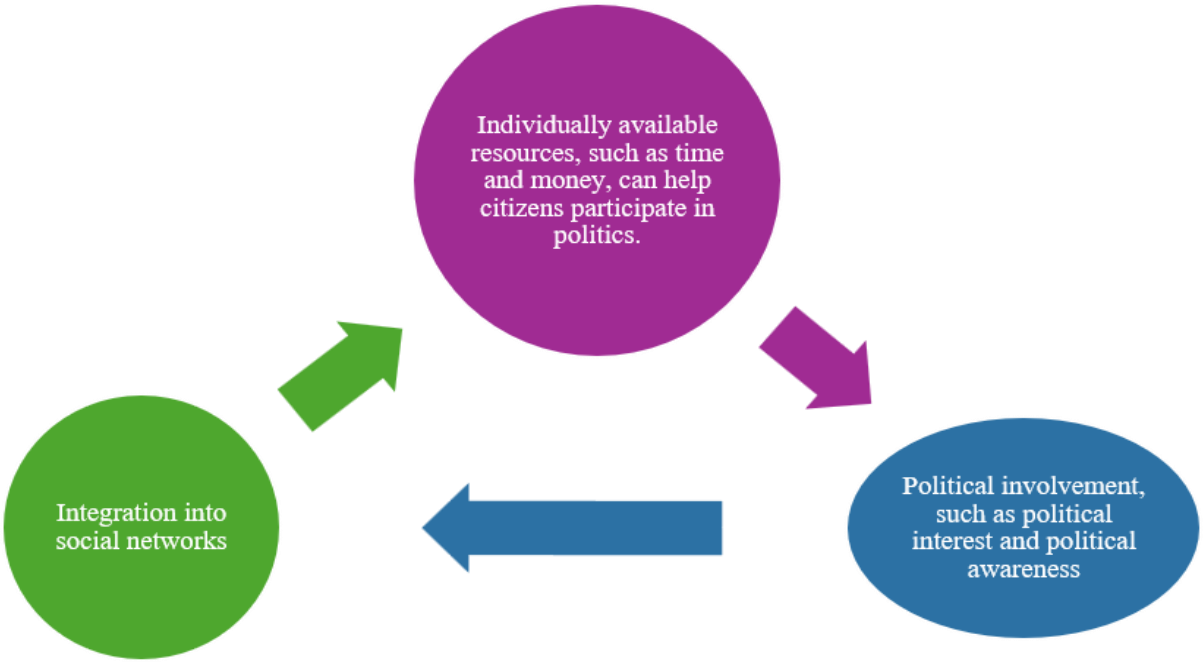
The European Green Deal is a broad strategy initiated by the European Union, which aims to transform the economy into a sustainable one and achieve climate neutrality by 2050, by reducing greenhouse gas emissions, promoting renewable energy and using resources efficiently (European Parliament, 2020; European Environment Agency, 2021). The central concept of this initiative is sustainable development, which involves balancing economic growth with environmental protection and social well-being. Among the main directions are the circular economy, decarbonization of the energy sector, green mobility and the protection of biodiversity, as well as supporting the transition to a more resilient and competitive economic system. The Green Deal also emphasizes technological innovation and a just transition, aimed at reducing the socio-economic impact on regions dependent on polluting industries. In this sense, the initiative represents not only an environmental policy, but a new model of economic and social development for Europe (European Commission, 2019), Council of the European Union, 2020; IEA, 2021; UNEP, 2020).

Perception

„Perception can be defined as our recognition and interpretation of sensory information" (Efron, 1969, pp. 137-173) . Perception is the psychological process by which an individual receives, interprets, and organizes sensory information in order to understand the environment. It involves transforming sensory stimuli, such as sounds, light, and smells, into meaningful and coherent experiences. This process is essential for interacting with the world around us and making decisions based on the information received. Psychologically speaking, humans go through a series of stages when they come into contact with things, events, and people (Efron, 1969, pp. 137-173). In terms accessible to all and without leading the discussion into a psychological context that is difficult to penetrate, according to the psychological cycle, first of all, man comes into contact with the outside through sensation, this being the process by which the first stimuli are sent to the individual, stimuli that inform him for a few seconds about the data he has in front of him. Going through this process, we move towards what

perception means, that is, the way in which we interpret the information we receive, synthesize and systematize it, understand it and begin to form opinions about the event itself (Efron, 1969, pp. 137-173). Finally, representation refers to the process by which applicability is included in the empirical scheme, and the individual passes the information through the filter of his own mind and puts into practice what he understands.

1.2. Analytical Framework



Individually available resources, such as time and money, can help citizens participate in politics. Political involvement, such as political interest and political awareness, can be classified as a second explanatory factor. Integration in social networks is the third explanatory factor. This determines whether citizens are confronted with details about participation opportunities (Perlot, Zandonella, 2009, p. 427). All of these are influenced by the age, gender, sex, education, occupation and social experiences of young people.

2. Methodological Chapter

2.1. Case Selection

Romania can be classified, according to the specialized literature and methodological patterns, as a deviant case, being a young democracy, accession to the EU having taken place recently, more precisely on January 1, 2007 (Constantin, Solomon, and Cristinel Gheorghe-Aurelian, 2016). Accession to the European Union represents only one pillar and a true argument for Romania's positioning as a young democracy. To these can be added a series of internal problems, institutional inefficiencies, the cumbersome construction of a vibrant civil society. Democracy in Romania has undergone a wide range of metamorphoses, presented

gaps and has been subject to internal and external risks, threats and vulnerabilities due to institutional inefficiencies, but also to the lack of civic involvement [3].

2.2 Data Collection Method

The data collection method itself exemplifies the mechanism by which we reach the information we need to conduct research (Silverman, 2004, pp. 40-41). An important point that we need to reach from the beginning of the work is the choice of a method by which we reach the possession of the notions we need (Järvinen, 2020, pp. 123-124). Whether we are talking about specialized works that we find at the level of books, articles, collective volumes, or whether we refer to official websites of institutions that present information of public interest, speeches of certain personalities, images, ethnographies, netnographies or interviews and questionnaires, each reprints an efficient working method with the help of which we reach the stage of knowledge on different issues and specific contexts Camic and others, 2003, pp. 200-210) . In the research we are conducting, a more comprehensive approach is considered appropriate. More than the complex nature, it is necessary to collect and subsequently analyze data from a looser perspective, which will give us the opportunity to study in depth the perceptions of young people in Romania.

The research method used in the data collection process will be mixed method, meaning the use of both quantitative and qualitative analyses. First, we will select the Eurobarometers from the period 2020-2024 and look at how they target the instruments of engagement in democratic political life. Second, we will conduct 50 semi-structured interviews (the number may vary) to find out the motivations behind the answers provided and to identify the factors that influence the perceptions of young people. The sample includes young people aged between 18 and 35 in Romania. This will be a representative one, with the aim of including various social and educational backgrounds.

2.3. Data Analysis Method

The data analysis method is a mixed one, being both qualitative and quantitative. We will use multiple regression to analyze the euobarometers and deductive thematic analysis to analyze the semi-structured interviews.

Conclusions

The European Union promotes fundamental values such as democracy, the rule of law and citizens' rights, but many citizens, especially young people, perceive European identity in an abstract and distant way. The active participation of young people is considered essential for the consolidation of European democracy, as they bring new perspectives, are more open to change and can contribute to the modernisation of democratic processes. The following

[3] Paragraph found in Polis Magazine, Political Science Journal, Iași, Volume XIV, No. 2 (52), New Series, March-May 2026, currently under publication, addressing another dimension of the topic studied.

results of the analyses carried out through interviews and Eurobarometers will try to explain this phenomenon.

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Appendix 1

Interview Grid

1. What do you understand by European democratic life?
2. What tools/ways of involvement in European democratic life do you know?
3. Which of these tools have you used?
4. Have you ever voted in the European Parliament elections? If so, how many times?
5. Why did you choose to participate in the elections?
6. How much did your choice matter?
7. Have you participated in social movements (protests, demonstrations)? If so, what was their theme and purpose?
8. How could this tool become more usable and effective?
9. What is your opinion on non-governmental organizations with the theme of „European democratic life"?
10. Have you ever been part of such organizations? If so, what were the motivations?
11. What are the strengths/weaknesses of these tools?
12. How much time do you devote to assimilating political knowledge? What about practicing/activating it?
13. Is this expensive? If so, how much money do you need?
14. What are the factors that influenced/created your behavior as a European citizen?
15. Do you debate topics about European democratic life? If so, with whom?
16. Where do you get information about the work of the European institutions and the tools that you, as European citizens, have at your disposal?
17. What recommendations would you have for a more effective use of these aforementioned tools?

Appendix 2

Table containing the list of people interviewed

Number	Age	Sex	Profession	Residential area	Environment of origin
R1.	25	Female	Student	Cluj-Napoca	Bucharest – urban area
R2.	23	Female	Student	Cluj-Napoca	Râmnicu-Vâlcea – rural area
R3.	21	Female	Student	Cluj-Napoca	Bacau – rural area
R4.	20	Female	Student	Piatra Neamt	Neamț- rural area
R5.	30	Male	Student	Bacau	Iași-urban area
R6.	25	Male	Economist	BISTRIȚA	Bistrita - urban area
R7.	21	Female	Srudent	Suceava	Ash – rural area
R8.	24	Female	Student	bucuresti	Neamț – rural area
R9.	30	Male	University Assistant	Cluj-Napoca	Câmpulun-Moldovenesc - rural area
R10.	35	Female	Human Resources Inspector	Turda	Turzii Plain – rural area
R11.	31	Male	Student	Cluj-Napoca	Neamț- urban area
R12.	29	Female	Professor	Oradea	Oradea – urban area
R13.	25	Female	Pensioner	Cluj-Napoca	Dej – rural area
R14.	23	Female	Psychologist	BISTRIȚA	Bistrita – rural area
R15.	19	Female	Student	Piatra Neamt	Neamț- urban area
R16.	33	Female	Student	Suceava	Gura-Humorului – urban area
R17.	22	Female	Student	Cluj-Napoca	Gherla – urban area
R18.	26	Female	Student	Iasi	Iasi – rural area
R19.	30	Female	Politician	Cluj-Napoca	Turda – urban area
R20.	29	Male	Border police officer	Timisoara	Suceava – urban area

*The table will be completed with the data of 30 more respondents and will be attached. This table and the interview grid are also found in Polis Magazine, Political Science Journal, Iași, Volume XIV, No. 2 (52), New Series, March-May 2026, currently under publication, addressing another dimension of the topic studied.

FROM GREEN TRANSITION TO SECURITY ARCHITECTURE: EU GREEN DIPLOMACY AND THE DETERRENCE OF EMERGING TERRORIST THREATS

Ioan Adrian MOCAN[1]

Abstract: *This article examines green diplomacy as a key component of the geopolitics of sustainability and analyzes how the European Union's policies project global influence, strengthen common security, and interact with emerging security threats, including terrorism. In the context of the European Green Deal, the EU Strategy on Adaptation to Climate Change (2021), and the EU Global Strategy (2016), the Union employs the green transition as a tool of soft power, promoting ambitious climate standards and fostering stability in vulnerable regions such as the Sahel, the Middle East, and the Eastern Neighborhood. Green diplomacy also contributes to mitigating radicalization risks linked to climate degradation, energy poverty, and socio economic instability—issues highlighted in various Europol reports and in the EU Security Union Strategy (2020–2025), which underscores the connection between climate stress and the emergence of environments conducive to violent extremism. The analysis shows that instruments such as the Carbon Border Adjustment Mechanism (CBAM), Global Gateway, and Just Transition programs help reduce energy vulnerabilities and limit the indirect financing of terrorist actors by decreasing dependence on unstable regions and strengthening green critical infrastructure. Moreover, EU strategies on cyber and energy security—including the EU Critical Entities Resilience Directive (2022)—emphasize the need to protect new renewable infrastructures from terrorist and hybrid attacks. The article also explores Romania's strategic repositioning within this framework, highlighting its role in regional energy security, investments in nuclear and renewable energy, and potential contributions to Black Sea stability through alignment with EU decarbonization and extended security objectives. The conclusions emphasize that green diplomacy is becoming a pillar of the EU's common security architecture and a vector for deterring terrorism, enhancing the Union's capacity to act as a global normative power in a world shaped by climate change, geopolitical competition, and transnational risks.*

Keywords: *green diplomacy, European Union security, climate change and terrorism, soft power, energy resilience.*

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Introduction

The green transition is reshaping the European Union's security paradigm and has a geopolitical dimension in which sustainability and resilience become vectors of influence, stability, and cooperation. In a world characterized by multipolarity, with rivalries among major powers and the global climate crisis, the EU uses green diplomacy as a soft power, as a tool to respond to the challenges generated by complex and interconnected threats, from energy vulnerability and insecurity to violent radicalization (Bradford, 2020; Manners, 2002) and even manifestations of terrorism. This article analyzes European climate policy, security mechanisms, and terrorism prevention to make an assessment of the strategic impact for Romania.

1. Climate Change – An Amplifying Factor of Radicalization

The conceptualization of green diplomacy and the geopolitics of sustainability represents an essential endeavor for understanding how climate, energy, and environmental policies influence the architecture of international relations. The evolution of these concepts reflects both the maturation of global approaches to climate change and the profound transformations of the world order, in which sustainability becomes a generator of new forms of power, cooperation, and conflict.

Green diplomacy emerged as an extension of environmental diplomacy in the 1970s–1980s, when the first international conferences – Stockholm (1972), Rio (1992) – introduced the idea of collective responsibility for protecting the environment into the global discourse. Subsequently, with the acceleration of climate change and the recognition of its impact on economies and security, environmental diplomacy transformed into a strategic geopolitical tool. The emergence of international agreements such as the Kyoto Protocol (1997) and the Paris Agreement (2015) has prompted states to redefine their global positioning in terms of climate commitments, green technologies, and development models. In this context, green diplomacy no longer represents just the negotiation of environmental objectives, but a set of strategies that include: the promotion of renewable energy, climate-conditioned trade agreements, global ecological standards, technological and financial cooperation for the green transition, and instruments of normative and economic power.

Thus, green diplomacy becomes a defining element of the soft power of global actors, especially that of the European Union. The consequences of climate change turn into threat multipliers that exacerbate pre-existing fears and tensions in fragile areas. The link between environmental degradation and security has become evident in the last two decades. As the destruction of the environment and essential resources—fresh water, arable land, pastoral pastures—becomes more difficult, competition for such resources increases, and weak governments find it increasingly hard to maintain social cohesion and political legitimacy.

According to the IPCC (2023) and UNDP (2017), the depletion of natural resources, migration, and food insecurity create a favorable environment for the exploitation of societies by terrorist entities, especially in the Sahel region, the Horn of Africa, and the Middle East.

These are areas of both poor governance and increased climate volatility, where both the climate threat and the lack of good governance encourage recruitment with promises of financial protection and personal identity security. Migration movements caused by climate disasters in these regions have also impacted European security in recent years. Extreme climatic phenomena—drought and desertification in the Sahel, floods in Pakistan, cyclones in Mozambique—have led to mass displacements towards North African countries and then further towards southern Europe (International Organization for Migration, 2025).

Such forced displacements, poorly managed by local authorities, become susceptible to being exploited by trafficking networks or radical groups that expand their influence along transit corridors toward the European Union. The takeover of migration routes toward North Africa by terrorist entities illustrates, as Loretta Napoleoni emphasizes in ISIS: The Traders of People (2016), the transformation of unregulated migration into a complex self-financing mechanism, in which jihadist groups operate in symbiosis with organized crime networks, extorting resources from migrants, controlling the logistics of human flows, and monetizing regional insecurity through taxes, ransoms, and illicit trafficking. Assessing these developments and trends, the EUROPOL and FRONTEX agencies warn that migratory pressure related to online extremist propaganda can contribute to political polarization and radical discourse in Europe. Thus, climate-induced migration should not be seen only as a humanitarian phenomenon, but also as a serious security problem that will require policies for integration, sustainable development, and proactive cross-border information exchange.

According to available official data, migration in Europe between 2015 and 2025 experienced major fluctuations, marked by humanitarian crises, the pandemic, and the war in Ukraine. Between 2015 and 2025, migration to Europe underwent a complex evolution, characterized by periods of crisis, institutional adaptation, and the redefinition of common policies. The peak of the migration crisis was recorded in 2015–2016, when conflicts in Syria and Iraq generated the largest influx of refugees in recent decades, prompting the European Union to adopt emergency measures and strengthen external cooperation on asylum. Subsequently, flows gradually stabilized, yet net migration remained positive, with an estimated annual contribution of between 1.5 and 3 million people to the Union's population growth. Over time, there has been a diversification of the origin of migrants: if until 2020 those from the Middle East and North Africa predominated, after this period, flows from Ukraine, Afghanistan, Venezuela, Syria, and Turkey became significant. Starting in 2022, an increase in labor migration has been noted, especially from the Western Balkans and North Africa, driven by post-pandemic economic recovery and the demand for labor in Western European countries.

In political terms, the European Union reacted by adopting, in 2024, the European Pact on Migration and Asylum, which establishes new mechanisms for solidarity-based distribution, harmonized rules for processing applications, and enhanced border control, marking a stage of maturation in European governance in the field of migration. The European Union uses green diplomacy as a pillar of its foreign and security policy. Documents such as the European Green Deal (2019), EU Global Strategy (2016), EU Climate Adaptation Strategy (2021), EU Security Union Strategy (2020–2025), and the EU Strategy on Renewable Energy

(2020) explicitly integrate the climate dimension into the Union's geopolitical objectives. As a consequence, green diplomacy is connected to the EU's foreign policy through: international climate negotiations (COP), conditioning trade agreements on compliance with climate standards, financial support for third countries through Global Gateway, global standardization of environmental policies, sanctions or diplomatic pressure against actors who undermine climate objectives, strengthening energy resilience and European security. Consequently, climate adaptation solutions — sustainable water management, reforestation, boosting agricultural resilience, and building community cohesion — become indirect, but crucial, means to prevent violent extremism. They reduce the social and economic vulnerability base for radicalization and restore state control over areas where climate and social insecurity intersect.

2. Decarbonization and Strategic Autonomy – Reducing Financial Vulnerabilities

The European Union (EU) policy in the field of green diplomacy represents a coherent set of climate, energy, trade, and geopolitical strategies through which the EU seeks to strengthen its status as a global leader in the transition to sustainability. Green diplomacy is deeply integrated into the European strategic agenda and functions both as a tool for projecting normative power externally and as a mechanism for security, resilience, and regional stability. Through its set of policies, the EU not only manages its own green transition but also tries to shape the rules of the international order in a manner compatible with climate objectives. The adopted approach reflects the conception that sustainability simultaneously represents an ecological necessity, an economic opportunity, and a tool of geopolitical influence. Through the European Green Deal and the REPowerEU Plan (European Commission, 2022), the European Union is accelerating the transition to renewable energy and independence from fossil fuel imports. This change has a geopolitical impact by reorienting the EU's relationship with traditional energy suppliers, most of which are autocratic, oil-rich states.

Stopping the supply of oil and gas from countries that exploit that energy to finance extremist networks or to impose geopolitical pressure — including Iran or other dictators from the Persian Gulf — represents a well-defined security concern against terrorism. European international sanctions against Iran, on the assumption of sponsoring Hezbollah and other proxy groups in the Middle East, can be used to illustrate the link between European energy dependence and the financing of indirect terrorism operations. The EU is trying to overcome this historical dependence, as can be seen through the diversification of imports, the establishment of internal green sources, and partnerships with democratic states (for example, Norway or the USA). Strategically, decarbonization activity contributes to achieving European strategic autonomy — of the Union as an autonomous provider of energy, economic power, and security actor. This autonomy does not imply that countries must isolate themselves from one another, but rather the emergence of a resilient, symbiotic model of positive interdependence among democratic states, on which the new geopolitical framework of

sustainability is based. Thus, the World Energy Outlook 2022 (IEA) highlights that the European energy transition reduces gas imports by over 55% in a net zero scenario and oil imports by 45% by 2030. This decrease not only reduces economic dependencies but also has the effect of lowering, if not canceling, capital flows that support the fragile alliance between oil economies and militant networks.

As a result, the green transition is a means of preventing war and limiting the indirect financing of terrorism, unguided by militancy. Furthermore, the decarbonization process establishes a global regulatory mechanism, for example, CBAM as an alternative for imposing EU production and fiscal transparency rules on its trading partners with similar standards. This process, called the „Brussels Effect," transforms the Union into a normative force that can export stability through law and economy, not through brute force. Through decarbonization, the Union integrates economic resilience and security, reduces strategic entanglements with unstable regimes, and improves its capacity to project power on a global scale, sustainably. In this way, clean energy becomes a symbol of political freedom and the geostrategic responsibility assumed by Europe.

3. Green Critical Infrastructures – The New Frontiers of European Security

The growth of green energy infrastructures — smart grids, wind farms, hydrogen stations — expands the risk surface of the European Union. The digitalization and automation of energy systems make them more efficient, but also make them susceptible to new physical and cyber threats that hostile actors or terrorist groups interested in disrupting the structure may pursue. In accordance with Directive (EU) 2022/2557 on the resilience of critical entities and the EU Cybersecurity Strategy for the Digital Decade (European Commission, 2020), these infrastructures must be protected through fully integrated hybrid security regimes that incorporate physical, cyber, and information security into a common European architecture. The EUROPOL TE SAT (2023) report drew attention to the increasing cyber security threats directed at energy networks and ESG industrial systems (energy, sustainability, and governance), some of which have been claimed by ideologically motivated entities. There is also a new ideological horizon of threat beyond technical risks. The propaganda magazines of terrorist groups — such as Dabiq (the official ISIS publication), Inspire (a publication associated with Al Qaeda and AQAP), or Voice of Khorasan (ISKP) — have begun to dedicate thematic articles to Western energy infrastructures, for instance the 'green' ones. These works describe solar power plants, wind farms, and smart grids as ideological targets in the 'neo-imperialist and anti-Islamic' world, arguing that a strike would lead to 'a loss of confidence in the life systems that the 'unbelievers' live by or rely on.'

Such narratives are embedded in a rhetoric of eco-terrorism, one in which extremists reframe technological development in apocalyptic terms and reinterpret economic exploitation with religious reasoning. Attacks on Iraq, Nigeria, Pakistan, and Libya, although isolated, are targeted at small-scale energy networks as „models of resistance" by online propaganda. Intelligence services have also observed an exploited element of these motives

within autonomous ecological extremism groups in Europe, which pursue anti-capitalist narratives and align them with the anti-system messages of jihadist groups. This hybrid phenomenon signifies a new risk trend known as 'ideological convergence of polarization,' in which radicalized individuals with opposing views use common targets to further erode social trust .

Under these conditions, there is a tendency for temporary alliances to form between groups with anti-Western views, which confirms the relevance of the saying used by Napoleon Bonaparte, 'The enemy of my enemy is my friend.' Thus, terrorist entities that have members and sympathizers within the community space are constantly motivated by the hate speech promoted against the West and look for signs of vulnerability by drafting 'hostile studies' against critical green infrastructure. In response to these risks, the European Commission has proposed through the Critical Infrastructure Protection Mechanism (Directive 2022/2557) the requirement for an annual assessment of combined technical, cyber, ideological, and informational risks by the member states. The implementation of advanced protection technologies (security by design), the training and guidance of energy personnel in cyber-physical crises, operational collaboration with NATO's Centre of Excellence for Energy Security: these features are the three main elements of such a strategy. In the final analysis, protecting crucial green structures is no longer just a technical issue, but represents a proactive instrument of strategic defence —complementing Europe's arsenal for combating ideological radicalization within its own model of sustainable development.

4. Implications in the Prevention and Deterrence of Terrorism in the European Union

The green transition has direct consequences on European security architecture, including how the EU anticipates, prevents, and discourages terrorism. The climate and security dimension is increasingly recognized in the Union's strategic documents, especially in the EU Security Union Strategy 2020–2025, which emphasizes that climate degradation can create conditions favorable to radicalization, instability, and the expansion of extremist networks. The introduction of this dimension into climate policy marks a new stage in conceptualizing terrorism as a phenomenon influenced by emerging ecological and geopolitical factors. Climate change affects human security, generating pressures on resources, migration, and the degradation of socio-economic conditions in vulnerable regions. In North Africa, the Sahel, or the Middle East – areas essential for European security – severe climate effects create environments conducive to the strengthening of terrorist groups such as Boko Haram, ISIS-Sahel, or Al-Qaeda in the Islamic Maghreb. The EU recognizes these risks and directs its external interventions to reduce the structural factors of radicalization, financing climate resilience and social inclusion projects in partner states. The energy transition generates new critical infrastructures – wind farms, smart power grids, hydrogen systems, electric transport stations – which become potential targets for conventional or cyber terrorism. Violent groups can target energy infrastructure to create economic and social chaos. According to the EU Critical Entities Resilience Directive (2022), the protection of these

infrastructures is a strategic priority, and member states must implement advanced monitoring, cybersecurity, redundancy, and rapid response capabilities. The EU's dependence on fossil fuels from unstable or authoritarian regions can indirectly contribute to financing extremist groups. Energy diversification, increasing domestic renewable energy production, and reducing imports from conflict areas lead to a decrease in financial resources available to hostile actors. In this regard, the EU's energy diplomacy – including partnerships on green hydrogen or liquefied gas infrastructure – becomes an essential tool for neutralizing terrorism funding channels. The Global Gateway initiative includes financing for green infrastructure, education, digitalization, and sustainable development in vulnerable states. These investments have a dual effect: they reduce socio-economic pressures that favor radicalization and strengthen the capacity of partner states to prevent the infiltration of extremist groups.

The EU thus adopts a multilateral approach in which preventing terrorism is achieved not only through traditional security measures, but also through development policies integrated into the green transition. At the same time, it becomes evident that state and non-state actors can exploit the green transition for hybrid operations: cyber-attacks on smart grids, manipulation of energy markets, sabotage of green infrastructures, or disinformation campaigns regarding climate policies. In this context, the EU integrates hybrid risk management into its energy and climate strategies, cooperating with NATO, the EEAS, and national security agencies.

The Global Gateway and NDICI–Global Europe projects strive to assist partner states in adopting clean energy technologies and building resilient governance. These actions target both infrastructure and local institutions – mechanisms for democracy, transparency, and human rights – the building blocks meant to help reduce radicalization. In Sub-Saharan Africa, for example, EU support for decentralized solar energy in Senegal and Niger has alleviated intercommunity tensions around competition for conventional resources. In Central Asia, sustainable irrigation and water collection initiatives are being established to address the future of cross-border conflicts between Tajikistan, Uzbekistan, and Kyrgyzstan — where climate change is leading to social instability and migration.

The project of Europe's normative power, as introduced by Ian Manners (2002), appears here through the external projection of European values, such as peace, a more sustainable way of life (i.e., sustainable development and human rights) and the rule of law, all within a framework of global cooperation, rather than through the need for military intervention. Thus, Europe does not seek domination through force, but transformation through standards. By promoting green production standards, fair trade agreements, and carbon adjustment mechanisms (CBAM), the Union projects a kind of soft regulatory power in the world, capable of establishing a 'hegemony through positive norms'.

The security plan also has a preventive dimension of green diplomacy. By supporting climate adaptation, improving the resilience of energy infrastructures, and providing ecological education, the EU reduces risk factors that fuel local conflicts. In the Sahel region or Ivory Coast, the European AXIS and LEAD programs have encouraged youth involvement through green micro-enterprises and community resource management campaigns, limiting the ground favorable for radical institutions. Geopolitically, the green foreign policy is part of

the development of a new multipolar order, which finds Europe at the balance point between North and South, development and security. By using these resources, Brussels does not pursue a 'green empire,' but the production of what Manners called an 'empire of values.' This type of strategy also supports the Paris Agreement and the 2030 Agenda for Sustainable Development, connecting climate resilience with human and state security.

Green diplomacy also becomes here a double-edged sword for conflict prevention and stability projection. It does this by acting on the economic roots of instability – inequality, energy dependence, poor governance – and on ideological factors, by promoting cooperation, solidarity, and climate responsibility. In this context, the European Union strengthens its position as a global normative power capable of making an impact through values and rules, rather than through the threat of doing so. As a soft power tool, green diplomacy allows the EU to stabilize vulnerable regions through: sustainable energy partnerships, financial support for climate adaptation, reducing competition for resources, and promoting transparent governance in partner countries. Thus, green diplomacy becomes part of the European strategy for preventing terrorism, contributing to the reduction of tensions, strengthening the resilience of unstable states, and addressing the root causes of extremism.

5. Romania in the Geopolitical Architecture of the Green Transition

Romania holds a strategic opportunity in light of Europe's new ecological-orientation geopolitics. Following EU policies, the Romanian state itself has, in recent years, initiated profound European cooperation initiatives, such as REPowerEU and the Danube Strategy, as well as the Three Seas Initiative, where the goal is to diversify energy transport systems and improve connections with neighboring countries in Central and Southeastern Europe. The regional system generates an advantage that will not only save energy but will also offer the opportunity to reduce the energy vulnerability of the entire region and strengthen the level of strategic independence of the Union. At the same time, there are both opportunities and vulnerabilities associated with the green transition for national security. The decarbonization process and technological transformation are linked to the macrostructural reconfiguration of the labor market and mono-industrial areas. The European Just Transition Mechanism assists these areas through vocational training programs and green investments; however, success depends on the Romanian institutional capacity to manage funds and ensure implementation coherence.

In terms of security, Romania is at the forefront of preventive measures against terrorism and violent extremism linked to terrorism within the green transition. The transformation of the energy system and the development of key green infrastructure—smart grids, hydrogen stations, offshore parks—offer the world new targets for terrorist actors or radicalization. So far, there is no concrete evidence of terrorist attacks (successful or foiled) directly targeting green infrastructure in Romania or in the European Union. However, the risk of terrorist attacks remains present throughout the territory, including critical infrastructure, and the national terrorism alert system needs to be updated to respond to

dynamic threats. Green infrastructure, such as renewable energy networks or water management systems, could be a potential target in the context of increased instability.

For this purpose, the coordination of national law enforcement and intelligence systems with the EU Counter-Terrorism Strategy (European Union Counter-Terrorism Strategy, 2020) is essential. The partnership between Romanian institutions, especially the Romanian Intelligence Service (SRI), the Directorate for Investigating Organized Crime and Terrorism (DIICOT), the General Inspectorate of the Romanian Police (IGPR), and EUROPOL, the EU Intelligence and Situation Centre (INTCEN), and the European Counter Terrorism Centre (ECTC), ensures a common architecture for strategic investigation, prevention, and coordinated deterrence. These mechanisms allow Romania to be included in the „early warning system" related to ideological, cyber, or hybrid threats, as part of the principles outlined in the EU Security Union Strategy 2020-2025. Moreover, countering terrorism in the era of the green transition can no longer be just an institutional problem; it is also one of social responsibility. There is a need for civil society to play a critical role in creating resilient communities and protecting against radicalization. The participation of civil society is what supports the resilience of a society—how well it tolerates shocks, maintains social order, and trusts democratic institutions—which helps prevent attacks motivated by extremist ideas. Therefore, integrating green dimensions into Romania's security strategy is not limited to the energy sphere but also includes public policy as well as civil cooperation.

By integrating the climate agenda with various security policies, Romania increases its credibility as a responsible regional actor and is in line with European standards for preventing hybrid and terrorist risks. The result is a governance order in which sustainability, security, and civil society complement each other to create a safer and stronger Europe.

6. The Future of Green Diplomacy

The European Union's (EU) green transition has one of the greatest strategic transformation potentials of the 21st century and has become the engine of a new geopolitical order shaped by sustainability, security, and partnership objectives. The European Commission has built a framework through the European Green Deal that goes beyond an environmental policy and becomes an integrated development and security strategy. Such a framework positions the European Union as a laboratory of global normative power, motivating, through rules and standards, a rethinking of the dynamics of energy, environment, and defence.

The analysis highlights that the sustainability/security equation is not just a political slogan, but an operational concept of the new European governance. Climate change creates vulnerabilities that lead to radicalization and chaos in migration, and green policies – climate adaptation, decarbonization, sustainable development – prove to be viable operational weapons in the fight against conflicts. By combining energy policy and counter-terrorism policy, the EU has redirected the climate agenda into a tool of global stability. Through the green transition, the European Union limits dependence on autocratic states and restricts the flow of finances that could support radical sectors or mechanisms of geopolitical coercion. At

the same time, the preservation of critical green infrastructures and the integration of cybersecurity practices into energy policies create new forms of hybrid resilience in which technological innovation and human security are interdependent. This model is replicated globally through the Union's green diplomacy.

Europe thus demonstrates an informed leadership style, cooperation, and responsible governance, through mechanisms such as Global Gateway, NDICI–Global Europe, or the Carbon Border Adjustment Mechanism (CBAM). By adopting the reform of its energy infrastructure, spreading technological innovations, and collaborating with EU law enforcement and intelligence agencies, Romania becomes a pillar of stability in Central and Southeastern Europe. At the same time, civil society and awareness of societal resilience are critical in terms of preventing and mitigating radicalization (EU Security Union Strategy 2020-2025).

In conclusion, the green transition demonstrates how the Union can combine climate and defence policy with foreign relations into a new form of governance. By doing so, Europe contributes to stability, reduces inequalities, and improves democratic preparedness to manage multifaceted crises. In a world dominated by globalization, climate change, and hybrid conflicts, green diplomacy acts as a profound tool for countering terrorism, strengthening security, and enhancing the European Union's international relevance.

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CLIMATE CHANGE, ARCTIC MARITIME ROUTES AND THE EUROPEAN GREEN DEAL: STRATEGIC AUTONOMY AND SUSTAINABILITY CHALLENGES FOR THE EUROPEAN UNION

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Abstract: *This article examines how the gradual opening of Arctic maritime routes reshapes the geopolitical position of the European Union in the context of climate change and the European Green Deal. As Arctic sea ice decline increases the seasonal accessibility of routes such as the Northern Sea Route, the Northwest Passage and the potential Transpolar Route, the Arctic is becoming relevant for trade, energy security and strategic competition. The paper uses qualitative document analysis supported by descriptive comparative indicators on distance, transit time and traffic volumes. It argues that Arctic routes make the European Union more strategically exposed, but not automatically more geopolitically powerful. A comparison with the Suez Canal shows that the Northern Sea Route offers potential distance and time savings, but remains marginal in global transit volumes and heavily constrained by seasonality, infrastructure, insurance, environmental risk and Russian regulatory control. The article highlights a central Green Deal paradox: Arctic routes may improve Europe-Asia connectivity, but their use is enabled by climate change and may generate new pressures in a fragile ecosystem. The main conclusion is that the EU should approach Arctic maritime routes not as a simple commercial shortcut, but as a test of its capacity to transform the European Green Deal into an external instrument of sustainable governance, maritime regulation and strategic autonomy.*

Keywords: *European Green Deal; Arctic maritime routes; strategic autonomy; Arctic geopolitics; climate change governance.*

Introduction

In recent decades, the Arctic has become one of the regions most visibly affected by climate change. Rising temperatures, declining sea ice extent and the progressive thinning of multi-year ice have transformed the Arctic from a largely inaccessible space into a region of growing economic, environmental and strategic relevance. This transformation is not only an

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ecological process, but also a geopolitical one. As the physical conditions of the Arctic change, new forms of access, mobility and competition are emerging.

One of the most important consequences of this transformation is the increasing seasonal accessibility of Arctic maritime routes. The Northern Sea Route, the Northwest Passage and, in the longer term, a potential Transpolar Route are increasingly discussed as possible alternatives or complements to traditional maritime corridors such as the Suez Canal. These routes may reduce the distance and transit time between Europe and Asia, making the Arctic more relevant to global trade and maritime connectivity. However, their commercial potential should not be overstated, as Arctic navigation remains constrained by seasonality, limited infrastructure, high operational costs, environmental risks and geopolitical uncertainty.

At the same time, Arctic maritime routes are becoming embedded in broader patterns of strategic competition. Russia treats the Northern Sea Route as a major national asset connected to infrastructure, energy exports and security policy. China, despite not being an Arctic state, has framed its regional engagement through the concept of the Polar Silk Road, linking Arctic shipping and infrastructure to its wider connectivity agenda. The United States and NATO increasingly approach the Arctic through the lens of security, deterrence and the protection of a rules-based order. These developments show that Arctic routes are not neutral commercial corridors, but geoeconomic and geopolitical spaces shaped by state interests, regulatory control and strategic rivalry.

For the European Union, this transformation creates a complex dilemma. The EU is directly affected by changes in global trade routes, energy security and maritime connectivity, yet it does not control the main Arctic corridors. Unlike Russia, it lacks territorial control over the most developed route, and unlike China, it does not promote a large-scale infrastructure project comparable to the Polar Silk Road. The Union's influence depends instead on regulatory power, market access, climate diplomacy, scientific cooperation and its ability to promote sustainable standards. In this sense, the Arctic represents an important test of whether the European Green Deal can function not only as an internal decarbonisation agenda, but also as an external instrument of sustainable governance and strategic positioning.

This article argues that the opening of Arctic maritime routes creates a central Green Deal paradox for the European Union. On the one hand, these routes could offer shorter connections between Europe and Asia and contribute to the diversification of global maritime corridors. On the other hand, their growing accessibility is made possible by climate change and may generate new environmental pressures in one of the world's most fragile ecosystems. A shorter maritime route is therefore not automatically a greener route. For the EU, the challenge is not simply to benefit from new Arctic connectivity, but to shape the environmental, legal and regulatory conditions under which such connectivity develops.

Against this background, this paper addresses the following research question: How does the opening of Arctic maritime routes reshape the geopolitical position of the European Union in the context of climate change and the European Green Deal? Its main contribution is to show that Arctic maritime routes make the European Union more strategically exposed, but not automatically more geopolitically powerful. The EU's position will depend on its capacity

to transform the European Green Deal, strategic autonomy and regulatory power into concrete influence over the future governance of Arctic connectivity.

The article is structured as follows. The first section outlines the methodological approach and conceptual framework of the analysis. The second section examines the relationship between climate change and the emergence of Arctic maritime routes. The third section analyses the geoeconomic and geopolitical relevance of these routes, with particular attention to Russia, China, the United States and NATO. The fourth section focuses on the European Union, the 2021 EU Arctic Strategy and the European Green Deal. The final sections discuss the Green Deal paradox, the implications for European strategic autonomy and possible policy recommendations for the EU.

Methodology

This article uses a qualitative document analysis in order to examine how the opening of Arctic maritime routes affects the geopolitical position of the European Union in the context of climate change and the European Green Deal. This method is appropriate because the paper focuses on the interpretation of policy documents, strategic narratives, academic literature and secondary data rather than on the production of original econometric measurements. The qualitative analysis is strengthened by a set of descriptive comparative indicators, including distance, transit time, vessel transits and cargo volumes, in order to give empirical weight to the geoeconomic assessment.

The analysis relies on three main categories of sources. First, it examines official policy documents relevant to the European Union's climate and Arctic agenda, particularly the European Green Deal and the 2021 EU Arctic Strategy. These documents are used to identify how the EU frames its role in relation to climate governance, sustainability, strategic autonomy and Arctic cooperation. Second, the paper analyses official and strategic documents associated with other relevant actors, especially Russia, China, the United States and NATO, in order to compare their approaches to Arctic maritime routes and regional security. Third, the article uses academic literature and institutional data on Arctic sea ice decline, maritime accessibility, shipping routes and environmental risks in order to connect policy discourse with material transformations in the Arctic environment.

The research does not aim to provide a quantitative forecast of the future commercial viability of Arctic shipping routes. Instead, it uses publicly available comparative statistics to contextualize the strategic debate and to interpret the implications of Arctic route development for the European Union. Arctic maritime routes are therefore analysed not only as physical transport corridors, but also as geopolitical and geoeconomic spaces shaped by infrastructure, regulation, energy interests, environmental vulnerability and great-power competition.

The analysis follows three steps. First, it establishes the link between climate change and the increasing seasonal accessibility of Arctic maritime routes. Second, it examines how major actors, especially Russia, China, the United States and NATO, frame and use the Arctic in strategic terms. Third, it assesses how these developments affect the European Union's

position, with particular attention to the European Green Deal, sustainable governance and strategic autonomy.

A limitation of this approach is that it relies primarily on publicly available documents and secondary data. As a result, the article does not measure the economic profitability of Arctic shipping or predict the exact timeline of future route development. Its contribution lies instead in analysing how Arctic maritime routes reshape the strategic environment in which the European Union seeks to act as a climate, regulatory and geopolitical actor.

Conceptual Framework: Climate Geopolitics, Geoeconomics and Strategic Autonomy

This article is built around three conceptual dimensions: climate geopolitics, geoeconomics and strategic autonomy. These concepts are useful because they allow Arctic maritime routes to be analysed not only as physical transport corridors, but also as strategic spaces shaped by environmental change, economic interests, regulatory power and geopolitical competition.

Climate geopolitics refers to the way in which environmental transformations reshape the conditions of international politics. Climate change is increasingly understood not only as an environmental problem, but also as a factor that affects security, mobility, access to resources and geopolitical relations (Dalby, 2013). In the Arctic, this is particularly visible because the decline of sea ice changes patterns of accessibility, creates new possibilities for maritime mobility and increases the interest of state and non-state actors in the region. From this perspective, Arctic maritime routes are a direct example of how climate change can transform geography into a political and strategic factor.

Geoeconomics is relevant because maritime routes are not neutral commercial infrastructures. They are connected to trade flows, ports, energy projects, insurance regimes, infrastructure investment, sanctions, regulation and state strategies. Geoeconomics generally refers to the use of economic instruments to pursue geopolitical objectives, as well as to the strategic effects of economic interdependence (Blackwill & Harris, 2016; Luttwak, 1990). In the Arctic, the Northern Sea Route, the Northwest Passage and the potential Transpolar Route are not only possible shortcuts between Europe and Asia, but also spaces where economic connectivity and geopolitical influence overlap. Control over infrastructure, access rules, technological capacity and emergency response mechanisms can become instruments of power. Therefore, the economic value of Arctic routes cannot be separated from the political conditions under which they operate.

Strategic autonomy is particularly important for the European Union. In the EU context, strategic autonomy refers to the Union's capacity to act and make decisions without excessive dependence on external actors, while preserving its economic, regulatory and diplomatic influence. The concept has become increasingly relevant in EU debates on security, energy, technology, trade and external action, especially in a context marked by geopolitical competition and economic interdependence (European Council, 2016; Fiott, 2018). Arctic maritime routes are relevant to this debate because they may diversify Europe-Asia

connectivity, but they may also create new dependencies on routes, infrastructure and regulatory frameworks shaped by other powers.

These three concepts also help clarify the role of the European Green Deal in the analysis. The Green Deal is not treated only as an internal environmental policy framework, but also as a potential instrument of external influence. The European Green Deal presents climate neutrality and sustainability as central priorities of the Union's transformation, while the 2021 EU Arctic Strategy frames the Arctic as a region where climate action, sustainable development and international cooperation are central to the EU's engagement (European Commission, 2019; European Commission & High Representative, 2021). Through environmental standards, maritime decarbonisation rules, sustainable finance, climate diplomacy and market access, the EU can shape the conditions under which Arctic connectivity develops, even without direct territorial control over the main Arctic routes.

The conceptual framework therefore supports the central argument of the article: the opening of Arctic maritime routes makes the European Union more strategically exposed, but not automatically more geopolitically powerful. Whether this exposure becomes a source of vulnerability or influence depends on the Union's capacity to connect its Green Deal agenda with strategic autonomy, sustainable connectivity and Arctic governance.

Climate Change and the Emergence of Arctic Maritime Routes

The emergence of Arctic maritime routes is directly connected to the accelerated effects of climate change in the region. The Arctic is warming at a significantly faster rate than the global average, a phenomenon commonly described as Arctic amplification (AMAP, 2021; NOAA, 2025). This process is driven by several feedback mechanisms, including the reduction of snow and ice cover, which lowers surface reflectivity and increases the absorption of solar radiation (AMAP, 2021). As a result, the Arctic has become one of the clearest examples of how climate change can produce not only environmental transformations, but also economic and geopolitical consequences (NOAA, 2025).

The decline of Arctic sea ice is particularly important for maritime accessibility. Since the beginning of satellite observations in 1979, September sea ice extent, which marks the annual minimum, has followed a long-term downward trend (European Environment Agency, 2025; NASA/NSIDC, 2024). This decline has not only reduced the spatial extent of sea ice, but has also altered its structure. Older and thicker multi-year ice has increasingly been replaced by thinner seasonal ice, making parts of the Arctic Ocean more accessible during late summer and early autumn (European Environment Agency, 2025). These changes provide the physical basis for the growing discussion about Arctic navigation, even if the region remains far from being permanently ice-free or fully navigable throughout the year (NASA/NSIDC, 2024).

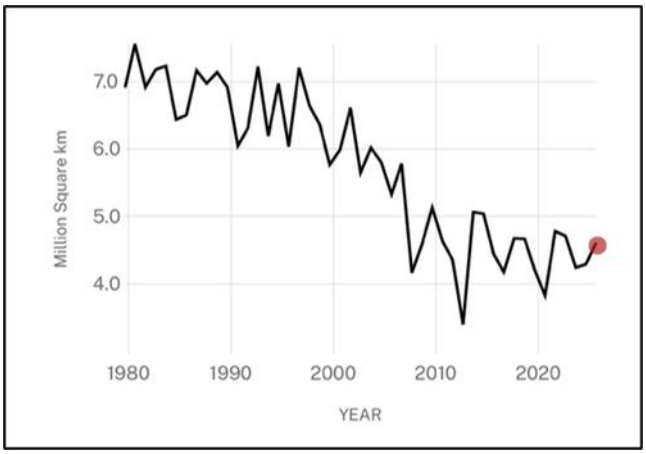

Figure 1. Annual September minimum Arctic sea ice extent, based on satellite observations. Source: NASA/NSIDC.

As Figure 1 illustrates, the long-term decline in September sea ice extent creates the environmental conditions that make Arctic maritime routes increasingly relevant (NASA/NSIDC, 2024). However, this trend should not be interpreted as a simple linear process. Recent research has shown that periods of slower decline or temporary stabilization may occur due to internal climate variability (England et al., 2025). The apparent slowdown in September sea ice loss during the last two decades does not represent a reversal of Arctic warming, but rather a temporary fluctuation within a broader pattern of decline (England et al., 2025). This is important because it shows that Arctic navigation will continue to be marked by uncertainty, variability and environmental risk.

These climatic transformations have brought renewed attention to three main Arctic maritime routes: the Northern Sea Route, the Northwest Passage and the potential Transpolar Route (Aksenov et al., 2017; Melia et al., 2016). The Northern Sea Route, which runs along the Russian Arctic coast, is currently the most developed and strategically relevant of these corridors (Aksenov et al., 2017). Its importance is connected not only to its potential as a shorter maritime link between Europe and Asia, but also to Russia's Arctic infrastructure, icebreaker fleet, port development and energy projects (Aksenov et al., 2017). The Northwest Passage, crossing the Canadian Arctic Archipelago, represents another possible connection between the Atlantic and Pacific Oceans, although its navigability remains more uncertain due to complex ice conditions, shallow waters and limited infrastructure (Aksenov et al., 2017; Melia et al., 2016). The Transpolar Route, which would cross the central Arctic Ocean more directly, remains a longer-term possibility dependent on further sea ice decline (Melia et al., 2016).

The economic interest in these routes is mainly based on their potential to reduce distance and transit time between major markets in Europe and Asia (Government Office for Science, 2017). Under certain conditions, Arctic routes could shorten maritime connections compared to traditional corridors passing through the Suez Canal (Melia et al., 2016). The opening of Arctic sea routes could therefore have implications for global trade patterns, particularly if navigation windows become longer and more predictable (Government Office for Science, 2017). However, these potential advantages should be treated with caution. A

shorter route does not automatically imply lower costs, higher reliability or reduced environmental impact (Aksenov et al., 2017).

Several factors continue to limit the commercial viability of Arctic shipping. First, navigation remains highly seasonal, with the most favourable conditions concentrated in late summer and early autumn (Melia et al., 2016). Second, Arctic routes often require ice-class vessels, specialized crews and, in some cases, icebreaker assistance (Aksenov et al., 2017). Third, the region still suffers from limited port infrastructure, insufficient search-and-rescue capacity, weak emergency response mechanisms and high insurance costs (Government Office for Science, 2017; PAME, 2020). Fourth, Arctic shipping creates serious environmental risks, including oil spills, black carbon emissions, underwater noise and potential damage to fragile marine ecosystems (PAME, 2020). These risks are particularly severe because emergency response operations in polar conditions are technically difficult, costly and slow (PAME, 2020).

For these reasons, Arctic maritime routes should not be understood as immediate replacements for existing global shipping corridors. They are better analysed as emerging and complementary routes whose relevance may increase gradually as climate change continues to reshape the region (Government Office for Science, 2017; Melia et al., 2016). Their importance lies not only in their potential commercial utility, but also in the strategic expectations they generate. Even limited and seasonal accessibility is enough to change how states, companies and international organizations think about trade, infrastructure, energy security, maritime regulation and geopolitical influence (Aksenov et al., 2017; PAME, 2020).

This is why the opening of Arctic maritime routes has broader implications for the European Union. The central question is not only whether ships can travel faster between Europe and Asia, but also who controls these routes, under what environmental standards they will be used, and how their development affects the balance between economic opportunity, sustainability and strategic autonomy (European Commission & High Representative, 2021). The physical transformation of the Arctic therefore creates the basis for the geopolitical and geoeconomic dynamics analysed in the following section.

The Geopolitics and Geoeconomics of Arctic Maritime Routes - A Quantitative Geoeconomic Baseline: Suez and the Northern Sea Route

The geoeconomic relevance of Arctic maritime routes should be assessed against the scale of existing global corridors. The Northern Sea Route is often presented as a shorter connection between Europe and East Asia, and this claim has a material basis: studies suggest that, depending on the port pair, trans-Arctic routes can reduce sailing distance by roughly one third and save around 10 to 12 days compared with routes through the Suez Canal (Melia et al., 2016; Government Office for Science, 2017). However, distance and time savings do not automatically translate into commercial competitiveness. Shipping costs also depend on seasonality, ice-class requirements, icebreaker support, insurance premiums, port infrastructure, cargo availability, sanctions exposure, regulatory uncertainty and environmental compliance.

Table 1. Comparative geoeconomic indicators: Suez Canal and Northern Sea Route. Source: author's synthesis based on Suez Canal Authority (2024, 2025), World Nuclear News (2025), UNCTAD (2024)

Indicator	**Suez Canal (baseline 2023)**	**Suez Canal (disruption year 2024)**	**Northern Sea Route (2024)**
Vessel transits / voyages	26,434 vessel transits	13,213 vessel transits	92 transit voyages
Cargo / tonnage scale	1,322.7 million tons of cargo; 1,568.3 million net tons	457.8 million tons of cargo; 524.5 million net tons	37.8 million tons total cargo; about 3.0 million tons transit cargo
Container relevance	5,847 container ships; 657.0 million net tons	1,748 container ships; 74.8 million net tons	Not yet a mainstream container corridor
Indicative route advantage	Established Europe-Asia corridor via Mediterranean-Red Sea	Traffic sharply reduced by Red Sea security disruptions	Potential 10-12 day saving on selected Europe-Asia routes
Main cost/risk logic	Canal dues and chokepoint exposure, but strong infrastructure and predictable services	Rerouting around the Cape increased fuel, time, insurance and emissions	Ice-class vessels, seasonality, icebreaker support, insurance, limited ports, sanctions and environmental risk

The comparison clarifies the scale of the argument. In the record year 2023, the Suez Canal handled 26,434 vessel transits and 1.322 billion tons of cargo, while the Northern Sea Route in 2024 recorded 92 transit voyages and approximately 3 million tons of transit cargo (Suez Canal Authority, 2024; World Nuclear News, 2025). Even if all NSR cargo is considered, the 37.8 million tons reported in 2024 represented less than 3% of the Suez Canal's 2023 cargo volume; if only transit cargo is considered, the NSR represented less than 0.3% of the Suez baseline. The 2024 collapse of Suez traffic, caused by the Red Sea security crisis, does not alter this conclusion. It shows the vulnerability of maritime chokepoints, but it does not prove that the NSR is ready to replace Suez. In 2024, Suez still handled 13,213 transits and 457.8 million tons of cargo, far above the NSR's transit cargo scale (Suez Canal Authority, 2025).

These figures strengthen rather than weaken the article's core argument. Arctic maritime routes are geoeconomically relevant not because they already rival Suez in volume, but because they reveal a possible future redistribution of maritime options under conditions of climate change and geopolitical disruption. Their importance is therefore strategic before it is fully commercial. For the EU, the NSR is not yet a substitute for Suez; it is a politically controlled, environmentally risky and potentially useful corridor whose future development could affect European connectivity, regulatory influence and strategic autonomy.

Russia occupies a central position in the geopolitics of emerging Arctic maritime routes because the Northern Sea Route runs along its Arctic coastline. This gives Moscow a geographical and institutional advantage that other actors, including the European Union, do not possess. Russia's Arctic strategy up to 2035 explicitly links the development of the Arctic Zone to national security, economic development, infrastructure and the growing importance of the Northern Sea Route (Russian Federation, 2020). In this sense, the NSR is not treated merely as a transport corridor, but as part of a broader state-led strategy for consolidating Russia's position in the Arctic.

Russian policy toward the Northern Sea Route has developed around state interests, economic opportunities and the management of strategic infrastructure (Moe, 2020). This is

particularly visible when the NSR is connected to Russia's Arctic energy projects. Yamal LNG and Arctic LNG 2 illustrate the connection between maritime infrastructure, resource extraction and export capacity, while also showing how energy, sanctions and shipping are increasingly intertwined in the Russian Arctic (Yermakov, V., & Yermakova, A, 2021; Yermakov, 2024). For the European Union, the Northern Sea Route is therefore not simply a potential shortcut to Asia, but a corridor embedded in Russian territorial control, infrastructure and regulatory authority.

China represents a different type of Arctic actor. Unlike Russia, it does not possess Arctic territory and does not exercise direct control over any Arctic maritime route. Nevertheless, Beijing has increasingly sought to position itself as a legitimate stakeholder in Arctic affairs. In its 2018 white paper, China defines itself as a near-Arctic state and connects Arctic shipping routes to the idea of a Polar Silk Road (State Council Information Office of the People's Republic of China, 2018). This language allows China to frame its Arctic engagement as cooperative and developmental, while also linking the region to its broader geoeconomic strategy.

The Polar Silk Road matters for the EU because it connects Arctic maritime routes to broader questions of Europe-Asia connectivity, infrastructure dependency and regulatory influence. Chinese participation in Russian Arctic energy projects, including Yamal LNG and Arctic LNG 2, shows that Beijing's Arctic strategy is not limited to scientific research or shipping, but also includes energy investment, long-term access and strategic partnership with Russia (Yermakov, 2024). If Arctic connectivity becomes more relevant, the EU may face a situation in which routes serving European markets are increasingly shaped by Russian control and Chinese investment.

The United States and NATO add a further security dimension to the geopolitics of Arctic maritime routes. Unlike Russia, the United States does not control the Northern Sea Route, and unlike China, it does not frame its Arctic role primarily through infrastructure-led connectivity. Instead, Washington's approach focuses on homeland defence, sovereignty, freedom of navigation and the preservation of a rules-based order in a region undergoing both environmental and geopolitical transformation (U.S. Department of Defense, 2024). NATO's role reinforces this shift, especially after the accession of Finland and Sweden, which made seven of the eight Arctic states members of the Alliance.

From the perspective of the European Union, the growing role of the United States and NATO creates both reassurance and complexity. NATO's presence strengthens the security of the European High North, but it also underlines the fact that the EU is unlikely to become the central hard-security actor in the Arctic. Its distinctive contribution lies elsewhere: in climate governance, scientific cooperation, environmental standards, market regulation and sustainable connectivity. The securitisation of the Arctic therefore narrows some of the EU's room for manoeuvre, but it also clarifies the kind of influence the Union can realistically exercise.

Taken together, the strategies of Russia, China, the United States and NATO show that Arctic maritime routes are becoming embedded in broader geopolitical and geoeconomic competition. The quantitative comparison with Suez also shows that this competition should

not be exaggerated in purely commercial terms: the Northern Sea Route remains marginal as a global transit corridor, but its strategic significance is amplified by climate change, Russia's territorial control, China's connectivity agenda and the vulnerability of established chokepoints.

Table 2. Main Arctic actors and implications for the European Union. Source: author's synthesis.

Actor	Main Arctic interest	Relevance for Arctic maritime routes	Implication for the EU
Russia	Territorial control, energy exports, NSR development	Controls the most developed Arctic corridor and links it to national strategy	EU access to the most viable route may depend on Russian-controlled infrastructure and regulation
China	Polar Silk Road, connectivity, access to resources	Frames Arctic routes as part of wider Eurasian connectivity	Europe-Asia trade may become increasingly linked to Chinese infrastructure ambitions
United States/ NATO	Security, deterrence, freedom of navigation	Frames the Arctic through defence planning and strategic competition	EU Arctic policy must operate in a more securitised environment
European Union	Sustainable governance, market regulation, Green Deal	Does not control the main routes, but represents a key market endpoint	Can influence standards, but must reconcile strategic relevance with climate credibility

The European Union's Arctic Strategy and the European Green Deal

The European Union occupies a complex position in relation to emerging Arctic maritime routes. Although it does not directly control the main corridors, it is one of the actors most likely to be affected by their development. The commercial relevance of Arctic shipping depends to a large extent on trade flows between Europe and Asia, on access to European ports and on the regulatory standards attached to maritime transport. This means that the EU is not absent from the Arctic equation, even if it lacks the territorial advantages enjoyed by Russia or the infrastructure-centred approach promoted by China.

The 2021 EU Arctic Strategy is essential for understanding this position. The document frames the Arctic as a region where peace, sustainability and prosperity should be preserved through international cooperation, climate action and scientific engagement (European Commission & High Representative, 2021). This approach is coherent with the European Green Deal, which presents climate neutrality, environmental protection and sustainable growth as central elements of the Union's transformation (European Commission, 2019). The problem is that the development of Arctic maritime routes exposes a tension within this framework: the same environmental transformation that the EU seeks to limit also creates new forms of connectivity that may affect European trade, energy security and geopolitical influence.

This tension does not make the EU's Arctic strategy irrelevant, but it does reveal its limits. The Union's Arctic engagement remains strongly normative and cooperative, while the regional environment is becoming increasingly geoeconomic and securitised. Russia links the

NSR to national development and strategic control, China connects Arctic routes to the Polar Silk Road, and NATO increasingly views the High North through a security lens. The EU's challenge is therefore to translate its normative priorities into concrete instruments of influence.

This is where the European Green Deal becomes strategically relevant. The EU's position in the Arctic should not be assessed only through territorial presence or military capacity, but also through its regulatory, economic and normative power. Through climate legislation, maritime decarbonisation rules, sustainable finance, research programmes and access to the European market, the Union can shape the conditions under which Arctic connectivity becomes acceptable. In this sense, the Green Deal can function as an external framework of influence, not merely as an internal programme for decarbonisation.

The regulatory dimension is particularly visible in the EU's approach to maritime decarbonisation. The extension of the EU Emissions Trading System to maritime transport from 2024 means that emissions from large ships entering EU ports are increasingly subject to carbon pricing, regardless of the flag they fly (European Commission, 2024). The FuelEU Maritime Regulation further promotes the use of renewable and low-carbon fuels in maritime transport and establishes progressively stricter requirements for ships calling at EU ports (European Union, 2023). These instruments are not Arctic-specific, but they show how the EU can influence global shipping practices through market access and regulation.

The EU's comparative advantage is therefore not the control of Arctic territory, but the ability to attach standards to connectivity. If Arctic maritime routes become more relevant for Europe-Asia trade, the EU can influence them through port access, emissions rules, monitoring requirements, sustainable finance and environmental diplomacy. This does not remove the geopolitical constraints created by Russia, China or the security role of NATO, but it clarifies the specific form of influence available to the Union.

The Green Deal Paradox: Economic Opportunity and Environmental Normativity

The opening of Arctic maritime routes creates a Green Deal paradox for the European Union. On the one hand, shorter maritime connections between Europe and Asia could reduce distance, transit time and potentially certain transport costs. On the other hand, these opportunities emerge from the very process of climate change that the European Green Deal seeks to mitigate. The EU therefore faces a difficult dilemma: it cannot ignore the strategic relevance of Arctic connectivity, but it also cannot treat the Arctic simply as a new commercial corridor without weakening its credibility as a global climate actor.

This paradox is particularly visible in the case of maritime transport. A shorter route is not automatically a greener route. Increased navigation in the Arctic may produce new environmental pressures, including black carbon emissions, risks of oil spills, underwater noise, disturbance of marine ecosystems and increased infrastructure development in a fragile region (PAME, 2020). From a Green Deal perspective, the question is therefore not only

whether Arctic routes are shorter, but under what environmental, legal and regulatory conditions they should be used.

The paradox also has a strategic dimension. If the EU ignores Arctic maritime routes, it risks becoming a passive observer of a region increasingly shaped by Russia, China and security dynamics in the High North. If it embraces them only as commercial opportunities, it risks undermining the environmental normativity that gives the Green Deal much of its international legitimacy. The EU's task is therefore to avoid both passivity and opportunism. It must treat Arctic routes as strategic infrastructures that require strict environmental governance.

This argument also helps clarify the relationship between sustainability and strategic autonomy. For the EU, autonomy should not mean a purely geopolitical search for alternative corridors at any environmental cost. It should mean the capacity to shape connectivity in ways that are consistent with the Union's climate commitments, regulatory principles and long-term security interests. In the Arctic, sustainable governance and strategic autonomy are therefore not separate agendas, but mutually dependent ones.

Strategic Autonomy and the EU's Arctic Position

The opening of Arctic maritime routes connects Arctic governance to questions of European strategic autonomy. As long as the Arctic was discussed primarily in terms of climate change, research cooperation and environmental protection, the EU's limited territorial presence appeared less problematic. However, as maritime routes become linked to trade corridors, energy projects, sanctions, infrastructure and security planning, the Union's position becomes more strategically exposed.

This exposure does not automatically translate into power. The Northern Sea Route may reduce the distance between Europe and Asia, but it is closely linked to Russian territorial control, infrastructure and regulation. The Polar Silk Road may expand connectivity options, but it also connects Arctic shipping to Chinese infrastructure ambitions and to a broader geoeconomic strategy. NATO may reinforce deterrence and security in the High North, but this does not necessarily increase the EU's independent regulatory or diplomatic influence in Arctic governance.

From this perspective, Arctic maritime routes do not automatically strengthen European autonomy. They may even create new vulnerabilities if the EU becomes a passive user of routes shaped by other powers. The challenge for the Union is to transform its regulatory and market power into strategic influence. This means using the European Green Deal, maritime standards, sustainable finance, climate diplomacy and scientific cooperation to shape the conditions of Arctic connectivity rather than merely adapting to them.

The EU's future Arctic relevance will therefore depend on its ability to act as a regulatory and diplomatic power in a region where it lacks classical territorial leverage. European ports, consumers, companies, environmental standards and climate policies give the Union an indirect but significant form of influence. The question is whether this influence can

be converted into a coherent Arctic strategy capable of balancing economic opportunity, environmental credibility and strategic autonomy.

Policy Recommendations for the European Union

First, the EU should treat the Arctic as part of the external dimension of the European Green Deal. The region should not be approached only through environmental protection or scientific cooperation, but also through the lens of sustainable connectivity and strategic autonomy. This would allow the Union to connect its climate agenda to a broader external policy framework.

Second, the EU should promote a Green Arctic Shipping framework, linking access to European ports and markets to strict environmental standards for vessels using Arctic routes. Such a framework could include stronger rules on black carbon emissions, fuel standards, monitoring obligations and emergency response capacity. This would help ensure that Arctic connectivity does not develop outside the environmental logic of the Green Deal.

Third, the Union should expand the use of Copernicus, satellite monitoring and scientific diplomacy in the Arctic. These instruments would allow the EU to contribute to maritime safety, environmental protection and transparency without relying on territorial control. They would also strengthen the Union's credibility as a knowledge-based and climate-oriented actor.

Fourth, the EU should avoid becoming strategically dependent on Arctic corridors shaped primarily by Russia or China. The Northern Sea Route and the Polar Silk Road may offer commercial opportunities, but they also raise questions about infrastructure dependency, regulatory control and geopolitical leverage. Any European engagement with Arctic routes should therefore include a strategic risk assessment.

Finally, the EU should use its maritime decarbonisation instruments to shape global shipping standards. The extension of the EU ETS to maritime transport and the implementation of FuelEU Maritime show that the Union can influence shipping beyond its own territory through access to its ports and market (European Commission, 2024; European Union, 2023). These instruments should be connected more explicitly to the Arctic debate.

Conclusions

The opening of Arctic maritime routes reshapes the geopolitical position of the European Union by transforming the Arctic from a primarily environmental and governance-related concern into a space of geoeconomic exposure and strategic relevance. The decline of Arctic sea ice does not simply create new maritime possibilities; it also changes the strategic meaning of the region. Routes that were once largely theoretical are increasingly discussed in relation to trade, infrastructure, energy, regulation and security.

The main finding of this article is that the EU's position becomes more important, but not necessarily stronger. The Union is more exposed to Arctic developments because climate

change may gradually expand maritime accessibility and because disruptions to existing chokepoints, such as the Suez Canal and the Red Sea, reveal the fragility of global trade routes. However, the quantitative comparison also shows that the Northern Sea Route remains far from replacing Suez: its transit cargo is still marginal when compared with the cargo volumes of established corridors. The Arctic should therefore be understood as a strategic option under development, not as an immediate commercial substitute.

In this context, the Arctic reveals a broader challenge for European strategic autonomy. Russia's control over the Northern Sea Route, China's long-term interest in the Polar Silk Road and the growing security role of the United States and NATO show that Arctic connectivity is becoming embedded in a competitive strategic environment. If the EU remains passive, it risks becoming a market endpoint for routes shaped by other powers. If it treats Arctic routes only as economic opportunities, it risks weakening its credibility as a global climate actor.

At the same time, the EU is not without instruments of influence. Its relevance in the Arctic does not derive primarily from territorial control or military power, but from its market size, regulatory capacity, climate diplomacy and ability to promote standards. The European Green Deal is therefore central to the EU's Arctic position because it allows the Union to frame Arctic connectivity not only as a question of trade, but also as a question of sustainability, environmental responsibility and strategic autonomy.

The opening of Arctic maritime routes thus creates a paradox for the European Union. The Union may become one of the economic beneficiaries of routes made more accessible by climate change, while at the same time seeking to preserve its credibility as a global climate actor. This tension is at the core of the EU's Arctic challenge. A shorter maritime route is not automatically a greener or safer route, especially in a fragile ecosystem where environmental damage can have long-lasting consequences.

Therefore, the EU's future role in the Arctic will depend on its ability to convert economic weight into regulatory and diplomatic influence. The opening of Arctic maritime routes does not automatically enhance the Union's power, but it does force the EU to redefine its Arctic engagement. Its strategic objective should not be to compete with Russia or China through territorial control, but to shape the rules, standards and environmental conditions under which Arctic connectivity develops. In this sense, the Arctic becomes a test of whether the European Green Deal can operate as an external instrument of sustainable governance and strategic autonomy.

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CARBON BORDER ADJUSTMENT MECHANISM AS AN INSTRUMENT OF CLIMATE DIPLOMACY AND THE EUROPEAN UNION'S NORMATIVE POWER

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Abstract: *The Carbon Border Adjustment Mechanism (CBAM) has become one of the European Union's most consequential instruments for linking climate policy, trade governance, and external influence. Introduced to prevent carbon leakage by equalising the carbon cost borne by EU producers and foreign exporters, CBAM entered its definitive phase on 1st of January 2026 and is being phased in alongside the reduction of free allowances under the EU Emissions Trading System (ETS) (European Commission, 2026; Regulation (EU) 2023/956, 2023). The present article argues that CBAM should be understood not only as a market-correcting climate measure, but also as an instrument of EU climate diplomacy and normative power, capable of externalising EU regulatory standards beyond its borders. Building on the concepts of normative power Europe, the Brussels Effect, and WTO-compatible border adjustment, the article examines how CBAM encourages third-country producers to adapt to EU carbon-accounting and decarbonisation requirements to preserve access to the EU market. It also analyses the legal and diplomatic tensions generated by this strategy, particularly the question of WTO compatibility and the criticism that CBAM may amount to unilateral green protectionism. Using in-depth analysis of EU documents, literature synthesis, and empirical case studies of third-country responses, the article shows that CBAM is simultaneously a climate, trade, and geopolitical instrument, whose effectiveness depends on the EU's ability to reconcile regulatory ambition with international legitimacy.*

Keywords: *Carbon Border Adjustment Mechanism; EU ETS; climate diplomacy; European normative power; carbon leakage.*

Introduction

The EU's dual climate policy framework—Emissions Trading System (ETS) and Carbon Border Adjustment Mechanism (CBAM)—aims to internalize carbon costs while safeguarding industrial competitiveness. ETS, operational since 2005, caps emissions and trades allowances, but free allocations have historically protected exposed sectors from relocation (carbon leakage) to low-regulation jurisdictions (European Environment Agency, n.d.). CBAM extends this by imposing border taxes on imports' embedded emissions,

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synchronized with ETS free allowance phase-out starting 2026 (European Commission, 2026). This phase-out addresses criticisms of free allocations distorting markets and delaying innovation, yet raises concerns over costs for energy-intensive industries (Bruegel, 2026). In Romania and Eastern Europe, where manufacturing relies on imports, these changes amplify decarbonization pressures (Mediafax, 2026). This article synthesizes regulatory evolution, mechanisms, and implications, contributing to policy discourse for equitable transitions.

Table - CBAM-ETS Timeline

Year	CBAM Regime	ETS Free Allowances (% Reduction)	Certificate Price Basis
2023-2025	Transitional Reporting (Quarterly)	100% (Full)	N/A
2026	Definitive: 97.5% Factor (Annual)	2.5%	Quarterly ETS Avg.
2027	95% Factor	5%	Weekly ETS Avg.
2028+	Full Scope	10%	Weekly ETS Avg.
2034+			

The Carbon Border Adjustment Mechanism (CBAM) embodies the European Union's (EU) ambition to wield normative power through climate policy, transforming unilateral decarbonization into a global governance instrument. Operational since 2023 in transitional reporting and mandatory from 2026, CBAM imposes carbon costs on imports of high-emission goods (steel, cement, aluminum, fertilizers, hydrogen, electricity), mirroring ETS prices to neutralize competitive distortions from free allowances phase-out (European Commission, 2026). Beyond economics, CBAM projects EU standards extraterritorially, pressuring trading partners to align with its net-zero trajectory—a hallmark of climate diplomacy (Manners, 2002). In a fragmented global climate landscape, where Paris Agreement ambitions falter, CBAM exemplifies „regulatory unilateralism" as diplomacy: it incentivizes third countries to implement carbon pricing via WTO-compliant border adjustments, amplifying EU influence without formal treaties. This article reframes CBAM-ETS interplay not merely as leakage protection but as normative entrepreneurship, drawing on prior discussions of timelines, allocations, and Romanian impacts to analyze its diplomatic potency.

In 2026, the Carbon Border Adjustment Mechanism moved from a reporting system to a binding compliance mechanism, and that transition immediately exposed the political economy tensions at the centre of the European Green Deal. Debates over fertiliser inflation intensified across the EU, while political pressure emerged from several member states to slow or soften the reduction of free ETS allowances for energy-intensive industries. These controversies make CBAM a particularly revealing case for the study of EU climate diplomacy. At its core, CBAM is the European Union's border carbon mechanism for imported carbon-intensive goods, designed to ensure that imports into the EU bear a carbon cost comparable to

that imposed on domestic producers under the ETS. It currently covers sectors such as cement, iron and steel, aluminium, fertilisers, hydrogen, and electricity, and it requires importers to report embedded emissions and, from 2026 onward, surrender CBAM certificates priced in line with the EU ETS (European Commission, 2026; Regulation (EU) 2023/956, 2023). The mechanism is closely linked to the gradual phase-out of free ETS allowances, because the EU is replacing internal carbon-cost exemptions with a border-based adjustment intended to preserve a level playing field while reducing carbon leakage. From this perspective, CBAM is not simply a technical environmental regulation. It is also an instrument through which the EU projects regulatory expectations outward, encouraging foreign producers and governments to align with European carbon-accounting standards, emissions monitoring practices, and broader decarbonisation pathways. This outward projection places CBAM within the logic of the Brussels Effect, whereby access to the EU market incentivises external adaptation to EU rules, and it also connects the mechanism to debates on normative power Europe, understood as the Union's capacity to shape what is considered legitimate or appropriate conduct in international affairs (Manners, 2002; Damro, 2015). Because CBAM affects trade relations, industrial policy, and climate governance at the same time, it offers a valuable lens through which to assess how the EU converts internal regulation into external influence. At the same time, this regulatory projection remains contested. The more the EU presents CBAM as a legitimate response to carbon leakage, the more it must defend the measure against accusations of discrimination, green protectionism, and unequal treatment of developing-country exporters. This is where the WTO dimension becomes analytically important: CBAM's legal durability and diplomatic credibility depend on whether the EU can show that the measure is non-discriminatory, proportionate, and genuinely environmental in purpose rather than industrially protectionist in effect (European Papers, 2026; International and Comparative Law Quarterly, 2023). The mechanism therefore sits at the intersection of trade law, climate governance, and geopolitical bargaining.

We wish to argue in this article that CBAM should be analysed as an instrument of climate diplomacy and normative power rather than only as an extension of carbon pricing. Its significance lies not merely in charging for embedded emissions, but in reorganising incentives for states, firms, and supply chains outside the EU. By linking market access to measurable carbon performance, the Union seeks to shape global production norms through regulation rather than through traditional diplomatic bargaining alone. The directions discussed are the following: first, we present the conceptual framework through the lenses of normative power Europe and the Brussels Effect; secondly, we explain the methodology and research design used to analyse the legal and political significance of CBAM. Thirdly, we review the main literature on normative power, regulatory externalisation, WTO legality, and third-country impacts. Furthermore, we present a few empirical case studies concerning Türkiye, Ukraine, India, and the Gulf states and we discuss the mechanism's broader diplomatic, legal, and distributive implications. Finally, we conclude by assessing whether CBAM can be sustained as a credible instrument of EU climate leadership without undermining the international legitimacy on which normative power ultimately depends.

There are two complementary conceptual approaches in which the present article is anchored: normative power Europe and the Brussels Effect. Normative power Europe, most closely associated with Ian Manners, describes the EU as an actor capable of shaping conceptions of the "normal" in international relations through the diffusion of norms rather than through military or purely coercive means (Manners, 2002). In the case of CBAM, the relevant norm is that carbon-intensive production should be subject to measurable accountability and economic pricing. CBAM thus serves not only as a regulatory instrument but as a normative claim about the acceptable conditions of participation in international trade. The Brussels Effect complements this perspective by highlighting the market-based mechanisms through which EU regulation travels beyond EU borders. Because access to the EU single market remains highly valuable, firms and foreign producers often adapt to EU rules even without formal extraterritorial jurisdiction (Damro, 2015). Applied to climate governance, this means that foreign producers may adopt EU-style emissions accounting, improve data verification, or support domestic carbon-pricing mechanisms in order to preserve market access. In that sense, CBAM converts the EU's internal regulatory power into external economic and political influence. Together, these concepts make it possible to analyse CBAM not simply as a response to carbon leakage, but as an instrument of climate diplomacy through conditional market access. This conceptual synthesis also helps explain why CBAM generates both adaptation and resistance. The mechanism can appear as legitimate climate leadership from the perspective of EU institutions, yet as coercive unilateralism from the standpoint of affected exporters. The central analytical question, therefore, is not whether CBAM projects EU norms, but under what conditions such projection is accepted as legitimate rather than contested as asymmetrical.

Literature review

The literature on CBAM increasingly situates the mechanism at the intersection of climate governance, international trade law, and EU external power. Early analyses focused primarily on carbon leakage and on the relationship between CBAM and the EU ETS, treating the mechanism as a corrective tool intended to preserve the environmental integrity of internal carbon pricing. More recent scholarship, however, has moved beyond this functional reading and now examines CBAM as a form of regulatory externalisation with broader diplomatic and geopolitical consequences. The first perspective we wish to underline when discussing the literature concerns the idea of normative power Europe. Manners' foundational argument remains central because it highlights the EU's capacity to shape ideas of legitimate conduct in international relations (Manners, 2002). Applied to CBAM, this perspective suggests that the mechanism is not merely about technical carbon accounting, but about advancing carbon pricing and emissions transparency as standards of appropriate economic behaviour. At the same time, critical scholarship on normative power warns that EU claims to universalism are vulnerable to accusations of self-interest and asymmetry, especially when regulatory measures impose significant costs on actors outside the Union. The second perspective concerns the Brussels Effect and market power Europe. This literature explains how internal EU rules often

generate external behavioural change because firms adapt in order to retain access to the EU market (Damro, 2015). In the CBAM context, this perspective is especially useful because it helps explain why foreign producers may improve emissions accounting, support domestic carbon-pricing schemes, or adjust production processes even before the full financial impact of the measure is felt. A third important body of work examines WTO compatibility. Legal scholarship generally holds that CBAM may be defensible under GATT rules, especially if it is applied in a non-discriminatory and proportionate manner and remains closely tied to equivalent domestic climate obligations (International and Comparative Law Quarterly, 2023; European Papers, 2026). Yet these studies also stress that legality is not automatic. WTO compatibility depends not only on the environmental objective of CBAM, but on details of implementation, procedural fairness, and the treatment of foreign carbon-pricing efforts. Finally, a growing policy literature examines third-country responses and distributive effects. Studies on developing-country exposure, supply-chain vulnerability, and political responses demonstrate that CBAM produces highly differentiated impacts across sectors and regions. This literature is particularly valuable because it reveals that CBAM is experienced simultaneously as climate leadership, regulatory coercion, industrial pressure, and strategic opportunity, depending on the position of the affected country in global value chains.

The literature therefore supports the article's central concern while also revealing a gap. Much of the scholarship remains compartmentalised: legal analyses focus on WTO legality, policy studies on cost distribution, and theoretical work on normative power or the Brussels Effect on abstract externalisation. This article contributes by integrating these strands into a single framework that links legal design, normative ambition, and empirical third-country impact.

Methodological Design

This study employs a mixt research design with a qualitative policy analysis approach, synthesizing secondary sources including EU regulations, official guidelines, and recent analyses (2023-2026). Data were drawn from European Commission documents, national ministries (such as Romanian Ministry of Environment), and think tanks via targeted web searches on CBAM-ETS linkages („CBAM ETS free allowances phase-out timeline"). The research is oriented in such a way to analyse CBAM as an instrument of climate diplomacy and normative power within the European Union's external action. The methodological choice follows directly from the article's core argument: because CBAM is a legal mechanism, a regulatory instrument, and a geopolitical signal all at once, its significance cannot be assessed through economic indicators alone, but must be examined through the interaction of legal texts, policy rationales, institutional design, and external effects. At the legal level, the research is centred on Regulation (EU) 2023/956, which establishes the CBAM framework and defines its objective of addressing carbon leakage in a manner linked to the EU's wider climate ambitions (Regulation (EU) 2023/956, 2023). This primary legal source is read together with Commission guidance, registry and reporting materials, and legal scholarship on WTO compatibility and international economic law (European Commission, 2026; European Papers,

2026). Particular attention is given to the transition from the reporting phase also known as the transitional phase (2023-2025) to the definitive compliance phase (from 2026), because that shift is essential for understanding how CBAM moves from a transparency instrument to a binding regulatory tool with external economic consequences.

The research strategy is structured around three analytical layers. First layer examines the legal content of CBAM: its scope, covered sectors, reporting obligations, and relationship to the gradual phase-out of free ETS allowances. Second, a policy-analysis layer evaluates the public rationale of the mechanism, especially the EU's claim that CBAM is necessary to ensure a level playing field, preserve the environmental integrity of the ETS, and prevent the relocation of carbon-intensive production outside the Union. Third, a normative-external layer considers how these internal regulatory choices generate effects beyond EU borders by incentivising compliance, provoking contestation, and shaping the behaviour of exporters, governments, and supply chains in third countries. Methodologically, the article relies on document analysis as its principal research technique. The corpus includes EU legal acts, Commission explanatory materials, scholarly publications on normative power and market power of Europe, and studies on trade-law implications and developing-country exposure. These materials are interpreted through the lens of: normative power, regulatory externalisation, climate diplomacy, carbon leakage, WTO compatibility, distributive justice, and third-country response. The analysis also incorporates empirical case studies as illustrative evidence of differentiated third-country impacts. These case studies are not designed as exhaustive comparative country studies, but rather as strategically selected examples that demonstrate how CBAM is received and contested across different economic and geopolitical contexts. This mixed approach is appropriate for the article's central claim: that CBAM is not only a technical border adjustment mechanism, but also a legal and diplomatic mechanism through which the EU seeks to project climate norms outward.

Data Analysis

The Carbon Border Adjustment Mechanism (CBAM) is the EU's carbon pricing tool that imposes a fair price on embedded greenhouse gas emissions in carbon-intensive imported goods, preventing carbon leakage by equalizing costs between EU-produced and imported products (European Commission, 2026). It targets high-risk sectors: cement, iron and steel, aluminium, fertilisers, electricity, and hydrogen, ensuring imports bear equivalent carbon costs to those under the EU ETS (European Commission, 2026). Designed WTO-compatible, CBAM promotes cleaner global production without undermining EU climate goals (Normative.io, 2025). CBAM requires EU importers (authorized declarants) to register, report embedded emissions (direct and indirect) quarterly in transition or annually post-2026 via the CBAM Registry, then purchase and surrender equivalent certificates priced at weekly EU ETS averages (European Commission, 2026). Emissions are calculated using default values, supplier data, or verified methodologies; certificates cover the difference between actual emissions and EU benchmarks, phased linearly (e.g., 97.5% factor in 2026) (Climease, 2024). Non-compliance incurs penalties up to 100 EUAs per tonne unreported (SAP, 2025). CBAM

unfolds in phases: transitional (October 1, 2023–December 31, 2025) for quarterly emissions reporting without financial obligations, aligning with ETS free allowance preparation; definitive/compliance from January 1, 2026, with certificate surrender based on 2025 reports due by May 2026, ramping to full scope by 2034 alongside ETS phase-out (European Commission, 2026; Coolset, 2026).

CBAM applies universally to imports into the EU's 27 member states from any non-EU country, with no exemptions for partners; highest impacts on top exporters: China (steel/aluminium), Russia, Turkey, Ukraine, India, US, Brazil, and Gulf states (UAE, Bahrain for aluminium) (Wikipedia, 2026; ORFME, 2026). De minimis thresholds exempt small consignments; equivalence possible for countries with linked carbon pricing (e.g., UK, Switzerland negotiations) (European Commission, 2026). CBAM raises import costs (e.g., 20-50€/tonne CO_2 initially), pressuring exporters to decarbonize or lose EU market share, spurring domestic ETS in China, India, Turkey, Brazil, Indonesia (Wikipedia, 2026). Economic hits vary: GCC aluminium exporters (UAE 0.53% GDP, Bahrain 2.89%) face reshaped trade; contesting nations (China, India, Russia, South Africa) risk WTO disputes or retaliation, while supporters (Japan, South Korea) align faster (GMK Center, 2025; OECD, 2025). Globally, it reduces leakage, cuts emissions ~0.5 $GtCO_2e$ by 2030, but inflates prices (e.g., fertilizers) in import-dependent economies like Romania (Brookings, 2025).

Table 1. Sectors to which CBAM is applied

Sector	**Direct Emissions (tCO2e/t)**	**Indirect Emissions Priced?**	**2026 Penalty Mark-up**
Iron & Steel	0.07–2.5	No	10%
Cement	0.40–0.87	Yes	10%
Aluminium	0.05–2.1	No	10%
Fertilisers	1.0–2.6	Yes	10%
Electricity	Grid-specific	N/A	10%
Hydrogen	0 (green) – 10+ (grey)	Yes	10%

The external significance of CBAM becomes clearer when examined through third-country responses and sectoral exposure. Comparative research suggests that non-EU countries have responded through a mixture of policy adoption, cooperation, and opposition, indicating that CBAM already functions as a source of regulatory pressure well beyond the Union's borders. Türkiye is one of the clearest cases of direct CBAM exposure because of the structure of its exports to the EU, especially in iron and steel. Its heavy trade integration with the European market creates strong incentives for regulatory adjustment, emissions accounting reforms, and domestic discussion on carbon-pricing instruments. The Turkish case thus illustrates how CBAM can operate through anticipatory adaptation rather than waiting

for the full effect of border charges. Ukraine represents a particularly sensitive case because of its export dependence in CBAM-covered sectors such as iron and steel and its wider strategic relationship with the European Union. Here, CBAM reveals the tension between regulatory consistency and geopolitical vulnerability. While the mechanism aims to preserve climate integrity, its application to a politically and economically fragile partner raises questions about differentiated treatment, fairness, and the limits of uniform externalisation. India illustrates the intersection of CBAM with climate justice, industrial competitiveness, and development concerns. Exposure in sectors such as aluminium has made CBAM a visible issue in discussions about trade fairness and development policy. The Indian case also suggests that exporters may respond by redirecting trade, contesting the legitimacy of the mechanism, or accelerating adaptation in order to maintain competitiveness.

Table 2. Countries exposure to CBAM

Country	**Main Sector**	**Annual Export Value to EU (€bn)**	**Response Type (2026)**
Türkiye	Steel	6–8	Adaptation (ETS Debate)
China	Steel/Aluminium	15+	Opposition/WTO
India	Aluminium	2–3	Trade Diversion
Canada	Steel	2	Cooperation
Taiwan	Steel	1.5	Adaptation
Vietnam	Steel	1	Adaptation
Ukraine	Steel	3.5	Vulnerable

The Gulf countries, particularly Bahrain and the United Arab Emirates, provide a more nuanced picture. Their exposure is concentrated in aluminium, and while CBAM creates adjustment pressure, some relatively cleaner producers may preserve or even improve their position compared with more carbon-intensive competitors. This demonstrates that CBAM does not affect all third countries in the same way; under some conditions, it can create incentives and strategic opportunities as well as costs. Taken together, these cases show that CBAM generates uneven but significant third-country effects. Rather than imposing a uniform external burden, it reorders incentives across countries depending on sectoral structure, emissions intensity, institutional readiness, and political relationship with the EU.

The empirical evidence suggests that this normative projection is already producing effects consistent with the Brussels Effect. Responses in Türkiye, India, and other exposed economies indicate that CBAM is altering policy calculations before its full long-term cost effects are realised, encouraging debate on domestic carbon pricing, emissions monitoring, industrial upgrading, and export competitiveness. This matters analytically because it shows

that the EU does not need to exercise formal jurisdiction over third countries in order to shape their behaviour. Access to the EU market operates as the channel through which internal EU rules become external incentives, producing a form of market-mediated regulatory convergence. At the same time, the evidence complicates any overly celebratory reading of EU normative power. If normative power is understood as the ability to shape what is seen as legitimate, then CBAM reveals that legitimacy is never simply asserted; it must be defended against claims of inequity, asymmetry, and regulatory unilateralism. Opposition from major developing and emerging economies frequently frames CBAM as discriminatory or as inconsistent with the principle of common but differentiated responsibilities, thereby exposing the tension between universal climate ambition and differentiated developmental capacity. The WTO dimension sharpens this point. There are credible legal arguments that CBAM can be defended under GATT Article XX as an environmental measure linked to equivalent domestic restrictions. Yet WTO defensibility is not merely a technical legal issue; it is part of CBAM's diplomatic credibility. If the EU cannot persuade trading partners that the mechanism is proportionate, transparent, and genuinely environmental, then CBAM risks undermining the very normative authority it seeks to project. The comparative case studies also show that CBAM's external effects are uneven rather than uniform. Türkiye illustrates anticipatory adaptation under strong market dependence; Ukraine highlights the challenge of aligning normative consistency with exceptional geopolitical circumstances; India reveals how exposure can trigger both strategic adjustment and justice-based resistance; and the Gulf states show that CBAM may create not only pressure but also relative opportunities for cleaner producers. These differences matter because they indicate that CBAM does not simply export a single rule; rather, it reorders incentives across different national and sectoral contexts, producing a varied landscape of compliance, resistance, bargaining, and repositioning.

The broader significance of CBAM therefore lies in whether the EU can convert regulatory power into legitimate climate leadership. The evidence suggests that CBAM is already effective as a driver of reaction and adaptation in third countries. Yet reaction is not the same as legitimacy, and adaptation is not the same as consent. The more the EU relies on market size and regulatory capacity to internationalise its climate preferences, the more it must confront accusations that those preferences are being universalised without sufficient regard for unequal capacities and differentiated responsibilities.

Discussion

The analysis developed in the preceding sections supports a central claim: the Carbon Border Adjustment Mechanism should be understood not merely as a technical complement to the EU Emissions Trading System, but as a regulatory instrument through which the European Union seeks to project climate norms externally. The conceptual framework showed that this external projection can be interpreted through the combined lenses of normative power Europe and the Brussels Effect, while the literature review demonstrated that legal, political, and distributive debates increasingly converge around the external consequences of CBAM. The empirical case studies then confirmed that these consequences are not speculative;

third countries are already responding through policy adoption, cooperation, contestation, and trade adjustment. From the perspective of normative power, CBAM reflects the EU's effort to define what constitutes legitimate economic conduct under conditions of climate crisis. By linking market access to the reporting and pricing of embedded emissions, the Union effectively advances the proposition that carbon-intensive production can no longer remain outside the regulatory logic of environmental accountability. In this sense, CBAM is not only a border mechanism; it is also a normative statement that participation in international trade should be conditioned by decarbonisation-compatible standards. This is precisely why the mechanism has generated such strong international reactions: it does not simply correct a market distortion, but intervenes in the global politics of who sets the terms of acceptable climate governance. The empirical evidence suggests that this normative projection is already producing effects consistent with the Brussels Effect. Responses in Türkiye, India, and several other exposed economies indicate that CBAM is altering policy calculations before its full long-term cost effects are realised, encouraging debate on domestic carbon pricing, emissions monitoring, industrial upgrading, and export competitiveness. This matters analytically because it shows that the EU does not need to exercise formal jurisdiction over third countries in order to shape their behaviour. Instead, access to the EU market operates as the channel through which internal EU rules become external incentives, producing a form of market-mediated regulatory convergence. At the same time, the evidence also complicates any overly celebratory reading of EU normative power. If normative power is understood as the ability to shape what is seen as legitimate, then CBAM reveals that legitimacy is never simply asserted; it must be defended against claims of inequity, asymmetry, and regulatory unilateralism. Opposition from countries such as China, India, Brazil, and South Africa has frequently framed CBAM as discriminatory or as inconsistent with the principle of common but differentiated responsibilities, thereby exposing the tension between universal climate ambition and differentiated developmental capacity. The mechanism may therefore represent normative leadership from the EU's perspective while appearing as climate conditionality or green protectionism from the standpoint of many affected exporters. This tension is especially visible in the relationship between climate ambition and distributive justice. The EU justifies CBAM as necessary to preserve the environmental integrity of the ETS and to avoid carbon leakage, and this rationale is logically strengthened by the parallel phase-out of free ETS allowances. Yet the very same design shifts adjustment pressures outward, often toward countries with weaker financial capacity, higher carbon intensity, or less immediate access to green technologies. The case studies reinforce this point. Ukraine's vulnerability illustrates the difficulty of applying uniform climate logic in conditions of geopolitical and industrial fragility, while India's concerns reflect how CBAM can be interpreted as a burden on development space rather than a neutral environmental correction. For this reason, the article's empirical findings suggest that CBAM should be understood as a form of climate diplomacy through conditionality rather than diplomacy in a purely consensual sense. It operates by changing the external incentive structure surrounding access to the EU market, thereby encouraging adaptation even among governments that publicly oppose the instrument. The finding that policy adoption was observed in 24 of the 32 non-EU countries mapped in recent research is particularly significant here, because it indicates that unilateral climate measures can function as international policy drivers rather than merely as sources of diplomatic

friction. However, the same research also shows that opposition remained widespread, which means that CBAM's effectiveness as a diplomatic instrument depends on whether adaptation occurs alongside durable political legitimacy. The WTO dimension further sharpens this point. Legally, there are credible arguments that CBAM can be defended under Article XX of the GATT as an environmental measure related to the protection of life and health or the conservation of exhaustible natural resources, especially because it is linked to equivalent domestic restrictions under the ETS. At the same time, legal scholarship warns that compatibility does not depend only on the abstract objective of climate mitigation, but also on the even-handedness and non-arbitrariness of the mechanism's practical application. This is crucial for the broader argument of the article: WTO defensibility is not merely a technical legal issue, but part of the diplomatic credibility of CBAM. If the EU cannot persuade trading partners that the mechanism is proportionate, transparent, and genuinely environmental, then CBAM risks undermining the very normative authority it seeks to project. The comparative case studies also show that third-country impacts are uneven rather than uniform, and this unevenness is central to interpreting CBAM as both climate diplomacy and regulatory power. Türkiye illustrates anticipatory adaptation under conditions of strong market dependence on the EU; Ukraine demonstrates the challenge of aligning normative consistency with exceptional geopolitical circumstances; India reveals how exposure can trigger both strategic adjustment and justice-based resistance; and the Gulf states show that CBAM may create not only pressure but also relative opportunities for cleaner producers within affected sectors. These differences matter because they indicate that CBAM does not simply export a single rule. Rather, it reorders incentives across different national and sectoral contexts, producing a varied landscape of compliance, resistance, bargaining, and repositioning. This unevenness also explains why the mechanism can be seen simultaneously as an instrument of decarbonisation, industrial strategy, and geopolitical signalling. On the one hand, CBAM protects the environmental credibility of the EU's internal climate regime by reducing the risk that emissions are simply displaced abroad. On the other hand, it protects domestic producers from asymmetric carbon costs as free ETS allowances decline, thereby reinforcing the industrial dimension of EU climate governance. At a third level, it sends a signal internationally that the EU is willing to use regulatory market power to defend the integrity of its transition. This triple function is precisely what makes CBAM such a powerful but controversial instrument: it fuses environmental purpose with trade consequences and diplomatic messaging. The 2026 political debates within Europe reinforce this interpretation. The controversy over fertilizer prices and the calls by several member states to preserve free allowances for industry show that the legitimacy challenge is not only external. If domestic actors within the Union regard the pace of implementation as economically destabilising, the EU's ability to present CBAM abroad as a fair and coherent climate measure becomes more difficult. Internal distributional tensions therefore matter for external normative power: a mechanism that is contested at home will struggle to sustain claims of universal fairness abroad. For that reason, the broader significance of CBAM lies not simply in whether it raises carbon costs for imports, but in whether it can convert regulatory power into legitimate leadership. The evidence assembled here suggests that CBAM is already effective as a driver of reaction and adaptation in third countries. Yet reaction is not the same as legitimacy, and adaptation is not the same as consent. The EU may succeed in externalising its carbon-

accounting logic, but whether this externalisation will be accepted as justifiable climate leadership depends on accompanying measures such as transparency, technical assistance, differentiated engagement with vulnerable partners, and sensitivity to distributive effects across the Global South. In this sense, the discussion points toward a nuanced conclusion. CBAM does support the claim that the European Union can exercise normative power through climate regulation, because it visibly changes the strategic calculations of third countries and embeds EU standards into global trade relations. At the same time, the mechanism shows that normative power in the climate field is inseparable from contestation. The more the EU relies on market size and regulatory capacity to internationalise its climate preferences, the more it must confront accusations that those preferences are being universalised without sufficient regard for unequal capacities and differentiated responsibilities. CBAM therefore emerges not as a settled model of legitimate climate governance, but as a powerful and still-contested experiment in the externalisation of climate norms through trade.

Conclusions

This article has adopted a qualitative legal-political approach in order to explain CBAM as an instrument of climate diplomacy and EU normative power, but that approach necessarily imposes analytical limits. Because the definitive phase of CBAM only began in 2026, many effects on investment patterns, firm-level decarbonisation, litigation strategies, and trade restructuring remain only partially visible. In addition, the article does not conduct econometric modelling or sector-specific simulation, and it therefore cannot measure the precise magnitude of welfare losses, carbon-cost pass-through, or employment effects across exposed economies and supply chains. A further limitation concerns the normative scope of the analysis. The article has treated climate diplomacy, legitimacy, and distributive fairness as central interpretive questions, but it has not fully examined how CBAM interacts with domestic politics inside third countries, including state capacity, business lobbying, labour-market effects, and industrial strategy. Nor does it fully resolve the tension between WTO defensibility and broader climate-justice critiques, particularly for low- and middle-income countries facing technical and administrative barriers in emissions monitoring and reporting. These limitations open several important avenues for future research. Longitudinal empirical work is needed to track how firms and governments actually adjust as CBAM costs deepen and free ETS allowances continue to decline. Comparative sector studies in steel, aluminium, fertilisers, and electricity would help explain why some countries move toward carbon pricing and industrial adaptation while others rely on resistance, delay, or trade diversion. Future scholarship should also investigate whether CBAM becomes the foundation of a more interoperable climate-trade order or contributes instead to fragmentation, competing carbon clubs, and new forms of green protectionism.

The present article has argued that the Carbon Border Adjustment Mechanism should be understood not simply as a technical extension of the EU Emissions Trading System, but as an instrument of climate diplomacy and a concrete expression of the European Union's normative power. By linking access to the EU market to the reporting and pricing of embedded carbon emissions, the Union has transformed an internal climate-regulatory logic into an externally consequential framework that shapes the behaviour of firms, sectors, and governments

beyond its borders. The conceptual discussion, literature review, and third-country case studies together show that CBAM already generates effects consistent with both the Brussels Effect and normative power Europe: it induces adaptation through market dependence, encourages regulatory convergence, and recasts climate accountability as a condition of legitimate participation in trade. The article's main contribution lies in showing that third-country responses do not fit a single pattern. Türkiye illustrates anticipatory adaptation under strong EU trade exposure, Ukraine reveals the tension between normative consistency and geopolitical vulnerability, India highlights the intersection of competitiveness concerns with climate-justice claims, and the Gulf states demonstrate that CBAM can produce both pressure and strategic opportunity depending on sectoral emissions profiles and market positioning. These findings suggest that CBAM operates not as a uniform external shock, but as a differentiated structure of incentives that redistributes costs, opportunities, and regulatory expectations across the global economy. The policy implication is clear: if the EU wishes CBAM to function as a legitimate instrument of climate leadership rather than merely a defensible trade measure, it must complement enforcement with diplomatic engagement, technical assistance, and targeted support for monitoring, reporting, and verification systems in low- and middle-income countries. Greater transparency, simplified compliance pathways for smaller operators, and more credible channels for recognising equivalent mitigation efforts abroad would strengthen both the fairness and the geopolitical sustainability of the mechanism. CBAM thus emerges as a powerful but still contested experiment in the externalisation of climate norms through trade.

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THE GEOPOLITICS OF DIGITALIZATION: HOW AI ENHANCES EUROPEAN STRATEGIC AUTONOMY AND GREEN TRANSITIONS

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Abstract: *As the global system fractures into competing technological spheres dominated by the United States and the People's Republic of China, the European Union faces a critical juncture in maintaining its geopolitical relevance. This paper examines the intersection of the so-called „Twin Transition" of digitalization and decarbonization and argues that artificial intelligence (AI) serves as a vital geopolitical instrument through which the EU can pursue Open Strategic Autonomy. Employing a qualitative research design grounded in policy and legal-institutional analysis, the study examines primary EU documents (notably the AI Act, the European Chips Act, and the European Green Deal) and a corpus of secondary academic literature in international relations, technology governance, and environmental studies. The findings suggest that the EU leverages its regulatory market power, the so-called „Brussels Effect" (Bradford, 2020), to embed human-centric and sustainability-oriented norms into the global governance of AI, while simultaneously deploying AI to operationalize the European Green Deal through smart grid optimization, predictive maintenance, climate modeling, and circular economy applications. However, the analysis also identifies structural vulnerabilities: an enduring innovation deficit (Draghi, 2024), persistent dependencies on foreign semiconductor supply chains, and the high concentration of critical raw material refining in third countries (IEA, 2025). The paper concludes that European geopolitical resilience in the age of AI will depend on synthesizing regulatory leadership with robust indigenous technological and industrial capabilities.*

Keywords: *European strategic autonomy; artificial intelligence; Twin Transition; European Green Deal; Brussels Effect.*

1. Introduction

The global distribution of power is undergoing a structural shift. Whereas classical geopolitics focused on the control of territory, maritime chokepoints, and natural resources, the contemporary international system is increasingly defined by mastery over the digital domain (Kello, 2017). At the center of this transformation stands artificial intelligence and the foundational infrastructure that supports it. As the international order fractures into

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competing technological spheres driven primarily by the rivalry between the United States and the People's Republic of China, the European Union finds itself navigating a landscape in which computational power, algorithmic dominance, and data sovereignty are inextricably linked to economic competitiveness and political influence (Bremmer, 2021). At the same time, the EU is pursuing its ambitious „Twin Transition" agenda, seeking to align digital transformation with the climate imperatives of the European Green Deal (Muench et al., 2022).

Within this geopolitical reality, the EU faces a structural vulnerability. Lacking an equivalent to the American „Big Tech" ecosystem or to the state-backed Chinese digital conglomerates, the Union has developed a profound reliance on foreign actors for cloud computing infrastructure, advanced semiconductor manufacturing, and foundational AI models (Leonard et al., 2019; Draghi, 2024). This „digital deficit" risks transforming Europe into a technologically dependent consumer market, with consequences for economic competitiveness, data security, and political sovereignty (Floridi, 2020).

The relevance of the topic stems from this dual condition: on the one hand, AI is reshaping the material foundations of state power; on the other hand, the EU is the only major polity to have chosen to project international influence primarily through regulation rather than corporate or state-led technological dominance. Understanding whether and how this regulatory route can deliver substantive autonomy in the age of AI is therefore a question of both academic and practical significance.

1.1. Context and Research Problem

The research problem this paper addresses concerns the apparent dissonance between the European Union's normative ambitions and its material capabilities in the digital domain. While the EU has produced the world's first horizontal legal framework for AI, the AI Act (European Parliament and Council, 2024), and has launched ambitious industrial policy initiatives such as the European Chips Act (European Parliament and Council, 2023), it remains structurally dependent on foreign hardware, foreign cloud infrastructure, and foreign critical raw materials (IEA, 2025). The problem matters because, in a fragmented international order, technological dependence translates directly into political vulnerability.

1.2. Research Questions

Two research questions guide the inquiry. First, to what extent does the European Union utilize artificial intelligence and AI-related regulation to bolster its strategic autonomy in an increasingly fragmented global technological landscape? Second, in what ways does AI act as a catalyst for the European Green Deal and the broader environmental transition, and what tensions arise between the digital and the green objectives of the Twin Transition?

1.3. Research Objectives

The general objective is to assess the role of artificial intelligence as a geopolitical instrument in the European Union's pursuit of Open Strategic Autonomy and ecological

sustainability. Three specific objectives follow: (i) to map the regulatory, infrastructural, and industrial layers through which the EU seeks to govern AI; (ii) to analyze the synergies and tensions between digitalization and decarbonization in EU policy discourse; and (iii) to identify the principal structural vulnerabilities that constrain the realization of European technological sovereignty.

1.4. Hypothesis

The working hypothesis of the paper is that the European Union's capacity to translate its regulatory leadership in artificial intelligence into substantive strategic autonomy is conditioned upon the simultaneous development of indigenous industrial and infrastructural capabilities. In other words, the „Brussels Effect" (Bradford, 2020) is a necessary but insufficient condition for European technological sovereignty in the age of AI; without complementary investments in compute, semiconductors, and critical raw materials, regulatory power risks producing normative influence without material autonomy.

1.5. Structure of the Paper

The remainder of the paper is organized as follows. Section 2 develops the theoretical and conceptual framework, drawing on the geopolitics of technology, the Brussels Effect, and the evolving notion of strategic autonomy. Section 3 outlines the methodology and sources. Section 4 situates the EU within the global geopolitical landscape of AI. Section 5 analyses AI as a catalyst for the Twin Transition. Section 6 examines European strategic autonomy across the regulatory, data, and hardware layers. Section 7 identifies the principal challenges and vulnerabilities. Section 8 advances policy recommendations. Section 9 concludes and outlines avenues for further research.

2. Theoretical and Conceptual Framework

The paper relies on a tripartite theoretical framework that combines the geopolitics of technology, the theory of regulatory diffusion known as the Brussels Effect, and the conceptual evolution of strategic autonomy in European policy discourse.

2.1. The Geopolitics of Technology

Classical geopolitical theory from Mackinder's „Heartland" thesis to Mahan's analysis of sea power emphasized the control of physical geography as the primary determinant of state power. The twenty-first century, however, has shifted the locus of international power into the digital substrate: data architectures, algorithmic capacity, semiconductor supply chains, and cloud infrastructure (Kello, 2017). Within this contemporary framework, technology is no longer treated as a politically neutral tool but as the very substructure of global influence. Bremmer (2021) has described this development as a „technopolar moment",

in which a small number of large technology firms exercise quasi-sovereign authority over digital space, rivaling states for geopolitical influence. For the EU, which lacks indigenous technology conglomerates of comparable scale, this shift creates an asymmetric environment in which most of the structural foundations of digital power are located outside its jurisdiction.

2.2. The Brussels Effect: Regulatory Power and Normative Diffusion

While the United States projects power through corporate dominance and China through state-backed infrastructure, the European Union projects power primarily through its regulatory capacity. This phenomenon is best captured by the concept of the „Brussels Effect" coined by Bradford (2020). The Brussels Effect operates through both de facto and de jure mechanisms. Because the EU constitutes one of the world's largest and wealthiest consumer markets, multinational corporations frequently find it economically inefficient to maintain separate products for different regulatory environments and instead adopt EU standards globally to minimize compliance costs (Bradford, 2020). The General Data Protection Regulation has been widely cited as the paradigmatic example of this dynamic in the digital domain. The present paper applies the same conceptual lens to the AI Act, which Floridi (2021) and Veale and Zuiderveen Borgesius (2021) interpret as an attempt to embed human-centric, fundamental rights-oriented norms into the global architecture of emerging technologies.

2.3. Strategic Autonomy: from Defense to Open Strategic Autonomy

The concept of strategic autonomy has undergone significant semantic evolution within European policy discourse. Originally rooted in the Common Security and Defense Policy following the 1998 Saint-Malo Declaration, the term initially referred to the EU's capacity to conduct military and crisis management operations independently of the United States and NATO (Fiott, 2018).

In response to the weaponization of global supply chains and the intensifying technological rivalry between the United States and China, the concept has been broadened to encompass economic, trade, and technological dimensions. It is today commonly framed as „Open Strategic Autonomy" (Leonard et al., 2019). This contemporary formulation does not advocate autarky; rather, it emphasizes resilience, defined as the capacity to mitigate critical dependencies, such as reliance on Taiwanese semiconductors, Chinese critical raw materials, or American cloud providers, while preserving open trade relations. In the context of the Twin Transition, Open Strategic Autonomy implies harnessing AI for decarbonization without merely substituting one form of foreign dependence for another (Muench et al., 2022).

2.4. Conceptual Framework: Key Concepts

The analysis relies on four interrelated concepts. Digital sovereignty is understood, following Floridi (2020), as the capacity of a polity to control the digital infrastructures, data flows, and algorithmic systems on which its political and economic life increasingly depends. The Twin Transition, drawing on Muench et al. (2022) and the European Commission's

Strategic Foresight Report (2022), refers not only to the parallel pursuit of digitalization and decarbonization but also to their active integration. Trustworthy AI, as articulated by the High-Level Expert Group on Artificial Intelligence (2019) and codified in the AI Act, denotes AI systems that are lawful, ethical, and technically robust. Finally, technological dependence is understood as a structural condition in which a polity's critical functions can be disrupted by decisions taken in other jurisdictions, a condition that the EU explicitly seeks to mitigate through both regulation and industrial policy (Draghi, 2024).

3. Methodology and Sources

The paper employs a qualitative research design that combines policy and legal-institutional analysis with a critical review of the academic literature. The methodological approach is appropriate to a research problem that involves the interpretation of normative frameworks, institutional dynamics, and contested concepts such as „sovereignty" and „autonomy" (Yin, 2018, on case-study and qualitative methods more generally).

Primary sources include EU legislative texts and official documents most notably the AI Act (European Parliament and Council, 2024), the European Chips Act (European Parliament and Council, 2023), the Communication on the European Green Deal (European Commission, 2019), the Joint Research Centre report on the Twin Transition (Muench et al., 2022), and the Draghi Report on European competitiveness (Draghi, 2024). Reports from international organizations, including the International Energy Agency (IEA, 2025) and the European Union Institute for Security Studies (Fiott, 2018), complement these reports and think tanks.

Secondary sources comprise peer-reviewed academic literature in international relations, technology governance, and environmental studies (e.g., Bradford, 2020; Floridi, 2020, 2021; Roberts et al., 2021; Veale & Zuiderveen Borgesius, 2021; Erie & Streinz, 2021; Bremmer, 2021; Lee, 2018; Zuboff, 2019; Strubell et al., 2019). The triangulation between primary policy documents, expert reports, and academic literature allows the analysis to assess both the stated ambitions of EU policy and the structural conditions under which those ambitions operate. The principal limitation of this approach is that the AI Act and many associated industrial policy instruments have only recently entered into force, so their effects can be analyzed only in terms of design and early implementation rather than long-term outcomes.

4. The global Geopolitical Landscape of Artificial Intelligence

A tripolar competition for technological supremacy and normative influence shapes the contemporary geopolitical landscape of AI. Three distinct governance models can be identified: a market-driven American model, a state-driven Chinese model, and a regulation-driven European „Third Way" (Roberts et al., 2021; Bradford, 2020).

4.1. The United States: a Market-driven Model

The American approach to AI is fundamentally market-driven and has historically privileged private-sector innovation over comprehensive ex ante regulation (Bremmer, 2021). Lee (2018) characterizes this as a „Silicon Valley" paradigm, in which a small number of vertically integrated technology firms aggregate vast datasets, attract concentrated venture capital, and benefit from a deep ecosystem of high-skilled labor. While the United States retains an overwhelming lead in elite AI research the MacroPolo Global AI Talent Tracker (Paulson Institute, 2024) reports that the United States hosts approximately 60 per cent of the world's top-tier AI institutions and remains the leading destination for elite researchers critics have argued that the same model has reinforced monopolistic concentration and created systemic risks for democracy and individual autonomy (Zuboff, 2019).

4.2. The People's Republic of China: a State-driven Model

In contrast, the People's Republic of China has pursued a state-driven approach to AI development. Under the New Generation Artificial Intelligence Development Plan, released by the State Council in July 2017, Beijing has explicitly articulated the objective of becoming the global leader in AI by 2030 (Roberts et al., 2021). The Chinese model is characterized by tight integration between state objectives, large-scale public investment, and nominally private national champions such as Baidu, Alibaba, and Tencent, alongside a doctrine of civil-military fusion that systematically channels civilian technological advances towards military and security applications (Lee, 2018).

Internationally, this model is projected through the „Digital Silk Road", a strand of the Belt and Road Initiative through which Chinese firms supply telecommunications infrastructure, surveillance platforms, and „smart city" technologies to host states across the developing world. Erie and Streinz (2021) describe this dynamic as a „Beijing Effect", through which Chinese standards and approaches to data governance diffuse beyond Chinese borders, generating new dependencies and shaping the global architecture of digital infrastructure.

4.3. The European Union: A Normative „Third Way."

Caught between the lightly regulated American model and the state-directed Chinese model, the European Union has positioned itself as a normative „Third Way" anchored in human rights, democratic oversight, and environmental sustainability (Floridi, 2021). This positioning is the product of both necessity and design: the EU lacks indigenous tech conglomerates of comparable scale to those of the United States or China, but it possesses a deep and wealthy consumer market and a tradition of regulatory innovation (Bradford, 2020).

Driven by the Ethics Guidelines for Trustworthy AI (High-Level Expert Group on Artificial Intelligence, 2019) and codified in the AI Act, the European model insists that technological development be subordinate to fundamental rights and to the Union's green objectives. Defensively, this regulatory architecture is intended to shield European citizens and markets from the externalities of surveillance capitalism (Zuboff, 2019) and from techno-

authoritarian practices (Erie & Streinz, 2021). Offensively, it seeks to leverage the Brussels Effect to project European norms into global AI governance (Bradford, 2020; Veale & Zuiderveen Borgesius, 2021).

5. Artificial Intelligence as a Catalyst for the Twin Transition

The European Union has framed the Twin Transition, the simultaneous pursuit of digitalization and ecological sustainability, as the cornerstone of its contemporary industrial strategy. Within this paradigm, AI serves as a critical enabler, translating the climate objectives of the European Green Deal (European Commission, 2019) into operational reality. However, leveraging AI for environmental purposes creates a significant duality: AI is both a powerful optimizer of resource efficiency and a highly energy-intensive technology in its own right (Strubell et al., 2019).

5.1. Synergies between the Digital and the Green

The Twin Transition concept holds that the European Union's digital and green agendas are mutually reinforcing rather than parallel (Muench et al., 2022). The Joint Research Center report Towards a Green and Digital Future argues that the EU cannot reach climate neutrality by 2050 without a deep integration of advanced digital technologies across the most emissions-intensive sectors, namely agriculture, buildings and construction, energy, energy-intensive industries, and transport and mobility (Muench et al., 2022). In this framing, AI processes vast and unstructured datasets generated by industrial sensors and the Internet of Things, identifies inefficiencies, optimizes supply chains, and enables a transition from linear to circular production models.

5.2. AI in Energy Systems

One of the most significant applications of AI within the European Green Deal concerns the modernization of the continent's energy infrastructure. The shift from centralized fossil-fuel generation to distributed renewable energy sources introduces substantial volatility into the power grid (Muench et al., 2022). Machine-learning algorithms are deployed in smart grids to predict localized demand, balance intermittent renewable supply, and prevent grid instability. Predictive maintenance models, trained on sensor data from offshore wind turbines and photovoltaic installations, anticipate mechanical failures and reduce operational costs. AI also facilitates the emergence of decentralized, peer-to-peer energy markets in which prosumer households or firms that both consume and produce electricity can trade surplus generation.

5.3. AI in Climate Mitigation and the Circular Economy

Beyond the energy sector, AI is being deployed across the European Union to mitigate climate change and optimize resource use. Deep-learning techniques are improving the resolution and accuracy of climate models, with European initiatives such as Destination Earth aiming to develop high-precision „digital twins" of the planet to support evidence-based policymaking. In the transport sector, AI is used to optimize logistics, manage urban congestion, and underpin electrified and increasingly autonomous mobility solutions. In the circular economy, AI improves waste sorting through computer vision in recycling facilities and supports the design of products and processes that minimize material waste (Muench et al., 2022).

5.4. The Sustainability Paradox of Artificial Intelligence

Notwithstanding its potential to support the European Green Deal, AI generates a significant sustainability paradox. The computational power required to train and operate large neural network models is high in both energy and water terms. Strubell et al. (2019) demonstrated that training a single large natural-language-processing model can emit several hundred metric tonnes of carbon dioxide equivalent and consume an amount of electricity comparable to the annual consumption of dozens of households. The proliferation of hyperscale data centers also places considerable strain on local water resources used for cooling. At the same time, the rapid obsolescence of specialized hardware contributes to the volume of electronic waste.

If the digital transition relies on energy-intensive AI models running on fossil-fuel-based electricity, it risks undermining the very climate mandates that the Twin Transition is supposed to advance (Muench et al., 2022). Resolving this paradox is therefore a geopolitical as much as an environmental imperative for the European Union, and is reflected in the AI Act's provisions on energy and resource reporting for general-purpose AI systems (European Parliament and Council, 2024; Veale & Zuiderveen Borgesius, 2021).

6. European Strategic Autonomy in the Digital Age

To pursue Open Strategic Autonomy and to operationalize the Twin Transition, the European Union must navigate its dependence on foreign digital infrastructure. The Union's strategy operates simultaneously across three layers: a regulatory layer that governs how AI is used; a data layer that shapes where information resides; and a physical layer that produces the hardware on which AI runs.

6.1. Normative Power through Regulation: the AI Act

The most visible mechanism of European technological strategy is the projection of normative power through proactive regulation. The Artificial Intelligence Act (Regulation

(EU) 2024/1689), which entered into force in 2024, constitutes the world's first comprehensive horizontal legal framework for AI (European Parliament and Council, 2024).
Unlike the United States, which has historically relied on voluntary corporate commitments, or China, which prioritizes state control, the AI Act adopts a risk-based regulatory architecture. It categorizes AI systems by risk level, prohibits practices considered to be of „unacceptable risk" (such as social scoring by public authorities or untargeted scraping of facial images for the construction of biometric databases), and imposes detailed compliance, transparency, and data governance requirements on „high-risk" systems (Veale & Zuiderveen Borgesius, 2021). For general-purpose AI models, the Act introduces additional obligations relating to documentation, training data summaries, and the disclosure of certain risks. From a geopolitical perspective, the Act compels foreign technology firms seeking access to the European single market to align their products with European norms, thereby instantiating the Brussels Effect in the AI domain (Bradford, 2020; Floridi, 2021).

6.2. Data Sovereignty and Cloud Infrastructure

Artificial intelligence is fundamentally dependent on access to large, high-quality data repositories. Nevertheless, the European data economy is hosted to a substantial extent on cloud infrastructure controlled by non-European hyperscalers, which generates well-documented concerns regarding the application of extraterritorial legislation, most notably the United States CLOUD Act, to data stored on European territory (Floridi, 2020). In response, European actors have pursued initiatives such as Gaia-X, which aims to establish federated, interoperable, and reversible standards for cloud and data services. Floridi (2020) characterizes this strategy as a „fight for digital sovereignty" through which the EU seeks to reclaim agency over the digital substrate of its economic and political life.

6.3. Industrial Policy and the Hardware Bottleneck: The Chips Act

The most acute structural vulnerability of the EU's digital strategy lies at the foundational physical layer. The Union currently accounts for less than 10 percent of global semiconductor manufacturing capacity and is heavily dependent on Taiwan and the United States for the most advanced nodes (European Commission, 2022). To address this vulnerability, the EU has enacted the European Chips Act (Regulation (EU) 2023/1781), which mobilizes public and private investment with the explicit objective of doubling the EU's share of global semiconductor production capacity to 20 percent by 2030 (European Parliament and Council, 2023; European Commission, 2022).
The Chips Act represents a notable shift away from strict neoliberal principles towards a more assertive industrial policy. By subsidizing the construction of „first-of-a-kind" facilities on European territory and supporting investment in advanced packaging, design platforms, and pilot lines, the Union seeks to secure the hardware foundations on which both AI and the Green Deal depend. Independent assessments, however, suggest that the 20 percent target is highly ambitious and that, even with full implementation of the Act, Europe will remain

structurally dependent on East Asian and North American producers for the most advanced nodes for at least the remainder of the decade (Draghi, 2024).

7. Challenges and Vulnerabilities

While the European Union has produced an ambitious regulatory and industrial agenda, the realization of Open Strategic Autonomy is constrained by an enduring innovation gap, persistent human capital deficits, and deep dependencies on foreign supply chains for critical raw materials.

7.1. The Innovation Gap and the Fragmentation of Capital

The Draghi Report on the future of European competitiveness diagnoses a profound innovation deficit, arguing that the European Union has fallen significantly behind the United States and China in the development and commercialization of frontier digital technologies, and that closing this gap will require additional annual investments in the order of EUR 750 to 800 billion (Draghi, 2024). A central driver of this gap is the fragmentation of European capital markets: while early-stage venture capital is relatively accessible, the deep pools of late-stage venture capital and private equity that characterize the United States' ecosystem are absent (Draghi, 2024; Leonard et al., 2019). As a consequence, European technology firms with global ambitions are frequently compelled to relocate their headquarters to the United States to secure capital for scaling, thereby transferring intellectual property and future market dominance to a systemic competitor.

7.2. The Human Capital Deficit

Artificial intelligence is a strongly talent-constrained field, and geopolitical dominance is closely correlated with the capacity to attract and retain elite researchers. The MacroPolo Global AI Talent Tracker (Paulson Institute, 2024) reports that the United States hosts approximately 60 percent of the world's top-tier AI institutions and remains the leading destination for elite AI talent at the post-graduate level, while approximately 80 percent of researchers who complete graduate studies in the United States subsequently work there. The structural drivers of this concentration include compensation differentials between American hyperscalers and European employers, as well as a significant compute deficit: frontier AI research requires access to large supercomputing clusters, which are predominantly located in the United States (Draghi, 2024).

7.3. Critical Raw Materials and Geopolitical Chokepoints

The most acute physical vulnerability of European strategic autonomy lies at the base of the supply chain. Both the digital and the green dimensions of the Twin Transition are

highly materials-dependent: AI requires advanced semiconductors, while renewable energy and electrified transport require lithium-ion batteries, photovoltaic cells, and permanent magnets manufactured from rare-earth elements. According to the International Energy Agency, China accounted for approximately 90 percent of global refining of magnet rare earths and the overwhelming majority of refining capacity for battery-grade graphite in 2024, and the geographic concentration of refining has increased rather than decreased since 2020 (IEA, 2025).

Recent years have illustrated the weaponization of these dependencies, including Chinese export controls on gallium, germanium, antimony, and several heavy rare earth elements (IEA, 2025). The European Union has responded with the Critical Raw Materials Act and with diplomatic outreach to alternative suppliers. However, building substitute refining capacity is a long-term project, leaving Europe exposed in the medium term.

8. Policy Recommendations

Based on the analysis above, four policy directions can be identified. First, the European Union should accelerate the completion of the Capital Markets Union to mobilize late-stage capital for European technology firms, in line with the recommendations of the Draghi Report (Draghi, 2024) and earlier analyses of European economic sovereignty (Leonard et al., 2019). Second, the Union should embed origin and low-carbon requirements into public procurement and state aid for digital and green infrastructure, building on the framework of the Chips Act and the Critical Raw Materials Act (European Parliament and Council, 2023).

Third, the implementation of the AI Act should be complemented by expanding regulatory sandboxes and proportionate compliance pathways for small and medium-sized enterprises and academic researchers, to mitigate the risk that compliance costs disproportionately benefit large foreign incumbents (Veale & Zuiderveen Borgesius, 2021). Fourth, future digital infrastructure policy should impose stringent environmental conditionality on hyperscale data centers, including requirements for renewable energy supply, waste-heat reuse, and water-efficient cooling, in line with the sustainability principles articulated in the AI Act (European Parliament and Council, 2024) and the Joint Research Center's Twin Transition framework (Muench et al., 2022).

Conclusions

This paper has argued that artificial intelligence functions as a vital geopolitical instrument in the European Union's pursuit of Open Strategic Autonomy and ecological sustainability. The Union has used its regulatory market power to embed human-centric and environmentally oriented norms into global AI governance, while simultaneously deploying AI to operationalize the Green Deal across the energy, mobility, and circular-economy sectors.

At the same time, the analysis has highlighted a profound dissonance between regulatory ambition and material reality. Open Strategic Autonomy remains constrained by an enduring innovation deficit, fragmented capital markets, persistent dependencies on

foreign cloud and semiconductor infrastructure, and a high concentration of critical raw material refining in third countries. The hypothesis of the paper that regulatory power is necessary but insufficient for European technological sovereignty is therefore supported by the available evidence.

Original Contribution

The original contribution of the paper consists in articulating an integrated reading of European strategic autonomy that links three layers of analysis: regulation, data, and hardware, to the dual objectives of digital sovereignty and ecological transition. By treating the AI Act, the Chips Act, and the European Green Deal as elements of a single geoeconomic strategy, rather than as separate policy initiatives, the paper offers a framework that may be useful for future empirical work on European technological sovereignty.

Limitations and Avenues for Future Research

The paper is subject to several limitations. The recent entry into force of the AI Act and of the Chips Act means that empirical assessments of their effectiveness must remain preliminary. The reliance on qualitative document analysis, while appropriate for the research question, does not allow for the kind of quantitative measurement of outcomes that longitudinal studies could eventually provide. Future research could empirically investigate the global diffusion of the AI Act to assess whether the Brussels Effect retains its potency in an era of heightened technological nationalism and to evaluate the extent to which the Chips Act and complementary instruments succeed in reshoring critical semiconductor capacity by 2030.

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PUBLIC HEALTH CO-BENEFITS OF THE EUROPEAN GREEN DEAL: ECONOMIC AND HEALTH EQUITY DIMENSIONS OF EUROPE'S TRANSITION TO CLIMATE NEUTRALITY

Ahmed Azzam ALI[1]

Abstract: *The European Green Deal (EGD), launched in December 2019, is the European Union's overarching strategy for climate neutrality by 2050. This paper examines the EGD as a public health policy and asks how its credibility now depends on confronting three structural challenges: distributing the health co-benefits of decarbonisation equitably across Member States, securing the economic case for transition under tightening fiscal and competitiveness constraints, and sustaining political legitimacy in an environment marked by backlash against green policy. Drawing on the 2024 Lancet Countdown Europe report, the 2025 global Lancet Countdown, the European Environment Agency's most recent burden-of-disease and industrial pollution assessments, peer-reviewed modelling studies, and the World Bank's 2023 review of the EGD, the paper argues four propositions. First, decarbonisation is a public health intervention: tens of thousands of premature deaths in the EU are avoidable each year through clean-air policy aligned with climate targets. Second, the air-quality and agricultural co-benefits of climate policy can offset a substantial share of mitigation costs, making the transition economically rational independent of long-run climate damages. Third, the energy mix chosen during the transition is at least as decisive for health outcomes as the speed of decarbonisation, and the Just Transition Mechanism in its current envelope is too narrow to close regional and social inequalities. Fourth, framing climate policy in health terms is the most defensible political response to the backlash now visible in EU institutions and elections. The paper concludes that the next phase of the EGD will be judged less by headline emission targets than by whether health, equity, and competitiveness are integrated into a single, durable policy architecture.*

Keywords*: European Green Deal; climate neutrality; public health; health equity; just transition.*

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Introduction

In December 2019, the European Commission unveiled the European Green Deal (EGD), framing climate neutrality by 2050 as the defining political project of the Union for the coming decades (European Commission, 2019). The EGD is broader than a climate package. It encompasses energy, transport, industry, agriculture, biodiversity, pollution, and finance, and it has since been operationalised through the European Climate Law, the Fit for 55 package, the Zero Pollution Action Plan, the revised Ambient Air Quality Directive, and the Farm to Fork Strategy, among other instruments. The political legitimacy of the EGD has so far been argued primarily in environmental and economic terms, but a growing evidence base suggests that its public health dimension may be equally important and, in the present political environment, possibly more persuasive.

Climate change is no longer a distant scenario for Europe. The 2024 Europe report of the Lancet Countdown on health and climate change tracks 42 indicators and documents that the European region is warming at roughly twice the global average, with heat-related mortality among adults over 65 rising by 167% relative to the 1990s and the geographic range of vector-borne diseases such as West Nile virus, dengue, and leishmaniasis expanding northward (van Daalen et al., 2024). Air pollution remains the largest environmental health risk in Europe. The European Environment Agency estimates that long-term exposure to fine particulate matter alone was associated with approximately 182,000 attributable deaths in the EU in 2023, with further deaths attributable to ozone and nitrogen dioxide (European Environment Agency [EEA], 2025a).

This paper examines the EGD as a public health intervention and as a test case for how Europe handles three connected challenges. The first is distributional: climate policy delivers the largest health gains where current pollution and energy poverty are highest, but the institutional and fiscal capacity to capture those gains is weakest. The second is economic: the EGD's viability depends on whether avoided health costs and productivity gains genuinely offset mitigation costs, and on whether the transition produces credible employment alternatives. The third is political: the 2024 European Parliament elections and ongoing legislative backlash have narrowed the coalition supporting ambitious climate policy. The paper proceeds by mapping the climate-health nexus in Europe, analysing the air-quality co-benefits of decarbonisation, examining health equity and the Just Transition Mechanism, assessing the economic dimensions of green employment and avoided healthcare costs, addressing the role of the Farm to Fork Strategy and of greener healthcare systems, considering adaptation and emerging health threats, and finally evaluating the political economy of the EGD's next phase.

The Climate-Health Nexus in Europe

The case for treating the EGD as a health policy begins with the scale of avoidable mortality and morbidity attributable to environmental factors in Europe. The EEA's 2025 update of the burden-of-disease assessment estimates that reducing air pollution to World

Health Organization (WHO) guideline levels could have prevented approximately 182,000 deaths attributable to PM2.5, 63,000 to ozone, and 34,000 to nitrogen dioxide in the EU in 2023 (EEA, 2025a). Premature deaths attributable to PM2.5 fell by 57% between 2005 and 2023, exceeding the Zero Pollution Action Plan target of a 55% reduction by 2030 ahead of schedule (EEA, 2025a). At the same time, almost everyone living in European cities, around 95% of the urban population, remains exposed to PM2.5 above WHO guideline levels, indicating that the residual burden is substantial and that further gains depend on continued alignment between climate, energy, and air quality policy.

The 2025 Lancet Countdown reinforces this picture at the global level. Of 20 health impact indicators, 12 reached record levels in the latest data, including a 23% increase in the rate of heat-related mortality since the 1990s (with an annual average of 546,000 heat-related deaths) and an estimated 154,000 deaths from wildfire smoke PM2.5 in 2024 alone (Romanello et al., 2025). For Europe specifically, the Lancet Countdown Europe finds that climate adaptation spending in health remains critically inadequate even as exposure to compound hazards intensifies food insecurity, with nearly 60 million Europeans experiencing moderate or severe food insecurity in 2021 (van Daalen et al., 2024). These figures support a reframing of climate policy as health policy: every fraction of a degree of warming avoided, and every microgram of PM2.5 removed, translates into measurable mortality reductions.

Air Quality Co-Benefits of Decarbonisation

Decarbonisation and air-quality improvement share most of their causal pathways, since fossil-fuel combustion is simultaneously the principal anthropogenic source of greenhouse gases and a dominant source of PM2.5 and NO2. The EEA's most recent industrial pollution assessment finds that environmental and health costs of European industry decreased by 33% between 2012 and 2021, with the energy sector accounting for approximately 80% of that reduction, primarily through the implementation of best available techniques and a shift to less polluting fuels driven by EU environmental and climate policy (EEA, 2024). Industrial air-pollution costs nonetheless remained equivalent to roughly 2% of EU GDP in 2021, and just 1% of facilities, predominantly coal power plants, accounted for half of total damages, indicating where further policy effort is most efficient (EEA, 2024).

Short-run estimates are reinforced by long-run modelling. Vandyck et al. (2018) showed that the air-quality co-benefits of climate policy on morbidity, mortality, and agriculture could globally offset the costs of meeting Paris Agreement pledges. A more ambitious 2°C-compatible pathway would prevent between 178,000 and 346,000 premature deaths annually by 2030 and up to 0.7–1.5 million by 2050 globally (Vandyck et al., 2018). High-resolution modelling for Europe by Pisoni et al. (2025) extends this evidence to the sub-national scale: under the most ambitious mitigation scenario (SSP1-1.9), more than 90% of the European population would meet WHO PM2.5 guidelines by 2100, with annual premature deaths in Europe falling to roughly 67,000, whereas under high-emission scenarios premature deaths could remain above 220,000. Markandya et al. (2018) and Aleluia Reis et al. (2022) converge on the conclusion that integrating air-pollution and climate objectives is welfare-

enhancing in nearly all major economies, and that ambitious mitigation pathways generate health co-benefits that reduce or offset their cost.

The EU's revised Ambient Air Quality Directive (2024/2881), adopted in October 2024 and entering into force in December of the same year, brings binding EU standards substantially closer to WHO recommendations and embeds a long-term zero-pollution objective for 2050 (European Parliament & Council of the European Union, 2024). Member States have until December 2026 to transpose the directive and must comply with the new limit values by 2030. Combined with the Zero Pollution Action Plan, the directive provides a legal architecture in which continued progress on key pollutants is expected through alignment with energy and climate policy rather than through stand-alone air-quality measures.

Health Equity and Regional Disparities

Aggregate European figures conceal pronounced regional inequalities in both the burden of pollution and the capacity to adapt. Pei et al. (2025) demonstrate that the health benefits of energy efficiency are markedly higher in Eastern Europe than in Western or Northern Europe: saving the same amount of electricity in Estonia delivers more than a thousand times the health benefits than the same saving in Sweden. The reason is straightforward. Countries that remain more dependent on coal and on emissions-intensive biofuels carry a disproportionately high air-quality health burden relative to their direct climate burden, and the type of energy source used during the transition is at least as decisive for health outcomes as the speed of decarbonisation (Pei et al., 2025). For Eastern European Member States, including Romania, this finding is consequential. A transition that replaces coal with natural gas, rather than with renewables and demand-side efficiency, would lock in a much smaller share of the available health gains.

Vulnerability is not only spatial but also social. Children, older adults, outdoor workers, and low-income households bear disproportionate health burdens from climate change (van Daalen et al., 2024). Energy poverty intersects systematically with health vulnerability: households unable to afford clean heating face combined exposure to indoor pollution and cold-related illness. Pisoni et al. (2025) further show that air-pollution mortality in Europe is concentrated in older age groups, with people aged 85 and over accounting for a rising share of premature deaths as populations age. These intersections matter for EGD design. An instrument that reduces aggregate emissions while leaving vulnerable households exposed to higher relative energy costs would deliver climate gains at the price of widening health inequalities, and would weaken precisely the political coalition the EGD needs to survive.

The Just Transition Mechanism: Equity Gaps

The EGD's principal answer to these distributional concerns is the Just Transition Mechanism (JTM), which mobilises approximately 55 billion EUR over 2021–2027 to support

regions, industries, and workers most exposed to the transition, of which the Just Transition Fund alone provides 19.7 billion EUR for the most affected regions (European Commission, 2021). The Social Climate Fund, established under the Fit for 55 package, is designed to support vulnerable households in the decarbonisation of transport and buildings. The World Bank, in its review of the EGD, argues that a credible transition must avoid replicating the income disparities seen in earlier transitions such as globalisation, and identifies education, health, and social protection policies as essential mechanisms to mitigate transition costs (Sanchez-Reaza et al., 2023).

Equity gaps nonetheless remain substantial. The combined fiscal envelope is small relative to the scale of regional transformation required, and the territorial just transition planning process, while it has created precedent for participatory governance, depends heavily on institutional capacity at the regional level. The World Bank assessment further notes that prosperous and innovative regions are best placed to capture the benefits of green transition, while less developed areas face higher costs of adjustment and lower adaptive capacity (Sanchez-Reaza et al., 2023). For health systems, the implication is that just-transition resources must explicitly include investments in primary care, occupational health, and adaptation infrastructure in the regions most exposed to coal phase-out, rather than being absorbed entirely by labour-market and infrastructure measures. Without such an explicit health envelope, the JTM risks treating health as an externality of transition rather than as one of its central deliverables.

Economic Dimensions: Green Employment and Healthcare Savings

The economic case for the EGD is increasingly compatible with its health case. The renewable energy sector employed approximately 1.8 million people in the EU in 2023, and EU renewable energy employment has grown markedly since the early 2020s, especially in solar photovoltaics, heat pumps, and wind (International Renewable Energy Agency [IRENA] & International Labour Organization [ILO], 2024). At the global level, IRENA and the ILO estimate that the renewable energy workforce reached 16.2 million in 2023, with continued growth concentrated in China, the EU, and the United States (IRENA & ILO, 2024). A high-ambition EGD pathway is therefore not labour-market neutral; it reallocates employment from fossil-intensive to low-carbon sectors, with implications for skills, social protection, and regional policy.

Healthcare savings reinforce these labour-market gains. The EEA's 2024 industrial pollution assessment documents a 33% reduction in environmental and health costs between 2012 and 2021, with the energy sector responsible for the bulk of that reduction (EEA, 2024). At the firm and worker level, evidence from Spanish social-security data shows that ambient PM10 concentrations exert a statistically and economically significant causal effect on sick leave incidence, and that air-quality improvements between 2005 and 2014 were associated with millions of avoided sickness days and substantial gains in foregone production (Holub et al., 2020). Markandya et al. (2018) and Aleluia Reis et al. (2022) further show, using global integrated assessment models, that health-aware climate policy is welfare-enhancing in nearly

all major economies, providing a robust economic rationale for the EGD beyond strict cost-effectiveness analyses of mitigation.

Farm to Fork: Food Systems and Public Health

The Farm to Fork Strategy, adopted in 2020, is the first EU-wide framework to address the food system as an integrated determinant of health and sustainability (European Commission, 2020). Its public-health implications are direct. The strategy targets a 50% reduction in chemical pesticide use by 2030, addressing chronic exposures associated with cancers and endocrine disruption, and a 25% share of EU farmland under organic farming by 2030, with collateral benefits for biodiversity and antimicrobial resistance reduction. It also explicitly aims to reorient food environments toward healthier diets, in a context in which more than 950,000 deaths in the EU were attributable to dietary risks in 2017, primarily through cardiovascular disease and cancer, and in which more than half of EU adults are overweight (European Commission, 2020).

From a public-health perspective, the Farm to Fork Strategy operationalises a key insight of the climate-health nexus: that mitigation and adaptation in food systems are inseparable from nutrition and chronic-disease prevention. The Council of the EU and the European Parliament have endorsed this integrated approach in successive conclusions and resolutions, even as implementation has met resistance from segments of the agricultural sector. The political contestation around the strategy underlines a broader pattern within the EGD: instruments with the largest health co-benefits are also the ones with the most politically organised opposition, and weakening them in response to short-term political pressure carries significant long-term health costs that rarely enter the debate.

Greening Healthcare Systems

Healthcare systems occupy an unusual position within the EGD: they are both affected by climate change and significant contributors to it. The 2024 Lancet Countdown Europe report added healthcare emissions as a new tracked indicator, recognising that health systems must transition alongside the broader economy if the EU is to achieve climate neutrality by 2050 (van Daalen et al., 2024). Beyond emissions, the climate resilience of hospitals and primary care networks has become a planning priority in the wake of recent heatwaves and wildfire events, both of which have generated demand surges that strain capacity even in well-resourced systems.

An emerging ecosystem of practice-oriented tools supports decarbonisation at the level of individual facilities. Practice Greenhealth, the Canadian Coalition for Green Healthcare, and My Green Doctor each provide methods for energy management, waste reduction, and clinical pathway redesign that can be embedded in routine quality improvement (Canadian Coalition for Green Healthcare, n.d.; My Green Doctor, n.d.; Practice Greenhealth, n.d.). For Member States with constrained healthcare budgets, including those of Central and Eastern Europe,

such tools offer a low-cost route to bringing healthcare into the EGD, without requiring large capital outlays in advance of national co-financing. The challenge is institutional rather than technical: healthcare decarbonisation requires national health authorities to treat climate metrics as quality metrics, and to align procurement, capital planning, and clinical guidelines accordingly.

Climate Adaptation and Emerging Health Threats

Even with rapid mitigation, a substantial degree of climate change is now locked in, and adaptation has become an unavoidable component of European public-health policy. The 2025 Lancet Countdown finds 12 of 20 health impact indicators at record levels, including a 23% increase in the rate of heat-related mortality and a record burden from wildfire smoke (Romanello et al., 2025). For Europe, this implies that adaptation must address heat (through urban planning, cooling infrastructure, and occupational protection), expanding vector-borne disease ranges (through surveillance and entomological capacity), and food and water security under more variable conditions.

The current allocation of climate finance to health adaptation in Europe remains modest relative to the scale of these threats. The Lancet Countdown Europe assessment notes that adaptation spending in health is critically inadequate, and that even well-resourced Member States have not yet integrated heat-health action plans, vector-borne disease surveillance, and disaster preparedness into a coherent national framework (van Daalen et al., 2024). Closing this gap is one of the more concrete contributions that the EGD's next phase, including the European Climate Adaptation Strategy, can make to public health, and one that does not require new fiscal envelopes so much as the redirection of existing health and structural funds.

Policy Integration: Health in All Climate Policies

A recurring theme of the literature reviewed here is that the public-health potential of the EGD is unlocked only when health considerations are formally integrated into the design of climate, energy, and agricultural policies, rather than treated as ex post benefits. As Pei et al. (2025) put it, the technical capability now exists to integrate public-health considerations directly into energy policy, and the principal obstacle is institutional rather than scientific. The architecture of the EGD provides multiple entry points for such integration. The European Climate Law, the Fit for 55 package, the revised Ambient Air Quality Directive, the Zero Pollution Action Plan, and the Farm to Fork Strategy each contain decision points at which health indicators could be made binding rather than indicative.

The 2025–2026 negotiations on the 2040 climate target illustrate both the opportunity and the risk. In November 2025, the Council and the European Parliament agreed positions endorsing a 90% reduction in net greenhouse gas emissions by 2040 relative to 1990, and a provisional political agreement was reached in December 2025; the amendment to the

European Climate Law entered into force in April 2026 (Council of the European Union & European Parliament, 2025; European Parliament, 2025). The political compromise included expanded flexibilities, including a higher cap on the contribution of high-quality international carbon credits and a delay of the ETS2 carbon market for buildings and road transport. From a public-health perspective, such flexibilities are not neutral. International credits do not deliver local air-quality co-benefits, and a delayed ETS2 postpones the price signal that would accelerate the shift away from fossil heating in buildings, where the health gains for vulnerable households are largest. Health-impact assessment of these design choices, currently absent from the legislative process, would make the trade-offs visible and politically accountable.

Challenges and Political Context

The political environment in which the EGD operates has shifted considerably since 2019. Implementation faces several structural challenges. Divergent national interests, rooted in economic disparities among Member States, generate uneven commitment levels. The combined fiscal envelope of the JTM falls short of what comprehensive regional transformation requires. The 2024 European Parliament elections produced significant gains for political forces that explicitly oppose central elements of the EGD, and subsequent legislative cycles have seen pressure to weaken provisions of the Common Agricultural Policy and the deforestation regulation. Geopolitical tensions, particularly the energy security concerns triggered by Russia's invasion of Ukraine, have at times pulled energy policy in directions that compete with climate ambition, including renewed investment in fossil-gas infrastructure.

There are equally strong reasons for resilience. The EGD is by now embedded in dozens of legislative provisions, ranging from the European Climate Law to sector-specific directives, which make wholesale dismantling legally and politically costly. The economic logic of inaction is increasingly unfavourable: the cost of non-transition, in terms of energy poverty, healthcare expenditure, and climate-related damages, is becoming visible to citizens and to treasuries. The April 2026 entry into force of the 2040 climate-law amendment, even with its negotiated flexibilities, demonstrates that the political coalition supporting the EGD remains operative. Health framing of climate policy, as advocated in this paper, is one of the most defensible routes to sustaining that coalition. The benefits it foregrounds, fewer premature deaths, lower healthcare costs, healthier children, are tangible, locally visible, and ethically difficult to dismiss in a way that aggregate emission targets are not.

Conclusions

The European Green Deal is at once a climate strategy, an industrial strategy, and, less often acknowledged, a public-health strategy. The evidence reviewed in this paper supports four conclusions. First, decarbonisation is a public-health intervention: tens of thousands of premature deaths per year in the EU are avoidable through clean-air policy aligned with climate targets, and continued progress against the Zero Pollution Action Plan target depends

on ambitious implementation of the Climate Law and the revised Ambient Air Quality Directive. Second, the health and agricultural co-benefits of climate policy can offset a substantial share, and in some scenarios the totality, of mitigation costs, making the green transition economically rational independent of long-run climate damages. Third, equity must remain central: without a credible just transition that addresses regional energy mixes, vulnerable households, and the health workforce, the EGD risks deepening existing disparities even as it reduces aggregate emissions. Fourth, health is the human face of climate policy and, in the present political environment, the most defensible argument for sustained ambition. Translating this argument into governance, through health-impact assessment, explicit health envelopes in climate finance, integrated indicators in the European Semester, and binding health metrics in the next round of National Energy and Climate Plans, is the central task of the next phase of the EGD. The challenge is not to choose between climate ambition, competitiveness, and social fairness, but to design the institutions that allow Europe to deliver all three at once.

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THE EUROPEAN GREEN DEAL – THE REAL BIG DEAL: MAKE EUROPE GREEN AGAIN

Laszlo BOCSKAI [1]

Abstract: *Europe has carried the banner of cultural, technical and economic evolution throughout history. Being at the crossroads of Eastern and transatlantic influences, it has always known how to defend its values, values for which entire generations have paid the ultimate price. The 21st century already threatens Europe with an extremely large number of complex dangers, dangers that require adequate, prompt reactions, in the spirit of promoting quality of life, social stability and an economy based on non-polluting energy resources.*

Keywords: *green deal, big deal, clean energy, life quality, social stability.*

Introduction

As Zbigniew Brzezinski notes in The Grand Chessboard (1997, pp. 31–35), Europe has historically represented a central geopolitical space shaped by the competition of major powers. Europe is at a crossroads. It stands, as it has always been throughout history, at the intersection of competing interests of powers from other continents. This is especially true for Asia, but also for Africa and, by extension, for North and South America. The dynamics of strategic policies have grown exponentially, incomparably faster than the tectonic movements of the continents themselves.

The European Green Deal-Why It Matters

Daniel Yergin argues in The New Map (2020, pp. 78–82) that energy resources remain one of the most influential instruments of geopolitical and economic power. Climate change is visible and affects our daily lives, regardless of the meridian on which we live. What over the decades seemed like a right and an acquired advantage, namely the quality of life, currently seems to be an increasingly unstable construction, the foundation on which it was based, energy resources, not being inexhaustible, but also extremely polluting, with harmful effects

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on nature, but also on human society. The cost of inaction or hesitant policies, of expensive projects but with intangible, negligible results, could have catastrophic consequences, given the complexity of modern society. Nature competes with us much more effectively in terms of regeneration power, even in the areas most affected by pollution on the globe. During the Covid-19 pandemic, when human activity and interference decreased to a historic minimum, nature began a remarkable process of self-cleaning, visible also from satellite space. On the other hand, despite some resounding projects, some large local and global investments still do not manage to leave behind definitively those energy resources that have made modern life sustainable for decades, comfortable for decades in a row. It is about a kind of „Goodbye, but I'll stay with you", a very damaging attitude and perspective, exploited in an extremely cynical but realistic way, from a geopolitical point of view, by state powers that own vast energy resources. Energy resources can create, build empires, societies that develop constantly, the shortage or lack of energy resources can, on the other hand, disintegrate, or at least seriously affect, damage a social construction that seemed stable.

The European Green Deal – What it means

Ulrich Beck's concept of the "risk society" (1992, pp. 21–27) becomes increasingly relevant in the context of climate instability and environmental uncertainty. The European Green Deal expresses not only a simple community spirit of conservation of European civilization but also the courage to think, plan and act in the face of an imminent danger: once the critical point in the process of contamination of the natural ecosystem, of which man is an integral part, is exceeded, an irreversible moment is reached when natural processes (stable and repetitive for millions of years and can thus be described by mathematical models) become chaotic, unpredictable, a situation in which nature itself seems to take drastic measures to correct the deviations caused by human decisions and actions. We could say that at global level the impact of green policies is limited, seen as a package of controversial laws and, in the end, what Europe has only succeeded in is the externalization of some industrial, agricultural and especially energy production processes, thus putting pressure on other local and regional natural ecosystems on other continents. In addition to these, we can highlight the extremely high costs, both financial and socio-economic, which must be made without the result being guaranteed. It seems to be a bet or a card game in which Europe cannot pull even an ace out of its sleeve, thus becoming the big loser of the global geostrategic game. Europe's great asset, however, is the initiation and support of this (perfectible) Green Deal project, this being a new card, unknown (we can call it the green card of clean and renewable energy resources) by those sitting at the table of the global geostrategic game, forcing them to accept the new rules of a game in which, until now, the detached winners were almost always known. These are those states and multi-state organizations that benefit from the advantage of „allocating" energy resources on their territory, these resources becoming formidable weapons in negotiations, constraints or even economic blackmail. In other words, the one who sells hydrocarbons wins on two levels: financially (stable income due to increasing demand and low-negotiable selling

prices) but also politically, the desire to impose national doctrinal policies at the international level being inevitable.

The European Green Deal – Main Objectives

Jeremy Rifkin, in The Green New Deal (2019, pp. 55–61), emphasizes that technological transition may generate entirely new economic and industrial ecosystems.

The Green Deal proposes a „factory reset" of the current economic model that is proving to be less and less sustainable, viable, predictable and, ultimately, less and less socially equitable. Although, theoretically, all people should benefit from the advantages offered by the exploitation of resources (both in terms of the comfort of life and from a financial point of view), in reality this does not happen in the case of many countries exporting natural gas or crude oil. In some cases, even their own populations suffer from energy shortages, this seriously affects the standard of living and the opportunity for advancement and civilizational development. The two crises unfolding in parallel (the war in Ukraine and the war in Iran) highlight better than ever the urgent need for Europe to gain real energy independence, currently facing not only the pressure of exploding prices at gas stations but also a real shortage in the supply chain. The price explosion can lead in a very short period of time to the implosion of entire branches of the economy and major social tensions. A question adjacent to the one related to the development of 100% green technologies in terms of energy production and distribution (mainly electricity) is the opportunity for major investments in transition technologies, which, based on the use of classic energy resources, are still much less gas or oil-consuming. The dilemma does not seem unfounded considering that the transition will be long despite massive investments in research and innovation. The use of nuclear energy and green hydrogen are proving to be viable alternatives, the technologies behind their exploitation being increasingly cleaner and safer.

Figure 1. The cost of developing less polluting technologies can be higher than the cost of fully green technologies. Source: Generated by Open AI

The European Green Deal – China, USA and Russia

100% green technologies are those based mainly on the exploitation of wind and solar energy. The production of solar panels and wind energy exploitation capacities has been outsourced to third parties in the last 10-15 years, mainly to China. Just as gas imported from Russia at optimized prices ultimately led to political and economic blackmail (after decades of decent relations) during the preparation and the outbreak of the war in Ukraine, so, in the case of batteries produced for cars or solar panels, the growing danger of political pressure from China, a country in full economic and cultural expansion worldwide, is imminent.

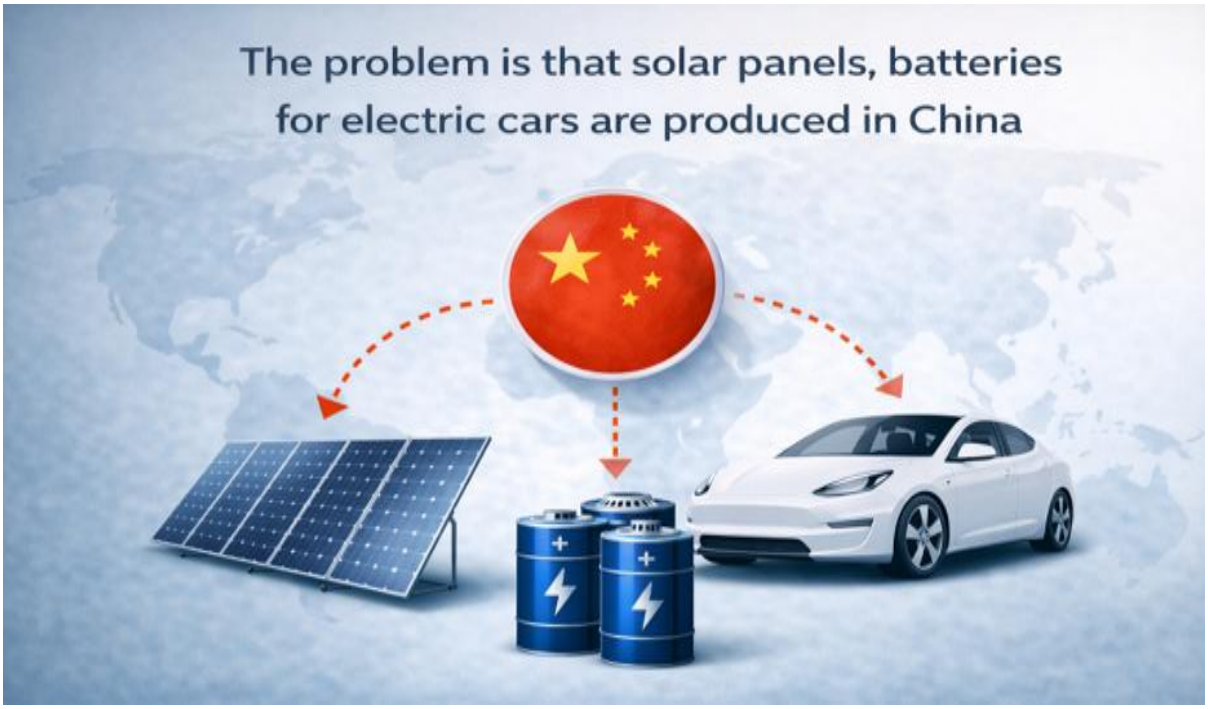

Figure 2. Solar panels must be produced within the EU. Source: Generated by Open AI

Apparently, Europe seems decisively disadvantaged both in terms of cheap energy resources and in terms of less expensive labor, but through the perspective of a true technical-energy transcendence based on the Green Deal politics, solid foundations will be laid for a very long period of a continental economy unhindered by the interests and whims of the moment of the suppliers of classic, extremely polluting energy resources. However, this transition cannot be made without Europe expecting a series of retreating movements from the suppliers of gas and crude oil resources, for example, considering that these state entities will lose their power of involvement in the political decision-making process at the level of European states and especially at the level of the European Union.

This process is unidirectional and irreversible, which is why attempts are already being made to slow down the implementation of the Green Deal Pact as much as possible. We could say that from many points of view, Europe is preparing for a big deal, although, initially, it started with many disadvantages, even strategic ones, in this fight to gain energy independence. It is interesting to follow the attitude of the world's major economic and political powers regarding the European Green Deal: China/United States/Russia. According

to Joseph Stiglitz in Globalization and Its Discontents (2002, pp. 43–49), globalization often produces asymmetric economic dependencies between developed and emerging economies. China's attitude can be characterized, following a time frame of 10-15 years, as a swing between a fearful attitude (considering the Green Deal policies as something intrusive, even harmful to highly centralized economic policies) and a perception of a huge economic development opportunity, an immediate recognition doubled by strategic duality: on the one hand, close diplomatic cooperation on climate issues, and on the other hand, a categorical rejection of measures that Beijing considers „green protectionism". China vehemently contests the EU's trade policies and mechanisms that penalize products with a high carbon footprint or massively and continuously subsidized by the Chinese state. The problem has become even more complex and difficult to solve considering that for years the European Union has outsourced the production of technological elements (solar panels, energy storage batteries produced during the day, electric car batteries) without following the opportunistic and non-transparent policies of the Chinese government, policies, mostly protectionist and dumping in nature. Dumping, the practice of selling products on a foreign market at lower prices than on the domestic market or even below the cost of production, in order to eliminate competition and capture the market, is a mainstream policy of the Chinese government. The Chinese state, in order to escape the taxes imposed by the European Union on vehicles imported from China, is trying to set up assembly/reassembly points on the territory of the European Union in order to escape the inherent taxes, in the meantime renegotiated and adjusted. China has had and still has a lot to gain from the European Environmental Pact, many billions of euros and dollars, considering that it not only honors the orders sent by the European Union (e.g. solar panels, storage batteries, car batteries) but also aggressively exports many electric cars, products of newly established brands.

Figure 3. Reducing fossil fuel dependency-of strategic importance. Source: Generated by Open AI

On the other hand, China also wants to preserve those branches of the economy (heavy industry) that operate on gas and crude oil but also coal. Therefore, in the new geopolitical paradigm, China wants to ensure its supply of crude oil, gas, coal from multiple sources: Russia, the Middle East but also Africa and South America. The European Union may not replace a decades-long dependence on Russia with a much more complex, energy and technological dependence on China. In the last 10-15 years, China has become a rising economic force (with many vulnerable points, however) that is trying to subordinate various regions of the world first economically and then politically, buying cheap gas, coal, crude oil, and getting involved in infrastructure development projects that are extremely expensive for third parties.

Samuel Huntington, in The Clash of Civilizations (1996, pp. 89–96), argues that future geopolitical tensions will increasingly involve competing civilizational and strategic models. For decades, the United States and European states, later the European Union, have proven to be strong allies in the face of the permanent aggression of the Soviet Union but also quite naive in the face of the feigned friendship of post-Soviet Russia. The economic interests of the moment have blinded the decision-making power in both Europe and America, leaving Russia to start its wars of reoccupation of states partially freed from the nefarious, damaging influence of the policies of the Soviet Union. The European Green Deal represents a paradigm shift in the relationship between the European Union and the United States, whose government has assumed in recent years a sovereignist policy that in many respects coincides and overlaps with similar ideas spread by the political leadership of Russia and China. The major economic interests of the United States see the European Union as a strong, disloyal, opportunistic competitor and from this perspective they try to intimidate and slow down the European economy through energy, economic and geostrategic blackmail, insisting on its political and military repositioning towards the Asia-Pacific space, thus leaving the way open for increasing influences and pressures from Russia, militarily bogged down in Ukraine, but also from China, which is much more subtly approaching the strategy of economic and commercial subordination of Europe. But if we look and investigate more carefully, we will notice that these economic and military giants - China, the United States and Russia - are in fact, at the end of historical cycles, carrying the burden of endemic over-indebtedness and growing social problems that could lead to an economic implosion. The transfer of billions of dollars of assets during the great crisis of 2008-2009 should have been a conclusive signal regarding the burden of American debts, sold in the form of extremely profitable financial packages to the European Union. The policy of political and economic expansion supported by extremely expensive military interventions has reached its limits. The disaster that Russia is heading towards after years of useless war in Ukraine, as well as the costly military adventure of the United States of America in Iran and predictably in other parts of the world, but also China's reluctance to assume any interventionist risk, reveals the fact that no so-called sovereign power can assume and acclaim the role of a determining power at a global level. The future belongs to supranational organizations, to federative state unions with a similar economic and cultural specifics, with their own currency, with a common social system. The European Union is also heading towards this organization, which seems to have understood that it has no alternative,

it must assume a much more pronounced role at a global level and this is not possible without a well-designed and functional internal structure. The United States does not want to have a major economic and political challenger, its hegemonic position being already diminished at a global level. Towards Europe, Russia seems to be the armed arm, while China seems to be the economic arm of the United States, in their desire to limit or even stop, before it is too late, the consolidation and strategic evolution of the European Union. Although the United States has strategic interests in the Indo-Pacific space, which could lead to a major conflict with China, however, in the „European file" they need both the help of China and that of Russia to put a stop to any European autonomy. The apparently isolationist policy of the United States, asking other states to follow their path of sovereign well-being, is nothing more than an attempt to suppress the European construction, in the first phase, and then, a reordering of the component states under their tutelage. The European social construction is among the disturbing elements, not accepted by the economic and political system in the USA and even less by the regimes in Russia and China. The European Green Deal helps to crystallize an economic and social system that can ensure a decent life for as many European citizens as possible. With the implementation of green policies, although many challenges will be encountered, the differences between economic and social systems will be even more pronounced, the large-scale advantages more visible. The economic, social and ultimately political project, the European Green Deal, is a new brand compared to the new MAGA policies of the American government, which seem to be essentially a kind of new branding (rebranding) of very old policies whose essence is „divide et impera". Any new project, especially of such a large scale, is often viewed, especially by those targeted, with suspicion, distrust and even fear. It's like building a new house, based on a new, innovative project, with innovative construction materials, but until it's ready, you can't give up the old house either..especially if some people also cultivate the fear and apprehension that the new house will never be ready..or it's too expensive to even start building it..especially since other construction companies still have large stocks of construction materials and many employees who would be left without a job or would have to retrain if the new project began to spread and the demand for new, innovative construction materials with zero harmful effect on the environment would grow exponentially. MAGA and the policies of other states, associated governments represent, in fact, the decline, the setback of an ecosystem built over several decades, in which the roles are well defined, in the input and output equation there are no unknowns or undefined variables. What is the solution? Is there a path to reconciliation and the adoption, the assumption of both, or do the multiple parties have a policy of synthesis but which has as its clearly established objective a green environment and a green society? After all, nature also urges us to take radical, real measures, not mimicked or just conjuncture, of magnitude, which would encompass the entire planet as soon as possible? Europe must be only the starting point, and soon, also the end point, of closing a global green circle..not of a vicious circle in which „petty" interests compared to the survival of the planet and human society, frustrate a project on a global and historical scale.

The European Green Deal -Costs vs Benefits

Zygmunt Bauman's concept of "liquid modernity" (2000, pp. 112–118) reflects the growing instability and unpredictability of contemporary economic systems. The current energy constraints force the European Union, faced with a real internal and external disintegrating danger, to accelerate on the one hand domestic technological innovation (not imported from third regions, China or even the USA), investing very large sums in research and development, and on the other hand to significantly reduce the bureaucratic decision-making chain, an extremely serious impediment to making prompt and correct decisions (and corrective ones if necessary) with high impact and consequences at all levels of the economy and society. Public policies that must always take into account at least a stabilization, but also a significant increase in the standard of living, will no longer be able to ignore the new trends promoted by the Green Deal policies, because they ultimately aim at the same thing, namely, ensuring a prosperous social and economic life, minimally exposed to the crises that will emerge imminently at a global level. Investments in education and health must be made in parallel with strategic investments in the field of green energy, so that society is prepared from a civilizational and cultural point of view for a rapid adaptation to the new ecosystem. This involves the emergence of many new jobs, which require new skills and the acquisition of new applied knowledge. A society partially or totally decoupled from public policies becomes extremely vulnerable to extremist influences, also classifying a major plan such as the Green Deal pact as a chimera, unachievable or so expensive that only very few will be able to benefit from the decisive advantages of the energy independent target. The success at the societal level of the Green Deal policies will be guaranteed only if the mass and individual benefits can be harmonized and correlated. Otherwise, major social discrepancies will result, exploited to the maximum by the other players at the table of the geo-strategic game.

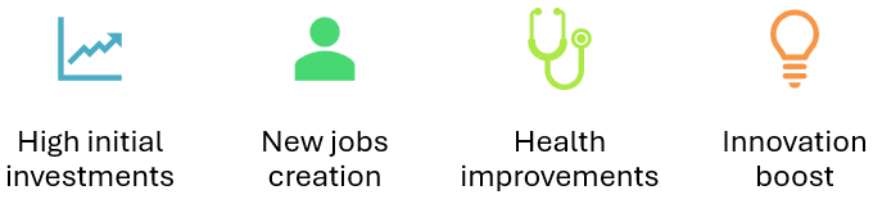

Figure 4. Investments will boost Innovation, Innovation will create new Jobs, new Jobs will create Wealth and Health. Source: Generated by Open AI

Thomas Kuhn explains in The Structure of Scientific Revolutions (1962, pp. 66–76) that major transformations emerge through paradigm shifts capable of fundamentally redefining existing systems. Innovation is the cornerstone of the development of society, this being even more true in terms of the creation, development of ultramodern and sometimes ultrasophisticated technologies for the capture, storage, transport and distribution of solar, wind and water kinetic energy (seas and oceans). The innovative process is, however, extremely expensive, requiring sustained human and financial effort, structured on well-defined research stages. Waste, multiple failures related to implausible projects would

endanger the essence of the approach, the Green Deal pact: the creation of a totally new ecosystem, a new global, sustainable home, in total harmony with the environment, in which man is not just a tenant, an irresponsible resident, disinterested in what he leaves behind, seeing everything as a financial transaction with benefits for him. Innovation materialized in complex production processes and large-scale distribution processes will inevitably lead to the creation of many new jobs for which young generations must develop new skills, with an emphasis on the applicability of knowledge in all related fields - economic, social, even cultural. The paradigm of thinking, processing and interpreting information will have a character never seen before in the known history of mankind. Current generations are transition generations, generations that if they do their job well, future generations will be able to enjoy more quickly the advantages and benefits of the new ecosystem created based on Green Deal policies. People's health at a global level is extremely affected by industrial development based on energy extracted from hydrocarbons. and health insurance costs are becoming increasingly higher, even unbearable for large categories of the population. The European Green Deal project also targets this extremely sensitive aspect at the level of society: a toxic environment is extremely harmful to human health, but an unaltered, clean natural environment will considerably reduce multiple health problems and implicitly the enormous costs of treatment and medication. The European Green Deal Pact is much more than „giving the environment a chance", saving what can still be saved, the rest we will take care of ourselves... it is an assurance, a guarantee that man can and wants to be responsible for his living space, the environment in which he lives his life, and ultimately, for himself and for the large family, which humanity represents spread across the globe.

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THE IMPLEMENTATION OF THE EU STRATEGY FOR SUSTAINABLE AND CIRCULAR TEXTILES IN ROMANIA

Nona CHIRIAC[1]

Abstract: *The EU Strategy for Sustainable and Circular Textiles addresses the production and consumption of textiles and implements the commitments of the European Green Deal, the Circular Economy Action Plan and the European industrial strategy. The main objective is to create a greener, more competitive sector that is more resistant to global shocks. In order for the European Union to reach its objective, every member state should be encouraged to do its part and translate the strategy into national legislation. Therefore, the research question proposed for this paper is "How does Romania implement the EU Strategy for Sustainable and Circular Textiles?". In order to formulate a comprehensive response, a two-level analysis was conducted. Besides looking at the national initiatives, we also wanted to understand how the business sector contributes to the strategy implementation and helps the Romanian citizens to make better choices in terms of clothing and textiles.*

Keywords: *European Green Deal, Textile Industry, The EU Strategy for Sustainable and Circular Textiles, Romania, sustainable businesses.*

Introduction

The purpose of this research is to understand how Romania is able to implement the Green Deal's policies in order to contribute to the mission of the European Union to attain its green targets for a better future. Because the Green Deal and its connected initiatives, such as the Circular Economy Action Plan, cover a vast array of policies, domains, and targets, we will focus only on the textile industry, the third most polluting industry in the world (Davda, 2026). Therefore, the research question that we want to answer in this paper is "How does Romania implement the EU Strategy for Sustainable and Circular Textiles?" The strategy represents the EU's main policy, with its own targets, when it comes to the textile, manufacturing and fashion industry. In the first part of the paper, we conducted a literature review in order to understand the current situation in Romania when it comes to the implementation of the Circular Economy principles and what policies are implemented for developing a more sustainable textile

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industry. We also presented the context in which the EU Strategy for Sustainable and Circular Textiles functions. In the second part of the paper, we presented the methodology of our research, the study case, divided in public and private initiatives and its findings. To develop our case study, we build on existing literature. The research papers found focus on Circular Economy initiatives with a general focus and not specifically on the textile industry. Besides, national policies are mentioned but less so the business sector. We wanted to cover the existing gap in the literature by presenting a wider range of national policies and business initiatives that promote a sustainable textile and fashion industry in Romania. The conclusion offers a final view into the situation of the textile industry in the country.

Literature Review

The textile industry problems might be a recent issue that is being discussed by the Romanian authorities, but other countries have been starting to set in place policies since as far back as the beginning of the 2000s. Until 2018, France was the only country in the world that tried to implement an extended producer responsibility or EPR in order to counterbalance the short life of clothing pieces that ended up in landfills shortly after they were bought by consumers. France is a country that can be taken as an example because the results of the EPR policies show us that clothing waste management can have a solution. The policy has contributed to a three-time increase in collection and recycling rates of post-consumer textiles since 2006. Besides this, the material recovery rate was reaching 90%, 50%, which could be reused (Bukhari et al., 2018).

Taking into consideration more than a 15-year gap between the implementation of textile waste management policies in countries such as France and Romania, the European Union is moving at two different speeds. This issue will slow down the EU's advancement towards its circular textiles industry objectives. The leading countries when it comes to advancements in pursuing Circular Economy targets are Germany, Belgium, Spain, France, Italy and the Netherlands. The states in which the advancement is going on at a lower pace are part of Central and Eastern Europe, and also South of Europe (Mazur-Wierzbicka, 2021). The differences between Western and Eastern Europe when it comes to textile waste management are clear; therefore, Romania is behind when it comes to the Western EU but is in line with the Eastern one. This shouldn't encourage our policymakers to continue with the slow development but rather encourage them to set Romania as an example along the Eastern and Southern Countries.

Tocan continues the analysis of the differences between Western and Eastern Europe when it comes to the Circular Economy while focusing on Romania as the main case study. One of the key components of her study refers to the circular material use rate, which represents the proportion of recycled and reintroduced materials into the economy. In the European Union, the circular material use rate increased by 12.74% from 2010 to 2021. In Romania, the circular material use rate was only 1.4% in 2022, well below the EU average of 11,4% and decreased by 0.1% compared to 2021. This data positions Romania at the bottom among EU Member States when it comes to the circular material use rate (Tocan & Chindriș-

Văsioiu, 2024). The study underlines the difficulty in introducing Circular Economy principles in Romania. While in the above article, it was mentioned the discrepancy between the Western and Eastern member states, from this paper we find out that Romania's position is much worse, being at the bottom of the ranking in EU.

Bătușaru also performed a comparative analysis between Romania's performance and the EU-27 member states when it comes to implementing the circular economy objectives. The paper revealed notable achievements and areas for improvement in Romania. The country has demonstrated its willingness to promote circular practices, as evidenced by its lower material import dependency, smaller consumption footprint, and reduced greenhouse gas emissions from production activities compared to the other member states. The paper underlines that these indicators present Romania's commitment to sustainable resource management and align with the circular economy principles. Even if there are notable developments in this regard, challenges persist. These include the need for further investment in recycling infrastructure, consumer awareness, and policy frameworks to enhance circularity (Bătușaru & Sbârcea, 2023). We can observe a more positive note on these findings in comparison with the previous article mentioned.

Weisner focused on the impact of Romania's Revised 2023 Action Plan that incorporated the elements of the Circular Economy. The plan highlighted some advancements but also the difficulties it encountered when it came to its implementation. The most important sectors incorporated in the document are: agriculture, automotive, construction, and textiles, as embodied in the National Strategy for the Circular Economy. Romania encountered difficulties when it comes to waste management infrastructure and consumer compliance. The policy implications which derive from the revised plan promote an environmentally conscious and sustainable future. By aligning with the EU directives, Romania can foster innovation, job creation and greener practices. The paper recommends a collaborative approach involving stakeholders from various sectors that prioritise innovation and support education with a focus on circular economy principles in Romania (Weisner & Nagy, 2024).

In Romania, Dociu mentions two initiatives that Romania is taking related to the Circular Economy and the Textile Industry. The waste management legislation established that by January 1, 2025, the separate collection of textiles must be implemented in all member states. The local authorities and companies were being kept accountable for this. This EU Directive (2008/98/EC) was transposed by Law no. 211 of 2011 and repealed by the Government Emergency Ordinance no. 92 of August 19, 2021. Due to this ordinance, waste recycling facilities will be set in place in different Romanian cities in 2026. A second initiative mentioned in the article is related to the business sector. Companies such as Roseco specialise in sorting and reusing textiles (Dociu & Gherghel, 2025).

A study done in Romania by Dondea examines the importance of implementing better waste management policies. In the country, the waste recycling rate is low, ranging at a low score from 6% to 10%. The composition of the textile materials found, such as fibre blends and woven structures, makes the recycling process more complicated, requiring specific treatments and technologies for each type of waste. Besides, the textile waste analysed by the research team found that, as mentioned in the EU strategy for Sustainable and Circular

Textiles, fast-fashion harms the apparel industry, because it promotes short product lifespans and contributes to increased waste volumes. The variety of colors of these days fashion garments also limits efficient recycling options compared to single-colour items. Therefore, implementing the principles of the circular economy in Romania's textile sector is an environmental necessity. (Dondea, et al. 2025)

Indrie and her collaborators mention in their article how Romanian businesses are working on improving the design of their clothing by implementing eco-design. The study examines six Romanian textile companies and the eco-design practices that they implemented. By these actions they contribute to the improvement of four sectors: environmental sustainability, education, social responsibility and circular economy. When it comes to environmental sustainability, the Romanian businesses offer garments from natural textiles, sustainable packaging and minimizing textile waste. The circular economy objectives are supported by recycling initiatives, reuse of textile scraps and eco-design that facilitates the later recycling process. Social responsibility is also at the core of the Romanian businesses' initiatives by donating fashion items to the Romanian Red Cross, promoting ethical production practices and fair labor conditions. By raising awareness about the fast fashion industry and the importance of environmentally friendly practices when it comes to garment consumption, the businesses are trying to educate the Romanian consumers about the negative impacts of the textile industry. (Indrie et al., 2025)

Context

The EU Strategy for Sustainable and Circular Textiles address the production and consumption of textiles, while recognising the importance of the textile sector. It implements the commitments of the European Green Deal, the Circular Economy Action Plan and the European industrial strategy. The Strategy looks at the entire lifecycle of textile products and proposes coordinated actions to change how we produce and consume textiles (European Commission, n. d.).

The European Green Deal was an initiative launched by President von der Leyen in 2019. It aims to cut emissions by at least 50% by 2030, rising towards 55%, while legally binding the 2050 neutrality goal through the European Climate Law. The initiatives invests in innovation, clean technology, and green infrastructure while ensuring a just transition for the communities most affected (European Commission, n.d.).

The second Circular Economy Action Plan, adopted in March 2020, is one of the main building blocks of the European Green Deal. The action plan includes initiatives addressing the entire life cycle of products, including how products are designed, as well as ensuring that waste is prevented and that used resources are kept in the EU economy for as long as possible. It also introduces legislative and non-legislative measures targeting areas where action at the EU level brings real added value (European Commission, n.d.).

The European Industrial Strategy was updated in May 2021 to ensure that EU's industrial ambitions takes account of the circumstances following the COVID-19 crisis, while

ensuring that the industry can lead the way in transitioning to a green, digital and resilient economy (European Commission, n.d.).

The main objective of the EU Strategy for Sustainable and Circular Textiles is to create a greener, more competitive sector that is more resistant to global shocks. The Commission's 2030 vision for textiles includes four main points. The first one is that all textile products placed on the EU market are durable, repairable and recyclable, to a great extent made of recycled fibres, free of hazardous substances, produced in respect of social rights and the environment. The second vision of the EU's Commission is represented by the slogan "fast fashion is out of fashion" and consumers benefit longer from high-quality, affordable textiles. The strategy also aims to make profitable reuse and repair services widely available. A last objective of the Commission is that the textile sector is competitive, resilient and innovative, with producers taking responsibility for their products along the value chain with sufficient capacities for recycling and minimal incineration and landfilling. Some of the actions that the EU is taking in order to attain its objectives are related to eco-design, waste management and supporting circular business models (European Commission, n.d.).

Methodology

Our case study was built on existing literature while also filling the research gap, as mentioned in the introduction. To answer the research question "How does Romania implement the EU Strategy for Sustainable and Circular Textiles?", we chose a qualitative method analysis by focusing on primary source materials. We looked at official documents, news articles and official websites. The sources mentioned were chosen using the snowball method. A two-level analysis was required for our study. First, we looked over at the public sector initiatives, starting with the official document of Romania's Circular Economy Action Plan. Second, we analysed the private sector using 10 Romanian fashion businesses, drawing on information presented on their websites. The businesses selected through the snowball method contribute to consumer awareness, waste management, and sustainable fashion production. Using this methodology, we observed how Romania is keeping up with the initiatives and objectives of the EU Strategy for Sustainable and Circular Textiles.

Study Case

The Public Sector Initiatives

When it comes to the implementation of EU's Green Deal policies in Romania, the country developed the Circular Economy Action Plan. This plan is part of the government's recent efforts to accelerate the transition to a circular economy in Romania in the next decade, from 2024 to 2032. The plan presents actions specific to 9 economic sectors with importance for the country, and textiles is one of them, alongside waste management (Romanian Government, 2023). There are 5 actions that Romania is planning to take in the next decade

related to the textile industry at a national level. These actions are well-detailed in the official documents. They refer to textile management, a digital passport for products with in-depth detail about production and sustainability, eco-design and supporting businesses that promote the circular economy principles in the textile sector (Romanian Government, 2023).

As it was mentioned in the Circular Economy Action Plan, the Government Emergency Ordinance no 92 of August, 19, 2021 was enforced. Because the amount of clothes produced globally has significantly increased with the emergence of the concept of fast fashion, the textile waste has increased as well. The world produces 92 million tons of textile waste each year. It's estimated that at the current rate, this could increase to 134 million tons of textile waste being generated globally by 2030. Around 100 billion new clothing items are created every year. The countries that are producing the most textile waste annually are: China, USA, India, Italy and Germany (Hall, 2025). In order to reduce the negative impact on the environment and fight the trend of increasing fast fashion and textile waste, the EU has implemented a series of regulatory acts, such as the Directive 2008/98/EC of the European Parliament and of the Council, amended by the Directive (EU) 2018/851. Following the EU's model, the Romanian Government has enforced the Emergency Ordinance no 92 of August 19, 2021. One of the most important provisions that can be found in this ordinance is that by January 1, 2025, the national authorities must introduce separate collection of textiles (Romanian Government, n.d.). A separate collection of textiles must be implemented, both by companies and local authorities. Even more, the authorities have the following obligations: to create the infrastructure necessary to install collection points and transport textile waste, to carry out advertising campaigns to raise awareness of the importance of recycling and the correct recycling of textiles, and to monitor and verify how the regulations are respected. In order to verify compliance with legal provisions, certain competent authorities, such as the National Environmental Guard or the Romanian Military Police, are delegated in this regard. Individuals and legal entities that do not comply with the rules may be subject to fines, for example, for local authorities, fines of up to 45,000 lei for the lack of an efficient textile collection system (Romanian Government, n.d.).

In addition to the Ordinance no. 92 that refers to the separate collection of textiles, Romania has undertaken through the Romania's Recovery and Resilience Plan to establish at least 26 waste recycling facilities that will be put into operation by June 30, 2026, with funds amounting to 220 million euros. According to the data provided by the Ministry of Environment, about 250,000 tons of textile waste are generated annually in Romania. However, only about 15% of textile waste is currently collected and recycled in the country. In some cities like Oradea, some collection bins which belong to TexCycle can be found, which reached over 200 textile collection units in Romania (Panaete, 2025).

Another action taken by the Romanian institutions is to apply a 25 lei tax to all parcels that come from outside the European Union and that have a value lower than 150 euros. The new tax will enter into force from 1st January 2026. Currently, the parcels under 150 euros are exempt from tax in the EU but the high volume of imports from China has prompted the EU institutions to impose this new tax starting from 2026. From China and Asian countries are imported a high number of fast fashion items from companies such as Temu and Shein. These

companies are producing cheap and low-quality clothes, which end up on the European continent and put pressure on the EU countries to deal with this issue. In the first half of 2025, Temu had in the EU an average of 115 million active users, while Shein had 145 million, with approximately 12% more than last year. Beside this, in 2024 in the EU entered 4,6 billion of parcels with low value, double in comparison with 2023 and three times more than in 2022. 91% from the 12 million parcels that enters daily are from China (Costea, 2025).

Even if it isn't directly related to the Circular Economy and the Strategy for Circular and Sustainable Textiles, Romanian educational policies can provide a space that raises awareness of the fast fashion industry. "The Green Week" is a national program that aligns with the provisions of the report "Education on Climate Change and the Environment in Sustainable Schools", developed by the working group at the Presidential Administration level, the National Strategy on Environment and Climate Change Education 2023-2030, and the National Strategy for the Sustainable Development of Romania 2030. The national program lasts for 5 consecutive working days during the school year and is carried out according to a schedule set by each educational institution, in accordance with the provisions of the Minister of Education's order on the structure of the school year for that year. (Romanian Government, 2023)

A good example of the positive impact that the Green Week program can have on the way fast fashion and the textile industry are perceived was offered by the students from Brăila, representing the Ray-Mond International Models Agency Academy, the "Hariclea Darclée" Art High School, and the "Panait Cerna" Theoretical High School. They have created a few fashion pieces centered on the theme of "environmental responsibility in fashion", which they presented this year, on April 3rd at Brăila Mall. The event, dedicated to creativity and sustainability, allowed the students to present the messages of fashion responsibility and better textile consumption to the general public and the city's community. The students mentioned in their interview that the garments were made with the intention of being entirely created from sustainable materials such as recycled denim and paper, emphasising how the young generation is discovering better alternatives to fast fashion and mass-produced clothing. Professor Lăzărică Panait from the "Panait Cerna" Theoretical High School launched the High School Fashion Week project, which is now integrated into the school's educational agenda. (Antonescu, 2026) This project can be taken as an example by other educational institutions, and more sustainable fashion-related initiatives can be developed at the national level.

Another educational initiative taken by the Romanian Government related to the Circular Economy will be developed for the new school year. Starting with the 2026-2027 school year, the 7th-grade students will have a new subject to opt for, titled Circular Economy and Responsible Consumption. According to MEC Order no.3.509/2026, which was published in the Romanian Official Gazette, on April 2nd, students will learn about recycling, waste, consumption, and environmental impact. The curriculum, approved as an integrated elective from the national offer, aims to develop critical thinking regarding the use of natural resources and sustainable production models. (Moise, 2026) The school curriculum is aligned with international directions and strategic documents in the field of education for sustainable development and the circular economy. Such key documents include: Learning for the green transition and sustainable development (OECD, 2023), Education for Sustainable

Development Goals: Learning Objectives (UNESCO, 2017), Circular Economy Action Plan (European Commission, 2020) and The Action for the National Strategy on Circular Economy, approved by Government Decision no. 927/2023. The curriculum will encourage the kids to learn about responsible consumption, and for example, a specific activity mentioned in the document guides the students to offer a description of a product's life cycle, such as a piece of clothing, like a t-shirt. (Romanian Government, 2026)

The Private Sector Initiatives

TexCycle is the brand that unites the textile recovery solutions provided by Eurotex Ltd., an established, sustainability-proven company. It was founded as a textile sorting and wholesale enterprise in the year 2000 in Bulgaria and expanded to a group of textile recovery companies, specialised in the collection, sorting, distribution and recycling of pre-owned clothing, shoes, and other textiles (TexCycle, n.d.). In Romania, Eurotex, has 6 distribution and selling points in the cities of Bucharest, Iași, Brăila, Craiova and Brașov. Throughout the years, the company established partnerships with major brands from the fashion industry in order to offer their customers second-hand clothes of high quality (Eurotex, n.d.).

Besides initiatives like Eurotex, which specializes in second-hand wholesale products, other companies like Roseco are taking the lead in Romania when it comes to sorting and reusing used textiles. The company, with its centre in Apahida, near the city of Cluj-Napoca, was established in 1992 and is one of the pioneers in the sorting and reuse of used textiles. By producing quality raw materials from textile waste, the company makes it easier for the entire textile industry chain to achieve a common goal: to respect resources and raw materials by extending their lifespan and significantly reduce the consumption of natural resources for the production of virgin raw material. In April 2024, Roseco inaugurated its new textile waste recycling plant, equipped with the most advanced mechanical recycling line in Romania. This represents a major step towards a sustainable future, using innovative technologies to transform textile into valuable resources. The company is dedicated to the development and implementation of the circular economy for textiles. The work is supported by four important pillars. The first one is represented by the collection of reusable textiles and recyclable industrial waste. The second one is reuse, re-introducing textiles back into the economy. The company sorts, repairs, cleans and puts used clothing back into the economic cycle, thus extending the average life of clothes. The third one is retail, selling pre-loved clothes through the company's network of shops LaMajole and through partners across the country. The last pillar is recyle through recycling of used and non-reusable clothing and textiles as well as textile waste from industrial production. Through this recycling process, the company produces textile fibers of various compositions for fields and industries such as construction, automotive, furniture, interior design and others (Roseco, n.d.)

Eco-design is another category where the Romanian businesses are taking the lead. The Ecodesign for Sustainable Products Regulation (ESPR), which entered into force on 18 July 2024, is the cornerstone of the Commission's approach to more environmentally sustainable and circular products. The ESPR is part of a package of measures that are central to achieving the aims of the 2020 Circular Economy Action Plan and fostering the transition to a circular,

sustainable, and competitive economy. It will contribute to helping the EU reach its environmental and climate goals, double its circularity rate of material use and achieve its energy efficiency targets by 2030 (European Commission, n.d.).

The concept of eco-design plays a pivotal role in the green transition by integrating sustainability into the design process, thereby enhancing product life cycle and minimizing waste. Eco-design in textiles involves creating products that are both visually appealing and eco-friendly throughout their life cycle. This includes considerations for material selection, production processes, and end-of-life management (Indrie et al., 2025). Some of the Romanian businesses that play an important part in the eco-design and sustainability movement are: Atelier Merci, Atelierul de Pânză, Bi ECO FASHION Ițe Urbane, Poartă-mă cu Flori, REDU. These six Romanian companies play a role in the circular economy, social responsibility, education, and environmental sustainability. For example, Atelier Merci produces all its garments exclusively from natural or organic materials, such as organic cotton, hemp, and linen. The fabrics used are certified by the Global Organic Textile Standard (GOTS) and OEKO-TEX. The company prioritizes sustainable packaging, using locally produced biodegradable, plastic-free packaging with natural adhesives instead of synthetic or petroleum-based ones.

REDU is a pioneering initiative in Romania, committed to reducing textile waste by transforming discarded materials into high-quality, sustainable products. The company follows an innovative upcycling model, collecting fabric scraps from garment factories in Iași and repurposing them into clothing, accessories, and utility items. Atelierul de Pânză integrates circular economy principles into its business model by focusing on waste reduction and resource efficiency. The company ensures that textile scraps are repurposed, contributing to a zero-waste production cycle (Indrie et al., 2025). Bi ECO FASHION demonstrates social responsibility by promoting ethical production practices and fair labour conditions. Their commitment to using recycled and natural fabrics supports not only environmental sustainability but also responsible manufacturing processes that prioritise workers' well-being. Ițe Urbane operates as a slow fashion atelier, focusing on ethical principles. They utilise natural fibres and collaborates with local tailors who are fairly compensated. Poartă-mă cu flori conducts a range of activities designed to increase awareness about the importance or reducing textile waste, particularly that of highly polluting fabrics (Indrie et al., 2025).

Besides the businesses mentioned above that focus on eco-design, recycling and reuse of textile scraps, there are more Romanian businesses that focus on sustainability and the use of natural fibers. One of these examples is Verlinne, the self-named first Romanian sustainable fashion brand. It was founded from a desire to create fashion pieces from natural fibres, having in mind the respect for people and the environment. On their webpage, they mention how they promote conscious and responsible consumption, clothes that are made from durable materials that can be worn for years, natural and sustainable materials and the sustainable use of resources (Verlinne, n.d.).

DeIonuescu uses a textile material that is specific to the region of Romania, hemp, which is a natural fibre. The brand is also supporting local artisans and working with local producers. The garments they produce are entirely handmade, and they take care of the whole production circle, thus implementing the Circular Economy principles. On their website, a

diagram can be noticed which mentions how the hemp seeds are planted and harvested, then transformed into textile materials and finally cut and sewn into clothing pieces (DeIonescu, n.d.).

Nono is a small Romanian fashion brand that focuses on the Circular Economy principles. The whole concept of the store is that no two pieces are the same and each one is unique in its own way. Every model is crafted individually. Besides, the pieces are not made from scratch but are made from older clothes. These are sewn together and given a new look. The entrepreneur behind the brand wants to encourage the Romanian consumer to work together and reduce the waste in the textile field. Another message on the website page is important – do not buy if you don't like the style. (Nono, n.d.). In this way, the risk of the garment having a short usage life is lowered. The circular economy and the strategy for circular textiles encourage consumers to benefit longer from their apparel purchases and to extend the life of their products (European Commission, n.d.).

AmiAmalia is a Romanian luxury knitwear fashion brand with a focus on sustainability. The business owner mentions on the store website how, in the world of mass retail and fast fashion, she wanted to create a sustainable, slow fashion brand built on responsibility and respect for the resources and people involved in the lifecycle of the products they develop. Besides, the business wants to offer transparency when it comes to the pricing of its garments, emphasizing that low prices hide unethical practices. The entrepreneur believes that ethical consumers exist, and by choosing ethical and sustainable businesses, the fashion industry can find an improvement when it comes to producing and consuming textiles. The brand also takes in consideration the eco-design principles. The items are created to last many years, to have flexibility when it comes to the events they are worn at and to overall be a slow fashion piece (AmiAmalia, n.d.). This type of garment is in line with the Circular Economy objectives, having an expanded usage life and being able to be passed from generation to generation.

Conclusions

To sum up, both the public sector and the private sector are trying to implement the principles of the Strategy for Sustainable and Circular Textiles in Romania. The Romanian government has developed the Circular Economy Action Plan, has enforced the Ordinance no 92 of August related to textile waste and will impose a 25 lei taxation for clothes that enter the country outside of EU. The legal measures are meant to align with the EU's regulations and policies. The educational initiatives are also part of the change by offering students a space to discuss solutions for the textile industry's challenges. Even more, the private sector, such as the businesses mentioned in this paper, are contributing to a cleaner environment by recycling clothes and textiles or developing eco-designs. In this way the Romanian private sector is aligning with the EU strategy slogan "fast fashion is out of fashion".

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ECOFEMINIST PERSPECTIVES IN CONTEMPORARY EUROPEAN ENVIRONMENTAL DISCOURSE

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Abstract: *In the context of growing attention to climate change and environmental crises, discussions about environmental issues have increasingly intersected with debates about gender equality. The paper examines how ecofeminist perspectives are reflected in European environmental policy and climate activism through a qualitative document analysis. Through this analysis, the study aims to identify recurring themes and narratives that link environmental concerns with gender-related perspectives and to explore the presence of ecofeminist ideas within environmental debates in Europe.*

Keywords: *ecofeminism, European policy, activism, gender equality, environmental discourse.*

Introduction

In the context of increasing attention to climate change and environmental crises, discussions about environmental issues have become increasingly interconnected with debates on gender equality and social justice. Within this framework, ecofeminism offers a perspective that links environmental degradation with structural inequalities, particularly those affecting women and marginalized groups. While ecofeminism has been explored in theoretical and global contexts, there is still limited research examining how ecofeminist ideas are reflected within the European context. In particular, there is a lack of comparative studies that analyze how these perspectives appear both in European environmental policy and in civil society and activism. At the same time, the growing importance of online spaces raises further questions about how ecofeminist narratives are communicated in digital environments.

Starting from these gaps, this paper addresses the following research question: how are ecofeminist ideas reflected in contemporary European environmental policy and climate activism discourse? To answer this question, the study uses a qualitative thematic content analysis of selected policy documents and civil society materials, including social media content.

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1. Methodology

1.1. Research Design

This study uses a qualitative research approach to examine how ecofeminist ideas appear in contemporary European environmental discourse. The research focuses on the ways in which gender perspectives and ecofeminist themes are reflected in discussions about environmental and climate issues in Europe, by combining a comparative analytical approach with thematic content analysis. The framework is primarily comparative, examining the differences between European environmental policy and civil society discourse.

Moreover, the study has a descriptive dimension, as it aims to highlight the patterns in how ecofeminist ideas are represented across policy documents and social media discourse. The research is also exploratory, given the limited existing research that comparatively examines ecofeminist perspectives in the European contexts, in both policy and activism initiatives. In addition, the paper uses a secondary historical-interpretative approach in order to contextualize the development of ecofeminism and its integration into environmental discourse over time.

1.2. Data Selection

The analysis is based on a qualitative examination of two categories of sources: (1) policy documents, including European strategies, institutional reports and policy frameworks and (2) civil society and digital communication materials, such as campaign materials and social media posts created by relevant organizations and initiatives in the field of climate and gender activism.

The selected materials were chosen based on various criteria. Firstly, the thematic relevance to environmental and gender-related issues. Secondly, the existence of explicit or implicit reference to climate justice, gender equality and ecofeminism, as well as the intersectionality of the first two concepts. Third, the visibility within European environmental discourse. Although the dataset is limited, it allows for an in-depth qualitative analysis of such patterns across the mentioned contexts.

Since the research also uses social media content, it is important to consider that online platforms may influence how ideas are communicated. Unlike policy documents, which use more formal language, social media content may be more simplified and promoted by certain algorithms. Without aiming to engage in a discussion about the design and specific characteristics of social media platforms, the difference in communication style needs to be acknowledged, as it could explain why certain perspectives, including explicit ecofeminist ideas, may appear more directly formulated within civil society initiatives and online contexts, rather than institutional policy.

1.3. Analytical Method

The research uses qualitative thematic content analysis in order to identify themes and patterns across the selected materials. The study has three main stages: (1) understanding the

data, through reading of policy documents and social media materials, (2) coding the identified themes and elements related to ecofeminism and (3) data interpretation.

The coding framework mainly distinguishes between explicit and implicit representations of ecofeminist ideas. Explicit ecofeminism is identified through: (a) direct references to ecofeminism (E-ECOFEM). In contrast, implicit ecofeminist perspectives are highlighted through two main ideas: (b) references to gender differences of climate impact (GE-CL) and (c) the use of equality and inclusion framing (EQ-I). These codes were formulated to reflect the patterns in which ecofeminism appears across policy documents, as well as civil society discourse.

2. Thematic Overview of Feminism

2.1. Definition and Key Aspects

Ecofeminism can be understood as a social and political perspective that connects environmental degradation with the oppression of women. It highlights the idea that the same power structures and structural dynamics responsible for the exploitation of nature also contribute to gender inequality and social injustices. Positioned at the intersection of feminist, peace and environmental movements, ecofeminism promotes a perspective of social justice, democratic values and more sustainable relationships between society and the natural environment (Doley, 2025).

From a psychological standpoint, ecofeminism focuses on identifying shared patterns across different systems of domination. It emphasizes that multiple forms of oppression are structured in similar ways, particularly through symbolic associations that link women with emotion, the body and nature, while masculinity is associated to reason, intellect and culture. Within this framework, the characteristics associated with women and nature are often perceived as inferior and therefore subjected to control and domination. Rather than suggesting an inherent connection between women and nature, ecofeminist perspectives critically examine how this association has been historically constructed and even mobilized to justify both gender inequality and environmental exploitation (Davidson et al., 2010).

At the same time, ecofeminism uses a double critique. It challenges traditional environmentalism from a feminist perspective, as well as offering an environmental critique of certain forms of feminism. Therefore, ecofeminist theory focuses on understanding the links between the oppression of women and the exploitation of nature, while proposing alternative social and ecological approaches (Doley, 2025). Based on this view, it is believed that gender inequality plays an important role in shaping how different groups are affected by the climate crisis. Women are often disproportionately impacted by climate change because of existing social and economic inequalities. Factors such as unequal access to resources, gendered divisions of labor and power imbalances increase women's vulnerability in the context of environmental crises (Doley, 2025).

Doley (2025) identified several strands of ecofeminism. Among these, the following section briefly outlines liberal, socialist, radical and Third World ecofeminism. First, liberal ecofeminism focuses on the role of institutions and political participation in addressing

environmental issues. This perspective argues that environmental problems are closely linked to economic development and policy decisions and can be addressed through institutional reform.

In contrast, socialist ecofeminism adopts a more structural perspective, linking environmental degradation to the broader dynamics of capitalism and patriarchy. This approach argues that environmental problems cannot be understood separately from systems of economic exploitation and gender domination.

Another strand is radical ecofeminism, which identifies patriarchy as the fundamental cause of environmental degradation. Radical ecofeminists argue that patriarchal culture historically associates women with nature in order to devalue and control both.

Finally, Third World ecofeminism focuses on the experiences of women in the Global South, particularly those affected by global economic inequalities and environmental exploitation. This perspective highlights how systems of patriarchy, colonialism and global capitalism shape the relationship between women and natural resources.

2.2. Critiques of Ecofeminism

The ecofeminist movement has been subject to criticism, as some critics argue that its emphasis on protecting nature can blur or weaken the original goals and focus of feminist thought (Hajad & Ikhsan, 2024).

One of the most common criticisms of ecofeminism is the idea that it suggests women are naturally or biologically closer to nature. Critics argue that this perspective can be problematic because it may reinforce traditional patriarchal beliefs that associate women with nature and emotion while placing men in positions of rationality and authority. From this point of view, such arguments risk repeating the same logic used historically to justify gender inequality (Archambault, 1993).

Another criticism of ecofeminism concerns the tendency to place too much emphasis on women's experiences in discussions about environmental issues. Some ecofeminists argue that because women have historically been less involved in activities that lead to environmental degradation, they may offer a different and more critical perspective on ecological problems. However, some critics say that giving excessive priority to women's experiences can create analytical limitations and such an approach may overlook the fact that some women have also participated in processes that contribute to environmental destruction (Archambault, 1993).

3. Historical Overview of Ecofeminism

3.1. Early Origins and Theorization

Ecofeminism emerged in the 1970s as a theoretical and activist perspective that emphasizes the role of women in responding to environmental degradation and in mobilizing against practices that harm the natural environment (Hajad & Ikhsan, 2024).

Critical ecofeminism was developed by Val Plumwood and later expanded by Greta Gaard. This approach emerged from the connection between feminist and environmental movements. Critical ecofeminism seeks to rethink the relationship between humans and nature by promoting relationships based on care and responsibility toward the natural world. Gaard further expanded the goals of ecofeminism by arguing that the movement should not only analyze systems of oppression, but also challenge the structures that allow domination to persist (Hajad & Ikhsan, 2024).

Ecofeminism began to gain wider recognition in the 1980s, particularly after the first major ecofeminist conference, Women and Life on Earth, held in the United States. This event brought together many women and contributed to the development of ecofeminist ideas, as well as to the formation of organizations focused on environmental and feminist issues. Ecofeminism has often been described as part of the third wave of feminism, which expanded the discussion to include women's relationship with nature and the environment (Mir, 2019).

3.2. Institutionalization and Global Environmental Agendas of Gender Perspectives

Early signs of women's involvement in environmental protection were recognized at the United Nations conference held in Nairobi in 1985, where attention was drawn to India's Chipko movement, in which rural women protected trees that were essential for their livelihoods. However, women's role in global environmental protection became more clearly articulated in November 1991, when the Women's Environment and Development Organization (WEDO) organized the World Women's Congress for a Healthy Planet in Miami, Florida. The event aimed to build on the progress made during the United Nations Decade for Women and to prepare a Women's Action Agenda for the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro. The congress brought together more than 1,500 women from 83 countries (Gaard, 2015).

The 27 Bali Principles of Climate Justice (2002) reinterpret climate change through the perspective of environmental justice. These principles were inspired by the earlier 17 Principles of Environmental Justice adopted in 1991 at the First National People of Color Environmental Leadership Summit. The Bali Principles emphasize the importance of addressing social inequalities related to gender, indigeneity, age, health, wealth and disability in discussions about climate change. They also promote sustainable practices in areas such as energy and food production, democratic participation in environmental decision-making and the development of ecological economic models. In addition, the principles call for gender justice and for economic support to help vulnerable communities adapt to the impacts of climate change (Gaard, 2015).

The Paris Climate Agreement recognizes the importance of gender equality and includes provisions aimed at supporting women in addressing and adapting to the impacts of climate change. These measures highlight the growing awareness of the need to integrate gender perspectives into international climate policy (Doley, 2025). In Decision 1/CP.21, Parties recognize that climate change is a common concern of humankind and affirm that climate

action should respect, promote and consider human rights, including gender equality and the empowerment of women. The framework also emphasizes the importance of addressing the differentiated needs, experiences and capacities of women and men, as well as ensuring their equal representation in climate governance processes. In this context, two key priorities are highlighted: improving gender balance and increasing the participation of women in climate-related decision-making and supporting the development and implementation of gender-responsive climate policies at the regional, national and local levels (United Nations Climate Change, n.d.).

4. Ecofeminist Perspectives in Europe

4.1. Ecofeminism in European Environmental Policy

At the European level, environmental policy is increasingly connected with broader discussions about social equality and inclusion. Although the concept of ecofeminism is not explicitly mentioned in most official policy documents, several European institutions, strategies and policy frameworks address the relationship between environmental sustainability and gender equality. These initiatives aim to ensure that environmental and climate policies are implemented in inclusive ways, reflecting what the study identifies as equality and inclusion framing (EQ-I), rather than explicit ecofeminist discourse (E-ECOFEM).

The most relevant contemporary initiative related to environmental policy in the European context is the European Union (EU) Green Deal. The initiative is part of the EU's efforts to implement the United Nations 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs) (European Commission, 2019). The Green Deal also mentions inclusivity in relation to sustainability, as one of its key goals is Climate justice and fairness, which supports a fair and inclusive transition, helping those most affected by the transition and leaving no one behind (European Commission, n.d.). This example represents the presence of equality and inclusion framing (EQ-I). However, the ecofeminist ideas remain largely implicit, with no direct references.

An important institution in this field is the European Institute for Gender Equality (EIGE). EIGE is the European Union's agency dedicated to promoting gender equality and eliminating gender-based discrimination. The institute focuses on improving gender statistics, measuring the state of gender equality across the EU and its member states and developing methodological tools for integrating gender perspectives into public policies (European Institute for Gender Equality, n.d.). One example of its activity is the Gender-responsive Evaluation for a Sustainable Future for All (GREENA) Toolkit. The toolkit provides practical guidance for implementing gender-responsive evaluations, particularly in the context of the European Green Deal and the objective of ensuring a fair and inclusive green transition. It includes examples from several key policy areas such as transport, energy, agriculture and the circular economy, which are central to European efforts to address climate change and environmental degradation. Through a step-by-step structure, the toolkit offers methods for identifying the gender implications of environmental issues and evaluating policies using a

gender and intersectional perspective. It also provides guidance for different stages of the evaluation process, from establishing evaluation teams and conducting fieldwork to drafting evaluation reports, with the aim of supporting more inclusive and sustainable policy outcomes (European Institute for Gender Equality, 2024). In this sense, the toolkit reflects both EQ-I and GE-CL, as it acknowledges that environmental policies affect women and men differently.

Moreover, the GREENA toolkit refers to the concept of an ecofeminist cost-benefit analysis as an alternative method of evaluating policies or projects. In this context, the document explains that such an approach assesses not only the economic costs and benefits of an intervention, but also its social and environmental impacts, particularly on women and communities. An ecofeminist cost-benefit analysis examines who benefits from an intervention and who bears its costs, while considering factors such as social inequalities, local communities and the effects on future generations. Through this approach, the toolkit highlights the importance of evaluating environmental policies in a way that considers both gender equality and long-term environmental sustainability (European Institute for Gender Equality, 2024). Besides the inclusion of EQ-I and GE-CL, the GREENA toolkit represents one of the few instances in which ecofeminism is explicitly referenced within a policy-related framework (E-ECOFEM), although it remains a limited inclusion.

Ecofeminist perspectives are also reflected in the positions of green political actors in Europe. In a resolution adopted by the European Green Party at the 6th EGP Congress in Copenhagen, Denmark, on 2-4 December 2022, titled On women's rights, gender and climate change in Europe, the party highlights the connection between gender equality and climate policy. The resolution highlights that gender equality has long been a core principle of the European Union, being recognized as a Treaty obligation, a fundamental right and a key element of the European Pillar of Social Rights. The EU Gender Equality Strategy 2020-2025 also emphasises diversity and intersectionality while promoting actions such as combating gender-based violence, ensuring equal participation in the labor market and improving gender balance in decision-making. Despite these commitments, climate policy and gender equality are still often treated as separate policy areas. Major EU climate frameworks, such as the European Climate Law and the Recovery Plan, emphasize that the green transition should be fair and inclusive, but they do not sufficiently address gender inequalities. This reflects a strong reliance on equality and inclusion framing EQ-I, without fully integrating E-ECOFEM. At the same time, socio-economic inequalities shape how different groups experience climate change. Women, particularly those from vulnerable groups, such as single mothers, elderly women, migrant women or women from minority communities, are often more exposed to risks, including energy poverty, climate-related health problems and economic insecurity. These inequalities are further intensified by existing structural issues, including wage gaps, unequal access to employment and the disproportionate burden of care responsibilities. As a result, it is highlighted that the impacts of climate change are not distributed equally and women are often more affected by environmental crises despite contributing less to emissions on average due to lower spending power (European Greens, 2022). These examples strongly represent GE-CL, showing the link between crises and socio-economic inequalities and gender differences in climate change impact.

Overall, the analysis shows that ecofeminist ideas are present in European environmental policy primarily in implicit forms, through equality and inclusion framing (EQ-I) and references to gender differences in climate impact (GE-CL). Explicit mentions of ecofeminism (E-ECOFEM) remain limited and appear mainly in specific cases, such as the GREENA toolkit. This suggests that ecofeminist perspectives are increasingly integrated into policy discourse, but are generally expressed through institutional and neutral language, instead of explicit references.

4.2. Ecofeminism in European Activism and Civil Society Initiatives

Ecofeminism has also become visible in various forms of activism across Europe, where environmental concerns have been linked with issues of gender equality and social justice. In this context, ecofeminist activism often focuses on raising awareness about the social impacts of environmental crises and advocating for more inclusive climate policies (European Environmental Bureau & Women Engage for a Common Future, 2021). This section explores how ecofeminist ideas are reflected in contemporary environmental activism in Europe and how activists integrate gender perspectives. This reflects both equality and inclusion framing (EQ-I) and, in many cases, more direct forms of ecofeminist discourse (E-ECOFEM), compared to institutional policy contexts.

One of the most prominent civil society actors advocating for gender equality in Europe is the European Women's Lobby (EWL), the largest umbrella organization of women's associations in the European Union, which works to promote women's rights and gender equality. They created the Women in Climate project, which brings together national partners from several European countries, including Romania, Bulgaria, The Netherlands, Portugal, Finland and the Czech Republic, with the aim of promoting the integration of gender perspectives into EU climate policies. It adopts a bottom-up approach that connects local knowledge and activism with policy advocacy at the European level. The initiative also emphasises an intersectional perspective by encouraging the participation of women from diverse and marginalized backgrounds. Through activities such as surveys, local consultations and policy discussions, the project seeks to develop recommendations that support a more inclusive and gender-sensitive approach to climate governance in Europe (European Women's Lobby, 2025). This example reflects the presence of equality and inclusion framing (EQ-I), as well as gender differences in climate impact (GE-CL), given the focus on how different groups of women experience environmental issues in distinct ways.

Moreover, the initiative No Solution Without Women: Romania's Voices in the Climate Crisis, organized by the Romanian Women's Lobby in Iași in 2025, illustrates how ecofeminist perspectives are emerging within both the Romanian and European context. The event brought together activists, academics, policymakers and civil society actors to highlight the gendered impacts of climate change and the need for more inclusive, gender-sensitive environmental policies. Discussions emphasized that women are often disproportionately affected by climate-related risks, while remaining underrepresented in decision-making

processes, which can lead to gender-blind climate policies. The initiative also underlined key structural gaps, such as the lack of gender-disaggregated data and insufficient integration of gender perspectives in national climate strategies, reinforcing the argument that effective climate action requires a more intersectional and inclusive approach (Česká ženská lobby, 2025). This example reflects gender differences in climate impact (GE-CL), alongside equality and inclusion framing (EQ-I), while also moving closer to explicit ecofeminist perspectives in their emphasis on structural inequalities.

Another relevant perspective within civil society is Women Engage for a Common Future (WECF), which is a nonprofit network working toward a gender-inclusive and a healthy planet for all. The organization was established during the 1992 Earth Summit in Rio de Janeiro, where women from across the European region came together to create a network grounded in a shared recognition of the essential role women play in advancing sustainable development (Women Engage for a Common Future, n.d.). This approach combines equality and inclusion framing (EQ-I) with the understanding of structural inequalities, reflecting implicit ecofeminist perspectives.

One of their most relevant works is the 2021 Report entitled Why the European Green Deal Needs Ecofeminism, which aims to highlight the importance of gender-transformative environmental policies and make recommendations around European climate policies. Chapter V of the report highlights the way in which the European Green Deal could address the gender perspective of climate policies. According to the document, there is a growing body of research showing that gender influences both the causes and the impacts of climate change, while also stressing the importance of using an intersectional approach in policy design. Moreover, the document is structured into several subsections that address different dimensions of this issue. Furthermore, it examines impacts and vulnerability, showing that women, especially those from disadvantaged groups, are often more exposed to the effects of climate change because of structural inequalities. It also discusses policy responses, highlighting that climate policies can affect men and women differently, but can also help reduce gender inequalities if designed in an inclusive way (EEB & WECF, 2021). This reflects a strong example of explicit ecofeminism (E-ECOFEM), as the report directly uses the concept and explicitly links environmental sustainability to gendered inequalities. At the same time, it also includes gender differences in climate impact (GE-CL) and equality and inclusion framing (EQ-I).

Another example, particularly related to digital activism, is Asociația Feminism Romania, which is an organization of young feminists militating for gender equality in Romania. Across their social media, they have highlighted the subject of ecofeminism through campaigns funded by the EU. In a March 2025 social media post, the organization linked ecofeminism to both climate change and recent crises such as the COVID-19 pandemic. The post argues that ecofeminism connects the exploitation of nature with the oppression of women, both rooted in patriarchal systems, and emphasises that climate change and environmental disasters are not gender neutral (Feminism Romania, 2026). This represents a clear example of E-ECOFEM, as the concept is directly named and theoretically articulated.

5. Findings and Discussion

The analysis reveals a pattern in how ecofeminist ideas are represented across European environmental discourse, particularly when comparing institutional policy frameworks with civil society and digital activism.

At the level of European environmental policy, ecofeminist perspectives are present primarily in implicit forms. Most policy documents do not explicitly reference ecofeminism (E-ECOFEM), but instead rely on concepts such as inclusivity, gender equality and social justice. These elements correspond to equality and inclusion framing (EQ-I), which represents the dominant way in which ecofeminist ideas are integrated into institutional discourse. In addition, several policy frameworks acknowledge that climate change does not affect everyone equally, reflecting gender differences in climate impact (GE-CL). However, these references are generally not framed within an explicitly ecofeminist perspective, using mainly neutral and institutional language.

An important exception to this pattern is represented by the GREENA toolkit developed by the EIGE, which explicitly refers to ecofeminism through concepts such as the ecofeminist cost-benefit analysis. This represents one of the few instances of E-ECOFEM within European policy discourse, suggesting that explicit ecofeminist perspectives are beginning to emerge, although they remain limited.

In contrast, ecofeminism is articulated more explicitly within civil society and activism contexts. Organizations such as the European Women's Lobby and Women Engage for a Common Future not only address gender equality and inclusion, but also directly link environmental issues to structural gender inequalities. In these cases, ecofeminist ideas are expressed both through equality and inclusion framing (EQ-I) and gender differences in climate impact (GE-CL), while also including explicit references to ecofeminism (E-ECOFEM), particularly in reports and advocacy materials.

Digital platforms further amplify this explicit articulation. Social media content allows ecofeminist narratives to be communicated in more direct and accessible ways, often linking environmental issues with social, economic and health crises. The case of Romania illustrates this dynamic, where organizations such as Feminism Romania explicitly use the concept of ecofeminism (E-ECOFEM) and highlight the interconnected nature of environmental and social inequalities. At the same time, these narratives emphasize how crises disproportionately affect women and marginalized groups (GE-CL), while advocating for more inclusive and intersectional approaches (EQ-I).

Conclusions

This paper has examined how ecofeminist ideas are reflected in contemporary European environmental discourse, with a particular focus on the differences between policy frameworks and civil society activism. The analysis shows that ecofeminism is present across both contexts, but in different forms and degrees of visibility. At the level of European environmental policy, ecofeminist perspectives are mainly integrated in implicit ways,

through equality and inclusion framing and through references to gendered impacts of climate change. In contrast, civil society actors and digital platforms play a central role in explicitly articulating ecofeminist perspectives.

However, the study also has several limitations. The analysis is based on a relatively limited number of policy documents and civil society materials, which may not fully capture the diversity of ecofeminist perspectives across Europe. In addition, the qualitative approach relies on interpretative analysis, which may involve a certain degree of subjectivity in identifying and interpreting the themes.

Future research could expand the dataset by including a larger number of policy documents, as well as a broader range of social media platforms and activist initiatives. Comparative studies across different European areas and countries could also provide a more detailed understanding of how ecofeminist perspectives vary across contexts.

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GREEN AGRICULTURE AND FOOD SECURITY IN EUROPE: GOVERNANCE CHALLENGES IN THE PATH TOWARD CLIMATE NEUTRALITY

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Abstract: *Europe's agri-food system occupies a paradoxical position in the continent's climate ambitions. It must simultaneously be sufficient for its 450 million citizens while contributing to net-zero targets by 2050. This, at the same time, while remaining economically viable for millions of farming households. This paper critically reviews the current state of EU agricultural governance in relation to climate neutrality objectives. It also examines the tensions between environmental ambition and political feasibility that have come to define the post-2020 global policy situation. Drawing on recent evidence from the Common Agricultural Policy (CAP) 2023-2027, the Farm to Fork Strategy, as well as the European Commission's February 2025 Vision for Agriculture and Food. The analysis traces how institutional design, subsidy architecture, and multi-level governance dynamics have produced a significant gap between stated climate goals and measurable progress. The paper situates EU agricultural emissions within global projections, finding that without structural reform, Southern European Member States face catastrophic yield losses by 2050, particularly for rain-fed crops such as maize and wheat. The review further examines how farmer protests in 2023-2024 precipitated a politically motivated simplification of the CAP's environmental provisions, effectively shelving key Farm to Fork commitments. Against this backdrop, the paper evaluates promising pathways. This includes: regenerative agriculture, organic farming expansion, and carbon farming certification, with reference to benchmarking evidence from 14 European countries. The paper reaches the conclusion that the post-2027 CAP cycle represents a critical point. Effective green agricultural transformation is technically feasible and economically justified, but requires governance structures capable of withstanding short-term political pressures while delivering long-term food system resilience.*

Keywords*: green agriculture; food security; Common Agricultural Policy; Farm to Fork; climate governance.*

Introduction

Agriculture lies at the intersection of the European Union's most consequential policy challenges. As the primary land user across the continent, covering approximately 38% of EU

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territory, the agri-food sector is simultaneously a major source of greenhouse gas (GHG) emissions, a victim of accelerating climate disruption, and an indispensable provider of food, livelihoods, and ecosystem services. This dual character, both cause and casualty of climate change, makes agricultural governance uniquely difficult: reforms that reduce emissions can threaten farm incomes, while adaptation investments often require long planning horizons that sit uneasily with short electoral cycles.

The European Green Deal, launched in 2019, placed agriculture at the centre of the EU's climate strategy through the Farm to Fork (F2F) Strategy and the biodiversity-focused provisions of the CAP 2023-2027. Targets for a 50% reduction in pesticide use, 25% of farmland under organic management by 2030, and the introduction of eco-schemes as compulsory CAP spending categories signalled an unprecedented attempt to align agricultural subsidies with climate and nature objectives. Yet by 2024, political retreat was already visible: a wave of farmer protests across France, Germany, the Netherlands, and Romania, combined with shifts in the European Parliament's political composition following June 2024 elections, prompted a rushed simplification of the CAP's environmental requirements and the effective abandonment of several F2F legislative proposals.

This paper reviews the current state of knowledge, policy, and governance challenges surrounding green agriculture and food security in Europe. It proceeds through five analytical sections: an account of the agricultural emissions challenge and climate projections; a mapping of the EU policy landscape; a critical analysis of governance strengths and failures; an examination of key barriers to transformation; and a set of evidence-based recommendations for the post-2027 policy cycle. The analysis draws on recent scientific literature, European Commission assessments, European Environment Agency (EEA) data, and evaluations by international organisations, alongside comparative evidence from Member State approaches.

Background: The Agricultural Emissions Challenge and Climate Projections

Agriculture accounted for approximately 13% of EU GHG emissions in 2022 when measured in direct farm-level terms; when the full agri-food system is considered, including upstream inputs such as fertilizer production and downstream activities such as food processing and distribution, that share rises to an estimated 31% (European Parliament, 2024). Despite decades of environmental conditionality in EU agricultural support, agricultural GHG emissions fell by only 6% between 2005 and 2023, a stark contrast to the approximately 37% economy-wide reduction recorded since 1990 (EEA, 2024). This persistent underperformance reflects structural features of agricultural emissions: the dominance of biogenic methane from enteric fermentation and nitrous oxide from soils makes agriculture a genuinely hard-to-abate sector, resistant to the electrification pathways available in energy or transport. The forward-looking picture is equally concerning. With current policies, the European Commission projects only a 10% reduction in agricultural GHG by 2030 relative to 2005 levels, with planned

additional measures bringing this to 13%. The EU's own climate modelling suggests that a 40-60% reduction by 2040 will be required to maintain compatibility with net-zero by 2050 (European Commission, 2024). The structural mismatch between the trajectory and the target represents a policy gap of considerable magnitude.

On the food security side, climate projections paint a geographically differentiated picture of European vulnerability. Analysis from the Joint Research Centre's PESETA IV project indicates that, under high-emission scenarios, rain-fed maize yields in Portugal, Bulgaria, Greece, and Spain could fall by more than 80% by 2050, while wheat yields in Southern Europe face substantial projected declines under high-emission scenarios (JRC PESETA IV, 2020). More recent global modelling by Hultgren et al. (2025), published in Nature, estimates an around 8% reduction in global crop yields by 2050 regardless of emissions pathway, as a consequence of warming already locked in by historical emissions. The IPCC's sixth assessment cycle further projects that global cereal prices could rise by up to 29% by mid-century, with disproportionate impacts on lower-income populations (IPCC, 2022).

Beyond domestic production, the EU's food security is complicated by its deep integration into global agri-food supply chains. The EU is the world's largest agri-food trader, with a trade value exceeding €390 billion in 2024 (European Commission, 2025). However, more than half of EU imports of key commodities including rice, maize, wheat, and soy originate from countries with low climate readiness, meaning that climate shocks in partner countries can transmit rapidly into EU food systems (ECDPM, 2025). The EU's heavy dependence on soy imports from Brazil and Argentina for animal feed represents a particularly acute vulnerability: one third of global soybean production losses in 2012 were attributable to climate-induced drought (European Parliament, 2025). Spain's experience in 2023, when olive oil production roughly halved due to extreme drought, offers a concrete preview of what structural disruption may look like at scale.

Policy Landscape: The EU Governance Architecture for Green Agriculture

The EU's approach to agricultural climate governance rests on three overlapping pillars: the Common Agricultural Policy, the European Green Deal and its sectoral strategies, and the emerging architecture of food system resilience. Each merits examination in terms of its design logic, resource allocation, and relationship to climate objectives. The CAP 2023-2027, with an allocated budget of approximately €387 billion, accounting for roughly 38% of the total EU budget, introduced several structural innovations intended to strengthen its environmental dimension. Chief among these was the mandatory introduction of eco-schemes in Pillar I, requiring Member States to dedicate at least 25% of direct payment funding to voluntary environmental practices. National Strategic Plans (NSPs), submitted and approved by the Commission, were intended to ensure that Member State ambitions were consistent with Green Deal and Biodiversity Strategy objectives. In practice, however, Commission

monitoring assessments found that the approved NSPs fell significantly short of the stated ambitions, and that the estimated mitigation potential of the 31 national plans collectively amounted to approximately 31 million tonnes of CO2 equivalent per year, modest relative to the sector's total annual emissions of approximately 490 Mt CO2e (European Commission, 2024; OECD, 2025).

The Farm to Fork Strategy, adopted in 2020, set legally non-binding but politically significant targets: 50% reduction in the use and risk of chemical pesticides, 20% reduction in fertilizer use, 25% of agricultural land under organic farming, and a 50% cut in antimicrobial sales for livestock by 2030 (European Commission, 2020). The strategy was conceived as a comprehensive food system approach, addressing production, distribution, consumption, and food waste within a single framework. Crucially, however, it remained a strategy rather than a legislative framework: no binding sustainable food systems law was adopted during the 2019-2024 parliamentary cycle, meaning that the targets lacked enforcement mechanisms.

The February 2025 Vision for Agriculture and Food represents the current Commission's attempt to reframe the post-Green Deal agricultural agenda. Presented against a backdrop of heightened concern about farmer competitiveness and food sovereignty following the Ukraine crisis, the Vision placed substantially greater emphasis on economic resilience, market access, and reduced regulatory burden than on climate ambition. A commentary published in Nature Food by van Zanten et al. (2025) argued that the Vision lacked a coherent food systems approach, prioritizing competitiveness metrics at the expense of emissions and biodiversity targets. The document was further criticized for abandoning the quantified sustainability targets of the F2F in favour of vaguer process-oriented language.

At the international level, the EU's agricultural climate diplomacy has increasingly intersected with trade policy. The EU-Mercosur agreement, under negotiation for over two decades and finalized in principle in 2024, has generated controversy precisely because it may expose EU farmers to competition from agricultural systems subject to less stringent environmental standards. The Carbon Border Adjustment Mechanism (CBAM), while currently covering energy-intensive industries rather than agricultural products, signals an emerging European interest in leveraging trade instruments for climate ends; its future extension to food and agriculture remains a contested policy question.

Several Member States have developed more ambitious national approaches worth examining as potential models. Denmark, which enacted the world's first national organic law in 1987 and now accounts for 13% of retail food sales in the organic category, has developed a comprehensive national action plan for plant-based food production and an industry-led regenerative agriculture transition supported by supply chain commitments from major food companies (Food Nation Denmark, 2025). The Netherlands, despite its notorious nitrogen crisis, has invested heavily in precision agriculture technologies and is developing a standardized Key Performance Indicator system for sustainable farming (KPI-K) that could serve as a template for EU-wide monitoring. These cases illustrate that ambitious national

approaches are politically and technically feasible, but require sustained policy commitment and sufficient transitional support for affected farmers.

Critical Analysis: Governance Strengths, Failures, and Contradictions

The EU's agricultural governance framework presents a genuinely contradictory picture. On the one hand, the institutional architecture is sophisticated: the CAP provides a continent-wide instrument with substantial financial resources, the NSP process creates a mechanism for national customization within EU-level constraints, and the Farm to Fork and Biodiversity strategies articulate a coherent vision of systemic transformation. On the other hand, the implementation record is weak, and recent political dynamics have accelerated a retreat from ambition precisely at the moment when the urgency of action is most scientifically evident.

A central contradiction in the current CAP architecture concerns subsidy allocation. An analysis published in Nature Food by Kortleve et al. (2024) found that over 80% of CAP subsidies effectively support emissions-intensive animal products, through direct payments linked to livestock holdings, through agri-environment measures that reward the maintenance of permanent grasslands grazed by ruminants, and through market interventions that sustain dairy and beef sectors. This structural bias toward high-emission production systems is difficult to reconcile with climate neutrality objectives, yet any politically viable reform must confront the entrenched interests of the livestock sector, which employs millions of people across rural Europe.

The 2024 CAP simplification episode illustrates the fragility of environmental governance in a context of political stress. The amendments, rushed through in the first half of 2024 in response to farmer protests, weakened or removed several key environmental provisions, including requirements for minimum areas of non-productive features on arable land, conditionality rules around crop rotation, and controls on the ploughing of carbon-rich grasslands. BirdLife International's assessment of the resulting national adjustments found that several Member States used the simplification opportunity to reduce the land area dedicated to nature (BirdLife, 2025). Morales et al. (2022) had warned in Communications Earth and Environment that precisely this kind of politically motivated policy retreat represented the greatest risk to European agricultural sustainability: a hasty, misguided simplification that would jeopardize the green transition.

The governance gap is compounded by misalignment between EU-level ambition and Member State implementation. An assessment by the European Commission itself found that only approximately 40% of regional agricultural policies are fully aligned with EU Green Deal objectives (European Commission, 2024). The NSP approval process, while necessary, was insufficiently demanding: the Commission approved plans that modelling showed to be inadequate in terms of emissions reduction potential, partly because the legal basis for rejection was limited and partly because political sensitivity around Member State autonomy

constrained Commission assertiveness. The result is a formal alignment at the level of approved plans combined with substantive misalignment at the level of on-the-ground implementation.

The regenerative agriculture evidence provides a counterpoint to this governance pessimism. A landmark 2025 benchmarking study by the European Alliance for Regenerative Agriculture (EARA) covering 78 farms across 14 countries and more than 7,000 hectares found that regenerative systems delivered yield parity with conventional farming on approximately 98% of output, while achieving 61% less synthetic nitrogen use, 75% less pesticide application, and a 20% higher gross margin per hectare (EARA, 2025). This evidence directly challenges the conventional assumption that environmental performance necessarily trades off against economic viability. If regenerative practices were adopted on half of European farmland, modelling by Schreefel et al. (2022) suggests this could more than offset current EU agricultural emissions; full adoption could mitigate three times the current annual agricultural emissions total.

Carbon farming represents an emerging governance instrument with significant potential but substantial implementation challenges. The EU's Carbon Removal and Carbon Farming (CRCF) regulation, adopted in 2024, established the first voluntary EU-wide certification framework for agricultural carbon removals. While the framework is technically sound, its voluntary character and the complexity of measurement, reporting, and verification (MRV) requirements mean that uptake among small and medium-sized farms, which constitute the majority of EU agricultural holdings, is likely to remain limited without additional public support for compliance costs.

Challenges and Barriers to Green Agricultural Transformation

The barriers to effective green agricultural transformation in Europe operate across economic, political, social, and technical dimensions, and their interaction creates a complex problem that resists simple solution. Economically, the transition costs for individual farmers are real and front-loaded, while the benefits, in terms of ecosystem services, reduced input costs after transition, and climate resilience, are distributed across time and space. This temporal mismatch between costs and benefits is a classic market failure that only public policy can address. The post-Ukraine energy crisis substantially increased the cost of synthetic fertilizers, compounding the compliance burden on farmers already navigating mandatory eco-scheme requirements. Input cost inflation interacted with perceived competitive disadvantage relative to import competition, particularly from countries not subject to equivalent environmental standards, to produce the conditions for the 2023-2024 protest cycle. The far-right capture of agricultural grievance, documented across multiple Member States in the lead-up to the June 2024 European Parliament elections, added a further political dimension to what might otherwise have been a manageable policy adjustment process.

Structurally, the EU farming sector faces a generational challenge with direct implications for green transition capacity. The average age of EU farmers is approximately 57 years, and access to land, capital, and knowledge remains a significant barrier to entry for

younger farmers who might be more open to innovative practices (OECD, 2023). Farm consolidation trends, while improving technical efficiency in some respects, reduce the diversity of farming systems and create obstacles for the adoption of labour-intensive regenerative practices that perform best at smaller scale. The persistence of large-scale, commodity-oriented farming systems in Central and Eastern Europe, often operating under contractual arrangements with major agroindustrial processors, means that farm-level decisions about practice change are constrained by value chain structures that extend well beyond the farm gate.

The technical challenge of agricultural emissions measurement deserves particular attention. Unlike the energy sector, where emissions monitoring can draw on metered consumption and standardized emission factors, agricultural GHG accounting is inherently uncertain: soil carbon stocks vary enormously at the local level, nitrous oxide emissions from soils are highly sensitive to weather conditions and management practices, and the biological processes underlying methane production in livestock systems are incompletely understood. This epistemic uncertainty has policy consequences: it makes it difficult to design meaningful performance-based incentives, to verify compliance with voluntary commitments, and to defend policy interventions against industry challenges based on contested measurement claims.

The north-south divide in European agriculture constitutes a systemic governance challenge that current policy frameworks are not designed to address. Southern Member States face the most severe projected climate impacts, have the least financial capacity for adaptation investment, and are simultaneously the most dependent on rain-fed agriculture systems that are most vulnerable to drought intensification. The structural funds and cohesion policy instruments that might address these disparities are not well integrated with CAP reform processes, creating a governance gap between territorial development policy and agricultural climate policy that no current institutional mechanism bridges effectively.

Future Directions and Recommendations

The evidence reviewed in this paper points toward several specific areas where policy reform could materially improve European agricultural climate governance. These are not incremental adjustments to the existing framework but structural reforms that would require sustained political will and institutional innovation.

First, the CAP's direct payment system should be fundamentally restructured to align subsidy flows with measurable climate outcomes. The current system, in which over 80% of direct payments support emissions-intensive production systems, is fundamentally inconsistent with net-zero objectives. A reformed system should link at least the majority of Pillar I spending to verified performance against emissions reduction, soil carbon, and biodiversity indicators, using the Dutch KPI-K model as a potential template for standardized national monitoring frameworks (Interreg Europe, 2025). This requires that the Commission develop legally robust grounds for requiring Member State NSPs to meet minimum ambition

thresholds, rather than accepting plans that are nominally compliant but substantively inadequate.

Second, scaling regenerative agriculture requires policy instruments that reduce transition risk for individual farmers. The EARA evidence base establishes clearly that the economic case for regenerative transition is sound in aggregate, but individual farmers face a transition period of two to five years during which yields may be temporarily depressed and the learning curve steep. An EU-wide transition insurance mechanism, analogous to those used in organic farming conversion support, would address this barrier directly. The Commission should also establish a network of at least 1,000 demonstration farms across the EU, distributed across climatic zones and farming systems, to accelerate knowledge transfer and reduce the perceived uncertainty associated with practice change.

Third, food system resilience requires a step change in institutional capacity for anticipation and response. The EU Food Security Crisis Preparedness and Response Mechanism (EFSCM), strengthened following the Ukraine shock, conducts annual stress tests and stockpiling assessments. However, these instruments focus primarily on supply disruption rather than on the longer-term structural resilience of European food production systems under climate stress. A binding food systems resilience framework, with quantified targets for domestic production capacity, import diversification, and protein crop self-sufficiency, would complement the existing crisis management architecture with a forward-looking preventive dimension (ECDPM, 2025).

Fourth, the governance architecture needs mechanisms to insulate long-term climate investments from short-term political volatility. The 2024 CAP simplification demonstrated how rapidly hard-won environmental provisions can be eroded under political pressure. One institutional response would be to establish environmental provisions in the CAP as legally protected minimum standards rather than as variable conditionality requirements subject to administrative simplification. Another would be to create a multi-annual climate performance framework for agricultural sectors, reviewed against scientific evidence every five years on a cycle aligned with the IPCC assessment process, within which annual policy adjustments would be constrained. The broader challenge is to build the kind of durable political coalitions for green agriculture, linking farmer organisations, consumer groups, environmental NGOs, and food industry actors, that can withstand electoral volatility.

Fifth, addressing the north-south divide requires targeted place-based investment strategies that go beyond the current co-financing arrangements for rural development. Southern and Eastern European Member States should receive enhanced EU support specifically tied to climate adaptation in agriculture, covering drought-resistant variety development and dissemination, precision irrigation infrastructure, soil health restoration, and agri-extension services capable of supporting the transition to more resilient farming systems. Generational renewal support, addressing the 57-year average farmer age, should be explicitly linked to adoption of climate-resilient practices rather than simply supporting farm transfers within existing production systems.

Conclusions

Europe stands at a genuinely decisive juncture in its agricultural governance trajectory. The scientific evidence reviewed in this paper establishes beyond reasonable doubt that the current policy trajectory is insufficient: a 6% reduction in agricultural GHG over eighteen years, against a target requiring 40-60% cuts by 2040, represents a structural failure of governance rather than a marginal underperformance. The projected consequences of inaction are not abstract: crop collapse in Southern Europe, escalating import dependency from climate-vulnerable exporters, rural abandonment, and social costs estimated at over €28 billion per year in climate damages (JRC PESETA IV, 2020; EARA, 2025).

Yet the same evidence base also establishes that green agricultural transformation is technically and economically feasible. Regenerative farming systems can match conventional yields while dramatically reducing emissions and improving farmer incomes. Organic farming can be scaled to meet meaningful production share targets, as Denmark demonstrates. Carbon farming can generate new income streams for farmers willing to invest in sequestration practices. The constraint is not knowledge or technology but governance: the capacity of EU institutions and Member States to maintain consistent ambition across political cycles, to translate strategic commitments into effective implementation instruments, and to manage the genuine distributional tensions that any significant structural reform will produce.

The post-2027 CAP negotiation, which will begin in earnest in 2026, is the decisive test. The February 2025 Vision for Agriculture, while disappointing in its reduced ambition, does not foreclose a more transformative outcome if the political conditions change. Building those conditions requires, above all, a clearer articulation of what European citizens, as both food consumers and taxpayers funding the CAP, expect from their agricultural system. The evidence reviewed here suggests that a green, food-secure, and economically viable European agriculture is achievable, but only if the governance framework is designed to deliver it.

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THE IMPLEMENTATION OF THE EUROPEAN GREEN DEAL IN THE REPUBLIC OF MOLDOVA: PROGRESS, CHALLENGES, AND EUROPEAN SUPPORT

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Abstract: *The implementation of the European Green Deal in the Republic of Moldova has become increasingly relevant given the country's vulnerability to climate change, its energy dependence, and its ongoing socio-economic transformation. As a candidate state for EU membership, Moldova is gradually adapting national policies to European environmental and climate standards, seeking to accelerate the transition towards a green and sustainable economy. The study analyses the main dimensions of this transition, focusing on sustainable energy, environmental protection, biodiversity conservation, and climate change adaptation, as well as how these priorities are integrated into public policies and national strategies. The research is grounded in a qualitative approach, based on documentary analysis of official reports, development strategies, and EU-funded programmes, complemented by the interpretation of results from the implementation of environmental and energy policies. The findings indicate that the energy sector remains the primary source of greenhouse gas emissions in Moldova, with an urgent need for decarbonisation and increased energy efficiency. Progress is observed in infrastructure modernisation, the expansion of renewable energy sources, and the reduction of energy poverty; however, these advances are constrained by economic and institutional limitations. Improvements have been recorded in the population's access to water supply and sanitation services, although significant disparities persist between urban and rural areas. Policies on biodiversity protection and natural resource management are under development, but require institutional strengthening and financial resources. Climate change, manifested in extreme events such as droughts and floods, affects agriculture, the economy, and the quality of life for the population. The study highlights the role of the EU in supporting the green transition through programmes such as EU4Climate, EU4Environment, and EU4Digital, which contribute to policy harmonisation and institutional capacity building. The transition towards a green economy in Moldova is an ongoing process requiring consistent investment, policy coherence, and continued international support.*

Keywords: *European Green Deal; Republic of Moldova; green economy; energy transition; climate change.*

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Introduction

In the current context of global transformations driven by climate change, the energy transition, and the imperative of sustainable development, the Republic of Moldova faces significant challenges in the process of economic and institutional modernisation. As a state vulnerable in terms of energy and climate, yet simultaneously pursuing a path of approximation to the European Union, Moldova is compelled to adapt its public policies and economic structures to new international requirements. In this regard, the orientation towards a green economy and the implementation of the principles of the European Green Deal represent fundamental strategic directions for the country's long-term development.

The European Green Deal constitutes the European Union's principal framework for achieving climate neutrality by 2050, through the reduction of greenhouse gas emissions, increased energy efficiency, the promotion of renewable energy, and the protection of natural capital (European Commission, 2019). For the Republic of Moldova, this development model offers both an opportunity for modernisation and an instrument for strengthening economic and social resilience. Given the country's energy dependence and ageing infrastructure, the transition towards a green economy becomes not merely a development option, but a strategic necessity.

An essential role in this process is played by the European Union, the Republic of Moldova's principal external partner in the implementation of reforms in the fields of energy, environment, and climate change. Through financial and technical assistance programmes, the EU supports the modernisation of energy infrastructure, the development of renewable energy sources, improvements in energy efficiency, and the reduction of energy poverty. Furthermore, European support contributes to building institutional capacities and harmonising the national legislative framework with European standards (European Commission, 2022).

At the same time, the green transition in the Republic of Moldova entails a series of structural challenges. The high level of emissions from the energy sector, ageing infrastructure, inefficient management of natural resources, and the low rate of recycling indicate the existence of significant gaps relative to the Member States of the European Union. These problems are compounded by limited investment in environmental protection and insufficiently developed institutional capacity for the implementation of green policies.

Beyond the energy sector, other domains such as water management, biodiversity protection, air quality, and adaptation to climate change require urgent and coherent interventions. Extreme climatic events, such as droughts and floods, have demonstrated the Republic of Moldova's vulnerability to environmental risks and have underscored the necessity of an integrated strategy for adaptation and prevention (Intergovernmental Panel on Climate Change, 2021).

The present paper aims to analyse the process of implementing the Green Deal principles in the Republic of Moldova, highlighting both the progress achieved and the difficulties encountered. The main policies, programmes, and initiatives supported by the

European Union in the fields of energy, environment, and climate change are also examined, with the purpose of understanding their impact on the country's sustainable development.

Thus, the research seeks to underscore the importance of the transition towards a green economy as a central element of the Republic of Moldova's modernisation and its approximation to European standards, contributing to the consolidation of a sustainable, resilient, and competitive development model.

The European Green Deal represents the European Union's strategy to become climate neutral by 2050 (European Commission, 2019). It pursues the transformation of the economy into a sustainable one, based on the reduction of carbon emissions and the efficient use of resources.

Although not a Member State of the European Union, the Republic of Moldova is gradually aligning itself with the objectives of this programme (World Bank, 2023). Cooperation with the EU provides Moldova with financial and technical support for the implementation of green reforms.

A priority area consists of the transition towards renewable energy sources and the increase of energy efficiency (International Energy Agency, 2022). Concurrently, policies on environmental protection and the sustainable management of natural resources are being promoted.

The Green Deal also contributes to the consolidation of the Republic of Moldova's energy security in the context of regional challenges (United Nations Development Programme, 2021). Adaptation to climate change represents another essential direction for the country's sustainable development. The implementation of these policies is closely linked to the European integration process.

Rising energy and food prices, the security crisis, the reconfiguration of value chains, and climate change have necessitated the Republic of Moldova's consolidation of its resilience and the creation of the preconditions for a sustainable and inclusive development trajectory. In this context, the European Union, as a global leader, continues to coordinate international efforts and, in partnership with the Republic of Moldova, addresses environmental challenges while promoting the implementation of ambitious agendas in the fields of climate, environment, and energy (European Commission, 2022). EU support in the process of transition towards a sustainable development model is primarily aimed at adapting to the effects of climate change and reducing the impact of anthropogenic activities on the environment, including through the promotion of the green economy. It also seeks to consolidate energy autonomy and security through the utilisation of renewable energy sources, while simultaneously reducing energy poverty.

Sustainable Energy

Energy production and consumption account for over 68% of total greenhouse gas emissions in the Republic of Moldova, which underscores the central role of the energy sector in addressing climate change (World Bank, 2023). In this context, the decarbonisation of the national energy system becomes a fundamental condition for the achievement of nationally

assumed climate objectives. The European Union remains the Republic of Moldova's principal partner in providing support for overcoming the energy crisis, facilitating the transition towards green and clean energy sources, and encouraging significant investment in the field of renewable energy (European Commission, 2022). EU assistance is directed towards increasing energy efficiency, strengthening energy security, and diversifying the country's energy supply sources.

Regarding energy efficiency, this pertains to the optimisation of energy consumption with a view to reducing carbon dioxide emissions and promoting the use of clean energy, particularly in public buildings such as hospitals, schools, kindergartens, and other medical institutions (International Energy Agency, 2022). Improvements in energy efficiency can be achieved through a series of concrete measures, including the enhancement of buildings' thermal insulation and the installation of modern, energy-efficient lighting, heating, air conditioning, and ventilation systems. The integration of renewable energy sources and the implementation of efficient energy management practices also play an important role.

The installation of biomass-based boilers and thermal power plants for district heating networks contributes, in turn, to reducing dependence on traditional energy sources (United Nations Development Programme, 2021). Furthermore, consultancy services and financial support are provided to enterprises, including SMEs, as well as to households, to reduce energy costs through investment in high-performance technologies and the adoption of efficient energy consumption practices.

Regarding energy security, the European Union provides financial support for the procurement of the necessary energy resources, thereby contributing to the strengthening of the Republic of Moldova's resilience in the face of current and future energy shocks (European Commission, 2022). At the same time, combating energy poverty represents an important priority, pursued through the support of socially vulnerable categories, particularly low-income families, to cope with high energy costs.

Biodiversity, Ecosystems, and Forests

The low level of quality of life often leads to reduced public awareness regarding the importance of natural resources and a clean environment for health and well-being (United Nations Development Programme, 2021). At the same time, the traditional perception that energy is inexpensive in the Republic of Moldova has fostered wasteful behaviours and contributed to maintaining a low level of ecological awareness in society (World Bank, 2023). In this context, European Union support is directed towards improving the situation in the field of water supply and sanitation, as well as towards strengthening environmental protection actions, with a view to facilitating the transition towards green and clean energy (European Commission, 2022).

In the water domain, interventions aim to improve access to water supply and sanitation services, reduce the pollution of water resources, and protect groundwater (World Bank, 2022). These objectives are achieved through the implementation of efficient water resource management practices, with an emphasis on transboundary cooperation in the

administration of river basins. With regard to the environment, the goal is to conserve natural capital and increase the ecological well-being of the population by supporting environmental protection initiatives and developing the green economy (United Nations Environment Programme, 2021).

Furthermore, the transition towards green and clean energy is supported through the promotion of economic digitalisation, as an essential factor for stimulating economic growth, job creation, and the improvement of living standards (Organisation for Economic Co-operation and Development, 2020). To this end, investments in smart (SMART) technologies used in public services, local administration, and water and sanitation infrastructure are encouraged, thereby contributing to increased efficiency and quality of services provided to citizens.

Climate Change

Climate change exerts a significant impact on the availability of natural resources and on the conduct of economic activities (Intergovernmental Panel on Climate Change, 2021). In the Republic of Moldova, these changes have manifested through a series of extreme phenomena, such as severe droughts and floods, which have generated negative consequences for both the national economy and the well-being and health of the population (World Bank, 2023). In this context, European Union support is directed towards the mitigation of and adaptation to the effects of climate change, through the promotion of a low-carbon and climate-resilient economy.

Furthermore, local public authorities play an essential role in this process, being directly involved in the implementation of measures necessary for fulfilling commitments regarding the reduction of greenhouse gas emissions.

EU-Funded Projects

The European Union actively supports the Republic of Moldova's efforts in the field of climate change, intervening in all relevant sectors through an integrated approach. This support aims to improve regional water supply and sanitation infrastructure, reduce greenhouse gas emissions, strengthen environmental protection actions, as well as develop and align climate policies and the legislative framework with European standards. Through these interventions, the EU contributes to the creation of a sustainable system capable of responding to current and future climate challenges.

The “Clean Water” Project

The European Union actively supports the Republic of Moldova's efforts in the field of climate change, intervening in all relevant sectors through an integrated approach. This support aims to improve regional water supply and sanitation infrastructure, reduce

greenhouse gas emissions, strengthen environmental protection actions, as well as develop and align climate policies and the legislative framework with European standards (World Bank, 2023). Through these interventions, the EU contributes to the creation of a sustainable system capable of responding to current and future climate challenges.

The EU4Digital Initiative

The EU4Digital initiative supports the implementation of digital reforms through the promotion of key areas of the digital economy and the energy transition. It contributes to stimulating economic growth, job creation, and the improvement of living standards, while simultaneously providing support to enterprises in adapting to new technological and environmental requirements. Digitalisation is regarded as an essential factor in the streamlining of public services and in accelerating the transition towards a green economy (Organisation for Economic Co-operation and Development, 2020).

Key Regions

Within projects oriented towards regional development, the aim is to modernise local public services through the implementation of smart (SMART) systems (European Commission, 2021). These are applied in areas such as urban planning, administrative services, water and sanitation infrastructure, the energy sector, and healthcare. The purpose is to increase the efficiency of local public administration and improve citizens' access to modern, high-quality services (United Nations Development Programme, 2021).

The EU4Climate Programme

The primary objective of the EU4Climate programme is to support the processes of climate change mitigation and adaptation, in accordance with the Paris Agreement. It contributes to the development of a low-emission, climate-resilient economy in the countries of the Eastern Partnership, including the Republic of Moldova (European Commission, 2021). Furthermore, the programme supports the integration of climate objectives into national development policies and the strengthening of the legislative framework, with the aim of reducing the negative impact of climate change on the population.

The EU4Environment Initiative

The EU4Environment initiative focuses on improving the management of the environment and water resources, contributing to the enhancement of long-term climate and socioeconomic resilience (European Environment Agency, 2022). The programme aims to improve the health and well-being of the population, as well as to support the achievement of

the Sustainable Development Goals in the Eastern Partnership states (Organisation for Economic Co-operation and Development, 2020).

The EU4Environment Green Economy component is directed towards promoting the green economy, through the conservation of natural capital and the enhancement of the population's well-being from an environmental protection perspective (Intergovernmental Panel on Climate Change, 2021). It supports the development of the circular economy, encourages sustainable production and consumption, improves governance mechanisms, and stimulates resilience in both the public and private sectors.

The New Council of Europe Convention against Environmental Crimes: Implications and Perspectives

On 3 December 2025, the Republic of Moldova signed in Strasbourg the Council of Europe Convention on the Protection of the Environment through Criminal Law, an important legal instrument aimed at combating environmental crimes, including those of a transboundary nature (Council of Europe, 2025; United Nations Environment Programme, 2024). The signing of this treaty reflects the state's commitment to strengthening the legislative and institutional framework in the field of environmental protection and to aligning itself with international standards (Intergovernmental Panel on Climate Change, 2021).

Alongside the Republic of Moldova, the document was also signed by Portugal and by the European Union, which underscores its relevance and broad support. The Secretary General of the Council of Europe, Alain Berset, issued a firm call to Member States to adhere to this treaty and to intensify joint efforts in combating ecological crimes (Alain Berset, 2025). The Convention establishes a modern legal framework for the criminal prosecution of acts that damage the environment and for the protection of ecosystems, as part of an international response to the challenges generated by climate change, pollution, and biodiversity loss (European Environment Agency, 2024).

Through its provisions, it establishes an extensive range of environmental offences, such as illegal pollution, improper waste management, and the illegal exploitation of natural resources (Organisation for Economic Co-operation and Development, 2023). It also introduces the concept of a particularly serious offence, comparable to ecocide, targeting intentional actions that may cause major harm to the environment (United Nations Environment Programme, 2023).

For the Republic of Moldova, the signing of this treaty implies the necessity of adjusting the national legislative framework, particularly in the areas of criminal law and environmental protection (World Bank, 2023). This process may involve the revision of the definitions of environmental offences, the sanctioning regime, and the mechanisms of legal liability. Furthermore, the implementation of the convention will contribute to the strengthening of institutional capacities and to the improvement of cooperation between national authorities and international partners. To this end, the exchange of information and the coordination of actions in cases of offences with a transboundary dimension will be facilitated (EUROJUST, 2024).

The subsequent ratification of the treaty by the national authorities will transform these commitments into concrete legal obligations. Thus, the Republic of Moldova will take an important step towards alignment with European and international standards in the field of environmental protection.

Progress and Challenges of the Green Transition in the Republic of Moldova

The Republic of Moldova is exposed to vulnerabilities generated by a model of economic growth insufficiently adapted to current challenges and opportunities (World Bank, 2023). By orienting itself towards climate neutrality and the development of a green economy, the country can consolidate its economic and social resilience (Intergovernmental Panel on Climate Change, 2021). This direction corresponds to Moldova's European aspirations as well as to the objectives of the European Green Deal (European Environment Agency, 2022). Following the adoption in 2018 of the Green Economy Promotion Programme, Moldova undertook the commitment to ensure economic growth compatible with the conservation of natural resources, the protection of the population's health, biodiversity, and climate (United Nations Environment Programme, 2018). The state committed to acting on green development priorities such as energy efficiency and the use of renewable energy, waste recycling, sustainable forest management, the greening of enterprise activities, organic farming, the responsible use of natural resources, and biodiversity conservation (Organisation for Economic Co-operation and Development, 2020). These priorities are well integrated into the international commitments assumed by the Republic of Moldova (United Nations Development Programme, 2021).

To assess the country's green transformation process, several monitoring reports have been developed, based on a set of internationally agreed 'Green Growth Indicators' (GGI) (Organisation for Economic Co-operation and Development, 2021). The current policy document synthesises the main findings and recommendations of the third National Report on GGI, which analyses the evolution of indicators from 2010 onwards and compares them with levels recorded in other European states (World Bank, 2022). This document contributes to the development of the new Green Economy Programme for the period 2022–2024 and its associated action plan, as well as the Environmental Strategy 2030 (United Nations Economic Commission for Europe, 2021). The analysis highlights positive but modest results in the process of transitioning towards an environmentally friendly economy and underscores the need to accelerate reforms in order to reduce the gap relative to other European states (European Environment Agency, 2022).

The National Report on Green Growth Indicators identifies several areas requiring urgent intervention (Organisation for Economic Co-operation and Development, 2021). Regarding energy productivity and CO_2 emissions, although an increase in energy efficiency and a reduction in the intensity of greenhouse gas emissions are observed, levels remain low compared to European standards (Intergovernmental Panel on Climate Change, 2021).

Ageing infrastructure and outdated technologies continue to limit energy performance, which necessitates the modernisation of the housing, transport, and district heating sectors. At the same time, it is necessary to increase the share of renewable energy and to diversify energy production sources (World Bank, 2023).

In the domain of natural resources, material use efficiency remains low, and the level of recycling is insufficiently developed. Although a reduction in industrial waste is observed, household waste continues to grow, indicating the need to consolidate collection and recycling infrastructure (Organisation for Economic Co-operation and Development, 2021). Alignment with the European Union's waste hierarchy and the promotion of the circular economy are also essential.

Regarding water resources, it is necessary to reduce losses from distribution networks and to make more efficient use of resources, given the increasing risks associated with climate change (United Nations Environment Programme, 2021). Concurrently, air quality and pollution levels remain significant challenges for public health and require urgent interventions (World Health Organisation, 2021).

In the biodiversity and land use sector, the Republic of Moldova remains a country with a predominantly agricultural profile, and forested areas are still limited, which necessitates additional measures for the protection and extension of forest resources (European Environment Agency, 2022).

Furthermore, the low level of investment in ecological innovations and environmental protection slows down the green transition process, being influenced by budgetary and institutional constraints (United Nations Development Programme, 2021). In this context, public policies must assign a higher priority to green investment and sustainable development.

The transition towards a green economy requires coherent policies, long-term investment, and the strengthening of international cooperation. The strengthening of institutional capacities, the adjustment of the legislative framework, and the enhancement of inter-sectoral coordination are essential, so that sustainable development objectives may be implemented effectively (United Nations Economic Commission for Europe, 2021).

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INTEGRATING ENERGY AND CLIMATE POLICIES INTO THE EUROPEAN UNION'S RESPONSE TO CONTEMPORARY CRISES: THE IMPACT OF THE WAR IN UKRAINE ON EUROPEAN ENERGY SECURITY

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Abstract: *The European Union (EU) is increasingly confronted with a complex set of crises, including energy insecurity, climate change, geopolitical instability, and economic pressures. These challenges have exposed structural weaknesses in the EU's energy system, particularly its reliance on external suppliers. To understand why energy and climate policies have become so important in the European Union, we need to look at its energy system. The EU is highly dependent on imports, with around 58% of its energy coming from outside sources. Before 2022, about 40% of gas imports, came from Russia. The Russian invasion of Ukraine marked a critical turning point, accelerating the need for a coordinated and integrated policy framework. This paper examines the integration of energy and climate policies as a strategic response to these crises. It argues that aligning energy security, climate mitigation, and economic competitiveness is essential for ensuring long-term resilience and sustainability. The analysis focuses on key EU policy instruments, including the Fit for 55 package, the EU Emissions Trading System, and the REPowerEU initiative. Also, the paper evaluates the main challenges associated with policy integration, such as disparities among Member States, financial constraints, and political trade-offs between short-term energy security and long-term climate goals. The paper argues that the integration of energy and climate policies must be understood as a structural transformation of the European project, and that energy security is defined less and less by the continuity of fossil fuel supply and more and more by reducing external dependencies, infrastructure flexibility, electrification, innovation and institutional coordination.*

Keywords*: European Union, Energy Policies, Invasion, Strategies, RePowerEU.*

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Introduction

The European Union has faced a series of crises in recent years that have profoundly changed the logic of public policy formulation. The climate crisis, the volatility of energy prices, the disruption of supply chains and the intensification of geopolitical conflicts have shown that energy can no longer be treated exclusively as a market issue, and climate policy can no longer be limited to the register of environmental protection.

After the Russian invasion in February 2022, a rupture was created, and the structure of energy dependence made the war not only a foreign policy crisis, but also a systemic shock to European energy security. It should be noted that the Union's reaction did not take the form of a suspension of the green transition. On the contrary, institutional documents show that the response was formulated through an increasingly close articulation between reducing dependence on imported fossil fuels, accelerating the development of renewable energies, energy efficiency and strengthening European strategic autonomy (European Commission, 2025)

The motivation for this paper is based on the transformations in the European Union following the outbreak of the war in Ukraine, which highlighted the structural vulnerabilities of European energy security and highlighted the need for integrated policy responses. The energy crisis, the dependence on fossil fuel imports and the pressure to accelerate the green transition have shown that energy and climate can no longer be analyzed separately, but must be understood as interdependent domains of the same governance style. (European Commission, 2025)

Two of the most important policy framework initiatives to reduce dependence on imported fossil fuels and accelerate the transition to clean energy sources are REPowerEU and the Fit for 55 package. These policies aim not only to reduce emissions, but also to strengthen the energy security, economic resilience and strategic autonomy of the European Union. REPowerEU was adopted as a direct response to the energy shock caused by the war in Ukraine and aims primarily to reduce the EU's dependence on Russian gas, oil and coal. Through measures such as diversifying supply sources, saving energy and increasing investment in renewable energy, this initiative has turned the crisis into an opportunity to accelerate the green transition. The Fit for 55 package represents the legislative framework through which the European Union aims to reduce greenhouse gas emissions by at least 55% by 2030. This package supports the development of clean energy by reforming the carbon market, stimulating energy efficiency and expanding renewable sources.

The main objective of this research is to analyze how the war in Ukraine affected the energy security of the European Union and accelerated the integration of energy and climate policies at the European level. Specifically, the paper aims to highlight how instruments such as REPowerEU and Fit for 55 reflect a strategic reconfiguration of European policies, in which decarbonization, security of supply and economic competitiveness are treated as convergent objectives.

The paper is guided by the following research questions: How has the war in Ukraine influenced the energy security of the European Union? To what extent has this crisis

accelerated the integration of energy and climate policies? How can REPowerEU and Fit for 55 be interpreted as expressions of a new model of European governance? Formulating clear questions is essential in academic research, as they guide both the analysis of the literature and the choice of methodology.

From a methodological point of view, the paper is based on qualitative research, carried out by analyzing official documents of European institutions and specialized literature relevant to the topic of energy security and climate policies. Such an approach is suitable for exploratory and interpretative objectives, especially when the research aims to explain institutional transformations and relations between public policies, rather than to measure statistical variables.

The structure of the paper is organized as follows: after the introduction, the literature review chapter follows, which synthesizes the main theoretical and empirical perspectives on the integration of energy and climate policies and the impact of the war in Ukraine on European energy security. Next, the research methodology is presented, followed by the data analysis chapter and the case study, and the final part is dedicated to discussions and conclusions, to highlight the theoretical and practical implications of the analyzed transformations.

1. Literature Review

The literature on European energy and climate policies shows that the integration process developed gradually, as the Union tried to harmonize emission reduction objectives with security of supply and the functioning of the internal market. A synthetic analysis of European policies up to the horizons of 2020, 2030 and 2050 highlights the fact that, since the stage of consolidating the 2030 framework, the Union has aimed to make the economy and the energy system "more competitive, secure and sustainable" (Amanatidis, 2019, p. 6). In the same logic, the Energy Union Strategy is presented as an integrative framework built around five interdependent dimensions: energy security, energy efficiency, decarbonization, research and innovation, and the internal energy market (Amanatidis, 2019, p. 7).

Recent literature treats energy security not as a solved problem, but as a long-term structural challenge, showing that Europe remains dependent on external suppliers and that the transition from "sprint" to "marathon" requires a strategic vision on raw materials, renewable energy production capacities, interconnections and joint procurement mechanisms (Boehm & Wilson, 2023, pp. 1, 9–10).

After 2022, the EU policy literature began to interpret the war in Ukraine as an accelerator of a reconfiguration already initiated by the European Green Deal. The European Commission explicitly states that REPowerEU aims to save energy, diversify supply and accelerate clean energy production (European Commission, 2025). These three features are important because they indicate a functional integration between reducing external vulnerability and decarbonisation.

The European Parliament report confirms this direction. Boehm and Wilson show that REPowerEU provided "an overall EU-level framework based on supply diversification,

demand reduction and energy efficiency, and increased renewable power" (2023, p. 2). Furthermore, the same analysis argues that, in the long term, the success of European energy security will depend on how the Union manages "to merge its energy policies with its ambitious climate policies" (Boehm & Wilson, 2023, p. 10).

2. Research Methodology

The paper uses a qualitative methodology, suitable for the analysis of a complex institutional transformation and the relationships between several public policy areas. The choice of this approach is justified by the fact that the objective of the research is not the statistical measurement of a single variable, but the interpretation of how the war in Ukraine has changed the discourse, instruments and priorities of the European Union in the field of energy and climate.

The main method used is document analysis. The sources consisted of official documents of the European institutions, in particular reports of the European Parliament and strategic materials of the European Commission on REPowerEU and Fit for 55, but also academic contributions relevant to the theory of policy integration.

The analysis process followed several stages. In the first stage, the documents were selected based on their relevance to the research topic. In the next stage, we moved on to identify recurring concepts and themes, such as energy security, decarbonization and economic competitiveness. In the last stage, the relationships between these categories were analyzed, in order to highlight how energy and climate policies are interconnected. This stage allowed the identification of patterns, such as the role of renewable energy investments in simultaneously achieving energy security and emission reduction objectives, as well as the reconstruction of the logic of post-2022 integration by comparing institutional formulations with interpretations in the specialized literature.

The research questions guiding the paper are: How did the war in Ukraine influence the energy security of the European Union? To what extent did this crisis accelerate the integration of energy and climate policies? How can REPowerEU and Fit for 55 be interpreted as expressions of a new model of European governance? Starting from this, three working hypotheses are formulated. The first argues that the war amplified existing structural vulnerabilities in the European energy model. The second states that the EU response accelerated the integration between energy and climate, transforming decarbonization into a security instrument. The third hypothesis argues that the sustainability of this integration depends on the coherence between objectives, the implementation capacity and the social acceptance of the costs of the transition.

3. Data Analyses

The analysis of institutional documents shows that the war in Ukraine has exposed structural vulnerabilities that already existed in the European energy system. According to the

European Parliament, Russia was the EU's largest energy supplier in 2021, supplying 45% of imported coal, 36% of imported natural gas and 25% of imported oil (Boehm & Wilson, 2023, p. 2). This dependence has created a type of asymmetric interdependence, in which the economic and political costs of supply disruptions were considerable for the Union. The source also highlights that natural gas represented a particular vulnerability because, unlike oil and coal, it is more difficult to transport and store, and LNG import infrastructure was unevenly distributed at the time of the invasion (Boehm & Wilson, 2023, p. 2).

Under these conditions, the war produced not only an increase in geopolitical risk, but also a material crisis in the European energy system, reflected in very high prices and pressure on markets and consumers. These developments confirm the first hypothesis of the paper: the war did not create dependence, but transformed it into an explicit strategic vulnerability.

From this point on, European energy security could no longer be conceived as a simple issue of market efficiency, but as a problem of geopolitical and institutional resilience.

Emergency measures were framed within a broader logic of energy and climate integration. The European Commission presents REPowerEU as an initiative aimed at reducing dependence on fossil fuels, saving energy and accelerating the transition to clean sources (European Commission, 2025). The European Parliament report reinforces this interpretation and shows that REPowerEU functioned as a general framework based on diversification of supply, reduction of demand, energy efficiency and increasing the share of renewable energies (Boehm & Wilson, 2023, p. 2). This change confirms the second hypothesis of the paper. Climate policy was not postponed in the name of security, but was reinterpreted as a resource for security.

3.1. Romania as a National Implementation Case

REPowerEU is the most relevant example of how the European Union has integrated energy and climate policy since the start of the war in Ukraine. The European Commission states that the initiative pursues three major objectives: saving energy, diversifying supply and accelerating the production of clean energy (European Commission, 2025).

The REPowerEU case is also important because it shows the change in direction of the energy transition. If before 2022 it was justified mainly by reducing emissions and modernizing the economy, after the invasion it was also justified by arguments of security and strategic autonomy. In this sense, REPowerEU represents the institutional expression of the new phase of integration between energy and climate at the level of the European Union.

Romania represents a relevant case study for the analysis of the integration of energy and climate policies in the European Union after the start of the war in Ukraine. The relevance of this case derives from the country's geostrategic position on the eastern border of the Union, from its role in regional energy security and from the fact that the adaptation of national energy policies occurred under the simultaneous pressure of geopolitical instability, rising prices and decarbonisation objectives. In this context, REPowerEU became an instrument through which European priorities regarding energy security and green energy were translated into national investments and reforms. (European Commission, 2025; European Commission, n.d.; MIPE, 2023a)

In the case of Romania, the contribution of REPowerEU to the diversification of energy sources is visible even in the formulation of the objectives of Component 16 of the PNRR. Official documents show that this component aims to "ensure the resilience of the Romanian energy system by increasing the share of electricity production from renewable sources", especially through investments in solar and hydropower, along with decarbonization and network modernization measures (Government of Romania, n.d.). At the same time, the component aims to develop and digitalize energy transmission and distribution capacities, which is essential for the integration of a larger volume of renewable production into the national energy system. (Government of Romania, n.d.; MIPE, 2023a)

However, by carefully studying the documents and legislation, we can see that there are also certain limits, and the efficiency of energy diversification depends on the administrative capacity to implement the projects, the absorption of funds and the stability of the regulatory framework. The existence of specific guides, ministerial orders and implementation documents dedicated to Component C16 shows that the process is institutionalized, but also complex, dependent on coordination between central authorities, economic operators and final beneficiaries (Ministry of Energy, 2025; MIPE, 2023b). In other words, REPowerEU offers Romania the opportunity to diversify its energy sources and accelerate green energy, but the concrete success depends on the quality of domestic implementation.

Overall, the case of Romania confirms that REPowerEU contributes to the diversification of energy sources through a combination of measures aimed at increasing production from renewable sources, modernizing energy infrastructure, energy efficiency and support for consumers. This combination shows that diversification is not reduced to replacing external suppliers, but involves a structural reconstruction of the national energy system in line with European priorities regarding energy security and the green transition. From this perspective, Romania offers a relevant example of how the crisis generated by the war in Ukraine accelerated the integration between energy policy and climate policy in a European Union member state.

4. Discussions

The results of the analysis show that the war in Ukraine acted as a catalyst for a deeper transformation of European governance. In theory, the first implication is the redefinition of energy security. It can no longer be reduced to the continuity of fossil fuel supplies, but must be understood as a combination of diversification, reduced dependence, energy efficiency, the development of renewables and institutional capacity for coordination. The EPRS report explicitly states that, in the long term, the success of European energy security will be measured by the EU's ability to combine energy policies with ambitious climate policies and the need for economic competitiveness (Boehm & Wilson, 2023, p. 10). The second implication is that climate policy acquires a new strategic function. Starting with 2022, decarbonization is no longer just a normative or ecological imperative, but also an instrument for reducing geopolitical vulnerability.

The third implication concerns the limits of integration. Although the European strategic framework is more coherent than before, implementation remains uneven, and success depends on financing, administrative capacity and social acceptance. The EPRS report warns that high energy prices and transition costs may accentuate the need to combat energy poverty and regional disparities, as they affect public acceptance of European energy and climate policies (Boehm & Wilson, 2023, p. 10). For this reason, energy–climate integration cannot be sustainable without a strong social dimension.

The Romanian case study shows that REPowerEU functions not only as a European instrument to respond to the energy crisis, but also as a mechanism to reposition national policies towards the green transition. In the case of Romania, the plan has contributed to connecting energy security objectives with investments in renewable energy, energy efficiency and infrastructure modernization. This relationship is important because it demonstrates that the diversification of energy sources is not achieved exclusively by changing suppliers, but by internally restructuring the energy system, so that it becomes more flexible, less vulnerable and more compatible with the climate objectives of the European Union.

At the same time, the Romanian case also highlights the limits of energy and climate integration. Although REPowerEU provides funds and a clear strategic framework, its effectiveness depends on administrative capacity, the pace of reforms and the quality of implementation at national level. This suggests that the success of the energy transition depends not only on the existence of European policies, but also on the way they are adapted and implemented in each Member State. Therefore, Romania illustrates very well that energy-climate integration is a complex process, in which the opportunities offered by the European Union must be harnessed through internal coordination, sustained investments and institutional coherence.

4.1. Challenges and Benefits of Integrating Energy and Climate Policies

The integration of energy and climate policies at the European Union level involves a number of structural, economic and political challenges, which affect both the process of developing and implementing them.

First of all, one of the most important difficulties is represented by the heterogeneity of the Member States. The European Union is not a homogeneous system, and differences in terms of energy mix, level of economic development and administrative capacity significantly influence the way in which policies are implemented. For example, the countries of Central and Eastern Europe are more dependent on fossil fuels, which makes the transition more difficult and costly (OECD, 2022, p. 30).

Secondly, the costs of the energy transition represent a major challenge. The investments needed to modernize energy infrastructure, develop renewable sources and increase energy efficiency are extremely high. According to the International Energy Agency, these costs can reach hundreds of billions of euros annually (IEA, 2022, p. 60). In the absence of effective financing and redistribution mechanisms, there is a risk of increasing inequalities between countries.

Another important aspect is related to the social acceptance of policies. The energy transition can lead to increased energy prices or to the restructuring of certain economic sectors, which directly affects the population. In this context, the lack of public support can become a major obstacle to the implementation of reforms.

There is also a permanent tension between short-term and long-term objectives. In times of crisis, governments are tempted to prioritize immediate energy security, even if this may conflict with climate goals. This contradiction was visible in the context of the recent energy crisis, when some states temporarily returned to using coal.

Last but not least, the institutional complexity of the European Union makes decision-making slow and sometimes fragmented. Coordination between European institutions and national governments requires political compromises, which can reduce the effectiveness of policies.Overall, these challenges show that policy integration is not a linear process, but one characterized by tensions and trade-offs.

Despite the challenges, the integration of energy and climate policies offers significant opportunities for the European Union, both economically and strategically.

One of the most important benefits is increased energy independence. Reducing dependence on imports contributes to reducing geopolitical risks and increasing economic stability (European Commission, 2019, p. 6). The development of renewable sources allows Member States to capitalize on their domestic resources and reduce external vulnerabilities.

Another important advantage is job creation. The green energy sector has a high growth potential and can contribute to reducing unemployment, especially in regions affected by the decline of traditional industries.

The European Union also has the opportunity to strengthen its position as a global leader in climate policy. By adopting ambitious standards, the EU can influence the international agenda and help set global norms.

Last but not least, policy integration contributes to modernising the economy and increasing competitiveness in the long term. The transition to a sustainable economic model can generate competitive advantages in the context of globalisation.

Conclusions

The analysis carried out in this paper shows that the war in Ukraine represented a turning point for European energy policy, as it transformed energy security from a predominantly economic concern into a strategic priority with climate, industrial and geopolitical implications. Rather than weakening the green agenda, the crisis led the European Union to accelerate the integration of energy and climate policies, placing the energy transition at the heart of its response to the systemic vulnerabilities generated by the dependence on imported fossil fuels (European Commission, 2025a; European Commission, 2025b). This development confirms that energy security and decarbonisation can no longer be treated as separate objectives, but as complementary dimensions of the same European resilience strategy.

An important result of the research is that REPowerEU has become the clearest expression of the new European orientation. By focusing on reducing energy waste, diversifying supply and expanding clean energy production, this plan demonstrates that the EU's response to the crisis was not limited to temporary measures, but aimed at a deeper transformation of the European energy structure (European Commission, 2025a). In parallel, the strengthening of the Fit for 55 direction showed that climate objectives were maintained and reinterpreted in the context of energy security and strategic autonomy. Therefore, the integration of energy and climate no longer appears only as a normative project, but as a concrete tool for reducing geopolitical dependencies and supporting European economic competitiveness.

The case study on Romania supports this conclusion at the national level. The inclusion of the REPowerEU chapter in the National Recovery and Resilience Plan shows that European priorities have been translated into a national framework of reforms and investments focused on renewable energy, energy efficiency and the modernization of energy infrastructure (European Commission, n.d.; MIPE, 2023; European Commission, 2023). In particular, the contribution of REPowerEU to the diversification of energy sources in Romania is relevant, as it does not limit itself to changing external suppliers, but involves expanding solar and hydropower production, digitalizing networks and creating a more flexible and less vulnerable energy system to external shocks (Government of Romania, n.d.; European Commission, n.d.). Thus, the case of Romania confirms that the diversification of energy sources must be understood as an internal restructuring of the energy mix, compatible with the objectives of security and sustainability.

In conclusion, the war in Ukraine has accelerated not only the shift in European energy priorities, but also the maturation of a new governance logic in which energy security, climate policy and competitiveness are increasingly intertwined. REPowerEU and the case of Romania show that the European Union is trying to transform a major geopolitical crisis into an opportunity for a strategic reconstruction of the European energy system. If this direction is supported by coherent policies, continued investment and effective implementation, the integration of energy and climate can become one of the most important foundations of European resilience in the coming decades (European Commission, 2025a; European Commission, 2025b; European Commission, n.d.).

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POLAND AND THE EUROPEAN GREEN DEAL: POLICY AND GOVERNANCE FOR A GREENER EUROPE

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Abstract: *This paper examines the implementation of the European Green Deal in Poland, focusing on how national institutions align with EU sustainability frameworks. Through a qualitative analysis of strategic documents, policies, and governance mechanisms, the study evaluates the effectiveness of Poland's transition in areas such as renewable energy and circular economy. Key challenges identified include institutional fragmentation, administrative capacity, and public engagement. The research highlights opportunities in economic modernization, regional development, and EU integration. Recommendations are proposed to strengthen intergovernmental coordination and promote inclusive green policies.*

Keywords: *European Green Deal, Poland, sustainability governance, renewable energy, policy coordination*

Introduction

Poland finds itself at a strategic turning point in its energy and climate transition, within the context of the ambitious European Green Deal (EGD) — the European Union's flagship initiative for socio-economic transformation toward climate neutrality by 2050 (European Commission, 2023). Today, the Green Deal represents not only a normative framework for reducing greenhouse gas emissions, but also a complex strategic architecture of multilevel governance that integrates policies on energy, the economy, innovation, social justice, and industrial competitiveness at the European level, under a robust legislative framework that includes the Climate Law, Fit for 55, and the Just Transition Mechanism (European Commission, n.d.).

Poland faces exceptional structural challenges within this context: its historical dependence on coal, an energy sector dominated by fossil fuels, and the economic and social constraints stemming from this dependency (Government of Poland, 2021). Despite formal commitments, Poland's climate-transition trajectory has at times been perceived as ambiguous

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or insufficiently ambitious, generating domestic debates and negotiations with European institutions over the pace, costs, and modalities of implementing green measures (European Commission, 2022a). Poland's energy transformation cannot be viewed in isolation from recent geopolitical developments, particularly the energy crisis triggered by the 2022 war in Ukraine, which underscored both the vulnerabilities associated with reliance on fossil-fuel imports and the imperative of energy security as an integral component of climate and economic strategy (European Committee of the Regions, 2023). In this sense, the 2023 change of government—through the political vote that brought Donald Tusk to the head of the Polish executive—opens a new potential stage of strategic repositioning in dialogue with EU partners and in aligning with European climate objectives. Although the EU's official objective is climate neutrality by 2050 and a net reduction of emissions by at least 55% by 2030, in line with the European Climate Law and the EGD framework, for Poland these targets function more as reference points than as realities already embedded in national energy policy (European Commission, 2021a). According to several official European assessments, for Poland to contribute to the EU's objectives, final energy consumption from renewable sources should reach at least 25% by 2030, and energy efficiency should increase significantly over the same period (European Commission, 2022b).

On the other hand, domestic strategic documents such as the *Energy Policy of Poland until 2040* (EPP2040) emphasize a "responsible" transition aimed at minimizing social and economic shocks, while simultaneously acknowledging the need to reduce coal use and diversify the energy mix through renewables and nuclear power (Government of Poland, 2021). This approach highlights the managerial tension between the imperative of climate transformation and local socio-economic constraints, particularly in regions dependent on the coal industry, such as Silesia. Contemporary academic and political discourse frames this tension as a "paradox of environmental policy": although Poland has made progress in diversifying its energy sources and increasing the share of renewables, emission reductions remain below the EU average, and its political negotiation stance tends to advocate for flexibility in European targets rather than for a radical acceleration of the transition (European Parliament, 2024).

1. The Strategic Architecture of the European Green Deal for Climate Neutrality

The European Green Deal (EGD) represents the most ambitious public policy initiative of the European Union for combating climate change and driving the systemic transformation of member states' economies toward climate neutrality by 2050 (European Commission, 2019). This strategic architecture constitutes an integrated framework of energy, economic, social, and institutional policies designed to ensure coherence between climate objectives and economic practices, through legislative, financial, and multi-level governance instruments (European Commission, n.d.).

The strategic structure of the EGD is built on three fundamental pillars: (1) a binding legal framework (the European Climate Law), which establishes climate neutrality as a legal

objective of the EU; (2) the Fit for 55 policy package, designed to reduce emissions by at least 55% by 2030 compared to 1990 levels; and (3) financial support and redistribution mechanisms, such as the Just Transition Fund and the instruments provided under the Recovery and Resilience Facility (RRF) (European Commission, 2021b).

1.1. European Climate Law and the Binding Objectives

The European Climate Law has transformed the objective of climate neutrality from a political pledge into a legally binding commitment for all EU member states. It introduces the 2030 intermediate targets and periodic monitoring and reporting mechanisms as part of a system of shared responsibility. Through this law, the European Commission and the member states are required to develop coherent climate-mitigation strategies aligned with the European Green Deal (European Commission, 2021c). The 2030 objective of reducing net emissions by at least 55% requires Member States to adapt their domestic policies in energy, industry, and transport to meet EU standards, which turns the European Climate Law into a governance instrument that goes beyond traditional voluntary guidelines.

1.2. The Fit for 55 Package

The Fit for 55 package brings together a series of directives and regulations that, taken collectively, reshape the European political and economic architecture oriented toward decarbonization. Among its most important components are the reform of the Emissions Trading System (EU ETS), the increase of the share of renewable energy in the energy mix, and the revision of energy-efficiency standards for buildings and industry (European Commission, 2021b).

This reglementations is not merely a set of regulations, but a coherent mechanism for reallocating responsibilities between EU authorities and national governments. The reform of the EU ETS, for instance, not only sets prices for carbon emissions but also incentivizes investment in clean technologies through the introduction of a carbon border adjustment mechanism for certain vulnerable industrial sectors (European Commission, 2021d).

Another essential element is the policy for promoting renewable energy, which sets binding targets for member states regarding the share of renewables in final energy consumption. This reinforces the role of renewable energy as a central pillar of the strategic decarbonization architecture (European Commission & European Parliament, 2018).

1.3. Financial and Socio-Economic Mechanisms: The Just Transition Fund and RRF Instruments

One of the elements that distinguishes the European Green Deal from previous climate initiatives is the inclusion of a financial mechanism specifically designed to mitigate the social effects of the transition: the Just Transition Mechanism (JTM). It was created to support the regions most affected by the gradual phase-out of fossil fuels, particularly those dependent on coal and related industries. The Just Transition Fund operates as a financing platform that

mobilizes both public and private resources, offering grants and preferential loans for projects that support the creation of green jobs, the reskilling of the workforce, and the regeneration of affected communities (European Parliament & Council of the EU, 2021).

Complementarily, the Recovery and Resilience Facility (RRF) has provided an additional financial framework for member states affected by the COVID-19 pandemic, which—under the conditions permitted by the European Commission—can be channelled toward investments that accelerate the green transition. This interdependence between the RRF and the EGD underscores the holistic nature of the strategic architecture, in which financial instruments are not merely optional tools but an integral component of achieving climate objectives (European Parliament & Council of the EU, 2021b).

1.4. Multi-level Governance and Shared Responsibility

The strategic architecture of the EGD operates on the principle of multi-level governance, in which EU authorities, national governments, and local actors collaborate in implementing climate objectives. A pertinent example is the process of drafting and updating the National Energy and Climate Plans (NECPs), which require member states to present detailed decarbonization trajectories and to revise them periodically (European Parliament & Council of the EU, 2018). Multi-level governance reflects both the complexity of the transition and the necessity for climate-policy decisions to be coordinated across institutional levels in order to avoid incoherence and fragmentation that would undermine the objectives of the EGD.

2. The Political Economy and Energy Structure of Poland (2019-2025)

2.1 Structural Dependence on Coal and Industrial Legacy

Poland represents one of the most distinctive cases within the European Union in terms of energy structure, due to its historical dependence on coal. Unlike most member states, which have significantly reduced the use of this fuel over the past two decades, Poland has maintained coal—both hard coal and lignite—as a central pillar of its energy security and industrial identity (European Parliament & Council of the EU, 2020). In 2019, approximately 70–75% of electricity production came from coal, placing Poland far above the EU average. This reality is not merely technical but deeply political and social. Regions such as Upper Silesia concentrate traditional mining activities, powerful trade unions, and communities dependent on the coal sector. In these areas, the energy transition is not perceived solely as a climate objective but as a threat to economic and identity-based stability (European Council on Foreign Relations, 2023).

Poland's historical dependence on coal explains Warsaw's longstanding reluctance toward certain components of European climate policies, particularly during the governance

of the Law and Justice Party (PiS). The dominant argument was that of "energy sovereignty" and the state's right to determine its own energy mix according to domestic conditions.

2.2. National Energy Policy: Between Sovereignty and European Convergence

Poland's central strategic document in the field of energy is the Energy Policy of Poland until 2040 (PEP2040), adopted in 2021. It marks a formal acknowledgment of the need for transition, but within a gradual and phased framework.

PEP2040 proposes:

- Reducing the share of coal in electricity production by 2040;
- Accelerated development of offshore wind energy in the Baltic Sea;
- Establishing a civilian nuclear program as an alternative to fossil fuels;
- Increasing the share of renewable energy in gross final consumption. (Ministry of Climate and Environment of Poland, 2021)

However, the document reflects a cautious approach in which decarbonization is subordinated to the stability of the energy system and the preservation of industrial competitiveness. Unlike some Western European states that have adopted clear coal-phase-out schedules, Poland has maintained a flexible position, linking the closure of mines to economic conditions and social negotiations. This stance has generated tensions with European institutions, especially in the context of the increased ambition of the Fit for 55 package. Nevertheless, Poland has not fundamentally rejected the Green Deal; rather, it has sought to negotiate the conditions and pace of its implementation.

2.3. The Impact of the War in Ukraine and Strategic Recalibration (2022–2023)

The Russian invasion of Ukraine in 2022 produced a major recalibration of the energy discourse in Central and Eastern Europe. For Poland, which had held a critical position toward Europe's dependence on Russian gas, the conflict partially validated its strategy of diversifying energy sources. Poland had already accelerated investments in strategic infrastructure, such as the LNG terminal in Świnoujście and the Baltic Pipe pipeline, which enables the import of gas from Norway. After 2022, the focus shifted from the climate debate to that of energy security. This shift produced a paradoxical effect: on the one hand, it temporarily justified maintaining coal as a safety solution; on the other hand, it stimulated investments in renewables and nuclear energy as structural alternatives to external dependencies (Konopelko, Kostecka-Tomaszewska & Czerewacz-Filipowicz, 2023).

The European energy crisis demonstrated that climate neutrality and energy security are not antagonistic objectives, but interdependent ones. In Poland's case, the argument of energy sovereignty was reinterpreted in a European strategic key, particularly through participation in regional projects and through support for sanctions against Russian energy imports.

2.4. The Impact of the War in Ukraine and Strategic Recalibration (2022–2023)

The 2023 parliamentary elections and the return of Donald Tusk to the head of the executive opened a new stage in Poland's relationship with EU institutions. In the previous period, disputes over the rule of law had led to the blocking of certain European funds, including components of the National Recovery and Resilience Plan.

The new administration signaled its intention to restore dialogue with Brussels and to accelerate access to European funds dedicated to the green transition. This shift has direct implications for the strategic architecture of climate neutrality in Poland: access to European financial resources may lead to a real acceleration of investments in green infrastructure, energy efficiency, and industrial modernization (Arthur D. Little, 2024).

The change of government does not, however, instantly alter structural realities: dependence on coal, social pressures in mining regions, and budgetary constraints remain constant. In this sense, the Polish transformation is not a rupture but rather a strategic adjustment within a more cooperative European framework.

2.5. A political Economy of Transition: Constraints and Opportunities

The political economy analysis of Poland's climate transition reveals a complex interaction between:

- traditional industrial interests,
- trade-union pressures,
- European requirements,
- geopolitical dynamics,
- energy-security imperatives.

Poland is not a passive actor within the Green Deal, but an active negotiator seeking to balance energy sovereignty with European integration. This positioning produces a national architecture of transition characterized by gradualism, pragmatism, and financial conditionality (Mrozowska, Wendt & Tomaszewski, 2021). The central question for the 2019–2025 period is not whether Poland will participate in the European climate transition, but at what pace and through what combination of instruments—coal in controlled decline, emerging nuclear energy, and expanding renewables—it will reconfigure its energy system.

3. Decarbonization Pathways: Coal Transition, Nuclear Energy and the Expansion of Renewables

If in Chapter 2 we analyzed the structural constraints of Poland's political economy, the present chapter examines the concrete instruments through which Poland is attempting to reconfigure its energy architecture in the context of the European climate-neutrality objectives. Polish decarbonization does not follow a single model but is built on three interdependent

strategic pillars: (1) the transition of coal regions, (2) the development of nuclear energy as an instrument of systemic stability, and (3) the acceleration of renewable energies, especially offshore wind in the Baltic Sea.

3.1. Coal Transition and Just Transition in Silesia

The region of Upper Silesia represents the historical center of the Polish mining industry and the social nucleus of resistance to accelerated decarbonization. Unlike in Western European states, where mine closures have taken place progressively over recent decades, in Poland the mining sector has continued to play a strategic and political role until recently. The agreements negotiated between the government and the mining unions established a gradual timetable for mine closures, with a horizon extending to around the year 2049. This timetable reflects a cautious approach aimed at avoiding severe social and economic shocks in regions dependent on coal (Strek, 2020).

External pressures — both from the emissions trading market (EU ETS) and from European climate obligations — have increased the costs of using coal, inevitably accelerating the restructuring process.

In this context, the Just Transition mechanism becomes essential. For Poland, it is not only a financial instrument but also a mechanism of political stabilization. The coal regions must be transformed through:

– industrial reconversion,

– investments in green infrastructure,

– professional retraining,

– attracting investments in clean technologies.

If these mechanisms fail, the transition risks becoming a factor of political polarization and Euroscepticism.

3.2. Nuclear Energy as a Tool for Strategic Autonomy

Poland, unlike many EU member states that have reduced or eliminated nuclear energy, sees the development of a civilian nuclear program as a central pillar of its energy transition. The absence of nuclear power plants at present creates a structural dependence on fossil fuels. In this sense, the Polish nuclear program has a dual function:

– reducing emissions in the medium and long term;

– strengthening energy security by reducing dependence on imports.

The projects under development foresee the construction of several reactors starting in the 2030s, in partnership with Western companies. Nuclear energy is presented in the Polish strategic discourse not only as a climate solution, but as sovereignty-enhancing infrastructure (International Energy Agency, 2022).

The option has important geopolitical implications. It aligns Poland with a group of European states that consider nuclear energy compatible with climate-neutrality objectives, strengthening a "nuclear coalition" within the EU.

However, nuclear development is capital-intensive, involves long timelines, and is exposed to cost-overrun risks. Consequently, it cannot fully substitute immediate investments in renewable sources.

3.3. The Expansion of Renewable Energy and Offshore Wind in the Baltic Sea

If renewable energy is a long-term solution, renewables represent the vector of accelerated transformation. In recent years, Poland has recorded a rapid increase in photovoltaic capacity, especially through residential investments and support schemes for prosumers. Solar energy has experienced one of the fastest percentage growth rates in Central Europe.

However, the true strategic stake is offshore wind energy in the Baltic Sea. Poland has considerable potential in this area, and the planned projects could transform the country into a major actor in the offshore wind sector of Central Europe.

Offshore wind has the advantage of relative stability compared to solar and can provide significant production capacity without generating the kind of social opposition encountered in the case of mines.

The development of renewables is, however, conditioned by:

– the modernization of transmission networks,

– investments in storage capacities,

– the reform of regulations regarding the placement of onshore wind turbines,

– the flexibilization of the energy market.

Without infrastructure modernization, the growth of renewable capacities risks being limited by technical bottlenecks.

3.4. Synergies and Tensions between the Three Pillars

The architecture of Polish decarbonization is characterized by a strategic triad:

– coal in controlled withdrawal,

– nuclear as a systemic stabilizer,

– renewables as a growth engine.

The central issue is not choosing one of these instruments, but synchronizing them.

If coal withdrawal is too slow, Poland risks economic penalties and loss of competitiveness.

If it is too fast, social shocks and political destabilization may occur.

If nuclear is delayed, the pressure on renewables becomes excessive (Szulecki, Maltby & Szulecka, 2024). Basically, Polish decarbonization is less a technical process and more a strategic engineering exercise.

4. Geopolitics and Energy Security after 2022: Poland between Decarbonization and Strategic Autonomy

The Russian invasion of Ukraine in February 2022 represented a turning point for European energy policy. If until then the green transition had been perceived mainly as a climate and economic project, after 2022 it became explicitly a project of strategic security. For Poland, this conceptual transformation was particularly relevant.

Unlike some Western European states, Poland had consistently warned about the risks of dependence on Russian gas. Thus, the energy crisis generated by the conflict did not represent a strategic surprise for Warsaw, but rather a confirmation of its previous position.

4.1. Energy Independence and Strategic Infrastructure

In the years preceding the conflict, Poland had already invested in diversifying its energy supply. The LNG terminal in Świnoujście, progressively expanded, enabled the import of liquefied natural gas from multiple global sources. In parallel, the Baltic Pipe pipeline, which connects Poland to the Norwegian fields via Denmark, became operational at a strategic moment, dramatically reducing dependence on imports from Russia.

After 2022, these investments acquired additional strategic value. Poland halted imports of Russian gas and accelerated its integration into regional energy networks. Thus, energy security became a central component of foreign and security policy (European Commission, 2023a). This repositioning generated an indirect effect on the Green Deal: the energy.

4.2. The Coal Paradox in a Crisis Context

The European energy crisis, however, also produced a paradox. Faced with uncertainty regarding gas supply, several member states temporarily reactivated coal-fired power plants to ensure system stability. In Poland's case, this situation provided a temporary argument for maintaining a domestic coal-based capacity. Although the strategic objective remains the reduction of its use, the crisis demonstrated that accelerated elimination without solid alternatives can create systemic vulnerabilities (Kardaś, 2023). Thus, for Poland, climate neutrality must be synchronized with energy resilience. This geopolitical lesson has reinforced the government's argument that the transition must be phased and calibrated to security realities.

4.3. Poland as a Regional Actor in Central and Eastern Europe

Poland's geographical and political positioning gives it a strategic role in the regional energy architecture. After 2022, Poland emerged as an active supporter of the energy integration of Central and Eastern Europe, supporting Ukraine and participating in regional interconnection initiatives. Through its gas and electricity infrastructure, Poland contributes

to stabilizing the regional energy market. In this sense, European climate neutrality acquires a regional dimension: the states of Central Europe must advance at a pace compatible with the infrastructural and economic capacity of the region (European Commission, 2024). This position transforms Poland from a „reluctant state" into a potential regional pivot of transition, provided it manages to harmonize investments in renewables, nuclear, and energy transport infrastructure.

4.4. The Relationship between Energy Security and Climate Neutrality

The 2022 crisis demonstrated that energy security and climate neutrality are not antagonistic objectives. On the contrary, investments in domestic renewable sources and in nuclear energy can reduce exposure to the volatility of external markets. For Poland, this convergence is essential. The argument of energy sovereignty, dominant in the previous period, is reinterpreted within a cooperative European framework. Instead of being used to contest climate policies, it can become a driver of investment in green infrastructure (European Commission, 2022c).

Investments in short-term energy security can favor transitional fuels (gas), while climate objectives require accelerated decarbonization. Balancing these two dimensions represents the major strategic challenge for the 2022–2025 period.

5. European Conditionality and Institutional Capacity (2019-2025)

If decarbonization represents the technological dimension of climate neutrality, and energy security constitutes the geopolitical dimension, governance is the invisible infrastructure that determines the viability of the entire strategic architecture. In Poland's case, the period 2019–2025 is marked by a structural tension between green investment ambitions and institutional conflicts with the European Union. Climate neutrality is not only a matter of industrial capacity, but also one of administrative capacity, regulatory coherence, and legal stability. Within this framework, the relationship between Poland and the European institutions becomes decisive for the effective implementation of the transition.

5.1. Recovery and Resilience Mechanism (RRF) and Conditionality

The central post-pandemic instrument was the Recovery and Resilience Facility, part of the NextGenerationEU program. For Poland, the allocated funds represent one of the most important opportunities to finance the energy transition, digitalization, and infrastructure modernization. However, full access to these funds was conditioned on meeting milestones related to the rule of law and the independence of the judiciary. The dispute between the previous conservative government (2015–2023) and the European Commission led to temporary blockages in the approval and release of payments (European Commission, 2022d).

This situation created a strategic paradox: while Poland needed European funding to accelerate the energy transition, the institutional conflict limited the financial flow. Thus, the architecture of climate neutrality was indirectly influenced by domestic political dynamics and by the relationship with Brussels.

5.2. The 2023 change of government and European recalibration

The 2023 autumn parliamentary elections produced a significant change in the political configuration. The new government, led by a pro-European coalition, announced its intention to normalize relations with EU institutions and to accelerate the implementation of the reforms required to unlock European funds.

This change has direct implications for the strategic architecture of climate neutrality:

– it increases the predictability of the relationship with the European Commission;

– it facilitates access to funding for green infrastructure;

– it reduces the risk of political isolation in European climate negotiations. (European Commission, 2024b)

5.3. Administrative capacity and project implementation

An often underestimated element in the analysis of climate neutrality is the effective administrative capacity for implementation. Major projects – nuclear power plants, offshore wind farms, grid modernization, storage infrastructure – require:

- efficient public procurement procedures,
- legislative stability,
- coordination between ministries,
- cooperation between the central level and regional authorities,
- transparency and predictability for investors.

In Poland, administrative bottlenecks and frequent legislative changes have in the past affected the pace of investment, especially in the onshore wind sector. Recent reforms are trying to simplify the regulatory framework, but results depend on coherence in the medium term. Climate neutrality by 2050 requires not just one-off projects, but a systemic reform of energy governance. (European Commission, 2024c)

5.4. Conditionality as a tool for strategic convergence

The European conditionality of the 2019–2025 period became an instrument of strategic convergence. Initially perceived as external pressure, the conditionality related to the rule of law and structural reforms can function, in the current context, as a mechanism of institutional consolidation. Access to European funding for green projects creates an incentive for regulatory stability and administrative transparency (Becker, 2024). In this sense, the strategic architecture of European climate neutrality is not only technical or financial, but also normative. It requires political and institutional convergence.

Conclusions: Poland in the Strategic Architecture of the European Climate Neutrality (2019-2025)

The analysis of the 2019–2025 period shows that Poland's positioning toward European climate neutrality cannot be reduced to opposition or compliance. The Polish case reveals a process of strategic recalibration in which decarbonization is gradually integrated into a broader matrix of energy security, socio-economic stability, and geopolitical repositioning.

Climate neutrality, as defined at the level of the European Union for the 2050 horizon, represents a systemic transformation of national economies. For Poland, this transformation begins from an energy structure historically dependent on coal, with profound economic and social implications. Therefore, the transition cannot be interpreted solely in technical or regulatory terms; it must be analyzed as a process of structural reconfiguration.

The energy dimension: between historical constraint and accelerated diversification

The first defining element of Poland's strategic architecture is the management of its coal legacy. The gradual withdrawal from coal is inevitable in the context of rising emission-certificate costs and European objectives, but the pace is calibrated to avoid the socio-economic destabilization of dependent regions.

The model adopted is based on three complementary pillars:

- the gradual phase-out of coal,
- the development of nuclear energy as a systemic stabilizer,
- the accelerated expansion of renewable energy, especially offshore wind in the Baltic Sea.

The essential element of this triad is balance. Nuclear energy provides baseload capacity and long-term predictability; renewables enable rapid emissions reduction; and the phased withdrawal from coal mitigates social risks. However, synchronizing these pillars is the main vulnerability. Delays in nuclear implementation or infrastructural limitations can create additional pressure on the energy system. In this sense, success depends on long-term strategic coordination capacity.

The geopolitical dimension: energy security as a driver of transition

The Russian invasion of Ukraine in 2022 accelerated the conceptual transformation of European energy policy. For Poland, energy security became the central argument for investments in diversification and infrastructure.

Through the development of the LNG terminal, the operationalization of the Baltic Pipe, and regional integration, Poland reduced its dependence on Russian gas and strengthened its energy resilience. This repositioning made it possible to reinterpret the climate transition not as an external imposition but as an instrument of strategic autonomy. Thus, security and decarbonization are no longer presented as antagonistic objectives. On the

contrary, investments in renewables and nuclear energy are also justified through the lens of reducing geopolitical vulnerabilities. The remaining structural tension lies in the fact that using gas as a transition fuel may conflict with the objectives of rapidly reducing emissions. Poland's strategic architecture seeks to manage this tension through a phased approach, but the balance remains fragile.

Institutional dimension: governance, conditionality and policy change

The analysis of climate neutrality is not only a technological process but an institutional one. The tense relationship between the previous government and the European institutions showed that political blockages can directly affect the capacity to finance and implement green projects. The change of government in 2023 opened a window of opportunity for normalizing relations with Brussels and accelerating access to European funds. This development has the potential to strengthen the strategic architecture of the transition. However, the main challenge remains administrative capacity: implementing major projects requires legislative stability, interinstitutional coordination, and predictability for investors. Without effective governance, climate neutrality risks remaining at a declarative level.

Critical assessment: between strategic pragmatism and limited ambition

The analysis indicates that Poland does not reject the objective of climate neutrality, but operationalizes it through pronounced strategic pragmatism. The emphasis on energy security, social protection, and sovereignty reflects a realistic approach adapted to national specificities. However, this approach may generate delays in achieving climate objectives if investments in alternatives are not accelerated sufficiently. In addition, reliance on long-term nuclear projects involves significant financial and technological risks.

The success of Poland within the European architecture for climate neutrality depends on:

– accelerating the implementation of renewables,
– modernizing the energy infrastructure,
– maintaining institutional stability,
– using European funds efficiently,
– ensuring strategic coherence between climate objectives and security objectives.

The general conclusion

Poland illustrates the complexity of integrating a state with a traditional energy structure into a European architecture oriented toward climate neutrality.

The 2019–2025 period highlights a transition from defensive reluctance to strategic recalibration. Climate neutrality becomes, in both discourse and practice, part of a broader strategy of energy autonomy and regional consolidation. Thus, the Polish case shows that strategic architectures for Europe's climate neutrality cannot be uniform. They must be flexible, differentiated, and integrated into a coherent geopolitical and institutional framework.

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MANAGEMENT OF MIGRATION FLOWS IN THE CITY OF IAȘI (2022–2026): ECONOMIC AND SOCIETAL RESILIENCE AT THE EASTERN BORDER OF THE EUROPEAN UNION

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Abstract: *This study examines the impact of war-induced migration on the city of Iași from the perspective of societal and economic security following the outbreak of the Russo-Ukrainian war. Located at the eastern border of the European Union, Iași became both a transit hub and a host community for Ukrainian refugees. The research question guiding the study is: "What is the impact of war-induced migration on the city of Iași from the perspective of societal and economic security?" The study analyses the city's resilience capacity under conditions of a sudden refugee influx and evaluates the measures adopted by local authorities to maintain local stability. Methodologically, the research relies on documentary analysis and thematic content analysis of reports issued by local institutions, policy papers, official statistics, NGO reports, and media sources. This approach enables an assessment of institutional responses, local governance practices, and the contribution of civil society organisations in managing the refugee crisis. The findings indicate that Iași successfully managed the initial pressures generated by refugee arrivals through rapid resource mobilisation, the establishment of emergency reception centres, and cooperation between authorities, NGOs, and citizens. These measures reduced pressure on social services and contributed to maintaining societal cohesion, economic stability, and a high level of local resilience and institutional adaptability.*

Keywords: *forced migration, urban resilience, societal security, economic security, local governance.*

Introduction

The date of February 24, 2022, marked the beginning of a security event with major implications for contemporary societies. In a context in which Europe, Romania, and the international community were still attempting to manage the social and economic effects of the COVID-19 pandemic, the outbreak of the Russo-Ukrainian war underscored the need to demonstrate greater resilience in the face of a large-scale crisis. The conflict generated one of the largest waves of forced migration in Europe since the end of the Second World War,

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placing considerable pressure on the capacity of states and local communities to rapidly and effectively manage the transit and accommodation of refugees.

In this context, the municipality of Iași emerged as an important regional centre for transit and humanitarian support for Ukrainian refugees, which makes it a relevant framework for analysing the impact of forced migration on societal and economic security at the local level.

The response to this humanitarian crisis manifested itself at multiple levels of governance. At the European Union level, the Temporary Protection Directive (Directive 2001/55/EC, 2001) was enacted and subsequently integrated into the framework of the Pact on Migration and Asylum (European Commission, 2024), providing Member States with a common mechanism for managing refugee flows. At the national level, the Romanian authorities implemented measures of institutional coordination and legislative transposition by involving central and local administrative structures and establishing dedicated mechanisms to manage the crisis. At the local level (AGERPRES, 2022), the authorities in Iași, in partnership with non-governmental organisations and civil society, played an essential role in implementing support measures (Cristi, 2022) and in managing the transit and accommodation of refugees.

The specialised literature on migration generated by armed conflicts predominantly focuses on the legal, humanitarian, and institutional dimensions of managing refugee flows, especially at the European and national levels. Although numerous analyses exist on temporary protection mechanisms and international cooperation, the impact of forced migration on local societal and economic security remains insufficiently explored, particularly in border cities and regional transit centres. In the context of the Russo-Ukrainian war, research on how urban communities in Romania managed the pressures generated by the influx of refugees through mechanisms of resilience and cooperation between institutional and non-institutional actors remains limited. In this regard, the present study aims to contribute to the development of this research direction by analysing the case of the municipality of Iași.

Understanding the impact of forced migration on local communities requires clearly defining the theoretical and conceptual framework used in the analysis. Consequently, the following section presents the main concepts and theoretical perspectives that underpin the study's analytical approach.

1. Conceptual and Theoretical Frameworks

1.1. Societal Security – The Copenhagen School

The concept of societal security was developed within the framework of the Copenhagen School as an alternative to traditional approaches to security, which were predominantly state-centred. The main representatives of this perspective are Barry Buzan and Ole Wæver (Buzan, Wæver, & de Wilde, 1998, p. 119). Within this approach, societal security is defined as a society's capacity to maintain its collective identity, social cohesion, and patterns of life in the face of perceived threats.

From the perspective of the Copenhagen School, migration may become relevant to societal security not because of its intrinsic nature, but because of the way it is perceived and discursively constructed at the political and social levels. Thus, migration may be interpreted as a factor exerting pressure on community cohesion, especially in contexts of crisis or instability. This approach allows for the analysis of forced migration as a process that can influence the social and institutional balance of local communities.

1.2. Forced Migration and Securitization

According to the specialised literature on the relationship between security and migration, forced migration is frequently associated with discourses of insecurity, especially in contexts of crisis. In the view of Jef Huysmans (Huysmans, 2006, pp. 45–61), migration becomes a security issue not through its objective effects, but through processes of securitisation and politicisation that transform it into an object of security discourse. From this perspective, the pressures exerted on local communities — particularly on social cohesion and institutional capacity — are associated with how forced migration is perceived and managed at the political and societal levels, without necessarily constituting a direct threat.

This approach highlights the relationship between the cultural dimension, risk perception, and the social construction of security, suggesting that insecurity represents not only an objective reality but also the result of discursive and political processes.

Forced migration is a complex phenomenon determined by factors beyond individuals' direct control that directly threaten their lives, security, or freedom. In the context of the Russo-Ukrainian war, this type of mobility is particularly relevant for understanding the conflict's impact on societal and economic security. Thus, forced migration may be defined as "the involuntary displacement of individuals or groups generated by armed conflicts, persecution, political instability, natural disasters, or environmental degradation ". In the case of the military aggression of the Russian Federation against Ukraine, it manifests itself through the massive displacement of the Ukrainian population as a consequence of armed hostilities and the destruction of civilian infrastructure.

1.3. Economic Security

At the European level, the concept of economic security lacks a unitary definition, being approached predominantly through functional and strategic dimensions. In this regard, the European Union Economic Security Strategy (European Commission & High Representative of the Union for Foreign Affairs and Security Policy, 2023) identifies three main pillars of economic security. According to the document, "economic security is based on protecting competitiveness, reducing strategic dependencies, and strengthening the resilience of supply chains."

Another relevant document for understanding the concept at the European level is the 2024 Report of the European Parliament (European Parliament, 2024), which analyses economic security in relation to "reducing external vulnerabilities, protecting critical infrastructures, and managing risks."

At the national level, economic security is approached on multiple levels — legal, institutional, and academic — without a universally accepted definition. From a legal perspective (e-Juridic, 2026), economic security is defined as an "essential element of the security of any state, materialised in the existence of conditions for the full exercise of the state's right to dispose freely, without external interference and in accordance with its own interests, of its national, material, human, and financial resources."

From an institutional perspective (Romanian Intelligence Service (SRI), n.d.), economic security represents "the state of a high-performing, competitive, stable, and dynamic economy, capable of adapting to opportunities and risks, to ensure national prosperity and competitiveness."

From an academic perspective (Băhnărenu, 2014), the concept is associated with "access to the resources and basic infrastructures necessary to ensure an acceptable level of prosperity and power for the state and its citizens."

This need for access to resources and infrastructure, emphasised in the academic sphere, acquires a new dimension in the context of overlapping crises (polycrisis) that have affected the European Union over the last decade. Thus, the classical vision of economic security is increasingly complemented by the imperative of sustainability. In this regard, Dupont et al. (2020, p. 1097) argue that the European Green Deal should not be viewed solely as an environmental policy, but as "Europe's new growth strategy," aimed at strengthening security through resource efficiency and economic modernisation.

This recalibration of the concept becomes evident in moments of major tension, which the authors define as "critical junctures," where crisis responses can accelerate structural changes (Dupont et al., 2020, p. 1098). From this perspective, economic security ceases to be a static state of resource protection and becomes a dynamic process of "future-proof resilience." This model of resilience involves the generalised integration (mainstreaming) of climate and energy objectives into all levels of economic security, thereby ensuring long-term stability in the face of external shocks such as supply chain disruptions or migration crises (Dupont et al., 2020, p. 1102).

1.4. Societal and Urban Resilience

Multiple definitions and analytical perspectives regarding the concept of resilience have been proposed in the specialised literature. In classical literature, resilience is considered "the capacity of a system to absorb disturbances and reorganise itself while maintaining its functions and social structures." In the field of social sciences, the concept is adapted to designate "the capacity of communities and institutions to cope with external stresses and adapt to profound changes without losing their basic functions."

According to the study conducted by Claire Wardle and Hossein Derakhshan (Wardle & Hossein, 2017)for UNESCO, the foundations of cognitive resilience are represented by critical education and media literacy. These contribute to the development of the capacity of communities and individuals to react appropriately in crisis contexts and to resist informational manipulation.

At the national level, resilience is defined, according to Iulian Chifu (Chifu, 2023), as "the ability of an entity — individual, organisation, or state — to prepare for, withstand, and recover rapidly from situations of stress or shock without compromising long-term development prospects." This definition positions resilience both as the result of a well-developed security culture and as a behaviour reflecting its maturity.

At the international level, NATO (North Atlantic Treaty Organisation (NATO), n.d.) defines resilience as "the ability of societies to prepare for, resist, respond, and recover rapidly from shocks, whether natural or man-made." At the European level, the European Union highlights (European Commission & High Representative of the European Union for Foreign Affairs and Security Policy, 2017), in the document A Strategic Approach to Resilience in the EU's External Action, that resilience involves "the capacity of individuals and communities to adapt to stress and to transform positively in the face of adversity."

Although the specialized literature proposes multiple definitions of the concept, the present study uses the perspective formulated in the report of the Organisation for Economic Co-operation and Development (Organisation for Economic Co-operation and Development (OECD), 2018), according to which urban resilience represents "the capacity of cities to absorb, adapt, transform, and prepare for the past and future impacts of shocks and economic, environmental, and social stresses in order to promote sustainable resilience, well-being, and inclusive growth."

In the context of forced migration, resilience does not imply the absence of pressures or vulnerabilities, but rather the capacity to manage them through the integrated mobilisation of economic, social, and institutional resources. Recent literature emphasises the importance of the local level in resilience analysis, since cities — especially border cities or regional transit centres — are the first to experience the impacts of migration and must implement concrete measures of response and adaptation. By defining these concepts, migration may be analysed not only as a demographic and humanitarian phenomenon, but also as a process with the potential to impact societal and economic security at the local level.

1.5. Synthesis of Relevant Literature and Positioning of the Study

The specialised literature on forced migration resulting from armed conflicts is predominantly focused on the European and national dimensions, particularly on legal and humanitarian aspects and refugee protection mechanisms. Within this framework, most studies analyse asylum and integration policies, mechanisms of institutional cooperation, and the role of international organisations in managing refugee flows.

From a theoretical perspective, the contributions of the Copenhagen School have provided a relevant framework for understanding the relationship between migration and societal security, highlighting the role of discourses and perceptions in constructing threats. The literature on the securitisation of migration emphasises that the transformation of migration into a security issue is mainly the result of political, symbolic, and discursive processes, rather than exclusively of the objective effects generated by population mobility.

In recent years, the concept of resilience has been increasingly used to analyse the capacity of institutions and communities to manage multiple crises, including forced

migration. Nevertheless, most research remains focused on the European and national levels, without examining in detail how cities, as key actors in crisis management, respond to the pressures generated by migrant influxes.

In this context, the specialised literature highlights a gap in the analysis of the impact of forced migration on societal and economic security at the local level, especially in border cities and regional transit centres. Therefore, the present study aims to contribute to the development of this research direction by analysing the case of the municipality of Iași in the context of the Russo-Ukrainian war.

2. Research Methodology

From a research design perspective, the present study employs an exploratory case study, chosen for its capacity to facilitate understanding of the mechanisms and processes through which an urban community responds to a complex crisis generated by forced migration. The selection of Iași as a case study is justified by its role as a regional centre for transit and humanitarian support in the context of the Russo-Ukrainian war.

The analysis focuses on the period February–December 2022, an interval corresponding to the initial stage of reaction and consolidation of the local response to the refugee crisis. This period includes both the moment of the initial shock generated by the influx of refugees and the development of early stabilisation and integration mechanisms, including the organisation of dedicated centres and the development of support services.

The corpus used in the analysis includes official documents — such as normative acts, institutional briefings, and administrative documents — as well as media sources, reports of non-governmental organisations, and materials elaborated by local authorities involved in managing the refugee flow.

The criteria for document selection (Bryman & Bell, 2019, p. 280) considered thematic relevance, temporal relevance, and the relevance of the issuers. From a thematic perspective, materials addressing perceptions of refugees, the measures adopted, and their effects on the local community were selected. Temporal relevance involved the inclusion of documents published in or referring to the year 2022, while the relevance of the issuers targeted institutions and actors directly involved in managing the crisis, such as the Government of Romania, the Ministry of Internal Affairs, the General Inspectorate for Immigration, the Prefecture, the County Council, the Local Council, non-governmental organisations, and the local or national press.

Through documentary analysis (Bowen, 2009, pp. 27–40), the study aimed to identify the legal and institutional framework for managing the refugee crisis and to extract the main intervention measures implemented at the local level, including social support, healthcare, and accommodation. At the same time, the analysis allowed identification of the main actors involved and the instruments used to manage the crisis.

To conduct the thematic analysis, four main stages were followed: the complete reading of the documents and the identification of recurring ideas; the initial inductive coding;

the grouping of codes into relevant themes; and the interpretation of the results in relation to the theoretical and conceptual framework of the study.

Furthermore, to support a coherent presentation of the results, the local context of the municipality of Iași is presented, providing the empirical framework for the case study.

3. The Local Context of the City of Iași

The city of Iași represents one of the most important urban centres of Romania (National Institute of Statistics – Iași County Directorate of Statistics (INS Iași), 2025), located in the North-East Region. Its role is strategic both from an administrative and socio-economic perspective. Situated near the eastern border of the European Union (Iași City Hall, 2023), in the vicinity of the Republic of Moldova and Ukraine, Iași functions as a regional hub (North-East Regional Development Agency, 2026) for public governance, mobility, education, and public services. This geographic location gave the city a significant role in managing mobility flows generated by the outbreak of the Russo-Ukrainian war.

This strategic importance is reinforced by the city's commitment to European sustainability objectives. Recently, Iași was selected within the EU Mission "100 Climate-Neutral and Smart Cities by 2030" (European Commission, 2021, p. 2). This status does not represent only an ecological target but also a new model of governance based on "Climate City Contracts," aimed at systemic transformation of urban infrastructure to cope with external shocks through innovation and efficiency (European Commission, 2021, p. 13).

From the perspective of its socio-economic profile (InfoIași, 2024), prior to 2022, the municipality of Iași was characterised by a diversified local economy and a large urban population. The main economic sectors were healthcare (Cojocaru, 2023), education (uniRank, 2026), services, and information technology, all of which made a major contribution to the local labour market. The city's social infrastructure was well developed, supported by the presence of national-level medical and academic institutions. Given that social infrastructure and administrative capacity constitute essential factors of urban resilience (Organisation for Economic Co-operation and Development, 2025), establishing this baseline is necessary for analysing the subsequent impact of forced migration. This allows for a more nuanced assessment of the pressures generated by the influx of refugees.

The outbreak of the Russo-Ukrainian war on February 24, 2022, rapidly transformed the municipality of Iași into an important centre (Cristi, 2022) for support and transit for Ukrainian refugees. The first stage of the conflict was characterised by a high volume of people in transit or seeking temporary accommodation, which exerted significant pressure on public services and local infrastructure.

The socio-economic profile of Iași County and municipality is grounded in the directions outlined in the Iași County Development Strategy 2021–2027, which prioritises the pillar "Iași – Green County" (SDL Iași, p. 17). In this regard, the energy efficiency of public buildings and the modernisation of urban transport systems are considered critical mechanisms for reducing economic vulnerabilities and improving the quality of life (SDL Iași, p. 405). This pre-existing strategic planning provided the framework necessary for local

infrastructure to absorb the additional demographic pressure without major degradation of public services.

In this context, local authorities were required to rapidly mobilise logistical and administrative resources in order to manage the emergency (Turza, 2022; Government of Romania, 2022). Reception centres were established, mechanisms of interinstitutional cooperation were activated, and communication channels with non-governmental organisations were formalised — measures that were essential for stabilising the situation and configuring a functional response framework.

The involvement of civil society (Deliu & Trifan, 2023) and non-governmental organisations represented a central element in managing the refugee crisis in Iași. The efforts of public institutions were complemented by local NGOs (Urgente Sociale, n.d.) and informal volunteer networks, which provided material, logistical, and informational support to refugees. This mobilisation helped reduce potential tensions at the community level and maintain social cohesion. The cooperation between state and non-state actors (United Nations High Commissioner for Refugees, 2023) in the context of a societal security crisis highlights the existence of collective adaptation mechanisms at the local level (Cubeddu & Martini, 2025, pp. 1–12), (General Secretariat of the Government, 2022).

Essentially, the management of migration flows in Iași intersected with the objectives of the European Green Deal. The capacity for collective adaptation was enhanced by the municipality's pursuit of the "co-benefits" of climate action, such as social inclusion and improved citizens' well-being (European Commission, 2021, p. 24). Thus, the response to the crisis was not solely an emergency response, but also aligned with efforts to transform Iași into a resilient city capable of using European funding instruments (such as the National Recovery and Resilience Plan or the mission label) to develop housing and mobility solutions serving both residents and newcomers (SDL Iași, p. 770).

The analysis of the local context reveals the complexity of the challenges generated by the refugee wave, as well as the diversity of actors involved in managing it. These elements provide the empirical framework for analysing the impact of forced migration on the municipality of Iași's societal and economic security. This analysis will be developed in the following section, based on the methodology and conceptual framework previously presented.

4. Documentary Analysis

This section provides a synthesis of the documents included in the analysis corpus and presents the themes and codes identified within them. The documents were organised into four main categories: normative acts and institutional documents; local-level measures and dynamics; documents of non-governmental organisations; and media sources.

The first category includes normative acts and institutional documents relevant to the management of the refugee crisis.

One of the first documents is Emergency Ordinance No. 15/2022, which establishes the framework for providing humanitarian assistance and support for food, hygiene, transport, and access to medical services. This normative act reflects a rapid institutional response and

the implementation of emergency funding mechanisms. Within the analysis, the following themes were identified: T1 (implementation and coordination), T3 (housing and accommodation), and T5 (resource mobilisation and stabilisation).

Another relevant document is the FDES Report on Romania's response to the refugee crisis, which describes the institutional coordination structure, decision-making flows, legislative changes, and international cooperation. Its analysis highlighted themes such as T1 (coordination, implementation, strategy, and legislative framework), T3 (reception, border management, accommodation, and assistance), T4 (crisis framing, vulnerability, and pressure), and T5 (cooperation and stabilisation).

The article published by Economica.net (Agerpres) highlights the existence of a governmental Task Force structure and the organisation of a strategic coordination group for humanitarian assistance. Six sectoral working groups are described (healthcare, education, labour, housing, vulnerable groups, children, and youth). The identified themes are T1 (interinstitutional coordination and rapid decision-making), T3 (healthcare, education, housing), and T4 (crisis management and sectoral pressures).

The briefing issued by the General Inspectorate for Immigration (IGI, 2022) regarding temporary protection details the emergency mechanism and the rights associated with it — access to the labour market, healthcare, residence, and education — as well as the IGI's institutional responsibilities regarding registration and permit issuance. The themes identified in this document are: T1 (implementation), T3 (healthcare and education), and T5 (cooperation and stabilisation).

The government's webpage "Ukraine – Together We Help More" highlights the institutional response architecture, including the distinction between the emergency and protection stages. The identified themes are T1 (coordination) and T5 (cooperation and stabilisation).

At the local level, media sources indicate that the Iași County Council is supporting refugees by allocating logistical spaces (including the Moldova Exhibition Centre) and partnering with humanitarian organisations such as the Romanian Red Cross. In this case, the identified themes are T1 (partnerships and implementation), T2 (community support), and T5 (cooperation).

Additionally, reports on migrant flows highlight pressure on administrative capacity and accommodation infrastructure, as reflected in data on border transit and the occupancy rates of reception centres (Cristi, 2022). The associated themes are T1 (coordination), T3 (housing and social services), and T4 (crisis discourse and pressure).

At the local level, debates within the Local Council indicate tensions and processes of politicisation regarding the refugee issue. This dynamic is relevant from the perspective of securitisation discourses, in which migration becomes an object of political competition. The identified themes are T1 (contested governance) and T4 (crisis and pressure).

The document regarding the Bethany Social Services Foundation highlights the functioning of a community centre dedicated to children and families from Ukraine, providing integrated services (social, legal, psychological, educational, and professional guidance). The

identified themes are T2 (integration), T3 (education and healthcare), and T5 (cooperation and adaptation).

Data from the Romanian Association of Aid Committees and Centres (ARC) indicate a significant mobilisation of resources during the first months of the crisis, with reported funds amounting to 12.3 million euros. These data highlight the role of NGOs as mechanisms for channelling resources during crises. The identified themes are T1 (organisational capacity) and T5 (resource mobilisation).

The activity report of the Federation of Non-Governmental Organisations for Social Services (FONSS Nicolina, 2024) highlights the partnership between NGOs and local authorities, as well as the capacity to absorb the refugee flow, estimated at over 20,000 persons (AGERPRES, 2025). The identified themes are T1 (partnerships), T3 (social services, healthcare, and housing), and T5 (mobilisation and stabilisation).

The SunMedia article regarding CTR Nicolina (Munteanu, 2022) describes the centre as a model of integrated services. It highlights both solidarity and multi-actor cooperation, as well as vulnerabilities such as disinformation, xenophobia, and the risk of declining public support. The identified themes are T2 (solidarity), T3 (services), T4 (securitisation through narratives), and T5 (cooperation and adaptation).

The article published by Vremea Nouă (Vremea Nouă, 2022) regarding Star of Hope Romania emphasises the support provided to more than 35,000 refugees and underlines the need for reassurance and continuous intervention. The identified themes are T2 (community support), T3 (services), and T5 (stabilisation).

5. Thematic Content Analysis: Results

Through thematic analysis, recurring patterns were identified in the selected document corpus, and five operationalised themes (T1–T5) were defined. The results are presented synthetically and illustrated with relevant examples from the analysed materials.

Theme 1: Institutional Capacity and Governance

This theme is particularly evident at the national level through formal institutional response mechanisms, including normative regulations defining the support framework and logistical instruments (e.g., Emergency Ordinance No. 15/2022 and Government Decision No. 625/2022). The theme is also reflected in the interinstitutional coordination architecture, such as task forces and county committees (Government of Romania, 2022).

At the local level, governance is manifested through the formation of operational partnerships (e.g., collaborations between local authorities, the Red Cross, and the Emergency Situations Inspectorate) and through the organisation of refugee management flows and reception centres. At the same time, in some cases, this dimension is accompanied by politicisation processes that may influence public perceptions of the efficiency of institutional responses.

Theme 2: Social Cohesion and Community

This theme is predominantly visible in sources originating from the NGO sector and narrative media reports. Solidarity and volunteering are presented as the main forms of community response to the crisis.

Integration is operationalised through services such as counselling, language courses, and after-school programs. Within organisations such as Star of Hope Romania, community support models emphasise reducing vulnerability and anxiety among beneficiaries, focusing on their immediate needs.

Theme 3: Pressure on Public Services

This theme reflects the pressures exerted on accommodation capacity, housing, and the provision of social services. These pressures are highlighted through reports on refugee flows, the need for continuous (24/7) operation of integrated centres, and the occupancy rate of existing infrastructure.

From a theoretical perspective, this pressure should not be addressed solely as a logistical emergency, but as an imperative of "social justice." As emphasised by Filipović et al. (2022, p. 2), the success of European resilience policies depends on maintaining a fair balance (social fairness), so that the expansion of public services for newcomers does not lead to a deterioration of the quality of life for vulnerable host populations.

The dimensions of education and healthcare are addressed both normatively, through the legislative framework (e.g., Emergency Ordinance No. 15/2022 and IGI regulations on access to services), and practically, through socio-medical and socio-educational services developed by organisations such as the Bethany Foundation and CTR Nicolina.

In this context, the continuous operation of centres and social housing incurs substantial operational costs that may increase the municipality's economic vulnerability. Applying the nexus proposed by Filipović et al. (2022, p. 5), combating "energy poverty" through investments in public building efficiency becomes essential. Thus, to prevent the pressure on services in Iași from becoming chronic, housing solutions and educational spaces (such as those provided by the Bethany Foundation) must be aligned with the sustainability objectives of the Green Deal, ensuring efficient resource use and long-term urban resilience (Filipović et al., 2022, p. 10).

Theme 4: Discourse and Securitisation

At the institutional level, the dominant discourse is technical, centred on terms such as "mass influx" or "emergency," reflecting a crisis- and resource-management approach.

At the same time, the analysis highlights elements specific to securitisation processes, in which migration is associated with systemic pressures on local resources and capacities. In the public sphere, local media reports, including sources such as SunMedia, refer to phenomena such as xenophobia, disinformation, and discourses on social costs, factors that may contribute to the erosion of solidarity and the intensification of discursive securitisation.

Theme 5: Local Resilience

This theme is shaped by the capacity to mobilise economic, institutional, and social resources, including funding from the NGO sector and state reserves, as well as the development of integrated local services.

This mobilisation can be interpreted through the lens of the "mission-oriented approach" theorised by Mariana Mazzucato (2018, p. 2). In the context of Iași, crisis management was not merely a response to market or infrastructure failure, but a mission assumed by the state as a "first-instance investor" (Mazzucato, 2018, p. 3). By rapidly unlocking resources (e.g., OUG 15/2022), authorities created the necessary framework for other actors to intervene effectively.

Resilience is reflected in local actors' ability to quickly stabilise the situation through the creation of centres, interinstitutional coordination, and the involvement of civil society. For resilience to be sustainable, Mazzucato (2018, p. 4) emphasises the importance of "symbiotic partnerships" between the public and private/NGO sectors. Rather than the state bearing costs alone, such partnerships (e.g., between the Iași City Hall and FONSS or Bethany) should generate "public value" through green and digital infrastructures that remain beneficial to the community beyond the acute crisis, thereby ensuring real and sustainable economic stabilisation.

However, the sustainability of these mechanisms depends on maintaining social support and the continuity of mobilised resources in the medium and long term.

6. Discussions

This section integrates the conceptual frameworks of societal security, economic security, and resilience to provide a coherent analysis of the dimensions investigated in relation to the research question. The approach highlights the interdependencies between the material effects of forced migration and its discursive and institutional dimensions.

Regarding societal security, forced migration generated by the Russo-Ukrainian war has exerted significant pressure on Iași's social infrastructure, particularly on housing capacity and access to social, educational, and medical services. These effects were concentrated in the initial phase of the crisis, characterised by a rapid and volatile influx of displaced persons, followed by a stage of relative stabilisation associated with the progressive adaptation of institutional mechanisms and local response capacity.

This transition from emergency to stabilisation confirms Dalby's (2020, p. 12) argument for rethinking security in the 21st century. In a geography marked by uncertainty, the security of the city of Iași can no longer be defined solely by border controls, but by the resilience and stability of its support systems (healthcare, transport, energy). Thus, Iași's capacity to integrate human flows into its urban infrastructure represents a form of systemic security adapted to contemporary realities.

In parallel, social dynamics were influenced by the consolidation of solidarity and community cohesion mechanisms, in which non-governmental organisations played an

intermediary and operational support role. These served as buffers against social pressure, reducing the likelihood of inter-community tensions and helping maintain local social stability. From a discursive perspective, the analysis highlights the coexistence of dominant managerial narratives focused on resource management in crisis contexts and contestatory narratives, including xenophobic discourse and forms of disinformation. The latter may influence perceptions of societal threat, affecting social cohesion and the legitimacy of institutional interventions.

From an economic security perspective, the influx of refugees initially placed pressure on administrative capacity and local public service infrastructure. However, these effects were partially mitigated through a mix of institutional interventions, public funding, and civil society support, allowing for the absorption of the initial shock and the avoidance of more severe social and administrative externalities.

Nevertheless, this absorption of shock highlights a structural vulnerability identified by Dalby (2020, p. 45): dependence on rigid infrastructures. In this sense, Iași's alignment with the objectives of the European Green Deal is not merely an ecological option, but an economic security strategy. An energy-efficient, sustainable public infrastructure reduces the city's vulnerability to resource fluctuations caused by external crises, making sustainability the foundation of local resilience.

At the macro-institutional level, the Romanian state's response included an adaptive legislative framework, operationalised through successive governmental acts, including Government Decisions from 2022, as well as mechanisms established under Emergency Ordinance No. 15/2022. Overall, the response process involved the adjustment of a significant number of normative acts, as well as the mobilisation of considerable financial resources from both the state budget and international sources. In this context, Romania was the first EU Member State to adopt, on June 26, 2022, a "National Plan of Measures for the Integration of Ukrainian Refugees" (Fota, 2023, p. 164).

The non-governmental organisation sector functioned as an extension mechanism of state capacity, contributing to the strengthening of local economic resilience. Organisations such as ARC facilitated the rapid mobilisation of resources in the acute phase of the crisis, while FONSS contributed to the development and coordination of integrated support services. These interventions played an essential role in reducing pressure on public infrastructure and preventing the accumulation of short-term social costs.

In the medium term, the transition from emergency interventions to integration strategies may help reduce reliance on assistance and strengthen refugees' socio-economic autonomy. However, a relevant structural vulnerability remains the phenomenon of "solidarity fatigue," associated with the gradual decline of public support and increasing pressure on the financial sustainability of interventions. This dynamic is amplified by the persistence of negative narratives in the public sphere, which can influence policies and collective perceptions.

From a theoretical perspective, the findings are consistent with the literature on the securitisation of forced migration, which highlights the transformation of migration into a security object through both its material effects and the social construction of threat. At the

same time, the urban resilience framework is confirmed through the identification of multi-actor cooperation mechanisms and the capacity for rapid resource mobilisation at the local level, indicating a relatively high degree of institutional adaptability.

Regarding the limitations of the study, the analysis is based on a finite documentary corpus restricted to the period February–December 2022. Incomplete access to some sources may limit the granularity of discursive interpretation. Consequently, the results reflect patterns identified in the analysed material and do not allow statistical generalisations; they are specific to a qualitative, interpretative thematic analysis approach.

Conclusions

The main conclusion that can be drawn from the presented data is that forced migration resulting from the Russo-Ukrainian war has placed significant pressure on the city of Iași's social infrastructure. However, the local response demonstrated a high capacity for absorption and adaptation. The combination of the national framework, civil society intervention, and local cooperation resulted in resilience in the face of this crisis.

From a societal perspective, integration and cohesion through services functioned as stabilising factors. On the other hand, disinformation and polarisation remain potential risks that may erode solidarity. From an economic perspective, the immediate burden was mitigated by the multi-source mobilisation of resources; however, in the medium term, sustainability depends on maintaining social support and funding continuity. Overall, the local community's response in Iași indicates the presence of a functional security culture at the local level.

In conclusion, the case of the municipality of Iași validates Dalby's (2020, p. 172) argument that sustainability is, in fact, the highest form of security in the face of current global challenges. The local success in managing the refugee crisis demonstrates that a resilient community aligns humanitarian responsibility with systemic innovation and resource conservation, offering a model of anticipatory governance at the eastern border of the European Union.

To assess the sustainability of the measures, the evolution of pressure on housing and education, and labour market integration, future research could extend the analysis to the period 2023–2024. Additionally, the analysis could be deepened by integrating semi-structured interviews with local stakeholders and using local statistical data to ensure triangulation and further validation.

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ANNEX

Analytical Theme	Codes
T1. Institutional capacity and governance	Inter-institutional coordination; implementation; rapid decision-making; partnerships
T2. Social cohesion and community	Solidarity; volunteering; integration; community support
T3. Pressure on public services	Social services; healthcare; education; housing
T4. Securitization discourses	Risk; crisis; vulnerability; pressure
T5. Local societal resilience	Adaptation; resource mobilization; cooperation; stabilization

Fig. 1. Synthetic table of themes and codes used in document analysis.

EUROPEAN ACADEMIC FORMATION AND THE ROMANIAN INTELLECTUAL ELITE: NATIONAL RESOURCES, INTERWAR MODERNISATION, AND THE CHALLENGES OF THE GREEN DEAL

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Abstract: *This article analyses the relationship between European academic formation, the Romanian intellectual elite and the question of national resources, placing the discussion between two different historical frameworks: interwar modernisation and the contemporary European Green Deal. The study starts from the role played by Western universities in the formation of Romanian intellectual and professional elites and examines how this European academic formation contributed to broader debates on state-building, national development and economic modernisation. In the interwar period, land, agriculture, forests, oil and energy were generally understood through the paradigm of national consolidation, economic sovereignty and the productive use of resources. In contrast, the European Green Deal redefines natural resources through the concepts of sustainability, climate neutrality, environmental responsibility and European governance. The article does not argue for a direct continuity between interwar Romanian intellectual debates and contemporary EU environmental policies. Rather, it proposes a diachronic comparison between two ways of understanding resources: as instruments of national modernisation and as objects of ecological responsibility. The central hypothesis is that the idea of national interest does not disappear in the context of the green transition, but is reformulated within a wider European framework of sustainability and climate policy.*

Keywords: *Romanian intellectual elite; European academic formation; national resources; interwar modernisation; European Green Deal.*

Introduction

The question of natural resources has been closely connected to the history of modernisation, state-building and national development. In the Romanian case, resources such as land, agriculture, forests, oil and energy cannot be interpreted only as economic categories. They also belong to a wider political and intellectual vocabulary through which elites discussed sovereignty, social order, institutional consolidation and the future of the state. This article

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examines the transformation of this vocabulary by comparing two distinct frameworks: the interwar understanding of national resources and the contemporary European Green Deal.

The first framework concerns the formation of Romanian intellectual and professional elites in relation to European academic models. Lucian Nastasă argues that, from the beginning of the modern period, Western universities played an important role in preparing Romanian elites, especially before the consolidation of a complete Romanian higher education network (Nastasă, 2008). This observation is relevant because it allows the Romanian intellectual elite to be understood not only as the product of national institutions, but also as the result of academic mobility, cultural transfer and European intellectual influence. The universities of Iași and Bucharest were founded in the second half of the nineteenth century, while Cluj and Cernăuți entered the Romanian university system after 1919; this chronology helps explain why foreign universities remained important spaces of formation for Romanian intellectuals and future professionals (Nastasă, 2008).

In the interwar period, this European academic formation intersected with the political and institutional challenges of Greater Romania. After 1918, the Romanian state had to integrate different provinces, administrative traditions and social structures. Irina Livezeanu's study on cultural politics in Greater Romania shows that the post-war process of nation-building involved the Romanisation of newly annexed regions and gave a central role to the educational system in the formation of new Romanian elites (Livezeanu, 1995). Keith Hitchins also emphasises that Romanian political and intellectual elites were deeply involved in the broader project of nation-building and institutional consolidation in modern Romania (Hitchins, 1994). In this context, the problem of natural resources belonged to a wider debate about education, economy, modernisation, and national consolidation. Land, agriculture, forests, oil and energy were relevant not only because they had economic value, but also because they were associated with the capacity of the state to organise development and to strengthen its autonomy (Hitchins, 1994; Livezeanu, 1995; Dragomir, 2010).

The second framework concerns the contemporary European Green Deal. The European Commission defines the Green Deal as a new growth strategy intended to transform the European Union into a modern, resource-efficient and competitive economy, while aiming for climate neutrality by 2050 and for the decoupling of economic growth from resource use (European Commission, 2019). This policy framework changes the meaning of natural resources. Resources are no longer discussed only in relation to national economic development, but also in relation to climate neutrality, sustainability, environmental protection and European regulation.

This transformation is reinforced by the European Climate Law. Regulation (EU) 2021/1119 establishes a binding objective of climate neutrality in the European Union by 2050 and sets a binding 2030 target of reducing net greenhouse gas emissions by at least 55% compared to 1990 levels (European Parliament & Council of the European Union, 2021, Articles 2 and 4). The Farm to Fork Strategy further extends the logic of the Green Deal to food systems, agriculture and environmental responsibility, presenting the transition toward fair, healthy and environmentally friendly food systems as part of the broader European sustainability agenda (European Commission, 2020a).

The article, therefore, proposes a diachronic comparison between two paradigms. The first is the interwar national-developmental paradigm, in which resources were interpreted mainly as assets of modernisation, economic sovereignty and state consolidation. The second is the contemporary green-transition paradigm, in which resources are increasingly interpreted as objects of ecological responsibility, sustainability and European governance. The purpose of this comparison is not to suggest that interwar Romanian elites anticipated the Green Deal. Rather, the article seeks to identify how the political and intellectual meaning of natural resources changes when the frame of reference moves from national modernisation to supranational environmental governance.

The study is guided by three research questions. First, how did European academic formation contribute to the emergence of Romanian intellectual and professional elites? Second, how can the interwar understanding of national resources be connected to broader debates on modernisation and state consolidation? Third, how does the European Green Deal reconfigure the meaning of natural resources in the contemporary European context?

The central hypothesis is that interwar Romanian intellectual and political elites tended to interpret natural resources through the paradigm of national modernisation and economic sovereignty, while the European Green Deal introduces a different paradigm, centred on sustainability, climate neutrality and environmental responsibility. Nevertheless, the idea of national interest does not disappear in the contemporary context. It is reformulated within the broader framework of European integration and green transition.

Research Design and Methodology

This article uses a qualitative research design situated at the intersection of intellectual history, document analysis and diachronic comparison. The aim is not to reconstruct the entire economic history of interwar Romania and not to provide a technical assessment of the European Green Deal. Instead, the article examines the changing meanings attributed to natural resources in two different historical and political contexts.

The first context is interwar Romania, where the formation of intellectual and professional elites was connected to European academic models and to the national project of modernisation. The article uses Lucian Nastasă's study on Romanian university professors educated in Western universities as a verified source for discussing the role of European higher education in the formation of Romanian elites (Nastasă, 2008).

The second context is the contemporary European Union framework represented by the Green Deal. The article uses official EU documents: the European Green Deal communication, the European Climate Law and the Farm to Fork Strategy. These sources are used to identify the concepts through which the European Union currently defines natural resources, sustainability, climate neutrality and environmental responsibility (European Commission, 2019; European Commission, 2020a; European Parliament & Council of the European Union, 2021).

The method of diachronic comparison makes it possible to compare two historically different ways of understanding resources. In the interwar framework, resources are analysed as part of a discourse on modernisation, national development and economic autonomy. In the Green

Deal framework, resources are analysed as part of a discourse on sustainability, climate policy and European governance. The comparison does not imply direct continuity. It is used to identify conceptual transformations in the political and intellectual language of resources.

The article is structured in four main parts. The first part discusses European academic formation and the Romanian intellectual elite. The second part examines the relationship between national resources and interwar modernisation. The third part analyses the European Green Deal as a contemporary framework for redefining resources. The final part identifies the main continuities and ruptures between the interwar paradigm of national development and the contemporary paradigm of green transition.

European Academic Formation and the Romanian Intellectual Elite

The formation of the Romanian intellectual elite in the modern and interwar periods was closely connected to academic mobility and to the role of Western and Central European universities. Lucian Nastasă argues that Western universities played an important role in preparing Romanian elites, especially before the Romanian higher education system became institutionally consolidated through the universities of Iași, Bucharest, Cluj and Cernăuți (Nastasă, 2008, pp. 221–222). This observation is relevant for the present study because it shows that Romanian intellectual and professional elites were formed not only within national institutions but also through contact with European academic models.

European universities functioned as spaces of professional training, cultural transfer and political socialisation. Elena Siupiur's research on Romanian and South-East European political elites emphasises that the university was not only an educational institution, but also a place where ideas, cultures, university elites and political elites were formed and transmitted. In the Romanian case, young people educated abroad returned home and became part of the first intellectual, professional and modernising generations (Siupiur, 2014, pp. 113–128). This perspective helps explain why the Romanian elite can be understood as a mediator between European intellectual models and national projects of modernisation. The connection between universities and elite formation became especially important in Greater Romania. Livezeanu dedicates a section of her study to universities as "workshops for a national elite", showing that higher education was not only a field of professional training, but also part of the wider cultural and political project of nation-building after 1918 (Livezeanu, 1995). This argument strengthens the interpretation of the university as an institution through which intellectual formation, national integration and social mobility intersected in the interwar period.

The phenomenon was not limited to one academic centre. Although Vienna, Paris, Berlin and other European universities had different degrees of importance depending on the period, Romanian academic mobility was part of a broader European pattern. Horațiu Bodale shows that, in the second half of the nineteenth century and the early twentieth century, many young Romanians from Transylvania studied at universities in the Habsburg Empire, but also in France, Germany, Switzerland and Italy. After graduation, many returned to Transylvania and became lawyers, physicians, teachers or public figures, contributing to the formation of the Romanian political and intellectual elite (Bodale, 2020, p. 197).

This European academic formation is important for the present article because it created a framework through which Romanian elites interpreted the problems of modernisation. The experience of studying abroad exposed future Romanian intellectuals and professionals to different institutional models, scientific disciplines and ideas about the relationship between state, society and economy. After returning to Romania, these elites did not simply reproduce Western models, but adapted them to local conditions and to the needs of national development, a process that can be understood in relation to the broader role of European universities in shaping Romanian intellectual and political elites (Nastasă, 2008; Siupiur, 2014; Bodale, 2020). In the interwar period, especially after the creation of Greater Romania, this process became connected to debates about institutional integration, economic development and the consolidation of the state.

Within this broader context, the question of natural resources can be approached as part of the political and intellectual vocabulary of modernisation. Land, agriculture, forests, oil and energy were not only economic categories; they were also connected to ideas of sovereignty, national wealth and state capacity. The European-trained elite did not produce a single doctrine concerning natural resources, but it contributed to a public language in which economic autonomy, productive development and national consolidation were closely linked to the broader problem of modernisation (Nastasă, 2008; Siupiur, 2014; Costinescu, 2018). This is the historical basis for the comparison proposed in this article: while the interwar paradigm associated resources with national modernisation, the contemporary European Green Deal redefines them through sustainability, ecological responsibility and European governance.

National Resources, Modernisation, and Interwar Romanian Political Thought

In interwar Romania, the question of natural resources was closely connected to the broader problem of modernisation. After the First World War and the creation of Greater Romania, land, agriculture, forests, oil and energy were not only economic categories, but also elements of a wider political vocabulary concerning national development and state consolidation. This interpretation is particularly visible in the agrarian question, because Romania remained, throughout the interwar period, a predominantly agrarian society, despite attempts to stimulate industrial development and exports (Dragomir, 2010). Hitchins similarly emphasises that Romanian economic life continued to depend heavily on agriculture, even as industry developed during the modern and interwar periods (Hitchins, 1994).

The agrarian reform of 1921 was one of the most important political and social measures adopted in Greater Romania. Sebastian Doboș argues that the reform had a strong social and national character, because it attempted to respond to peasant claims to land and to create a more uniform structure of land ownership within the enlarged Romanian state. However, the reform did not produce the expected long-term economic effects, since small agricultural holdings became numerically dominant but often remained economically fragile and insufficiently viable (Doboș, 2024). From this perspective, land was not only a productive resource but also a central element in the social and national reorganisation of the Romanian state after 1918.

The legal dimension of land reform also shows the political importance of natural resources. István Valdman emphasises that agrarian reforms involved large processes of expropriation and redistribution, affecting both property rights and the relation between state authority and social groups. In this sense, the 1921 reform can be understood not only as an economic intervention but also as a legal and political transformation of property relations (Valdman, 2022). Land, therefore, became a field in which social justice, private property, public utility and national consolidation intersected.

The persistence of the agrarian question influenced the way Romanian elites thought about modernisation. Elena Camelia Dragomir places Romania among the interwar European peripheral economies, arguing that Romania and Lithuania tried to address economic backwardness through similar instruments: radical agrarian reform, export orientation and industrialisation. Nevertheless, Romania remained essentially agrarian during the interwar period, which limited the effects of modernisation and kept agriculture at the centre of economic and political debate (Dragomir, 2010). This helps explain why the discourse on natural resources was closely linked to the problem of transforming a rural society into a modern national economy.

Interwar Romanian political thought did not offer a single interpretation of modernisation. Ion Matei Costinescu shows that thinkers such as Dimitrie Gusti, Virgil Madgearu, Mihail Manoilescu and Ștefan Zeletin proposed different projects of national development, each connected to broader diagnoses of Romania's economic, political and social blockages. These projects were concerned with the transformation of Romanian society and with the creation of subjects capable of participating in national modernisation (Costinescu, 2018). Although these authors differed in their ideological orientations, their writings illustrate the importance of economy, society and state intervention in the interwar imagination of development.

In this context, natural resources functioned as a key category of national modernisation. Land, agriculture, forests, oil and energy were associated with the capacity of the state to organise production, reduce dependency and strengthen economic autonomy. The interwar discourse on resources was not equivalent to contemporary environmental thinking. Its main concern was not ecological sustainability, but the productive use of resources for national development, social stabilisation, and economic sovereignty. This distinction is essential for the comparison with the European Green Deal. While the interwar paradigm interpreted resources primarily through the logic of state-building and national economy, the contemporary Green Deal paradigm redefines them through sustainability, climate neutrality and European governance.

The interwar understanding of resources may therefore be described as a national-developmental paradigm. In this paradigm, resources were valuable because they could support the economic and institutional consolidation of the state. The agrarian reform, debates on small agricultural holdings, the persistence of rural poverty and competing projects of modernisation all show that resources were embedded in larger discussions about Romania's place in modern Europe. The relevance of this historical framework lies in the fact that it allows a comparison with the present: contemporary European policies no longer define resources only as instruments of national development, but increasingly as objects of ecological responsibility and supranational regulation.

The European Green Deal and the Redefinition of Natural Resources

The European Green Deal represents a different framework for understanding natural resources. While the interwar Romanian paradigm connected resources mainly to national development, economic autonomy and state consolidation, the contemporary European paradigm places them within a wider agenda of sustainability, climate neutrality and ecological governance. The European Commission defines the Green Deal as a strategy meant to transform the European Union into a modern, resource-efficient and competitive economy (European Commission, 2019). This formulation is important because it does not separate economic development from environmental transformation. Instead, it presents resource efficiency, decarbonization and competitiveness as interconnected objectives of European policy.

The Green Deal also changes the scale at which resources are politically interpreted. In the interwar national-developmental paradigm, land, agriculture, forests, oil and energy were primarily discussed in relation to the state and to the national economy. In the Green Deal framework, the same categories are placed within common European targets and regulatory mechanisms. The European Climate Law establishes the objective of climate neutrality in the European Union by 2050 and sets a binding 2030 target of reducing net greenhouse gas emissions by at least 55% compared to 1990 levels (European Parliament & Council of the European Union, 2021, Articles 2 and 4). As a result, energy, land use, agriculture and industrial production are no longer only matters of national economic planning, but also objects of European climate governance.

Agriculture offers a particularly relevant example for this transformation. In the interwar Romanian context, land and agricultural production were central to debates about property, rural society and national modernisation. In the Green Deal framework, agriculture is reinterpreted through sustainability, food security, biodiversity and climate responsibility. The Farm to Fork Strategy, adopted by the European Commission in 2020, is explicitly presented as part of the European Green Deal and aims to accelerate the transition toward a fair, healthy and environmentally friendly food system (European Commission, 2020a). The strategy connects food production with environmental impact, climate adaptation, biodiversity loss, public health and fair economic returns for actors in the food chain (European Commission, 2020a).

The redefinition of resources is also visible in the field of biodiversity. The EU Biodiversity Strategy for 2030 is described by the European Commission as a long-term plan to protect nature and reverse ecosystem degradation, and it is presented as a key component of the European Green Deal (European Commission, 2020b). Through this perspective, forests, land, water and ecosystems are not viewed only as exploitable resources, but as elements of ecological resilience and public interest. The strategy aims to put Europe's biodiversity on a path to recovery by 2030, linking nature protection to climate, health and social resilience (European Commission, 2020b).

This shift does not mean that the economic dimension of resources disappears. On the contrary, the European Green Deal tries to combine economic transformation with ecological responsibility. However, the meaning of development changes. In the interwar discourse, development was generally associated with productive use, national consolidation and economic

sovereignty. In the Green Deal discourse, development is increasingly associated with sustainability, emission reduction, circularity, resilience and long-term environmental limits. The resource is no longer defined only by its contribution to national wealth, but also by the ecological consequences of its use.

The comparison with the interwar Romanian paradigm, therefore, reveals both a rupture and a continuity. The rupture lies in the conceptual framework: natural resources are no longer interpreted mainly as assets of the nation-state, but as part of a European ecological and regulatory order. The continuity lies in the persistence of political concern over resources. Land, agriculture, forests and energy remain strategic issues, but the vocabulary through which they are discussed has changed. The language of national modernisation has been partially replaced by the language of green transition, sustainability and climate neutrality.

For this reason, the Green Deal can be understood as a contemporary reconfiguration of the resource question. It does not eliminate the political importance of resources, but relocates it. Resources remain central to economic and social life, yet their governance is increasingly shaped by European objectives, environmental standards and long-term climate commitments. In this sense, the Green Deal transforms the older problem of how resources should serve development into a new question: how development itself can be reorganised within ecological limits. (Ciot, Vănoagă, Butișcă, 2024)

Continuities and Ruptures between Interwar Modernisation and Green Transition

The comparison between the interwar Romanian discourse on national resources and the contemporary European Green Deal reveals both continuities and ruptures. The main continuity concerns the political importance of natural resources. In both frameworks, resources are not neutral economic objects. They are connected to broader questions of development, authority, social organisation, and collective future. In interwar Romania, land and agriculture were central to the modernisation of a predominantly agrarian society, while the agrarian reform of 1921 was interpreted as a social and national intervention in the structure of property (Doboș, 2024; Valdman, 2022). In the contemporary European framework, agriculture, forests, energy and ecosystems remain strategic issues, but they are increasingly defined through sustainability, climate neutrality and environmental responsibility (European Commission, 2019; European Commission, 2020a; European Commission, 2020b).

A second continuity concerns the persistence of the idea of public interest. In the interwar paradigm, the public interest was generally associated with state consolidation, national development and the strengthening of economic autonomy. Natural resources were important because they could support the productive and institutional development of the Romanian state. In the Green Deal paradigm, the public interest is reformulated through climate policy, ecological resilience and long-term sustainability. The European Climate Law gives this transformation a legal form by establishing climate neutrality by 2050 and a binding 2030 target for the reduction of net greenhouse gas emissions (European Parliament & Council of the European Union, 2021,

Articles 2 and 4). Thus, the public importance of resources persists, but the principles through which it is defined change.

The most important rupture concerns the scale of governance. Interwar debates placed resources primarily within the framework of the nation-state. Land reform, agricultural productivity, rural society and economic modernization were discussed in relation to the consolidation of Greater Romania and to the capacity of the state to organize national development (Dragomir, 2010; Doboș, 2024). By contrast, the Green Deal places resources within a supranational regulatory framework. The European Union defines common objectives regarding climate neutrality, resource efficiency, food systems and biodiversity protection (European Commission, 2019; European Commission, 2020a; European Commission, 2020b). This means that resources are no longer governed only through national priorities, but also through European commitments and shared environmental standards.

A second rupture concerns the meaning of development. In the interwar period, modernisation was usually associated with productive use, economic growth, agrarian reform, industrialisation, and state consolidation. Studies on interwar Romania show that political and intellectual projects of modernisation were concerned with the transformation of a rural and peripheral economy into a more integrated and productive national economy (Dragomir, 2010; Costinescu, 2018). In the Green Deal framework, development is redefined through the need to reconcile economic activity with climate and environmental limits. The European Commission presents the Green Deal as a strategy for a modern, resource-efficient and competitive economy, thereby linking development to decarbonization and resource efficiency (European Commission, 2019).

A third rupture concerns the status of nature itself. In the interwar national-developmental paradigm, nature appeared mainly as a source of production, wealth and economic autonomy. Land, forests, oil and energy were interpreted through their contribution to national development. In the Green Deal paradigm, nature is not only a resource to be used, but also a system to be protected and restored. The EU Biodiversity Strategy for 2030 presents biodiversity protection and ecosystem restoration as central components of the European Green Deal (European Commission, 2020b). This marks a shift from an extractive or productive understanding of natural resources toward an ecological and regulatory understanding of the relationship between society and nature.

The role of intellectual and political elites also changes. In the interwar period, elites educated in European universities acted as mediators between European academic models and national projects of modernisation. Their formation abroad contributed to the circulation of ideas about the state, society, economy and development (Nastasă, 2008; Siupiur, 2014; Bodale, 2020). In the contemporary period, expertise is increasingly institutionalised within European policy frameworks, legal regulations and administrative strategies. The Green Deal is therefore not only a political discourse, but also a complex system of governance that translates environmental objectives into binding targets, strategies and sectoral policies (European Commission, 2019; European Parliament & Council of the European Union, 2021).

This comparison shows that the meaning of natural resources has not remained stable. In interwar Romania, resources were mainly connected to the national question: how could the state

consolidate itself, organise production and reduce dependency? In the Green Deal framework, the central question is different: how can economic and social development continue within ecological limits? The shift is not from politics to technocracy, but from one political vocabulary to another. The older vocabulary of national modernisation is replaced or supplemented by the vocabulary of sustainability, climate neutrality, biodiversity and European governance.

Therefore, the European Green Deal does not eliminate the historical importance of resources. Rather, it redefines the conditions under which resources can be used, protected and governed. The interwar paradigm treated resources as instruments of national development, while the contemporary paradigm treats them as elements of a broader ecological, economic and regulatory system. The concept of national interest does not disappear, but it is no longer sufficient on its own. It must be articulated in relation to European commitments, climate objectives and the long-term sustainability of economic and social life.

Conclusions

This article has examined the changing meanings attributed to natural resources by comparing two different historical and political frameworks: interwar Romanian modernisation and the contemporary European Green Deal. The starting point of the analysis was the role of European academic formation in shaping Romanian intellectual and professional elites. Western and Central European universities contributed to the formation of Romanian elites by providing models of professional training, institutional organisation, and intellectual culture (Nastasă, 2008; Siupiur, 2014; Bodale, 2020). This European academic formation became particularly relevant in the interwar period, when the Romanian state had to address the challenges of territorial integration, institutional consolidation and national modernisation.

In the interwar framework, natural resources were interpreted mainly through the logic of national development. Land, agriculture, forests, oil and energy were not only economic realities, but also elements of a broader political vocabulary centred on sovereignty, economic autonomy and state-building. The agrarian reform of 1921 illustrates this connection between resources, social transformation and national consolidation, since land redistribution was linked to both peasant demands and the political reorganisation of Greater Romania (Doboș, 2024; Valdman, 2022). At the same time, Romania's persistent agrarian character and its peripheral economic position kept agriculture and rural development at the centre of interwar debates on modernisation (Dragomir, 2010). Interwar political thought did not offer a single model of development, but the projects associated with figures such as Dimitrie Gusti, Virgil Madgearu, Mihail Manoilescu and Ștefan Zeletin show the importance of economy, state intervention and social transformation in Romanian debates about modernisation (Costinescu, 2018).

By contrast, the European Green Deal introduces a different framework for understanding resources. The European Commission defines the Green Deal as a strategy for transforming the European Union into a modern, resource-efficient and competitive economy (European Commission, 2019). The European Climate Law gives this transformation a binding

legal dimension by establishing the objective of climate neutrality by 2050 and the target of reducing net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels (European Parliament & Council of the European Union, 2021, Articles 2 and 4). In this context, natural resources are no longer defined only through their contribution to national economic development, but also through sustainability, climate neutrality, biodiversity protection and ecological responsibility.

The comparison developed in this article shows both continuity and rupture. The continuity lies in the fact that natural resources remain politically important. They continue to be connected to questions of public interest, economic organisation, and collective future. The rupture lies in the vocabulary through which their importance is defined. In the interwar Romanian paradigm, resources were primarily understood as instruments of national modernisation and economic sovereignty. In the Green Deal paradigm, they are increasingly understood as elements of a wider ecological and regulatory order. Agriculture, forests, land and energy remain strategic, but they are now interpreted through European commitments, environmental limits and long-term sustainability.

The analysis supports the central hypothesis of the article. The idea of national interest does not disappear in the context of the green transition, but it is reformulated. In the interwar period, national interest was closely connected to the productive use of resources and to the consolidation of the state. In the contemporary European context, national interest must be articulated in relation to climate objectives, ecological responsibility and supranational governance. This transformation does not erase the historical relevance of resources; rather, it changes the conditions under which they are politically and intellectually understood.

The contribution of this article is twofold. First, it connects the study of Romanian intellectual elites and European academic formation with the history of modernisation and national resources. Second, it places this historical discussion in dialogue with the contemporary European Green Deal, showing how an older problem of national development is reconfigured in the language of sustainability and climate governance. From this perspective, the article contributes to a historically grounded understanding of the Green Deal, not as an isolated contemporary policy, but as part of a longer transformation in the way European societies define the relationship between development, resources and collective responsibility.

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